Technical Report on the Yauricocha Mine

Yauricocha Mine

Yauyos, Peru

Effective Date: December 31, 2023

Report Date: June 14, 2024

Prepared by

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IMPORTANT NOTICE

This technical report was prepared in accordance with National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101) for Sierra Metals Inc. (Sierra Metals) by AGP Mining Consultants Inc. (AGP), also known as the Report Author. The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in the Report Authors' services, based on i) information available at the time of preparation of the report, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report. This report is intended for use by Sierra Metals subject to the terms and conditions of their contract with the Report Author. Those contracts permit Sierra Metals to file this report as a Technical Report with Canadian Securities Regulatory Authorities pursuant to NI 43-101. Except for the purposes legislated under applicable Canadian provincial, territorial, and federal securities laws, as well as under TSX policies, any other use of this report by any third party is at that party's sole risk.

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Units of Measure

Above mean sea level	amsl
Acre	ac
Ampere	A
Annum (year)	a
Billion	B
Billion tonnes	Bt
Billion years ago	Ga
British thermal unit	BTU
Centimetre	cm
Cubic centimetre	cm3
Cubic feet per minute	cfm
Cubic feet per second	ft3/s
Cubic foot	ft3
Cubic inch	in3
Cubic metre	m3
Cubic yard	yd3
Coefficients of Variation	CVs
Day	d
Days per week	d/wk
Days per year (annum)	d/a
Dead weight tonnes	DWT
Decibel adjusted	dBa
Decibel	dB
Degree	°
Degrees Celsius	°C
Diameter	ø
Dollar (American)	US$
Dollar (Canadian)	C$
Dry metric ton	dmt
Foot	ft
Gallon	gal
Gallons per minute (US)	gpm
Gigajoule	GJ
Gigapascal	GPa
Gigawatt	GW
Gram	g
Grams per litre	g/L
Grams per tonne	g/t
Greater than	>

Hectare (10,000 m2)	ha
Hertz	Hz
Horsepower	hp
Hour	h
Hours per day	h/d
Hours per week	h/wk
Hours per year	h/a
Inch	"
Kilo (thousand)	k
Kilogram	kg
Kilograms per cubic metre	kg/m3
Kilograms per hour	kg/h
Kilograms per square metre	kg/m2
Kilometre	km
Kilometres per hour	km/h
Kilopascal	kPa
Kilotonne	kt
Kilovolt	kV
Kilovolt-ampere	kVA
Kilovolts	kV
Kilowatt	kW
Kilowatt hour	kWh
Kilowatt hours per tonne (metric ton)	kWh/t
Kilowatt hours per year	kWh/a
Less than	<
Litre	L
Litres per minute	L/min
Megabytes per second	Mb/sec
Megapascal	MPa
Megavolt-ampere	MVA
Megawatt	MW
Metre	m
Metres above sea level	masl
Metres Baltic sea level	mbsl
Metres per minute	m/min
Metres per second	m/s
Metric ton (tonne)	t
Microns	µm
Milligram	mg
Milligrams per litre	mg/L
Millilitre	mL
Millimetre	mm
Million	M
Million bank cubic metres	Mbm3

Million tonnes	Mt
Minute (plane angle)	'
Minute (time)	min
Month	mo
Ounce	oz
Pascal	Pa
Centipoise	mPa·s
Parts per million	ppm
Parts per billion	ppb
Percent	%
Pound(s)	lb
Pounds per square inch	psi
Revolutions per minute	rpm
Second (plane angle)	"
Second (time)	sec
Specific gravity	SG
Square centimetre	cm2
Square foot	ft2
Square inch	in2
Square kilometre	km2
Square metre	m2
Thousand tonnes	kt
Three-Dimensional	3D
Tonne (1,000 kg)	t
Tonnes per day	tpd
Tonnes per hour	t/h
Tonnes per year	t/a
Tonnes seconds per hour metre cubed	ts/hm3
Total	T
Volt	V
Week	wk
Weight/weight	w/w
Wet metric ton	wmt

Abbreviations and Acronyms

Absolute Relative Difference	ABRD
Acid Base Accounting	ABA
Acid Rock Drainage	ARD
Alpine Tundra	AT
Atomic Absorption Spectrophotometer	AAS
Atomic Absorption	AA
British Columbia Environmental Assessment Act	BCEAA
British Columbia Environmental Assessment Office	BCEAO
British Columbia Environmental Assessment	BCEA
British Columbia	BC
Canadian Dam Association	CDA
Canadian Environmental Assessment Act	CEA Act
Canadian Environmental Assessment Agency	CEA Agency
Canadian Institute of Mining, Metallurgy, and Petroleum	CIM
Canadian National Railway	CNR
Carbon-in-leach	CIL
Caterpillar's® Fleet Production and Cost Analysis software	FPC
Closed-circuit Television	CCTV
Coefficient of Variation	CV
Copper equivalent	CuEq
Counter-current decantation	CCD
Cyanide Soluble	CN
Digital Elevation Model	DEM
Direct leach	DL
Distributed Control System	DCS
Drilling and Blasting	D&B
Environmental Management System	EMS
Flocculant	floc
Free Carrier	FCA
Gemcom International Inc.	Gemcom
General and administration	G&A
Gold equivalent	AuEq
Heating, Ventilating, and Air Conditioning	HVAC
High Pressure Grinding Rolls	HPGR
Indicator Kriging	IK
Inductively Coupled Plasma Atomic Emission Spectroscopy	ICP-AES
Inductively Coupled Plasma	ICP
Inspectorate America Corp.	Inspectorate
Interior Cedar – Hemlock	ICH
Internal rate of return	IRR
International Congress on Large Dams	ICOLD
Inverse Distance Cubed	ID3

Land and Resource Management Plan	LRMP
Lerchs-Grossman	LG
Life-of-mine	LOM
Load-haul-dump	LHD
Locked cycle tests	LCTs
Loss on Ignition	LOI
Metal Mining Effluent Regulations	MMER
Methyl Isobutyl Carbinol	MIBC
Metres East	mE
Metres North	mN
Mineral Deposits Research Unit	MDRU
Mineral Titles Online	MTO
National Instrument 43-101	NI 43-101
Nearest Neighbour	NN
Net Invoice Value	NIV
Net Present Value	NPV
Net Smelter Prices	NSP
Net Smelter Return	NSR
Neutralization Potential	NP
Northwest Transmission Line	NTL
Official Community Plans	OCPs
Operator Interface Station	OIS
Ordinary Kriging	OK
Organic Carbon	org
Potassium Amyl Xanthate	PAX
Predictive Ecosystem Mapping	PEM
Preliminary Assessment	PA
Preliminary Economic Assessment	PEA
Qualified Persons	QPs
Quality assurance	QA
Quality control	QC
Rhenium	Re
Rock Mass Rating	RMR ‘76
Rock Quality Designation	RQD
SAG Mill/Ball Mill/Pebble Crushing	SABC
Semi-autogenous Grinding	SAG
Standards Council of Canada	SCC
Stanford University Geostatistical Software Library	GSLIB
Tailings storage facility	TSF
Terrestrial Ecosystem Mapping	TEM
Total dissolved solids	TDS
Total Suspended Solids	TSS
Tunnel boring machine	TBM
Underflow	U/F

Valued Ecosystem Components	VECs
Waste rock facility	WRF
Water balance model	WBM
Work Breakdown Structure	WBS
Workplace Hazardous Materials Information System	WHMIS
X-Ray Fluorescence Spectrometer	XRF

Forward Looking Statements

This Technical Report, including the economics analysis, contains forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995 and forward-looking information within the meaning of applicable Canadian securities laws. While these forward-looking statements are based on expectations about future events as at the effective date of this Report, the statements are not a guarantee of Sierra Metal's future performance and are subject to risks, uncertainties, assumptions, and other factors, which could cause actual results to differ materially from future results expressed or implied by such forward-looking statements. Such risks, uncertainties, factors, and assumptions include, amongst others but not limited to metal prices, mineral resources, mineral reserves, capital and operating cost forecasts, economic analyses, smelter terms, labour rates, consumable costs, and equipment pricing. There can be no assurance that any forward-looking statements contained in this Report will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements.

1 SUMMARY

1.1 Introduction

Sierra Metals Inc. (Sierra Metals) is a Canadian mining company with its corporate office located in Toronto, Canada with their Peruvian head office in Lima, Peru. Sierra Metals is a mid-tier mining company with two active mining operations: Yauricocha Mine (Peru) and Bolivar Mine (Mexico). Sierra Metals also has several exploration properties in both Mexico and Peru.

This Technical Report (Report) was prepared on behalf of Sierra Metals by AGP Mining Consultants Inc. (AGP), Caracle Creek International Consulting Inc. (Caracle Creek), and Atticus Geoscience Consulting (Atticus). The purpose of the Report is to present the results of the Mineral Resources and Mineral Reserves for the Yauricocha Mine to include all available drill information and account for the depletion of mineral resources in 2023.

This Report was prepared in compliance with the Canadian disclosure National Instrument 43-101 – Standards of Disclosure for Mineral Projects (NI 43-101) and in accordance with the requirements of Form 43-101 F1 and in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum Standards on Mineral Resources and Reserves: Definitions and Guidelines, May 10, 2014 (CIM, 2014). The effective date of this Report is 31 December 2023.

1.2 Property Description and Location

The Yauricocha Mine, the subject of this Report, is situated in central Peru approximately 330 km by road south-east of Lima, is a polymetallic mine producing copper, gold, and silver. The mine is operated by Sierra Metal’s wholly owned subsidiary, Dia Bras Peru S.A.C. (DBP).

The mineral rights to the Property is comprised of a single mining concession (Concession Minera). The mineral rights are in good standing.

The mining rights that make up the mining concession Acumulación Yauricocha were transferred to Minera Corona in 2002 (Empresa Minera, 2002) by Empresa Minera del Centro del Peru S.A. (CENTROMIN). In May 2011, Dia Bras Peru S.A.C. (DBP), a subsidiary of Sierra Metals, purchased 82% of Minera Corona, which includes the mining concession Accumulation Yauricocha.

1.3 Accessibility, Climate, Local Resources, Infrastructure and Physiography

The main access to the Property is from Lima, along the Pan-American Highway south for approximately 135 km, following the coast to San Vicente de Cañete. The road turns inland along Highway 24 northeast (Carretera Yauyos-Cañete), through the valley of the Rio Cañete, for approximately 190 km to the turn off on the access road (Chumpe Road) to the mine. The mine is situated a further 6 km along this road. The road is unpaved from Chupaca to the mine. The drive is typically 7 hours.

The largest community in the area is Huancayo located approximately 100 km to the east-northeast. Huancayo and the surrounding communities have a combined population of approximately 619,000. Huancayo is the capital of the Junin Region of Peru.

There are Tailings Storage Facilities (TSF), Waste Rock Dumps and Processing plant facilities in operation on at the mine site.

The primary power is provided through the existing power system, Sistema Interconectado Nacional (SINAC) to the La Oroya Substation.

Water is sourced from Mishquipuquio spring the Klepetko Tunnel and Huacuypacha spring. Water is also sourced from the recycle/overflow water from the tailings storage facility (TSF) depending on end use.

The Property position including mineral concessions and surface rights are expected to be sufficient for foreseeable mine activities. The Project infrastructure is located within the area where Sierra Metals has surface rights.

The Yauricocha mine is situated in the high altitudes of the Andean Cordillera in central Peru. Elevations on the Property vary from 4,000 to 4,700 masl. The highest peaks in the vicinity of the mine reach 5,000 masl.

1.4 History

The silver of Yauricocha was initially documented by Alexander von Humboldt in the early 1800s. In 1905, the Valladares family filed the claims of what is today the Yauricocha Mine. The Valladares family mined high grade silver mineralized material for 22 years and in 1927, Cerro de Pasco Corporation acquired the Yauricocha claims. In 1948, Cerro de Pasco commenced mining operations at Yauricocha until the Peruvian Military Government nationalized Cerro de Pasco Corporation and Yauricocha became a production unit of State-owned Centromin Peru S.A. for 30 years. In 2002, the Yauricocha unit was privatized and purchased by Minera Corona. Sierra Metals, through DBP, acquired 82% of the total equity of Corona in May 2011 (SRK, 2022).

Sierra Metals retains a 100% controlling ownership status in the Yauricocha Mine, through their subsidiary Sociedad Minera Corona S.A. (Minera Corona). An unnamed private interest holds 18.16% equity ownership in Yauricocha, with Sierra Metals holding the remaining 81.84% (SRK, 2022).

Prior to the 1970s detailed production records are unavailable. Since 1973, Company records indicate that Yauricocha has produced 13.6 Mt of mineralized material containing 63 Moz of silver as well as 378 kt of lead, 117 kt of copper and nearly 618 kt of zinc. Since 1979, Yauricocha has averaged 413,000 t of production per year.

1.5 Geology and Mineralization

The Western Andean Cordillera is recognized for its world class base- and precious-metal deposits, many of which have been intermittently mined since Incan time. Most of the metal deposits in Peru are spatially and genetically associated with metal-rich hydrothermal fluids generated along magmatic belts that were emplaced along convergent plate tectonic lineaments. Furthermore, many of these primary base-metal deposits have undergone significant supergene enrichment due to uplift and weathering over the last 30 Ma.

Formations significant to the Yauricocha Mine include the oldest rocks of the lower Cretaceous Goyllarisquizga arenites; the mid-Cretaceous limestones of the Jumasha Formation; the Celendín Formation which concordantly overlies the Jumasha Formation and contains finely stratified silicic lutites with intercalations of recrystallized limestone; the Casapalca red beds lay concordantly on the Celendín Formation with a gradational contact; and Miocene age intrusions with an average age of about 6.9 Ma.

All of the intrusions have produced metamorphic aureoles in the surrounding rocks. The extent, type, and grade of metamorphism vary greatly with the type of rock intruded. The rocks have been altered to quartzites, hornfelsed lutites, and recrystallized limestones. Locally, the intrusions have produced narrow zones of skarn of variable width. These skarn zones contain epidote, zoisite, tremolite, wollastonite, phlogopite, garnet, chlorite and diopside.

The Andean Cordillera uplift has dominated the structural evolution of the Yauricocha area through episodes of folding, fracturing, and brecciation associated with the local structure having a general NW-SE strike.

Mineralization at the Yauricocha Mine is represented by variably oxidized portions of a multiple- phase polymetallic system with at least two stages of mineralization, demonstrated by sulphide veins cutting brecciated polymetallic sulphide mineralized bodies. The mineralized bodies and quartz- sulphide veins appear to be intimately related and form a very important structural/mineralogical assemblage in the Yauricocha mineral deposit. Comments herein made regarding the characteristics of the Yauricocha district apply directly to the Minera Corona Yauricocha Mine.

1.6 Deposit Types

Mineralization in the Yauricocha district is spatially and genetically related to the Yauricocha stock, a composite intrusive body of granodioritic to quartz monzonitic composition that has been radiometrically dated at late Miocene (approximately 7.5 Ma) (Giletti and Day, 1968). The stock intrudes tightly folded beds of the late Cretaceous Jumasha and Celendín Formations and the overlying Casapalca Formation (latest Cretaceous and Paleocene?). Mineralized bodies are dominantly high-temperature polymetallic sulphide bodies that replaced limestone. Metal-bearing solutions of the Yauricocha magmatic-hydrothermal system were highly reactive and intensely attacked the carbonate wall rock of the Jumasha and Celendín Formations, producing the channels in which sulphides were deposited. Base and precious metals were largely precipitated within several hundred metres of the stock (Lacy, 1949; Thompson, 1960). Skarn is developed adjacent to the stock but does not host appreciable amounts of economic mineralization (Alverez and Noble, 1988). Mineralization typically exhibits both vertical and radial zoning and there is a pronounced district zoning, with an inner core of enargite (the principal copper mineral) giving way outward to an enargite-chalcopyrite-bornite zone, which in turn is succeeded to the west by zones characterized by sphalerite, galena, and silver (Lacy, 1949; Thompson, 1960).

The mineralized zones at Yauricocha are partially to completely oxidized and extend from the surface to below level 1220. Supergene enrichment is closely related to oxidation distribution. Supergene covellite, chalcocite and digenite are found where the sulphide minerals are in contact with oxidized areas.

1.7 Exploration

Since 2016, surface exploration has focused more on areas surrounding the Central mine, mainly to the south of the mine in the areas of Doña Leone, El Paso, Success, Kilcasca, and the South Yauricocha Fault. The work has consisted of detailed geological mapping, sampling for geochemical interpretation and focusing on areas with strong anomalies. During 2017, the Canadian company, Quantec Geoscience Ltd. ("Quantec"), was contracted to perform a surface geophysical study using the Titan 24 DC resistivity induced polarization (DCIP) & Magnetotelluric (MT) methods.

The Yauricocha mining district contains multiple polymetallic deposits represented by skarn and carbonate replacement bodies and intrusion-hosted veins related to Miocene-era magmatism. Mineralization is strongly structurally controlled with the dominant features being the Yauricocha Fault and the contact between the Jumasha limestones and the Celendín Formation (especially the France Chert). Exploration is being conducted to expand the mineralized zones currently being exploited as well as on prospects in the vicinity of the operations.

Exploration in the district has been ongoing and work has been successful in delineating several targets (described above) for future drilling or exploration development. This work has included detailed geological mapping of the areas, surface rock chip sampling, and limited trench / channel sampling.

1.8 Drilling

As of the Effective Date, 31 December 2023, Sierra Metals has completed approximately 663,013 m of diamond drilling in 4,502 drill holes. Drill holes are categorized as exploration and development, drilling by contractor, and drilling by the Company. Since the effective date of the previous technical report (SRK, 2022), Sierra Metals has completed 73,913 m of drilling in 568 diamond drill holes. Drilling is ongoing on the Project.

1.9 Sample Preparation

Samples were processed and analyzed for the Company by ALS Minerals an industry leader in sample preparation and analysis which uses equipment that meets or exceeds industry standards. Preparation included jaw crushing to 70% less than 2 mm, with a riffle split of 250 g, followed by pulverization using ring pulverizers to >85% passing 75 micrometres. Samples are tracked in barcoded envelopes throughout the process using internal software tracking and control measures.

The core samples were analyzed for a suite of 35 elements using inductively coupled plasma atomic emission spectroscopy (ICP-AES) after an aqua-regia digestion. Samples are also analyzed using an atomic adsorption (AA) method after an aqua-regia digestion for accuracy at overlimit ranges. Au is analyzed using fire assay (FA) with an AA finish.

Since 2018 a rigorous program for quality assurance and quality control has been in place to monitor the results of the reported analyses. The QA/QC process was supported by the insertion of various materials into the normal sample stream including: i) eleven different custom CRMs (certified reference materials); samples of inert blank material; fine (pulp) and coarse (reject) duplicates; and field (quartered core) duplicates. The results conclude that the database is supported by adequate QA/QC to have reasonable confidence to estimate Mineral Resources.

1.10 Data Verification

It is the opinion of the Authors that the procedures, policies and protocols for sampling and drilling verification are sufficient and appropriate and that the core sampling, core handling and core assaying methods used are consistent with good exploration and operational practices such that the data is reliable for the purpose of mineral resource estimation, and for a preliminary economic assessment or other future economic study and for the purposes of the Report as outlined in Section 2.1.

1.11 Mineral Resources

The Mineral Resources for the Yauricocha Mine are: Measured Resource of 1.9 Mt at 1.37% copper, 2.12% zinc, 40.35 g/t silver, 0.48% lead and 0.56 g/t gold. Indicated Resource of 8.4 Mt at 1.29% copper, 2.21% zinc, 42.73 g/t silver, 0.56% lead and 0.47 g/t gold; and an Inferred Resource of 13.2 Mt at 1.30% copper, 1.59% zinc, 34.42 g/t silver, 0.49% lead and 0.43 g/t gold.

Mineral Resources are reported at an NSR and are variable by mining method, the cut-off US$39.71/t for sub-level caving (SLC) and US$62.86/t for cut and fill (OCF) method. Table 1-1 presents the Measured, Indicated and Inferred Mineral Resources on the Yauricocha Mine at the two NSR cut-offs.

Table 1-1: Consolidated Yauricocha Mine Mineral Resource Statement; effective date 31 Dec. 2023.

Class	Tonnes (kt)	Metal Grade							Value	Contained Metal				
		Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%)	As (%)	Fe (%)	NSR (US$/t)	Cu (Mlb)	Au (koz)	Ag (koz)	Zn (Mlb)	Pb (Mlb)
Measured	1945.6	1.37	0.56	40.35	2.12	0.48	0.17	28.53	114.90	58.76	35.03	2523.99	90.93	20.59
Indicated	8428.7	1.29	0.47	42.73	2.21	0.56	0.18	28.07	113.84	239.71	127.36	11579.35	410.66	104.06
M+I	10374.3	1.30	0.48	42.28	2.19	0.55	0.18	28.16	114.04	297.33	160.10	14102.12	500.88	125.79
Inferred	13211.1	1.30	0.43	34.42	1.59	0.49	0.11	30.22	102.88	378.63	182.64	14619.77	463.10	142.71

Notes to Table 1-1:

- Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
- Summation errors may occur due to rounding.
- Mineral Resources are reported at Cut-Off values (COV)'s based on 2023 actual metallurgical recoveries and 2024 smelter contracts.
- Reporting cut-off value is an NSR and are variable based on mining method: US$39.71/t (SLC) and US$62.86/t (OCF).
- NSR was calculated as follows: NSR = Cu∗47.337+Ag∗0.346+Pb∗15.448+Zn∗12.346 +Au∗4.588.
- Metal prices for the NSR formulas are: US$3.77/lb Cu, US$1,711.21/ oz Au, US$22.55/ oz Ag, US$1.17/lb Zn, US$0.94/lb Pb.
- Capping of grades for silver, gold, copper, lead, zinc, arsenic, and iron assays were applied depending on mineralized domain and where appropriate.

The QPs (Simon Mortimer and Oscar Retto) are not aware of any information not already discussed in this report, which would affect their interpretation or conclusions regarding the subject property. The QPs (Simon Mortimer and Oscar Retto) are required to inform the public that the quantity and grade of reported Inferred resources in this estimation must be regarded as conceptual in nature and are based on limited geological evidence and sampling. The geological evidence is sufficient to imply, but not verify, geological grade or quality of continuity. For these reasons, an Inferred resource has a lower level of confidence than an Indicated resource. It is reasonably expected that most of the Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration. The rounding of values, as required by the reporting guidelines, may result in apparent differences between tonnes, grade, and metal content.

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

1.12 Mineral Reserves

AGP Mining Consultants affirms the adherence of the Mineral Reserve Estimate to rigorous industry standards, with the available dataset robustly supporting the categorization of reserves as Probable and Proven. Given the operational status of the Yauricocha Mine, recent production data stands as a cornerstone for validating and, if necessary, deriving pertinent modifying factors to convert Mineral Resources into Mineral Reserves.

Each mining area underwent meticulous evaluation, with tailored mining block configurations aligning precisely with the specific mining methods employed within each zone. This evaluation process drew upon an extensive dataset, incorporating crucial parameters such as mining recovery, dilution, metallurgical recovery rates, operational expenditures, and smelter agreements. These metrics, derived from comprehensive historical data including mine-to-mill reconciliation processes, underpinned the robustness of the assessment.

The production schedule aligned with these reserve estimates extends mining activities until Q4 2029, with an anticipated daily production rate averaging approximately 3,780 tonnes of ore. The overarching Life-of-Mine (LoM) production plan encompasses material sourced from 22 primary mining zones, forming the core of the Ore Reserves for the Yauricocha Mine.

The Mineral Reserves for the Yauricocha Mine are: Proven Reserve of 1.1 Mt at 0.86 % copper, 0.39 g/t gold, 28.22 g/t silver, 1.71 % zinc and 0.24 % lead and Probable Reserves of 5.2 Mt at 1.05 % copper, 0.36 g/t gold, 35.75 g/t silver, 1.85 % zinc and 0.47 % lead.

Mineral Reserves are reported at an NSR and are variable by mining method, the cut-off $US 39.71/t for sub-level caving (SLC) and $US 62.86/t for cut and fill (OCF) method. Mining recovery and dilution have been applied and are variable by mining area and proposed mining method. The effective date of the Mineral Reserves is 31 December 2023.

The consolidated Mineral Reserve statement for the Yauricocha Mine is presented in Table 1-2.

Table 1-2: Individual Mineral Reserve Statement for Yauricocha Mine Areas as of 31 December 2023, AGP.

Class	Tonnes (kt)	Grade							Value	Contained Metal				
		Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%)	As (%)	Fe (%)	NSR ($US/t)	Cu (Mlb)	Au (koz)	Ag (koz)	Zn (Mlb)	Pb (Mlb)
Proven	1,114	0.86	0.39	28.22	1.71	0.24	0.13	21.98	77.08	21.11	13.86	1,011	42.10	5.90
Probable	5,239	1.05	0.36	35.75	1.85	0.47	0.15	21.30	93.89	121.57	59.94	6,021	213.55	53.98
Total	**6,353**	**1.02**	**0.36**	**34.43**	**1.83**	**0.43**	**0.15**	**21.42**	**90.94**	**142.68**	**73.80**	**7,032**	**255.65**	**59.87**

Notes:

Mineral Reserves have been classified in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") Definition Standards on Mineral Resources and Mineral Reserves, whose definitions are incorporated by reference into NI 43-101.

All figures are rounded to reflect the relative accuracy of the estimates. Totals may not sum due to rounding.

The consolidated Yauricocha Reserve Estimate is comprised of Proven and Probable material

Mineral Reserves are reported at Cut-Off values (COV)'s based on 2023 actual metallurgical recoveries and 2024 smelter contracts.

Reporting cut-off value is an NSR and are variable by mining method:

$US 39.71/t. (SLC) and $US 62.86/t (OCF)

NSR was calculated as follows:

$$NSR = Cu*47.337+Ag*0.346+Pb*15.448+Zn*12.346+Au*4.588$$

Metal prices for the NSR formulas are: $US 3.77/lb Cu, $US 1,711.00/ oz Au; and $US 22.55/ oz Ag, $US 0.94/lb Pb, and $US 1.17/lb Zn.

Mining recovery and dilution have been applied and are variable by mining area and proposed mining method.

AGP Mining Consultants confidently asserts that the reserve estimations are apt for public reporting, offering a transparent and accurate portrayal of the mill feed tonnes, grade, and metal content for the Yauricocha deposit. Nonetheless, the consultancy recommends further refinement, particularly suggesting the development of flow modeling techniques for the SLC mining areas and calibration of the geotechnical numerical modeling, to enhance the accuracy and reliability of future assessments.

1.13 Mining and Geotechnical

1.13.1 Mining

Access to the Central Mine and the Cachi-Cachi Mine is facilitated through key infrastructure, including shafts, tunnels, and various access points. The Central Shaft provides access to different operational levels, with the Yauricocha Tunnel connecting it to the Chumpe concentrator plant. Similarly, the Cachi-Cachi Mine utilizes the Yauricocha Tunnel for access, with personnel reaching operational levels via ramps, galleries, and raises.

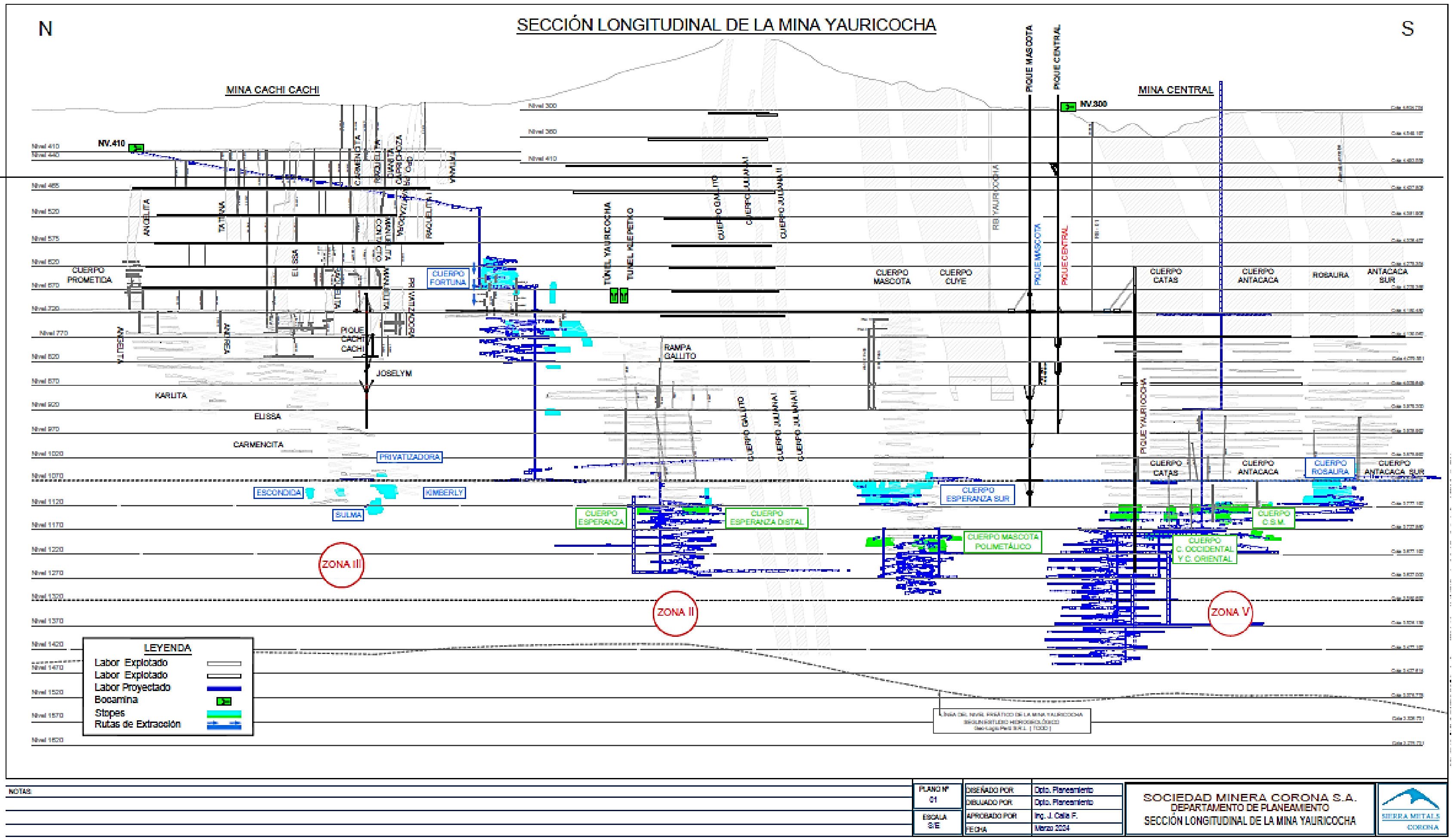
Extraction of minerals and overburden from different levels is conducted through designated shaft pockets, with ore and waste transported to the surface using a combination of vehicles and rail systems. The mining methods employed vary based on the characteristics of the mineralized bodies, with mechanized sub-level caving and overhand cut-and-fill being the primary methods.

A detailed Life of Mine (LoM) production schedule has been developed to ensure operational efficiency, aligning with historical performance and targeting sustainable production rates. Strategic plans are in place to enhance operational facets and maintain targeted production levels, including improvements in equipment maintenance, processing plant optimization, and talent acquisition. The Production Rates are 3,780 tonnes per day for ore extraction

Ventilation systems have been meticulously engineered to supply necessary airflows to all mining zones, ensuring a safe and conducive working environment underground. Presently, the mine maintains a comprehensive ventilation system to facilitate airflow throughout the various mining areas. Ventilation System total fresh air drawn is 204.2 m3/s, with exhaust at 217.2 m3/s.

Overall, the Yauricocha mine is a well-established underground operation with a robust infrastructure and strategic plans for sustainable production and operational excellence, as shown in Figure 1-1.

Figure 16-2: Yauricocha Long Section Showing Mining Areas and Ore Zones (Looking Northeast)



Source: Sierra Metals, 2024

1.13.2 Geotechnical

The Geotechnical logging database initially serves its purpose for preliminary assessments, yet ongoing data collection programs are imperative for deeper sections. AGP Mining Consultants strongly advises the continuous updating and maintenance of the geotechnical model. Closer definition of geotechnical domains near ore zones is imperative to prevent data smearing from disparate domains within block modeling geotechnical classifications unless distinct boundaries are enforced.

Assessments of stoping and SLC layouts through numerical modeling reveal shortcomings in stress modeling adequacy. Considering regional "thrust" tectonic conditions, the horizontal to vertical stress ratio ought to exceed 1.5. Relying solely on individual triaxial tests to determine local strength parameters instead of domain averages risks misinterpretation. Long sections for SLC assessment neglect stress concentration effects around the cave zone, necessitating 2D numerical models perpendicular to ore zone strike, or even full 3D models, to ascertain stress concentration and yield extent around orebodies. Recommendations outlined in Section 26 aim to ensure compliance if adopted and followed.

Current stoping methods align with geotechnical conditions, with potential for reduced Overhand Cut & Fill (C&F) support requirements in poorer ground if cemented rock or pastefill is available for undercutting beneath filled ore drives.

Assessment of ground control management level plans reveals alignment with the conceptual geotechnical rock mass model and domain/sub-domain descriptions outlined in the Geomechanical Assessment Mining Plan 2024. These plans, accompanied by development profiles and installation procedures, are well-prepared for operational implementation. While ground support designs weren't extensively scrutinized, the absence of surface support in favorable ground contradicts industry standards. Incorporating surface mesh and/or shotcrete, even in favorable conditions, is customary unless a comprehensive and systematic check-scaling procedure is ensured.

While the current understanding of subsidence and its impacts is deemed adequate, deeper planned mining areas warrant site-specific stress measurements and modeling. Although comprehension of factors contributing to mudflow and implemented mitigation measures is reasonable, the perpetual risk of mud rush events, particularly during new mining area initiation, emphasizes the need for vigilant dewatering practices, continuous monitoring of existing drawpoints, and thorough investigation of new development areas prior to commencement.

1.13.3 Hydrology

Water ingress into the underground mine, though significant, is effectively managed, a common challenge in Sub-Level Caving (SLC) operations. Operational measures mitigate risks associated with inflow volume and mud rushes, ensuring continuous mining progress. The subsequent sections offer a comprehensive overview of prevailing water conditions and mitigation strategies.

Abundant hydrogeological and hydrological data, from internal mine records and external consultant studies, underpin informed decision-making. These data encompass flow rates and water quality parameters, meticulously mapped for spatial understanding.

Current inflow, approximately 100 liters per second in 2023, arises from surface infiltration and underground discharge. Surface inflow, estimated to surge by 20 to 35 liters per second by 2029, is projected to increase with mine expansion.

Future mine water management necessitates ongoing mitigation efforts to comprehend and control inflow distribution. Monitoring pressure and flow in hydrogeological boreholes, establishing permanent monitoring stations, consolidating data into a unified database, and updating the mine water balance are recommended.

While historical efforts manage water inflows, anticipated expansion demands continual evaluation of mitigation measures. Proactive operational management and strategic planning are vital to mitigate water-related risks effectively.

1.14 Mineral Processing

Various metallurgical test work programs have occurred at the Yauricocha Mine. The Yauricocha process plant currently treats polymetallic sulphide ore via conventional comminution and flotation circuits. The process plant has been progressively upgraded and can nominally treat 3,600 tpd. The plant historically had a capacity of 3,100 tpd to process sulphides and 500 tpd to process oxides. Since 2018, no oxide material has been treated at Yauricocha. The process plant treated 0.99 Mt of ore in 2023 to produce 39 kt of zinc, 26 kt of copper and 11 kt of lead concentrate products.

1.15 Infrastructure

The surface facilities at the mine are essential for its operations, encompassing various critical components. These include hoists and headframes to facilitate the operation of on-site shafts, as well as amenities such as change houses, workshops, engineering spaces, and administrative facilities to support operational needs.

Access to the underground mine is facilitated through a network of pre-existing shafts and tunnels. Presently, the site has three operational shafts: the Central shaft, Mascota shaft, and the Cachi-Cachi shaft, with construction underway for a new shaft, the Yauricocha shaft. These shafts primarily serve to transport personnel and materials, as well as to convey ore and waste to the surface when required.

Material transportation from underground to the surface primarily occurs through tunnels, with all ore and waste transportation currently happening exclusively through these tunnels. At the Cachi Cachi Mine, ore and waste extraction are transported via dump trucks along the Hidden Ramp to the pocket of the Cachi Cachi Shaft at Level 920, then hoisted to Level 720 and conveyed by locomotive through the Yauricocha tunnel to the Concentrator Plant – CHUMPE. Similarly, at the Central Mine, ore and waste extraction are transported by dump trucks along Level 1070 to the pocket of the Mascota Shaft, hoisted to Level 720, and transported by locomotive through the Yauricocha tunnel to the Concentrator Plant – CHUMPE.

The fragmented ore from mechanized sub-level caving (SLCM) and ascending cut-and-fill (OCF) exploitation fronts is directed into accumulation chambers before being loaded onto mine cars and transported to shaft pockets for subsequent hoisting. Waste rock generated from advances is accumulated in loading chambers and loaded onto mine cars before being hoisted to the surface.

0The transportation system utilizes locomotives and mine cars, operating on continuous 250 Volt trolley power, along with low-profile trucks for each mining zone. The water flow trajectory through tunnels reaches the mine water treatment plant via channels and pipelines, where conventional treatment processes are carried out.

The mine ensures an uninterrupted electrical power supply through primary and secondary energy sources. The primary energy source is drawn from the Sistema Electrico Interconectado Nacional (SEIN) and distributed through dedicated transformers, while the secondary energy source utilizes backup generators in case of unforeseen disruptions.

Tailings from the mill are processed and stored in on-site tailings facilities. Currently, Stage 6 of the tailings storage facility (TSF) has been constructed, with ongoing expansion to Stage 7 to accommodate future capacity needs.

1.16 Market Studies and Contracts

Yauricocha functions as a polymetallic mining facility, strategically extracting and processing lead, zinc, and copper ores to produce high-quality concentrates. These concentrates are meticulously tailored to meet specific requirements of smelting operations and are sold to various smelters across the market. Sierra Metals holds a contractual agreement for concentrate sales, meticulously reviewed by AGP Mining, and found to be reasonable and compliant with industry standards. The metals derived from Yauricocha concentrate are actively traded on metal exchanges, including zinc, copper, silver, lead, and gold. Metal prices, sourced from Sierra Metals and validated against the November 2023 CIBC Global Mining Group Analyst Consensus Commodity Price Forecast, are deemed rational and appropriate by AGP Mining for accurate mineral resource and ore reserve representation. Detailed metal price assumptions are provided in Table 1-3 for transparency and reference.

Table 1-3: Metal Prices for Mineral Reserves for the Yauricocha Mine

Metal	Price	Unit
Copper	8,302.27	$/tm
Gold	1,711.21	$/oz
Silver	22.55	$/oz
Zinc	2,588.55	$/tm
Lead	2,064.04	$/tm

1.17 Environmental, Permitting, Social Impact

Sierra Metals has all relevant permits required for the current mining and metallurgical operations. Sierra Metals also has a Community Relations Plan that includes annual assessment, records, minutes, contracts, and agreements. An Environmental Impact was obtained on 11 February 2019.

Currently Sierra Metals is developing a modification of its EIA (EIA Modification), the preparation of the study has been formally started, Sierra Metals expects to present this study to the authority in the fourth quarter of 2024 for their evaluation.

1.18 Capital and Operating Costs

The Project's technical team has meticulously compiled a capital estimate to sustain mining and processing operations, covering essential components. Equipment sustaining costs include resources for maintaining and renewing mining and plant machinery, encompassing vital elements such as the concentrator plant, water pumping systems, tailings dam expansion, mine camp facilities, underground ventilation systems, and environmental considerations.

Additionally, the expansionary capital estimate includes investments like the Yauricocha shaft extension and Yauricocha Tunnel finalization to enhance operational efficiencies. This estimation categorizes into areas including mine development, ventilation, equipment, infill drilling and exploration, plant and tailings storage facility (TSF) enhancement, closure activities, and project or expansionary capital.

Given the Project's operational status, AGP Mining Consultants considered existing working capital reserves sufficient for ongoing operations, thus excluding provisions for working capital fluctuations from economic modeling. A comprehensive breakdown of capital expenditure by area is succinctly presented in Table 1.4 for reference and clarity.

Table 1-4: Capital Cost Summary 2024-2027 (US$)

Description	Budget 2024 (US$,000)	Life of Mine (US$,000)
Sustaining Capital Development	$8,153	$24,910
Sustaining Capital Ventilation	$1,807	$7.804
Sustaining Capital Equipment	$835	$3,495
Sustaining Capital Infill Drilling - Exploration	$811	$1,734
Sustaining Capital Concentrator	$500	$1,500
Growth Capital Tailings Dam	-	$13,082
Sustaining Capital Draining System	$1,483	$4,618
Sustaining Capital Pumping System	$900	$3,225
Growth Capital Yauricocha Shaft	$2,181	$3,938
Growth Capital Waste Dump	-	$1,267
Growth Capital Integration Access to Yau Shaft	$780	-
Growth Capital Mine Closure	-	$10,100
TOTAL CAPITAL	**$17,451**	**$76,483**

Source: Sierra Metals (2024)

The operating cost estimation is meticulously based on site-specific data, supported by historical cost analysis for contextualization. Costs are categorized into mining, processing, and General and Administrative (G&A). For clarity, Table 1.5 presents a summarized comparison of estimated and historical costs, aiding in trend analysis for informed decision-making.

Table 1-5: Modeled Operating Cost Summary

Description	Budget 2024 (US$,000)	Life of Mine (US$/t ore)
Underground Mining	358,330	60.05
Process	81,468	13.78
G&A	29.813	5.42
Total Operating	**439,798**	**79.25**

Source: Sierra Metals (2024)

1.19 Economic Analysis

In accordance with NI 43-101, producing issuers may omit the information necessary for Economic Analysis on properties in current production if the technical report does not entail a substantial expansion of ongoing production. As a producing issuer, Sierra Metals operates the Yauricocha Mine, which is currently in production. Moreover, there are no plans for a significant expansion of current production. Sierra Metals has conducted an economic analysis based on the estimates provided in this report for the life-of-mine plan of the Yauricocha Mine. The analysis affirms positive cash flow, thereby substantiating the declaration of Mineral Reserves.

1.20 Conclusions and Recommendations

1.20.1 Geology

The Yauricocha Mine is an active underground mine operation, situated in Yauyos Province, Peru, approximately 135 km by road from Lima. The Yauricocha Mine and has been in production since the early 1900's. In 2002, the mine was privatized and acquired by Sociedad Minera Corona SA (Minera Corona). In 2011, Sierra Metals, through Dia Bras Peru S.A.C (DBP), a subsidiary of Sierra Metals, purchased and holds an 82% interest in Minera Corona. Since 2001, through Minera Corona, the Yauricocha Mine has remained an active mining operation.

Like many of the ore deposits in the Yauricocha District of central Peru, the Yauricocha Deposit is spatially and genetically related to the Yauricocha Stock, a composite intrusive body of granodioritic to quartz monzonitic composition. The approximately 7.5 Ma (Giletti and Day, 1968) stock intruded tightly folded beds of the Cretaceous Goyllarisquizga, Jumasha, and Celendin formations, and Cretaceous-Tertiary Casapalca Red Beds.

Mineralization in the Yauricocha Deposit features several mineralized zones which have been emplaced along structural trends, with the mineralization itself related to replacement of limestones by hydrothermal fluids related to nearby intrusions. Mineralization varies widely in morphology from large, relatively wide, tabular manto-style deposits, to narrow, sub-vertical chimneys (shoots or pipes). The majority of the mineralization is related to the regional high-angle northwest-trending Yauricocha Fault, or the northeast trending and less well-defined Cachi-Cachi structural trend. The mineralization generally presents as polymetallic sulphides but is locally oxidized to significant depths or related to more Cu-rich mineralization.

All parts of the Property with historical exploration or current production activity are in the current area of operations. This area is nearly centered within the concession boundary and there is both space and potential to expand the resources and the operation both directions along the strike of the Yauricocha Fault.

The sedimentary-hosted Yauricocha polymetallic (copper, lead, zinc, silver, gold) deposit closely resembles that typified by polymetallic Ag-Au deposits, which comprise quartz-sulphide-carbonate fissure vein equivalents of quartz-sulphide and carbonate- base metal deposits.

Mineralized bodies are dominantly high-temperature polymetallic sulphide bodies that replaced limestone. Metal-bearing solutions of the Yauricocha magmatic-hydrothermal system were highly reactive and intensely attacked the carbonate wall rock of the Jumasha and Celendín Formations, producing the channels in which sulphides were deposited. Mineralized zones at Yauricocha are partially to completely oxidized and extend from the surface to below level 1220. Supergene enrichment is closely related to oxidation distribution. Supergene covellite, chalcocite and digenite are found where the sulphide minerals are in contact with oxidized areas.

As of the Effective Date, 31 December 2023, Sierra Metals has completed approximately 663,013 m of diamond drilling in 4,502 holes. Drill holes are categorized as exploration and development, drilling by contractor, and drilling by the Company. Since the effective date of the previous technical report (SRK, 2022), Sierra Metals has completed 73,913 m of drilling in 568 diamond drill holes (Table 10-2). Drilling is ongoing on the Project.

Since 2018 a rigorous program for quality assurance and quality control has been in place to monitor the results of analyses reported from samples of drill core processed by ALS Minerals for the Company. The QA/QC process included the insertion of various materials into the normal sample stream. This included: i) eleven different custom CRMs (certified reference materials); samples of inert blank material; fine (pulp) and coarse (reject) duplicates; and field (quartered core) duplicates.

The results conclude that the database is supported by adequate QA/QC to have reasonable confidence to estimate Mineral Resources. The QP recommends that QA/QC failures be addressed as soon as possible a through a continuous review of the QA/QC results and their performance limits.

QPs (Simon Mortimer and Oscar Retto) have undertaken detailed review of the database, domain interpretation, estimation parameters and validation of the block models of Yauricocha Mine for all stages of the mineral resource estimate.

The Mineral Resources for the Yauricocha Mine are: Measured Resource of 1.9 Mt at 1.37% Cu, 2.12% Zn, 40.35 g/t Ag, 0.48% Pb, and 0.56 g/t Au; Indicated Resource of 8.4 Mt at 1.29% Cu, 2.21% Zn, 42.73 g/t Ag , 0.56% Pb, and 0.47 g/t Au; and an Inferred Resource of 13.2 Mt at 1.30% Cu, 1.59% Zn, 34.42 g/t Ag, 0.49% Pb, and 0.43 g/t Au.

Mineral Resources are reported at an NSR and are variable by mining method, the cut-off US$39.71/t for sub level caving (SLC) and US$62.86/t for cut and fill (OCF) method. The QP responsible for the Mineral Resources Estimate for the Yauricocha Mine is Oscar Retto, MAIG. The effective date of the Mineral Resources is 31 December 2023.

The QPs (Simon Mortimer and Oscar Retto) are of the opinion that the Mineral Resources have been estimated using standard industry practices and are suitable for public reporting in compliance with NI 43-101.

QP (Simon Mortimer) has made the following recommendations for the development of the Mineral Resources at Yauricocha:

- Integrate geology data in a single database for the entire Yauricocha mine, which can be easily verified and audited.
- The number of bulk density measurements be increased in mineralized structures that lack sufficient values.
- Integration of structures (fault model) and mineralized zones as shown in Mina Central into a global model is essential in developing a comprehensive exploration and mining model. This will improve the representation of mineral continuity and prevent inconsistencies in defining domains.
- Evaluate the inclusion of channel samples for block estimation with alternative geostatistical methods as conditional simulation.
- Conduct geostatistical studies to investigate if the current block dimensions used in the model are the optimum size for resource estimation and mining method.
- Lithology and structural models be extended to cover all the zones of the mine and that the individual mineralised zone wireframes be remodelled with respect to the new 3D lithostratigraphic interpretation.
- Completion of an integrated structural-lithostratigraphic and mineralisation model would facilitate the mine planning process with regards to the ability to apply a waste density for dilution purposes and serve for brownfields exploration.

1.20.2 Mineral Reserves and Mining Method

The Yauricocha Mine operates efficiently with a rich production history. Its primary mining method, mechanized sub-level caving, supplemented by overhand cut and fill, ensures operational stability. With a projected daily production rate of 3,780 tonnes (1.38 million tonnes annually) in 2024, the mine's operational continuity is deemed sustainable throughout its Life of Mine (LoM) plan.

The QP (Alonso Gonzales) have the following recommendations for the Mineral Reserve estimation practices and mining methods at Yauricocha:

- Efforts should be directed towards streamlining and automating the mineral reserve estimation process to facilitate future estimates, reviews, and audits.
- The mine planning group should thoroughly review the latest version of the MRMR Best Practice Guidelines published by CIM on November 29th, 2019, and strive to implement the best practices pertaining to the mineral reserve estimation process.
- It is imperative to establish a robust mineral reserve to mine-to-mill reconciliation process to provide solid support for the dilution and mining recovery assumptions.
- The redesign and update of the SLC mine design layouts and sequencing based on the Geotechnical recommendations:

  - lead/lag rules
  - cave front retreat direction
  - pillar analysis (Interlevel and on level design)
- Reassessment of the production drilling equipment fleet utilised on site to meet redesign requirements.
- The development of an SLC flow model for grade and tonnage forecasting
  - step-outs
  - cave draw strategy
  - HoV optimisation
  - SLC flow model calibration and reconciliation
- Integration of flow model with Deswik mine design and scheduling process.
- The development of a cave and operational management plan
  - enhancing operational practices and reduces hazards on the SLC
  - improvement on the risk and safety protocols
  - optimising the SLC mining recovery and reduction in dilution
- Incorporating a risk assessment as a standard component of the reserve estimation process is considered a best practice.
- An appropriate data collection system must be implemented to gather the necessary data for establishing the reconciliation process in a usable format. While this is relative straightforward for cut and fill areas, it presents greater challenges for sub-level caving areas.
- Close monitoring of the Yauricocha Shaft project is essential to ensure timely access.
- Completion of a consolidated 3D Life-of-Mine (LoM) design is recommended to enhance communication of the LoM plan, infill drilling requirements, and overall mine planning and execution.
- Update on the Base Case LoM plan should be maintained and utilized by Yauricocha to furnish medium and short-term mine production forecasts.
- The mine planning group should prepare one or more LoM plans that are more optimistic than the Base Case for strategic planning purposes.
  - typically, the optimistic LoM plan incorporates inferred mineral resources designed to a conceptual level of detail and is updated as resources transition to Indicated or Measured categories.

1.20.3 Geotechnical

AGP Mining Consultants suggests ongoing data collection for deeper sections and detailed definition of geotechnical domains near ore zones. They recommend improved stress modeling for stoping and SLC layouts and utilizing 2D and 3D models. Current stoping methods are deemed appropriate, with potential support reduction in poorer ground conditions. While ground control management plans align with geotechnical models, the absence of surface support in good ground contradicts industry standards. AGP acknowledges the adequacy of understanding subsidence and induced stress within existing mining areas but highlights the need for site-specific stress measurements in deeper planned areas and vigilant dewatering practices to mitigate mud rush risks during new mining area initiation.

AGP's geotechnical recommendations are:

- Develop a comprehensive Geotechnical Management Plan
    - available logging, mapping, and testing data,
    - maintain a centralized geotechnical database for efficient data management.
    - planned investigation programmes,
    - develop and uphold geotechnical models, encompassing structures and rock mass wireframes, to enhance geological understanding.
    - design methods to be applied for mining sections,
    - ground support requirements,
    - monitoring systems.
- Continue the acquisition of geotechnical characterization data from mined drifts and exploration drillholes.
- Undertake further numerical modelling analyses to assess ore drive stability and potential dilution in deeper mining sections; analyses should include prominent structural features.
- Conduct an insitu stress measurements in the deeper planned mining areas.
- Friction bolts (split sets) are not effective in high stress/deformation conditions.
    - consider using higher capacity grouted and yieldable types of rock bolts.
- Conditions will become more difficult with increasing depth and stress. Increased deformation/yield is likely to develop.
    - increased spacing between cross-cut drives and levels to limit pillar yield.
- If cemented rock or pastefill is available, the mine could reduce C&F support requirements in poorer ground by undercutting beneath filled ore drives.
- Longhole open stoping does not appear to be a practical method for Fortuna 7 ground conditions; it is likely to result in extensive wall failure/dilution.
- Sustain short-term to long-term dewatering programs, employing drainage systems to manage groundwater levels effectively.
- Review the current mine sequence and simulate an optimal mine sequence to mitigate safety risks and the potential for inadvertent ore reserve sterilization due to unforeseen ground conditions.
    - cave front retreat relative to principal stress
    - SLC step-outs
    - lead lag rules (inter-level and within production level)

1.20.4 Capital and Operating Cost

AGP Mining believes that the current operating and capital cost estimates represent reasonable projections for extracting the existing Mineral Reserves, given the current state of knowledge.

2 INTRODUCTION

Sierra Metals Inc. (Sierra Metals) is a Canadian mining company with its corporate office located in Toronto, Canada and its Peruvian head office in Lima, Peru. Sierra Metals is a mid-tier mining company with two active mining operations: Yauricocha Mine (Peru) and Bolivar Mine (Mexico). Sierra Metals also has several exploration properties in both Mexico and Peru.

The Yauricocha Mine, the subject of this Report, is situated in central Peru approximately 135 km from Lima, along the Pan-American Highway south to San Vicente de Cañete. Yauricocha is a polymetallic mine producing copper, gold and silver, operated by Sierra Metal's wholly owned subsidiary, Dia Bras Peru S.A.C. (DBP).

The mineral rights to the Property comprise a single mining concession, Acumulación Yauricocha (the "Property" or "Project" or "Mining Concession"), which were transferred to Minera Corona in 2002 (Empresa Minera, 2002) by Empresa Minera del Centro del Peru S.A. (CENTROMIN). In May 2011, Dia Bras Peru S.A.C., a 100% subsidiary of Sierra Metals Inc., purchased 82% of Minera Corona, which holds the Mining Concession.

2.1 Issuer and Purpose

This Technical Report (Report) was prepared on behalf of Sierra Metals by AGP Mining Consultants Inc. (AGP), Caracle Creek International Consulting Inc. (Caracle Creek), and Atticus Geoscience (Atticus). The purpose of the Report is to present the results of the Mineral Resources and Mineral Reserves for the Yauricocha Mine to include all available drill hole information and account for the depletion of mineral resources in 2023.

This Report was prepared in compliance with the Canadian disclosure National Instrument 43-101 – Standards of Disclosure for Mineral Projects (NI 43-101) and in accordance with the requirements of Form 43-101 F1 and in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum Standards on Mineral Resources and Reserves: Definitions and Guidelines, May 10, 2014 (CIM, 2014). Qualified Persons

2.2 List of QPs

The list of Qualified Persons (QPs) responsible for the preparation of this Report and the sections under their responsibility are provided in Table 2-1.

Table 2-1: Distribution of Qualified Persons' Responsibilities

Qualified Person	Position	Responsibilities
Mr. Simon Mortimer, FAIG	Principal Resource Geologist Atticus Geoscience	Section 1.11, 2.3.1, 2.4-2.7, 3, 10, 12, 14.1 – 14.4, 25, 26; co-author 1.11, 3, 10, 12, 25, 26
Dr. Scott Jobin-Bevans, P.Geo.	Principal Geoscientist Caracle Creek	Section 1.1 – 1.8, 1.10, 1.20, 2.1, 2.2, 3 – 10, 12, 23, 25, 27; co-author 3, 10, 12, 25
Mr. John Siriunas, P.Eng.	Associate Professional Engineer Caracle Creek	Sections 1.9, 1.10, 11, 12, 25; co-author 12, 25
Mr. Oscar Retto, MAIG	Resource Estimator, AGP	Sections 1.11, 12, 14.5 – 14.11,25,26; co-author 1.11, 12, 25, 26
Mr. Alonso Gonzales, MAusIMM	Principal Mining Engineer, AGP	Sections 1.12, 1.13, 1.15, 1.16, 1.18, 1.19, 1.20, 2.3.2, 15, 16, 18, 19, 21, 22, 24, 25, 26; co-author of 25, 26
Mr. Neil Lincoln, P.Eng.	Principal Process Engineer, AGP	Sections 1.14, 13 and 17
Mr. Sandro Guarniz Anticona, MAusIMM	Mining Engineer, Sierra Metals	Sections 1.17 and 20

2.3 Site Visits and Scope of Personal Inspection

2.3.1 Geology

A personal inspection (site visit) to the Project was completed by the co-author and Qualified Person (QP), Mr. Simon Mortimer (FAIG), arriving on 6 November and leaving on 8 November 2023, spending two full days on the Project. During the site visit, the QP spent time underground within the active mine operations, spent time in the geology office, in the core storage facilities, and in the on-site laboratory.

As part of the inspection, Mr. Mortimer confirmed access to the Project, verified the presence of the mining operation, the historical and the ongoing exploration work, visited the underground drilling sites and the extractive front, examined diamond drill core, reviewed sampling and analysis protocols at the onsite laboratory, and reviewed data management procedures for the exploration sampling and assay data.

Mr. Mortimer was accompanied on site by:

- Mr. Ricardo Salazar, Corporate Manager, Mineral Resources for Sierra Metals
- Mr. Vladimir Bedoya, Chief Project Geologist for Minera Corona
- Ms. Jeimy Salas, Modeller Geologist, for Minera Corona

2.3.2 Mining

Mr. Gonzales completed a site inspection to the Yauricocha Mine between 12 January and 16 January 2024, for three days. The site visit included a detailed review of the mine plan, scheduling, ventilation, infrastructure requirements, geotechnical data and costing for the extraction zones within the Yauricocha Mine for all stages of the Ore Reserve Estimate. The site visit and meetings have led to a comprehensive understanding of all aspects for ore reserves estimation.

2.4 Effective Date

The effective date for the Technical Report and the Mineral Resource Estimate is 31 December 2023

2.5 Information Sources and References

Information used to support this Report was also derived from previous technical reports on the Project, and from the reports and documents listed Sections 3 and 27. Additional information was sought from Sierra Metals and DBM personnel where required.

All units of measurement in this report are in metric and all costs are expressed in United States dollars (USD or US$) unless otherwise stated. Contained copper is expressed as pounds (lbs). All material tonnes are expressed as dry tonnes (t) unless stated otherwise.

Lists of the main units of measure and abbreviations used throughout this report are presented in Sections 2.6 and 2.7, respectively.

2.5.1 Previous Technical Reports

This Technical Report is the current NI 43-101 report on the Project. Recent technical reports filed on SEDAR by Sierra Metals are listed in Table 2-2.

Table 2-2: Summary of Previous NI 43-101 Technical Reports

Reference	Date	Company	Name
Rubio, E., et.al., 2018	8 Aug 2018	Sierra Metals	NI 43-101 Preliminary Economic Assessment for the Yauricocha Mine, Peru
SRK, 2020	19 Nov 2020	Sierra Metals	Preliminary Economic Assessment Yauricocha Mine, Yauyos Province, Peru
SRK, 2022	25 Feb 2022	Sierra Metals	Preliminary Economic Assessment Yauricocha Mine, Yauyos Province, Peru

All other information used in this report are listed in Section 27.0 References.

Table 2-3 shows the units of measure used in this study.

2.6 Units of Measure

Table 2-3: Units of Measure

Unit	Abbreviation
Ampere	A
Billion	B
British thermal unit	BTU
Cubic centimetre	cm^3
Cubic feet	ft^3
Cubic inch	in^3
Cubic yard	yd^3
Day	d
Days per year (annum)	d/a
Decibel	dB
Degree	°
Diameter	Ø
Dollar (Canadian)	C$
Foot	ft
Gallons per minute (US)	gpm
Gigapascal	GPa
Gram	g
Grams per tonne	g/t
Hectare (10,000 m^2)	ha
Horsepower	hp
Hours per day	h/d
Hours per year	h/a
Kilo (thousand)	k
Kilograms per cubic metre	kg/m^3
Kilograms per square metre	kg/m^2
Kilometres per hour	km/h
Kilotonne	kt
Kilovolt-ampere	kVA
Kilowatt hour	kWh
Kilowatt hours per year	kWh/a
Litre	L
Megabytes per second	Mb/sec
Megavolt-ampere	MVA
Metre	m
Metres Baltic sea level	mbsl
Metres per second	m/s

Unit	Abbreviation
Acre	ac
Annum (year)	a
Billion tonnes	Bt
Centimetre	cm
Cubic feet per minute	cfm
Cubic feet per second	ft^3/s
Cubic metre	m^3
Coefficients of variation	CVs
Days per week	d/wk
Dead weight tonnes	DWT
Decibel adjusted	dBa
Degrees Celsius	°C
Dollar (American)	US$
Dry metric ton	dmt
Gallon	gal
Gigajoule	GJ
Gigawatt	g
Grams per litre	g/L
Greater than	>
Hertz	Hz
Hour	h
Hours per week	h/wk
Inch	“
Kilogram	kg
Kilograms per hour	kg/h
Kilometre	km
Kilopascal	kPa
Kilovolt	kV
Kilowatt	kW
Kilowatt hours per tonne (metric ton)	kWh/t
Less than	<
Litres per minute	L/min
Megapascal	MPa
Megawatt	MW
Metres above sea level	masl
Metres per minute	m/min

Unit	Abbreviation
Microns	ųm
Milligrams per litre	mg/L
Millimetre	mm
Million bank cubic metres	Mbm^3
Minute (plane angle)	‘
Month	mo
Pascal	Pa
Parts per billion	ppB
Pound(s)	lb(s)
Revolutions per minute	rpm
Second (time)	sec
Square centimetre	cm^2
Square inch	in^2
Square metre	m^2
Three dimensional	3D
Tonnes per day	tpd
Tonnes per year (annum)	t/a
Total	T
Week	wk
Wet metric ton	wmt

Unit	Abbreviation
Metric ton (tonne)	t
Milligram	mg
Millilitre	mL
Million	M
Million tonnes	Mt
Minute (time)	min
Ounce	oz
Parts per million	ppM
Percent	%
Pounds per square inch	psi
Second (plane angle)	“
Specific gravity	SG
Square foot	ft^2
Square kilometre	km^2
Thousand tonnes	kt
Tonne (1,000 kg)	t
Tonnes per hour	t/h
Tonnes seconds per hour metre cubed	ts/hm^3
Volt	V
Weight per weight	w/w

2.7 Terms of Reference (Abbreviations & Acronyms)

Table 2-4 shows Terms and Abbreviations used in this study. Table 2-5 shows the Conversions for Common Units.

Table 2-4: Terms of Reference

Unit	Abbreviation/Acronym
Absolute Relative Difference	ABRD
Acid Base Accounting	ABA
Acid Rock Drainage	ARD
Alpine Tundra	AT
Atomic Absorption Spectrophotometer	AAS
Atomic Absorption	AA
British Columbia	BC
British Columbia Environmental Assessment Act	BCEAA
British Columbia Environmental Assessment Office	BCEAO
British Columbia Environmental Assessment	BCEA
Canadian Dam Association	CDA

Unit	Abbreviation/Acronym
Canadian Environmental Assessment Act	CEA Act
Canadian Environmental Assessment Agency	CEA Agency
Canadian Institute of Mining, Metallurgy, and Petroleum	CIM
Canadian National Railway	CNR
Carbon-in-leach	CIL
Caterpillar's ® Fleet Production and Cost Analysis software	FPC
Closed-circuit Television	CCTV
Coefficient of Variation	CV
Copper	Cu
Copper Equivalent	CuEq
Counter-current decantation	CCD
Cyanide Soluble	CN
Digital Elevation Model	DEM
Direct Leach	DL
Distributed Control System	DCS
Drilling and Blasting	D&B
Environmental Management System	EMS
Flocculant	floc
Free Carrier	FCA
Gemcom International Inc.	Gemcom
General and Administration	G&A
Gold	Au
Gold Equivalent	AuEq
Heating, Ventilating, and Air Conditioning	HVAC
High Pressure Grinding Rolls	HPGR
Indicator Kriging	IK
Inductively Coupled Plasma	ICP
Inductively Coupled Plasma Atomic Emission Spectroscopy	ICP-AES
Inspectorate America Corp.	Inspectorate
Interior Cedar-Hemlock	ICH
Internal Rate of Return	IRR
International Congress on Large Dams	ICOLD
Invers Distance cubed	ID^3
Land and Resource Management Plan	LRMP
Lerchs-Grossman	LG
Life-of-Mine	LOM
Load-haul Dump	LHD
Locked Cycle Tests	LCTs
Loss on Ignition	LOI
Metal Mining Effluent Regulations	MMER

Unit	Abbreviation/Acronym
Methyl Isobutyl Carbinol	MIBC
Metres East	mE
Metres West	mW
Metres North	mN
Metres South	mS
Mineral Deposits Research Unit	MDRU
Mineral Titles Online	MTO
Nation Instrument 43-101	NI 43-101
Nearest Neighbour	NN
Net Invoice Value	NIV
Net Present Value	NPV
Net Smelter Price	NSP
Net Smelter Return	NSR
Neutralization Potential	NP
Northwest Transmission Line	NTL
Official Community Plans	OCPs
Operator Interface Station	OIS
Ordinary Kriging	OK
Organic Carbon	org
Potassium Amyl Xanthate	PAX
Predictive Ecosystem Mapping	PEM
Preliminary Assessment	PA
Preliminary Economic Assessment	PEA
Qualified Person	QP
Quality Assurance	QA
Quality Control	QC
Quality Assurance and Quality Control	QA/QC
Rhenium	Re
Rock Mass Rating	RMR
Rock Quality Designation	RQD
SAG Mill/Ball Mill/Pebble Crushing	SABC
Semi-autogenous Grinding	SAG
Silver	Ag
Silver Equivalent	AgEq
Standards Council of Canada	SCC
Stanford University Geostatistical Software Library	GSLIB
Tailings Storage Facility	TSF
Terrestrial Ecosystem Mapping	TEM
Total Dissolved Solids	TDS
Total Suspended Solids	TSS

Unit	Abbreviation/Acronym
Tunnel Boring Machine	TBM
Underflow	U/F
Valued Ecosystem Components	VECs
Waste Rock Facility	WRF
Water Balance Model	WBM
Work Breakdown Structure	WBS
Workplace Hazardous Materials Information System	WHMIS
X-ray Fluorescence Spectrometer	XRF

Table 2-5: Conversions for Common Units.

Metric Unit	Imperial Measure
1 hectare	2.47 acres
1 metre	3.28 feet
1 kilometre	0.62 miles
1 gram	0.032 ounces (troy)
1 tonne	1.102 tons (short)
1 gram/tonne	0.029 ounces (troy)/ton (short)
1 tonne	2,204.62 pounds
Imperial Unit	**Metric Measure**
1 acre	0.4047 hectares
1 foot	0.3048 metres
1 mile	1.609 kilometres
1 ounce (troy)	31.1 grams
1 ton (short)	0.907 tonnes
1 ounce (troy)/ton (short)	34.28 grams/tonne
1 pound	0.00045 tonnes

3 RELIANCE ON OTHER EXPERTS

The Report has been prepared by AGP, Caracle Creek, and Atticus for the Issuer, Sierra Metals. The Authors (QPs) have not relied on any other report, opinion or statement of another expert who is not a qualified person, or on information provided by the Issuer concerning legal, political, environmental or tax matters relevant to the Report.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Property Location

The Yauricocha Mine is located in the Alis District, Yauyos Province, and the department (departamento) of Lima approximately 12 km west of the Continental Divide and 60 km south of the Pachacayo railway station (Figure 4-1). The mining area within the mineral concessions is located at approximate coordinates 421500 mE, 8638300 mN, in UTM Zone 18S on the World Geodetic System 1984 datum (WGS84), or latitude and longitude of 12°19' South and 75°43' West.

Figure 4-1: Location Map, Lima Department, Peru

Source: Sierra Metals (2024)

The Property is located within the 1:50,000 scale IGN Mapsheet 25L2, in the east of Lima Region (Departamento), in the southeast of Yauyos Province (Provincia), in the Alis District (Distrito), and in the Communities (Communidades) of San Lorenzo de Alis and Tinco.

It is geographically in the high zone of the eastern Andean Cordillera, within one of the major sources of the River Cañete, which discharges into the Pacific Ocean. The mine is at an average altitude of 4,600 metres above sea level (masl).

4.2 Mineral Tenure

The mineral rights to the Property is comprised of a single mining concession (Concession Minera). The mineral rights are in good standing. Additional details on the history of the concession and Property are provided by SRK (2022), (Table 4-1).

Table 4-1: Summary of Mineral Rights for the Yauricocha Property

Concession Name	Title Number	Expiry Date	Area (ha)	Title Holder
Acumulación Yauricocha	010000105L	-	19,204.75	Sociedad Minera Corona SA

4.3 Project Ownership

The mining rights that make up the mining concession Acumulación Yauricocha were transferred to Minera Corona in 2002 (Empresa Minera, 2002) by Empresa Minera del Centro del Peru S.A. (CENTROMIN), as part of the privatization of such sate owned company, for the sum of US$4,010,000, plus an agreement to invest US$3,000,000 to project development, or for social works executed, or handed over to the surrounding communities to the operation; a commitment that has already been thoroughly completed.

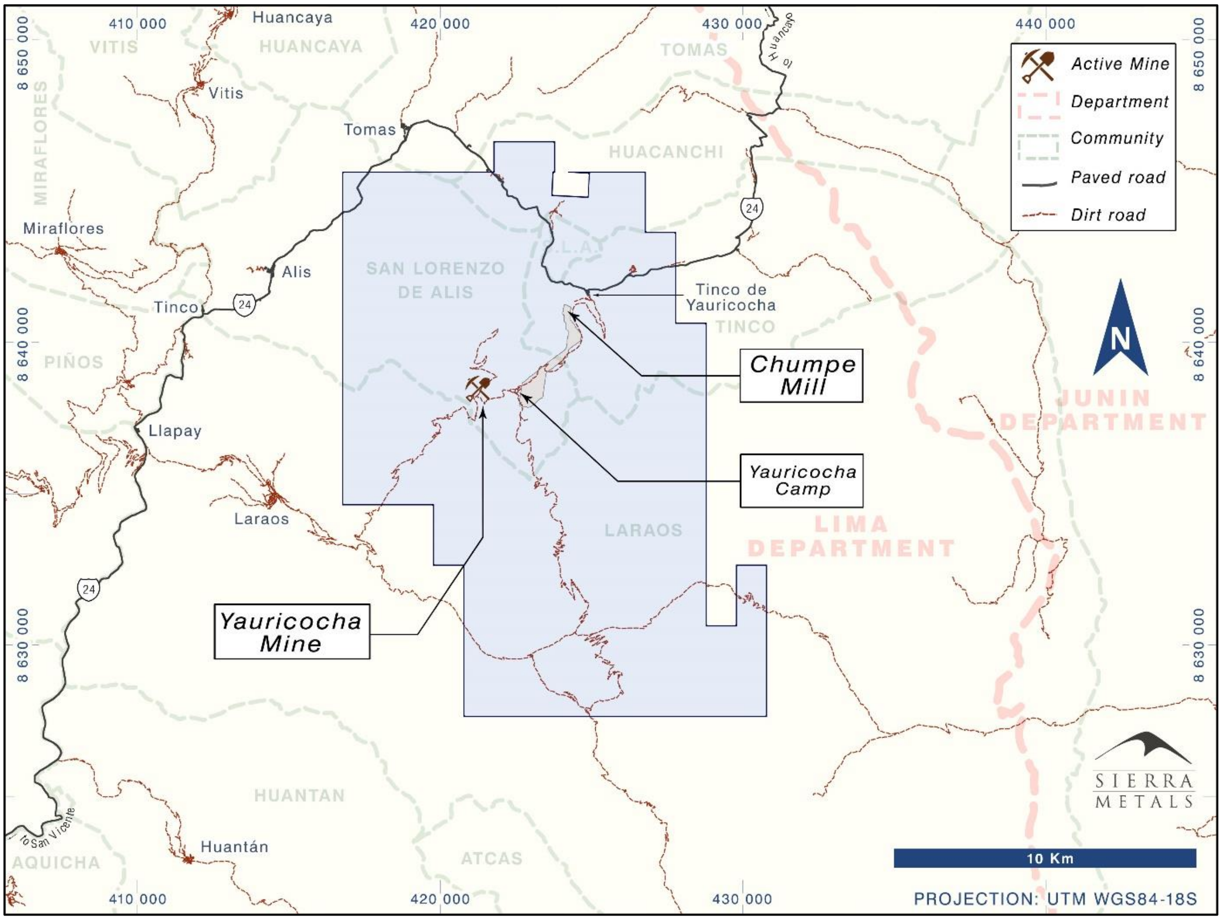
The mining concession Acumulación Yauricocha, constituted in favor of Minera Corona through Presidential Decree No. 1277-2008-INGENMET/PCD/PM dated 22 May 2008, has a total extension of 19,204.57 ha, and an available area of 18,777.92 ha for the execution of mining activities of exploration and exploitation. It is located on superficial land which belongs to the village communities of San Lorenzo de Alis, Santo Domingo de Laraos, Tinco, Huancachi, and Tomas (Figure 4-2).

In May 2011, Dia Bras Peru S.A.C. (DBP), a subsidiary of Sierra Metals, purchased 82% of Minera Corona, which includes the mining concession Accumulation Yauricocha. According to information provided by Sierra Metals, the mineral concessions are not subject to an expiration date and remain in effect, as long as the following conditions are fulfilled:

- Compliance with an annual payment of the right of renewal, which condition is established by Peruvian law to keep the validity of the mining right, calculated in the amount of US$3.00 per year and per hectare (ha) granted.
- Compliance with a minimum yearly production, which condition is established by law, and which will not be inferior to the equivalent of one Unidad Impositiva Tributaria (UIT) per year

and per hectare. The UIT is an annual value in soles established by the Peruvian State to determine taxes, infractions, penalties, fines, and other taxation purposes.

Figure 4-2: Mineral Rights Map



Source: Sierra Metals (2024)

Minera Corona holds, similarly, the processing concession of the processing plant of Chumpe, which is in the land of its property (duly registered in folios 90028219 and 90028227 of the Registry of Land in the city of Cañete – Lima) and in the land of the peasant community of San Lorenzo de Alis, with a total area of 232.902 ha and a capacity of current processing authorized of 3,600 TM/d as per Directorial Resolution No. 341-2021-MINEM-DGM/V dated 4 April 2022.

The processing concession does not have an expiration date; however, similar to the mining concession, its validity is subject to the compliance of the annual payment to maintain validity, which, for this type of concessions is calculated in respect to the installed processing capacity and the UIT in force for the corresponding year, in accordance with the scale established in article 46 of the Texto Unico Ordenado de la Ley General de Mineria (General Mining Law), approved by Supreme decree No. 014-92-EM.

4.3.1 Nature and Extent of Issuer's Interest

As part of the privatization process and the transfer of mining concessions, Minera Corona purchased 63.6151 ha from CENTROMIN in a zone named Chumpe-Tinco, (expropriated from the peasant community San Lorenzo de Alis), and 18.9760 ha in an area called Alis-Tinco-Yauricocha (expropriated from the peasant community Tinco), as well as 6.4134 ha in an area called Huacuypacha, the latter destined to camp sites for Minera Corona employees. These three areas are located in the district of Alis, province of Yauyos, department of Lima.

Additionally, Minera Corona has in place several land surface agreements by means of which the title holders of the land surfaces within the area of the Acumulación Yauricocha mining concession, grant the Company the right to use the superficial land for mining activities. The agreements signed by the Company in this regard, are the following:

Usufruct Contract: Yauricocha

In August 2007, Minera Corona signed an agreement with the peasant community of San Lorenzo de Alis (Villaran, 2009) called Extrajudicial Transaction and Lease Contract, by which the local community grants Minera Corona the exclusive right of a piece of land of 676.6870 ha, for mining activities in the most ample and possible manner. The Usufruct Contract is valid until August 2, 2037, or until closure of the mine, whichever occurs first.

In exchange, Minera Corona is currently mandated to pay the community of San Lorenzo de Alis an annual fee. This contract has been duly registered in folio 21000574 of the Land Registry in the city of Cañete – Lima Site (Public Records of Lima et al, 2023).

Usufruct Contract: Queca, Saclanco and Cachi-Cachi

In November 2022, Minera Corona signed an agreement with the Varillas family, by which Minera Corona acquires the exclusive right of a parcel of land, with an area of 489.5238 ha, in the zones named Queca, Saclanco and Cachi-Cachi for mining activities in the most ample and possible manner. This Usufruct Contract is valid until December 8, 2032. This land has not been registered in the Public Registry Office.

Through this agreement, the owner granted Minera Corona the use of such land for an annual payment.

Usufruct Contract: Yauricocha Fault

In December 2022, Minera Corona signed a contract of use of land with the peasant community Santo Domingo de Laraos, by which the community granted Minera Corona the exclusive right for using and benefiting from the usage of 5 pieces of land, totaling 1,292.8256 ha in the zones named Yauricocha Fault (442.5381 ha), Yauricocha Fault II (222.1290 ha), Exito-El Paso (294.7959), Kilcasca (109.3068), and Yana Orco (224.0558), for the development of prospection activities, and afterwards exploration and exploitation activities.

Initially, the contract was valid for 2 years, computed from 15 November 2022, until 15 November 2024. However, if it was determined that one or more of the zones became viable for exploration, the contract will be automatically extended for 3 years. Then, if it is determined that one or more of the zones become viable for exploitation, the contract will be automatically extended for 5 additional years; that is , until 15 November 2032.

According to this Usufruct Contract, Minera Corona pays the community an annual fee. This payment would increase in case Minera Corona initiates exploration activities, and the payment would raise again, if Minera Corona enters into exploitation activities. The land indicated in the contract has not been registered in the Public Registry Office.

Usufruct Contract: Cantera 1

In October 2017, Minera Corona signed an Extrajudicial Transaction and Lease contract with the local community of San Lorenzo de Alis, by which the community grants Minera Corona the exclusive right of a parcel of land of 12.89 ha in the area named Cantera 1 (also known as Patachuclla), for mining activities in the most ample and possible manner. This contract is valid from 1 January 2012 to 1 January 2035. For this lease, Minera Corona has carried out a unique payment in favor of the community for the entire validity period of the contract.

The lease contract has been duly registered in folio 21000574 of the Land Registry Office in Cañete – Lima Site.

Easement Contract: Chacapata

In September 2019, Minera Corona signed a contract with the Juan de Dios family for the right of use over a parcel of land of 21.02 ha, located in the sector named Chacapata, by which Minera Corona has the right of use with the purpose of accessing the land of their property located in the zone named Chumpe, for a term of 35 years, starting from 1 March 2002 to 1 March 2037. Minera Corona has carried out a unique payment for the entire term of this contract. This land has not been registered in the Public Registry Office.

Easement Contract: Huacuypacha (Family Vilchez)

In January 2023, Minera Corona signed an Easement Contract with the Vilchez family for the right of use over three areas of land covering 1,259 m^2, 258 m^2 and 1,152 m^2 adjacent to the land named Huacuypacha, property of Minera Corona, located in Tinco, for the purposes of right of way and access to pumps and water wells, property of Minera Corona. This land has not been registered in the Public Registry Office. The term of this contract is of 10 years expiring on 31 December 2032. Minera Corona has made a single payment for the entire term of the contract.

Lease Contract and Easement Contract: Huacuypacha (Family Basurto)

In August 2018, Minera Corona signed a Lease Contract with Basurto family, by which they granted a piece of land of 1.36 ha, adjacent to the land named Huacuypacha, property of Minera Corona, located in Tinco, where poles that support the electrical wiring, wells, and conductor pipe are located: all being on the property of Minera Corona. This land has not been registered in the Public Registry Office. The term of this contract is of 8 years, expiring on 15 August 2026. Minera Corona has made a single payment for the term of the contract.

Additionally, in June 2022, Minera Corona signed an Easement Contract with the Vilchez family for the right of use over two areas of land of 1,196 m^2 and 773 m^2 adjacent to the land named Huacuypacha, property of Minera Corona, located in Tinco, for the right of way and access to the property of Minera Corona. This land has not been registered in the Public Registry Office. The term of this contract is of 10 years, expiring on 7 June 2032. Minera Corona has made a single payment for the entire term of the contract.

4.4 Surface Rights

Sierra Metals has several surface rights agreements in place for surface access and mining activities as described in Section 4.3.1. Sierra Metals does not own any surface rights on the Property.

4.5 Royalties and Encumbrances

4.5.1 Debt

On 11 March 2019, the Company entered into a new six-year senior secured corporate credit facility ("Corporate Facility") with Banco de Credito de Peru that provides funding of up to $100 million effective March 8, 2019. The Corporate Facility provides the Company with additional liquidity and will provide the financial flexibility to fund future capital projects as well as corporate working capital requirements. The Company will also use the proceeds of the new facility to repay existing debt balances. The most significant terms of the agreement were:

- Term: 6-year term maturing March 2025
- Principal Repayment Grace Period: 2 years
- Principal Repayment Period: 4 years
- Interest Rate: 3.15% + Inter-banking bid of London at 3 months (LIBOR)

The Corporate Facility is subject to customary covenants, including consolidated net leverage and interest coverage ratios and customary events of default. The Company is complying with all covenants as of 31 March 2019. On 11 March 2019, DBP drew down $21.4 million from this facility. Interest is payable quarterly and interest payments will begin on the drawn and undrawn portions of the facility starting in June 2019.

Principal payments on the amount drawn from the facility began in March 2021. The Company repaid the amount owed on the Corona Acquisition Facility on 11 May 2019, using funds drawn from the new facility. The loan is recorded at amortized cost and is being accreted to face value over 6 years using an effective interest rate of 5.75%.

4.5.2 Royalties and Special Taxes

In September of 2011, the Peruvian Congress approved Law 29789. Under this law, a Special Tax for the Mining Sector is introduced, as well as Law 29788 that modifies Law 28258, Law of Mining Royalties. In accordance with these norms, applicable from the last quarter in 2011, the calculations for such concepts are carried out over the basis of operational margins in the mining producing companies, being its compliance mandatory, as indicated, from 2012 onwards. The rates of margins for a given interval of profits before interests and taxes (EBIT) are shown on Table 4-2. The royalty is the sum of the special mining tax and the mining royalty.

Table 4-2: Royalty and Special Tax Scale

*EBIT Margin	Special Mining Tax – Margin Rate	*EBIT Margin	Mining Royalty – Margin Rate
0.00% 10.00%	2.00%	0.00% 10.00%	1.00%
10.00% 15.00%	2.40%	10.00% 15.00%	1.75%
15.00% 20.00%	2.80%	15.00% 20.00%	2.50%
20.00% 25.00%	3.20%	20.00% 25.00%	3.25%
25.00% 30.00%	3.60%	25.00% 30.00%	4.00%
30.00% 35.00%	4.00%	30.00% 35.00%	4.75%
35.00% 40.00%	4.40%	35.00% 40.00%	5.50%
40.00% 45.00%	4.80%	40.00% 45.00%	6.25%
45.00% 50.00%	5.20%	45.00% 50.00%	7.00%
50.00% 55.00%	5.60%	50.00% 55.00%	7.75%
55.00% 60.00%	6.00%	55.00% 60.00%	8.50%
60.00% 65.00%	6.40%	60.00% 65.00%	9.25%
65.00% 70.00%	6.80%	65.00% 70.00%	10.00%
70.00% 75.00%	7.20%	70.00% 75.00%	10.75%
75.00% 80.00%	7.60%	75.00% 80.00%	11.50%
80.00% 85.00%	8.00%	More than 80%	12.00%
More than 85%	8.40%		

Source: Sierra (2023)
*EBIT – Earnings Before Interest and Taxes

4.6 Property Agreements

The mine known as "Acumulación Yauricocha Unit" is located on the property of the San Lorenzo de Alis and Laraos Communities and in the buffer zone of the Nor Yauyos-Cochas landscape reserve. It was established by the Supreme Decree N° 033-2001-AG (01/05/2001). The landscape reserve Nor-Yauyos-Cochas has in place a Master Plan 2022-2027, approved by Presidential Decree No. 264-2022 - SERNANP (15/11/2022),

4.7 Permits

Sierra Metals, through it's subsidiary Minera Corona, has managed its operations in Acumulación Yauricocha based on:

- Program of Adequacy and Environmental Management (PAMA) of the Unit of Production Yauricocha, presented by CENTROMIN (approved by Directorial Decree No. 015-97-EM/DGM,13/01/1997).
- First modification of PAMA in the Production Unit in Yauricocha (approved by Directorial Resolution No. 331-1997-EM/DGM, 14/10/1997).
- Second modification to the PAMA of the Unit of Production Yauricocha (approved by Directorial resolution No. 419-2001-EM/DGAA of 28 December 2001).

- Modification of PAMA in connection to the Project No.7, keeping the schedule of activities and investments of nine projects of PAMA of the Production Unit of Yauricocha, presented by CENTROMIN (approved by Directorial Resolution No. 159-2002-EM-DGAA, 23/05/2002).
- Approval of the execution of the PAMA “Yauricocha” Economic Administrative Unit, presented by Sierra (approved by Directorial Resolution No. 031-2007-MINEM-DGM, 02/08/2007).
- Plan for the Closure of Mines (PCM) at the level of feasibility of the Production Unit of Yauricocha, presented by Minera Corona (approved by Directorial Resolution No. 258-2009-MINEM- AAM, 24/08/2009).
- Authorization to Operate Plant No. 4 (8’ x 10’), and the modification of the processing concession “Yauricocha Chumpe” to the extended capacity of 2,500 TMD, presented by Minera Corona (approved by Resolution No. 279-2010-MINEM-DGM-V, 14/07/2010).
- Updating of the Plan for the Closure of Mine in the Mining Unit Yauricocha (approved by Directorial Resolution No. 495-2013-MEM-AAM of 17 December 2013).
- Technical Report of Support (ITS) to the PAMA (First ITS of the PAMA) for the extension of the capacity of the processing plant Chumpe of the Mining Unit Accumulation Yauricocha from 2,500 to 3,000 TMD (approved by Directorial Resolution No. 242-2015- MINEM-DGAAM, 06/09/2015).
- Mining Technical Report (ITM), Authorization of construction and operation of civil works and installation of new equipment in the process plant Chumpe for a capacity of 3,000 TMSD (approved by Directorial Resolution No. 0460-2015-MINEM-DGM/V, 14/10/2015).
- Second Technical Report of Support to the PAMA (Second ITS of the PAMA) for the “System for the treatment of domestic residual waters” in the Unit of Accumulation Yauricocha (approved by Directorial resolution No. 486-2015-MINEM-DGAAM of 12 November 2015).
- Modification to the Plan for the Closure of Mine in the Mining Unit Yauricocha (approved by Directorial Resolution No. 002-2016-MEM-DGAAM of 8 January 2016).
- Second modification to the Plan for the Closure of Mine in the Mining Unit Yauricocha (approved by Directorial Resolution No. 063-2017-MEM-DGAAM of 28 February 2017).
- Third Supporting Technical Report to the PAMA (Third ITS of the PAMA) for the “Addition of new equipment and infrastructure in the process of the concentrator plant Chumpe” in the Accumulation Unit Yauricocha (approved by Directorial Resolution No. 176- 2017-MEM-DGAAM of 3 July 2017).
- Mining Technical Report (ITM), for the addition of new equipment and auxiliary installations, and for the expansion of the area of the processing concession “Process Plant Chumpe, Yauricocha, without the modification of the installed capacity of 3,000 TM/day (approved by Directorial Resolution No. 0366-2017-MINEM-DGM of 29 August 2017, rectified by Directorial Resolution No. 0039-2018-MEM/DGM of 15 February 2018, and Directorial Resolution No. 058-2019-MEM/DGM of 13 March 2019).

- Environmental Impact Study (EIA) in the Accumulation Mining Unit Yauricocha for the regrowth of the Tailings Deposit in Yauricocha, (approved by Directorial Resolution No. 028-2019- SENACE-PE/DEAR, of 11 February 2019).
- Fourth Supporting Technical Report to the PAMA (Fourth ITS of the PAMA) of the Unit of Accumulation Yauricocha (approved by Directorial Resolution No. 051- 2019/MEM-DGAAM of 5 April 2019).
- First Supporting Technical Report to the EIA (First ITS of the EIA) of the Mining Unit Accumulation Yauricocha to specify the disposition of sterile material within the interior of the mine (approved by Directorial Resolution No. 078-2020-SENACE-PE/DEAR of 7 July 2020).
- Authorization to operate the tailings facilities of Yauricocha up to 4,531 metres in altitude (phase 5 – Stage 1) (approved by Directorial Resolution No. 326-2020-MINEM-DGM/V, 20/11/2020).
- Second update of the Closure Plan of Mine of the Mining Unit Yauricocha (approved by Directorial Resolution No. 111-2020/MINEM-DGAAM, 01/09/2020).
- Second Technical Report of Support to the EIA (Second ITS of the EIA), for the extension of the capacity of the process plant Chumpe of the Unit Accumulation Yauricocha, from 3,000 to 3,600 TMD (approved by Directorial Resolution No. 041-2021-SENACE-PE/DEAR, 12/03/2021).
- Mining Technical Report (ITM), Authorization of construction and Operation of additional installations in the process plant for a capacity of 3,600 TMSD, (approved by Directorial Resolution No. 0241-2021-MINEM-DGM/V, 14/06/2021).
- Third Technical Report of Support to the EIA (Third ITS of the EIA), for the extension of the operational life of mine until 2024, precision in the advance and disposal of mine removal indoors, and peroxide plant (operational improvement in the water recirculation system) and other components (approved by Directorial Resolution No. 0121-2021-SENACE-PE/DEAR, 13/09/2021).
- Mining Technical Report (ITM), Authorization of construction and operation of the peroxide plant (operational improvement in the water recirculation system) (approved by Directorial Resolution No. 0018-2022-MINEM-DGM/V, 18/01/2022).
- Authorization to operate the tailings facilities of Yauricocha up to 4,533 metres in altitude (phase 5 – Stage 2) (approved by Directorial Resolution No. 341-2022-MINEM-DGM, 04/04/2022).
- Fourth Technical Report of Support to the EIA (Fourth ITS of the EIA), for relocation, implementation, and improvement of auxiliary facilities; improvement of the safety factors of the Yauricocha tailings deposit, and implementation of exploration platforms (approved by Directorial Resolution No. 0163-2022-SENACE-PE/DEAR, 17/11/2022).
- Third modification to the Plan for the Closure of Mine in the Mining Unit Yauricocha (approved by Directorial Resolution No. 293-2023-MINEM-DGAAM, 06/11/2023).

4.8 Environmental Liabilities

Environmental liabilities and permitting are discussed in further detail in Section 20.

4.9 Significant Risk Factors

The Authors are not aware of any additional significant factors or risks that affect access, title, right, or ability to perform work on the property.

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

5.1 Accessibility

The main access to the Property is from Lima, along the Pan-American Highway south for approximately 135 km, following the coast to San Vicente de Cañete. The road turns inland along Highway 24 northeast (Carretera Yauyos-Cañete), through the valley of the Rio Cañete, for approximately 190 km to the turn off on the access road (Chumpe Road) to the mine. The mine is situated a further 6 km along this road. The road is unpaved from Chupaca to the mine. The drive is typically 7 hours.

The nearest airport is in Jauja (JAU), roughly 250 km north of the mine area.

5.2 Climate

The Property is situated in a temperate highland tropical climate climatic zone (Cwb; Köppen climate classification) and is characterized by dry cool winters and warm wet summer seasons (SENAMHI, 2024)

The winter, from May to October, is characterized by very low rainfall, sunny days and cool nights with temperatures ranging from night-time lows of -5°C to 5°C and daytime high temperatures of 18°C to 24°C. Most of the region's rainfall occurs in the summer, from November to April. The average annual precipitation in the area varies between 500-1,200mm annually. Average summer temperatures ranges from lows near 5°C to highs around 18°C.

Mining and exploration activities may operate all year-round.

5.3 Local Resources and Infrastructure

5.3.1 Personnel

The largest community in the area is Huancayo located approximately 100 km to the east-northeast. Huancayo and the surrounding communities have a combined population of approximately 340,000. Huancayo is the capital of the Junin Region of Peru.

Project employees and contractors live on-site in four accommodation camps: Esperanza, Vista Alegre, Chumpe y Huacuypacha, plus a hotel, with total accommodation facilities for approximately 1,700 people. The camps include the supervisory camp, the mill camp, and the mining camp that also houses mining contractors. Mine personnel are split between roughly 600 employees and 1,100 contractors. The camps include, dining facilities, exercise facilities, and housing facilities.

Other general facilities include engineering and geology, safety, and environmental offices and buildings. A health clinic on-site is staffed by a National Health Service doctor. There are additional underground shops, explosives and detonator magazines, and fuel and oil storage facilities.

The mine is scheduled to begin construction in 2026 of the New Camp in Chumpe with a capacity for 1,700 people, where the staff of Camp Esperanza will be relocated to in 2027.

5.3.2 Mine Infrastructure

There are Tailings Storage Facilities (TSF), Waste Rock Dumps and Processing plant facilities in operation on at the mine site.

5.3.3 Power

The primary power is provided through the existing power system, Sistema Interconectado Nacional (SINAC) to the La Oroya Substation. A three phase, 60 hertz, 69 kV power line owned and operated by Statkraft (SN Power Peru S.A.) through its subsidiary, Electroandes S.A. delivers electricity from the Oroya Substation to the Project substation at Chumpe. Power is transformed to 69 kV line voltage and approximately 9 MVA is supplied to the mine and 3.75 MVA is supplied to the processing plant.

5.3.4 Water

Water is sourced from Mishquipuquio spring the Klepetko Tunnel and Huacuypacha spring. Water is also sourced from the recycle/overflow water from the tailings storage facility (TSF) depending on end use.

5.3.5 Communication

There is little or no cell phone coverage at the mine. There is internet at the mine, however, there is little or no cell service.

5.3.6 Railway

The nearest rail head is located in Huancayo roughly 200 km north of the mine.

5.3.7 Sufficiency of Surface Rights

The Property position including mineral concessions and surface rights are expected to be sufficient for foreseeable mine activities. The Project infrastructure is located within the area where Sierra Metals has surface rights.

The Cachi-Cachi mine is located within the area of mineral rights, but outside of the area of surface rights. Cachi-Cachi is an underground mine, and surface access to Cachi-Cachi is located within the area of surface rights.

Of the 20 km length of the Property along strike, approximately 4 km have been developed near the center of the property.

5.4 Physiography

The Yauricocha mine is situated in the high altitudes of the Andean Cordillera in central Peru. Elevations on the Property vary from 4,000 to 4,700 masl. The highest peaks in the vicinity of the mine reach 5,000 masl.

The topography of the Yauricocha mining district is abrupt, typical alpine terrain. Pliocene erosion is clearly recognizable in the undulating, open fields to the northeast of the Continental Divide while to the southeast the terrain is cut by deep valleys and canyons. The extent of this erosion is evidenced by mountain peaks with an average elevation of 5,000 masl.

To the southeast of the Continental Divide, the high valleys are related to the Chacra Uplift. Below 3,400 m elevation, this grand period of uplift is clearly illustrated by deep canyons that in some cases are thousands of metres deep. Valleys above 4,000 masl clearly demonstrate the effects of Pliocene glaciations, with well-developed lateral and terminal moraines, U-shaped valleys, hanging valleys and glacial lakes.

Vegetation in the Yauricocha area is principally tropical alpine – rain tundra. The flora is varied with species of grasses, bushes, and some trees. The biological diversity is typical of Andean alpine regions.

6 HISTORY

6.1 Prior Ownership and Ownership Changes

The silver of Yauricocha was initially documented by Alexander von Humboldt in the early 1800s. In 1905, the Valladares family filed the claims of what is today the Yauricocha Mine. The Valladares family mined high grade silver mineralized material for 22 years and in 1927, Cerro de Pasco Corporation acquired the Yauricocha claims. In 1948, Cerro de Pasco commenced mining operations at Yauricocha until the Peruvian Military Government nationalized Cerro de Pasco Corporation and Yauricocha became a production unit of State-owned Centromin Peru S.A. for 30 years. In 2002, the Yauricocha unit was privatized and purchased by Minera Corona. Sierra Metals, through DBP, acquired 82% of the total equity of Corona in May 2011 (SRK, 2022).

Sierra Metals retains a 100% controlling ownership status in the Yauricocha Mine, through their subsidiary Sociedad Minera Corona S.A. (Minera Corona). An unnamed private interest holds 18.16% equity ownership in Yauricocha, with Sierra Metals holding the remaining 81.84% (SRK, 2022).

6.2 Exploration and Development Results of Previous Owners

Prior to the 1970s detailed production records are unavailable. Since 1973, Company records indicate that Yauricocha has produced 13.6 Mt of mineralized material containing 63 Moz of silver as well as 378 kt of lead, 117 kt of copper and nearly 618 kt of zinc. Since 1979, Yauricocha has averaged 413,000 t of production per year. The historical estimates presented below predate CIM and NI 43-101 reporting standards and therefore cannot be relied upon. These estimates were not used as a basis for the current resource and/or reserve estimates, as the material has already been mined and processed.

Table 6-1 summarizes exploration and mining statistics under Minera Corona ownership prior to DBP acquiring the majority equity from Minera Corona.

Table 6-1: Prior Exploration and Development Results

Year	Exploration (m)	Development and Infill (m)	Exploration & Development (m)	Drilling (DM) by Company (m)	Drilling (DDH) Contractor (m)	Mine Production (t)	Mineral Inventory1 (t)
2002	2,726	1,160	3,886	1,887		124,377	344,630
2003	3,307	1,648	4,955	3,415		212,677	571,520
2004	1,778	2,245	4,023	2,970		233,486	1,001,350
2005	2,004	2,030	4,034	3,160	8,043	373,546	702,524
2006	788	1,998	2,786	2,999	10,195	487,909	6,371,845
2007	826	1,640	2,466	4,751	6,196	546,652	4,773,198
2008	796	1,584	2,380	5,379	13,445	690,222	4,720,606
2009	872	1,040	1,912	4,955	13,579	802,737	4,974,593
2010	454	632	1,086	4,615	3,527	837,389	5,379,526

Source: Sierra Metals (2021)

With respect to Table 6-1, Mine Production is derived from actual mine production records and Mineral Inventory is derived from Company reports to Peruvian regulatory Authorities and are not CIM-compliant. Mineral Inventory includes Proven and Probable Reserves and Indicated Resources as reported to the Peruvian Exchange and are not CIM-compliant. These numbers are for historical information purposes only.

6.3 Historical Production

Historical production is shown in Table 6-2 and is based on Yauricocha Mine production reports.

Table 6-2: Historical Yauricocha Mine Production (From Mine Production Reports)

Fiscal Year	Data Source	Date Ending	Mineralized Material Processed (t)	Ag (oz)	Cu (t)	Zn (t)	Pb (t)
2001	Reported Actual	12/31/2001	235,000	1,124,086	530	15,136	8,402
2002	Reported Actual	12/31/2002	124,000	592,538	356	7,736	4,965
2003	Reported Actual	12/31/2003	213,000	898,066	803	11,389	6,540
2004	Reported Actual	12/31/2004	356,800	643,000	1,046	14,952	996
2005	Reported Actual	12/31/2005	374,642	868,000	2,491	22,657	6,883
2006	Reported Actual*	12/31/2006	464,544	745,182	3,704	19,065	6,236
2007	Reported Actual*	12/31/2007	517,932	1,008,654	4,530	18,301	5,141
2008	Reported Actual*	12/31/2008	552,901	1,424,251	4,759	17,772	7,558
2009	Reported Actual*	12/31/2009	603,805	1,348,280	5,703	17,818	8,295
2010	Reported Actual*	12/31/2010	625,320	1,258,578	5,532	19,795	7,781

Source: Sierra Metals (2024)

Note: * – Annual Report Sociedad Minera Corona SA

7 GEOLOGICAL SETTING AND MINERALIZATION

Sections 7.1, 7.2 and 7.3 of this Report has largely been extracted from NI 43-101 Technical Report on the Yauricocha Mine, prepared by Gustavson Associates, report date 11 May 2015 (Gustavson, 2015). Some new information has also been provided by Sierra Metals. Standardizations have been made to suit the format of this Report; any changes to the text have been indicated by the use of [brackets].

7.1 Regional Geology

Most of the stratigraphy, structure, magmatism, volcanism, and mineralization in Peru are spatially- and genetically related to the tectonic evolution of the Andean Cordillera that is situated along a major convergent subduction zone where a segment of the oceanic crust, the Nazca Plate, slips beneath the overriding South American continental plate. The Andean Cordillera has a metamorphic rock basement of Proterozoic age on which Hercynian Paleozoic sedimentary rocks accumulated and were, in turn, deformed by plutonism and volcanism to Upper Paleozoic time. Beginning in the Late Triassic time, following Atlantic Ocean rifting, two periods of subduction along the western margins of South America resulted in the formation of the present Andes: the Mariana- type subduction from the Late Triassic to Late Cretaceous and Andean-style subduction from the Late Cretaceous to the present. Late Triassic to late Cretaceous Mariana-type subduction resulted in an environment of extension and crustal attenuation producing an oceanic trench, island arcs, and back arc basin from west to east. The back-arc basin reportedly has two basinal components, the Western Basin, and Eastern Basin, which are separated by the Cusco – Puno high, probably part of the Maranon Arch. The basins are largely comprised of marine clastic and minor carbonate lithologies of the Yura and Mara Groups overlain by carbonates of the Ferrobamba Formation. The western back-arc basin, called the 'Arequipa Basin', is the present Western Andean Cordillera of Peru; the site of a Holocene magmatic belt that spans the Andes and was emplaced from Late Oligocene to 25 Ma.

The Western Andean Cordillera is recognized for its world class base- and precious-metal deposits, many of which have been intermittently mined since Incan time. Most of the metal deposits in Peru are spatially and genetically associated with metal-rich hydrothermal fluids generated along magmatic belts that were emplaced along convergent plate tectonic lineaments. Furthermore, many of these primary base-metal deposits have undergone significant supergene enrichment due to uplift and weathering over the last 30 Ma.

Radiometric studies have correlated the igneous host rocks and attendant hydrothermal alteration for some of the largest and richest porphyry copper deposits in the world along the Western Andean Cordillera from 6° to 32° south, including the Chalcobamba – Tintaya iron-gold-copper skarn and porphyry belt (30 to 35 Ma) in the main magmatic arc, southward through the Santa Lucia district (25 to 30 Ma) and into Chile. The Andahuaylas-Yauri Porphyry Copper Belt, a well-known 300 km long porphyry copper belt related to middle Eocene to early Oligocene calc-alkaline plutonism, is situated along the northeastern edge of the Western Andean Cordillera.

7.2 Local Geology

The local geology of the Yauricocha mine has been well understood by Minera Corona personnel for a number of years and is summarized as follows. Figure 7-1 shows the surface geology in around the Project and Figure 7-2 shows the local surface geology of the Yauricocha Mine area.

7.2.1 Goyllarisquizga Formation

The oldest rocks exposed in the area are the lower Cretaceous Goyllarisquizga arenites. This formation is approximately 300 m thick and comprises thick gray and white arenites, locally banded with carbonaceous lutites as well as small mantos of low-quality coal beds and clay. In the vicinity of Chaucha, these arenites have near their base interbedded, red lutite. The arenites crop out in the cores of the anticlines southwest of Yauricocha, as beds dispersed along the Chacras uplift, and isolated outcrops in the Éxito Zone.

7.2.2 Jumasha Formation

The mid-Cretaceous Jumasha Formation consists of massive gray limestone, averages 700 m thick, and concordantly overlies the Goyllarisquizga Formation. Intercalations of carbonaceous lutites occur at its base near the contact with the arenites. These layers are succeeded by discontinuous lenses of maroon and grey limestone, occasionally with horizons of lutite and chert about 6 m thick. Also present are pseudo-breccias of probable sedimentary origin and a basaltic sill.

7.2.3 Celendín Formation

The Celendín Formation concordantly overlies the Jumasha Formation and contains finely stratified silicic lutites with intercalations of recrystallized limestone of Santoniana age as well as the France Chert. The average thickness in the Yauricocha area is 400 metres.

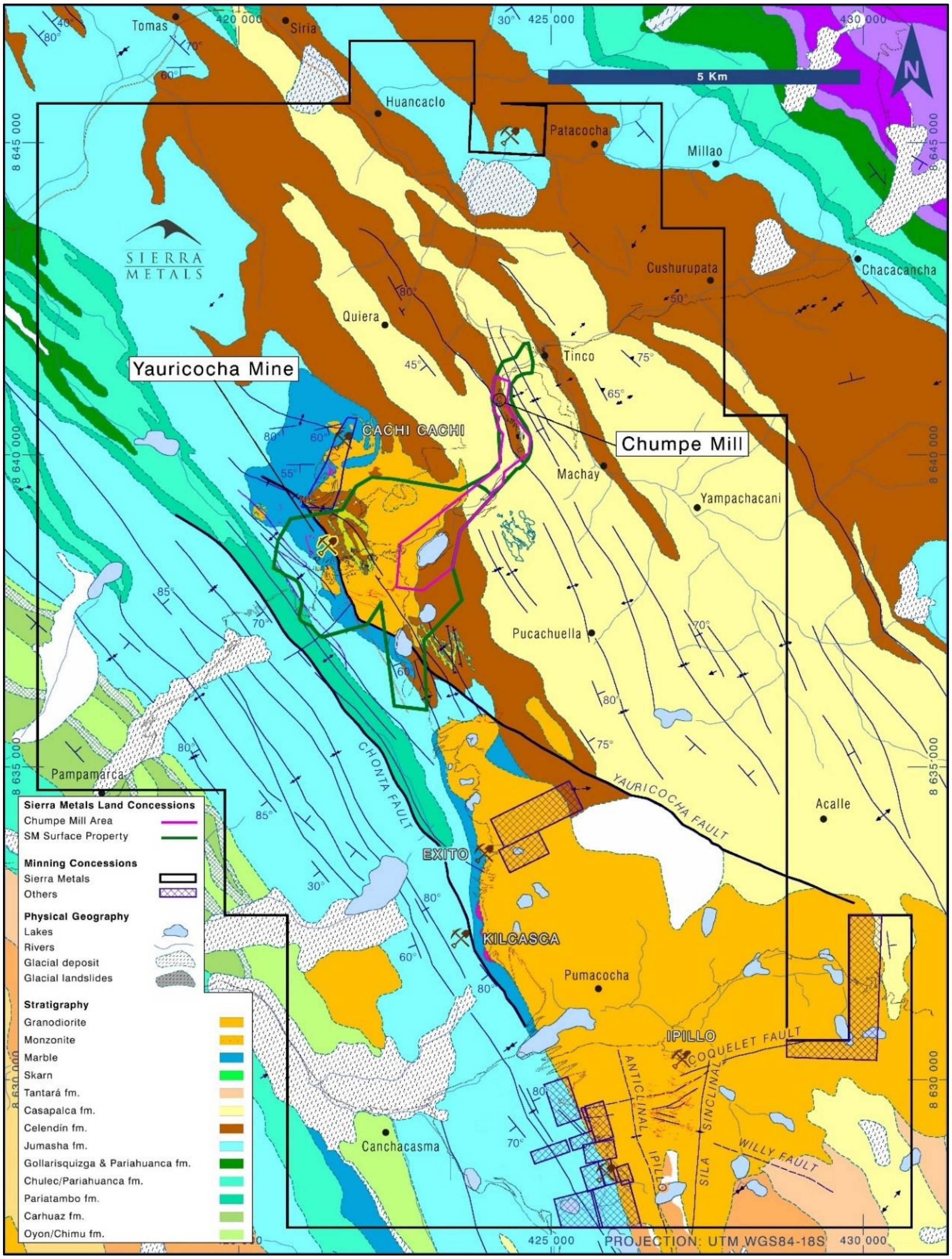
7.2.4 Casapalca Red Beds

The Casapalca red beds lay concordantly on the Celendín Formation with a gradational contact. It has been assigned an age between upper Cretaceous and lower Tertiary, but because of the absence of fossils its age cannot be precisely determined. It is composed primarily of calcareous red lutites, pure limestones, and reddish arenaceous limestone. Lava flows and tuffaceous beds have been occasionally reported.

7.2.5 Intrusions

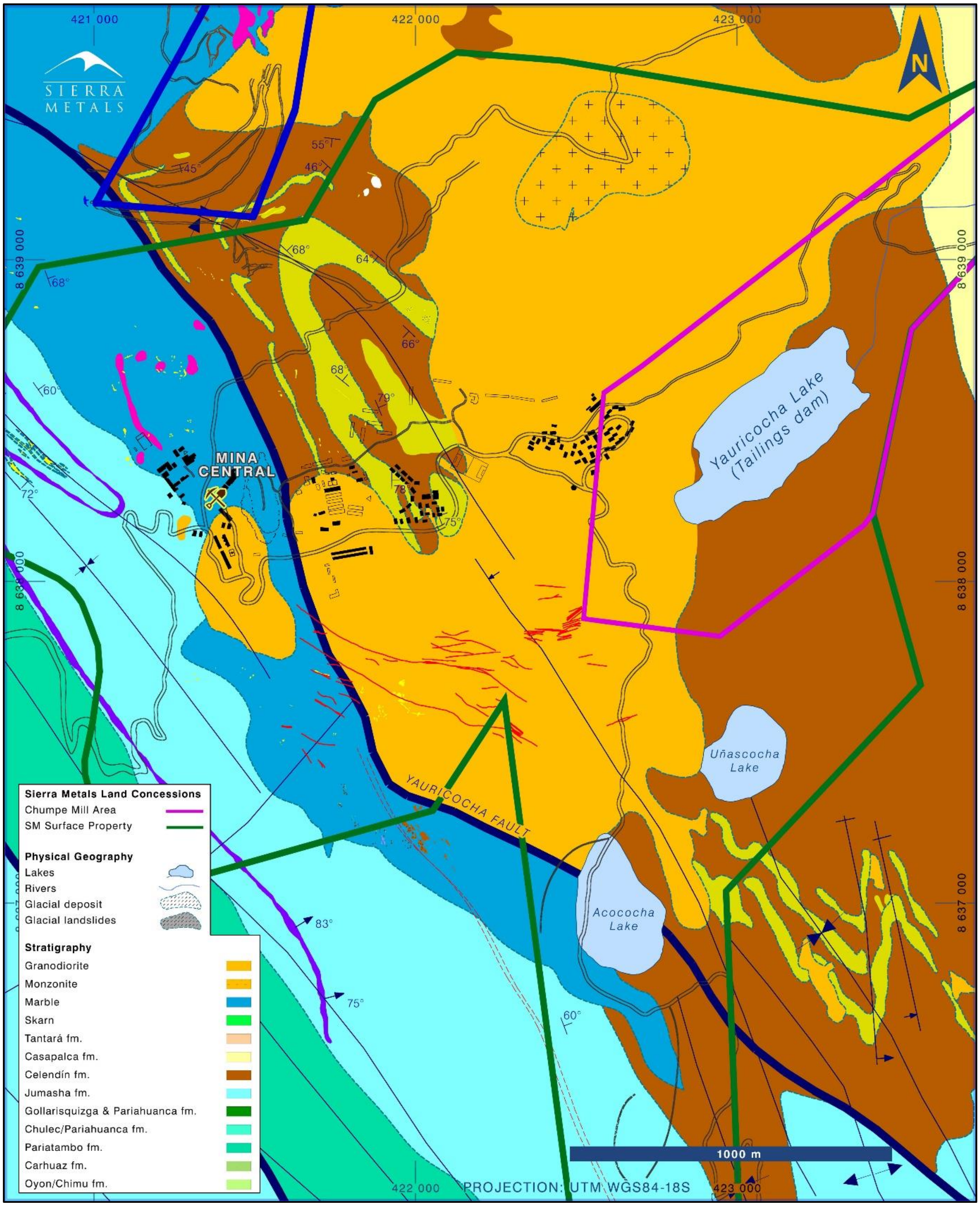
Major intrusive activity occurred during the Miocene period. Radiometric K-Ar ages derived from biotite samples taken in the Yauricocha and Éxito areas yield an average age of 6.9 Ma. The intrusives cut the sediments at a steep angle and exhibit sharp contacts, as well as a tendency to follow the regional strike and dip of the structure. The intrusions vary in size from bodies of several hundred square metres to large masses that cover several square kilometres. Small intrusive compositions vary from granodiorite to quartz monzonite at margins and are typically porphyritic with phenocrysts of plagioclase, orthoclase, biotite, hornblende, and quartz. The plagioclases vary from orthoclase to andesine.

Figure 7-1: Local Geology Map



Source: Sierra Metals (2024)

Figure 7-2: Geologic Map of Yauricocha Mine Area



Source: Sierra Metals (2024)

7.2.6 Metamorphism

All of the intrusions have produced metamorphic aureoles in the surrounding rocks. The extent, type, and grade of metamorphism vary greatly with the type of rock intruded. The rocks have been altered to quartzites, hornfelsed lutites, and recrystallized limestones. Locally, the intrusions have produced narrow zones of skarn of variable width. These skarn zones contain epidote, zoisite, tremolite, wollastonite, phlogopite, garnet, chlorite and diopside.

7.2.7 Structure

The Andean Cordillera uplift has dominated the structural evolution of the Yauricocha area through episodes of folding, fracturing, and brecciation associated with the local structure having a general NW-SE strike principally expressed as follows:

7.2.8 Folds

Various folds make up the principal structures of the Yauricocha area. The Purísima Concepcíon anticline and the France Chert syncline occur in the Mina Central area, while the Cachi-Cachi anticline and Huamanrripa al Norte syncline and the Quimpara syncline occur immediately to the south of Lake Pumacocha, north of Mina San Valentíne.

The Purísima Concepcíon anticline, located southwest of the Yauricocha Mine in the Mina Central area, is well defined by a tightly folded basaltic sill 17 m thick. The axial trace trends approximately N50W with a gentle SE plunge of 20°. In the axis of this anticline and towards Flanco East, the basaltic sill contains occurrences of disseminated gold in horizontal, silicic breccias.

The France Chert syncline is a tight fold, also in the Mina Central area, but located northeast of the mine. Its axial trace changes trend from N35W in the south to N65W in the north and has a SE40 plunge. The Yauricocha mineral deposit is found in the west flank of this fold and in banded limestones without subsidiary folding.

In the Mina Central area, the NW strike of the folded sediments was rotated about 30° clockwise horizontally. This distortion can be attributed to a basement shear fault that strikes NE-SW. The axial trace of the Cachi-Cachi-Prometida anticline strikes approximately N80W to N70W and its flanks dip to the north (Prometida) and south (Cachi-Cachi) with a plunge to the east. Mineralization in the vicinity of the major North Intrusive located 2 km north of Mina Central is associated with this fold.

The Quimpara syncline, located 1 km south of the discharge stream of Pumacocha Lake, has an axial trace that strikes N45W. Its east flank is in contact with the intrusive at an angle dipping 70° to 75°W. Its west flank dips about 80°E conformably with beds of dark gray limestone that are recrystallized in the vicinity of the contact. Garnets, magnetite, and copper oxides occur in the same contact.

7.2.9 Fractures

Diverse systems of fractures were developed during episodes of strong deformation.

Folding occurred before and/or contemporaneous with intrusive emplacement. Primary fractures developed during folding along with longitudinal faults parallel to the regional strike of the stratigraphy. These faults combined to form the Yauricocha Fault along the Jumasha limestone-

Celendín lutite contact. The Yauricocha Fault extends a great distance from the SE of the Ipillo mine continuing to the north behind Huamanrripa hill, parallel to and along Silacocha Lake.

After the intrusions were emplaced, the strike of the folds NW of the mine was rotated by strong horizontal forces some 30°. As a result of this rotation, three sets of shears and joints were developed: NW-SE, NE-SW and E-W with dips of 50-80° NE or SW first, then 60-85° SE or NW, and finally N or S with nearly vertical dips. This set of fractures forms fault blocks that cut the dominant lithologies of the area and join with the Yauricocha Fault. The Yauricocha Fault is the most significant fault in the mining district and is a strong control on mineralization.

7.2.10 Contacts

The contacts of the Jumasha limestone-Celendín lutite, the Jumasha limestone-intrusions, and Celendín lutite-intrusions had major influence on the development of folds, fractures, and ascension of mineralizing fluids.

7.2.11 Breccias

The breccias that occur in the Yauricocha area typically follow structural lineaments and occur predominantly in the limestones associated with contacts and intersections of fractures. They form tabular and chimney-like bodies. Tectonic breccias, forming near intrusions or contacts, constitute some of the principal receptive structures for mineralization.

7.3 Significant Mineralized Zones

Mineralization at the Yauricocha Mine is represented by variably oxidized portions of a multiple- phase polymetallic system with at least two stages of mineralization, demonstrated by sulphide veins cutting brecciated polymetallic sulphide mineralized bodies. The mineralized bodies and quartz- sulphide veins appear to be intimately related and form a very important structural/mineralogical assemblage in the Yauricocha mineral deposit. Comments herein made regarding the characteristics of the Yauricocha district apply directly to the Minera Corona Yauricocha Mine.

All parts of the property with historic exploration or current production activity are in the current area of operations. This area is nearly centered within the concession boundary and there is both space and potential to expand the resources and the operation both directions along the strike of the Yauricocha Fault.

Minera Corona has developed local classifications describing milling and metallurgical characteristics of mineralization at Yauricocha: polymetallic, oxide, and copper. "Polymetallic" mineralization is represented by Pb-Zn sulphides, often with significant Ag values, "oxide" refers to mineralization that predominantly comprises oxidized sulphides and resulting supergene oxides, hydroxides and/or carbonates (often with anomalous Au), and the "copper" classification is represented by high values of Cu with little attendant Pb-Zn.

Yauricocha mineralization is associated with the Triada (Cu-Mo) porphyry, with a diameter of about 900 m, is located about 300 m East of the Central Mine, on the East side of the Yauricocha Fault. There are several types of intrusions, such as granodiorites, quartz monzodiorites, and monzodiorites with phaneritic and porphyritic textures. Structurally, there are network and stockwork zones with an N110°

direction, as well as an E-W direction, with 65° dips to the SE. The most relevant hydrothermal alteration is the intermediate argillic type, which is widely distributed, with clay minerals, illite, kaolin and smectite; phyllic alteration is restricted to fracture zones and quartz veinlets with halos of clays and sericite. Extensive chloritization with disseminated pyrite coexists at the margins.

8 DEPOSIT TYPES

Section 8.1 of this Report has been largely extracted from the NI 43-101 Technical Report on the Yauricocha Mine, prepared by Gustavson Associates, report date May 11, 2015 (Gustavson, 2015). Some new information has also been provided by Sierra Metals. Standardizations have been made to suit the format of this Report; any changes to the text have been indicated by the use of [brackets].

8.1 Mineral Deposit

Mineralization in the Yauricocha district is spatially and genetically related to the Yauricocha stock, a composite intrusive body of granodioritic to quartz monzonitic composition that has been radiometrically dated at late Miocene (approximately 7.5 million years old) (Giletti and Day, 1968). The stock intrudes tightly folded beds of the late Cretaceous Jumasha and Celendín Formations and the overlying Casapalca Formation (latest Cretaceous and Paleocene?). Mineralized bodies are dominantly high-temperature polymetallic sulphide bodies that replaced limestone. Metal-bearing solutions of the Yauricocha magmatic-hydrothermal system were highly reactive and intensely attacked the carbonate wall rock of the Jumasha and Celendín Formations, producing the channels in which sulphides were deposited. Base and precious metals were largely precipitated within several hundred metres of the stock (Lacy, 1949; Thompson, 1960). Skarn is developed adjacent to the stock but does not host appreciable amounts of economic mineralization (Alverez and Noble, 1988). Mineralization typically exhibits both vertical and radial zoning and there is a pronounced district zoning, with an inner core of enargite (the principal copper mineral) giving way outward to an enargite-chalcopyrite-bornite zone, which in turn is succeeded to the west by zones characterized by sphalerite, galena and silver (Lacy, 1949; Thompson, 1960).

The mineralized zones at Yauricocha are partially to completely oxidized and extend from the surface to below level 1220. Supergene enrichment is closely related to oxidation distribution. Supergene covellite, chalcocite and digenite are found where the sulphide minerals are in contact with oxidized areas.

Mineralization at Yauricocha very closely resembles that typified by polymetallic Ag-Au deposits, which comprise quartz-sulphide-carbonate fissure vein equivalents of quartz-sulphide and carbonate- base metal deposits. These deposits are best developed in Central and South America, where they have been mined since Inca times as important Ag sources. Quartz and pyrite of the quartz-sulphide Au +/- Cu mineralization suite typically occur early in the paragenetic sequence; carbonate-hosted mineralization and some polymetallic Ag-Au veins evolved at a later stage. Predominant controls on mineralization are structural, where dilatational structures, voids resulting from wall rock dissolution, and/or rheologic dissimilarities at contacts between units serve as enhanced fluid pathways for mineralizing solutions.

8.2 Geological Model

The geological model used for the Yauricocha deposit has been developed and verified through extensive exploration and mining activities during more than 50 years of mining. The QP is of the opinion that the geological model is appropriate and will continue to serve the Company going forward.

9 EXPLORATION

Much of the information in Section 9 Exploration has been extracted from SRK (2022). Since 2016, surface exploration has focused more on areas surrounding the Central mine, mainly to the south of the mine in the areas of Doña Leone, El Paso, Success, Kilcasca and the South Yauricocha Fault. The work has consisted of detailed geological mapping, sampling for geochemical interpretation and focusing on areas with strong anomalies. During 2017, the Canadian company, Quantec, was contracted to perform a surface geophysical study using the Titan-24 DC resistivity induced polarization (DCIP) & Magnetotelluric (MT) methods.

The Yauricocha mining district contains multiple polymetallic deposits represented by skarn and carbonate replacement bodies and intrusion-hosted veins related to Miocene-era magmatism. Mineralization is strongly structurally controlled with the dominant features being the Yauricocha Fault and the contact between the Jumasha limestones and the Celendín Formation (especially the France Chert). Exploration is being conducted to expand the mineralized zones currently being exploited as well as on prospects in the vicinity of the operations.

Exploration in or close to the mining operations is of higher priority since it is performed under existing governmental and community permits. Any exploration mineralization discovery can be quickly incorporated into defined mineral resources and reserves and therefore the mine's business plan.

9.1 Relevant Exploration Work

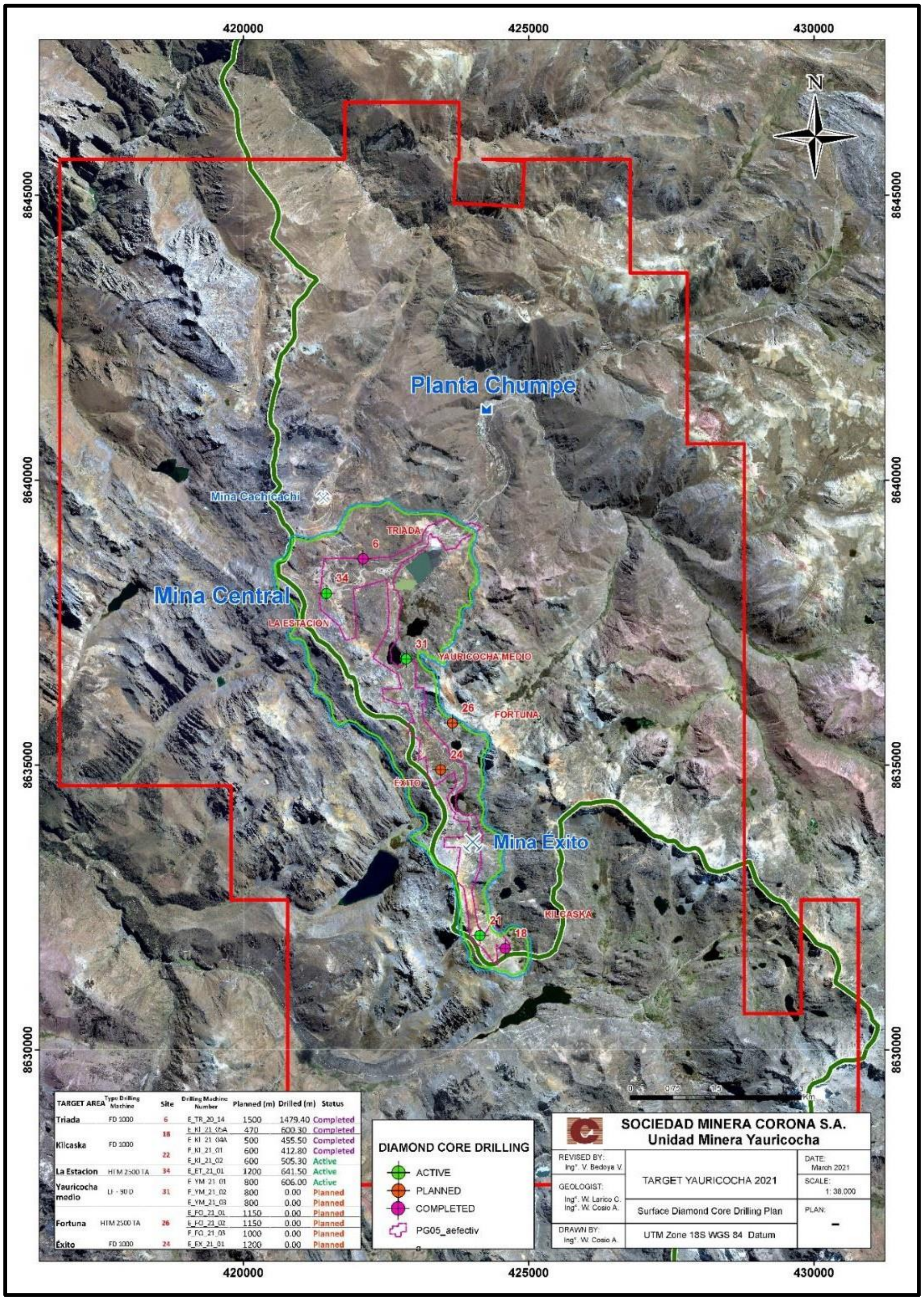
Exploration in the district has been ongoing and work has been successful in delineating several targets (described above) for future drilling or exploration development. This work has included detailed geological mapping of the areas, surface rock chip sampling, and limited trench / channel sampling.

The 2021 planned underground and surface drilling programs have been revised due to the impact of the Covid Pandemic. Planned diamond core drilling for 2021 is focused on the areas of Kilcasca, Éxito, Fortuna, Yauricocha Medio and La Estación (Figure 9-1). A total of 11,770 m of surface drilling comprising 13 drill holes is planned for 2021, budgeted at US$1.2 million.

During the period of 3 June 2017, to 6 September 2017, a geophysical survey was carried out with the Titan-24 DCIP & MT Survey method. A total of 20 DCIP-MT profiles (23 differentials) were carried out, ranging from 400 m to 500 m covering 54.2 kilometres. Based on this work, several anomalous areas were identified, and priority has been given to diamond drilling these areas from surface. The most relevant geophysical targets were ranked considering the proximity to the mining operations plus the similarity of skarn type mineralization or meso-epithermal replacement, in order of priority are Doña Leona, El Paso-Éxito, Victoria and Alida.

Kilcasca is situated 7.5 km southeast of the Yauricocha mine. Historically, the polymetallic Francolina and Felicidad mineralized bodies were exploited in the Kilcasca area. El Paso-Éxito is located 3.5 km southeast of the Yauricocha mine, in the vicinity of the Éxito and Antonia mines. Éxito and Antonia mines are historical Pb, Zn, Cu and Ag producers. Fortuna is located 3.5 km southeast of Central Mine within the Yauricocha fault zone. Yauricocha Medio is located 2.2 km southeast of Central Mine, where historical mining took place. La Estación is a historical mined area located 350 m west of Central Mine, where sulphide mineralization has been noted during geological mapping.

Figure 9-1: Yauricocha Surface Exploration Drilling Areas



Source: SRK, 2022

9.2 Sampling Methods and Sample Quality

Sampling of exploration targets generally features rock chip or hand samples taken by geologists from surface outcrops using rock hammers and chisels. These samples are point samples and should be considered indicative of mineralization rather than representative of any volume or tonnage.

In cases where channel or trench samples are collected, these are done so using pickaxes, shovels, chisels, hammers, and other hand tools, and are likely more representative of the mineralization as they are taken across the strike of mineralization observed at surface.

Regardless, the results of exploration related sampling in this context are used as guides for future drilling programs, rather than resource estimation.

9.3 Significant Results and Interpretation

There have been satisfactory results with exploration diamond drilling in the Cuye mineralized area where additional mineralization has been identified and designated as Cuye iii and Cuye Sur respectively. Similarly, in the Esperanza area additional polymetallic mineralization was identified and designated as Esperanza ii.

The 2017 surface geophysical survey interpretation has identified several resistivity anomalies in the Doña Leona, El Paso-Éxito and Victoria areas located within less than 10 km of the current Yauricocha mine area.

Replacement-type alteration within the Jumasha limestones, intense brecciation, silicification and localized skarns have been observed during surface mapping of the Doña Leona area. Doña Leona's interpreted low resistivity geophysical anomalies (less than 205 ohm/p) are the focus of exploration drilling (Figure 9-2). A low resistivity anomaly can be indicative of metallic mineralization, whereas a narrow high resistivity zone surrounding a very low resistivity zone can be an indication of alteration such as silicification.

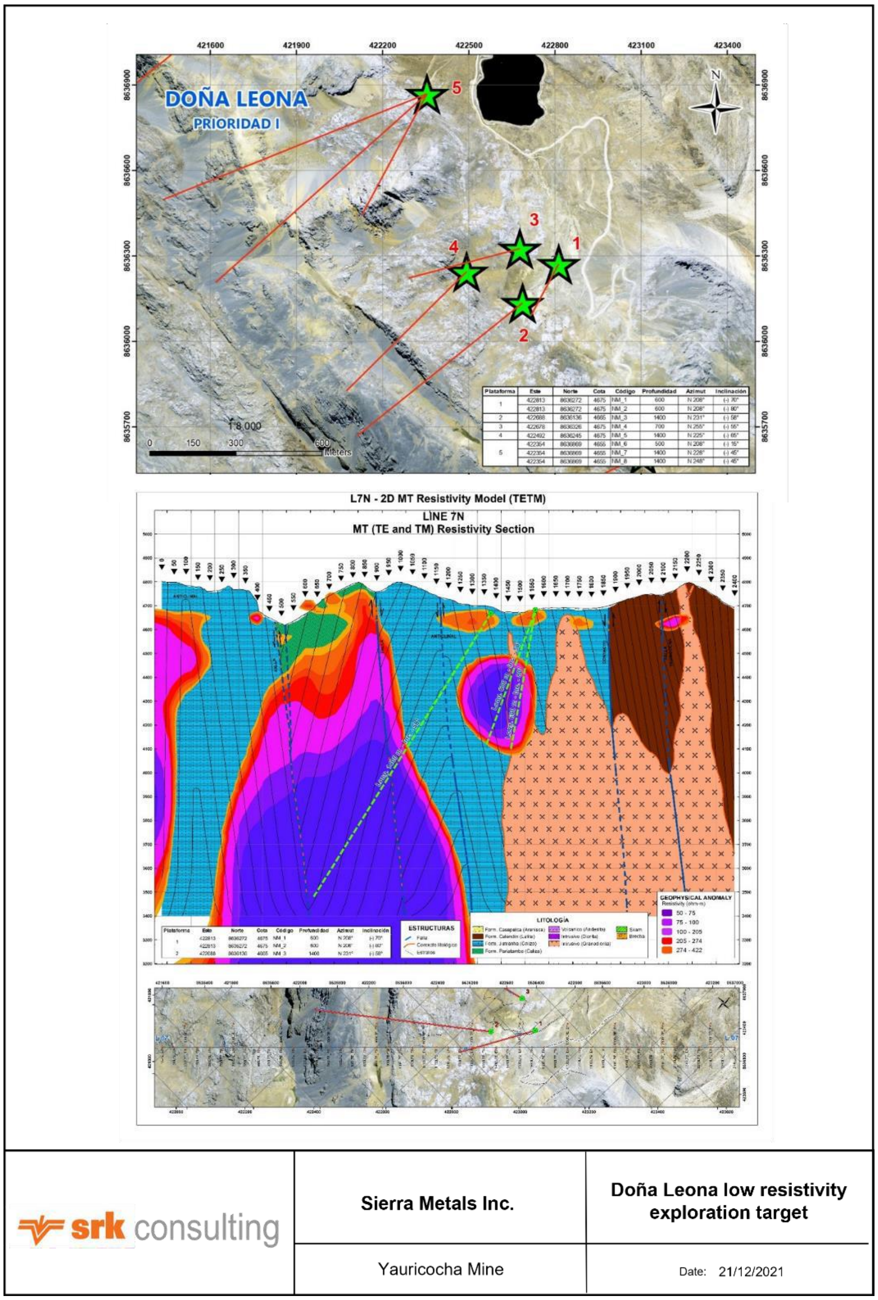
Surface geochemical sampling of non-mined areas' structure have yielded results as high as 22.36% zinc, 11.45% lead, 0.19% copper and 43.5 g/t silver. Historically mined areas' re-sampling has yielded values as high as 10.78% zinc, 5.36% lead, 0.01% copper and 58.8 g/t silver.

In the El Paso-Éxito granodiorite and diorite intrusives were observed during geological mapping within the limestones and marbles of the Jumasha and Pariatambo Formations. The Chonta Fault lies to the extreme west of the area. Contact metasomatism and skarn development have been observed at contacts between the intrusives and the limestones.

The geophysical resistivity anomalies are not as prominent as those interpreted at Doña Leona (Figure 9-3). Furthermore, the most prominent anomaly is significantly deeper below surface. The historical Éxito mine yielded grades of 14.00% zinc, 3.00% lead, 0.60% copper and 37.3 g/t silver. El Paso was historically mined by Cerro de Pasco Corporation and Centro Min Perú who exploited oxidized mineralization. The average grade mined at El Paso has been recorded as 183.0 g/t silver, 17.93% lead, 7.40% zinc, 0.96% copper and 0.20 g/t gold.

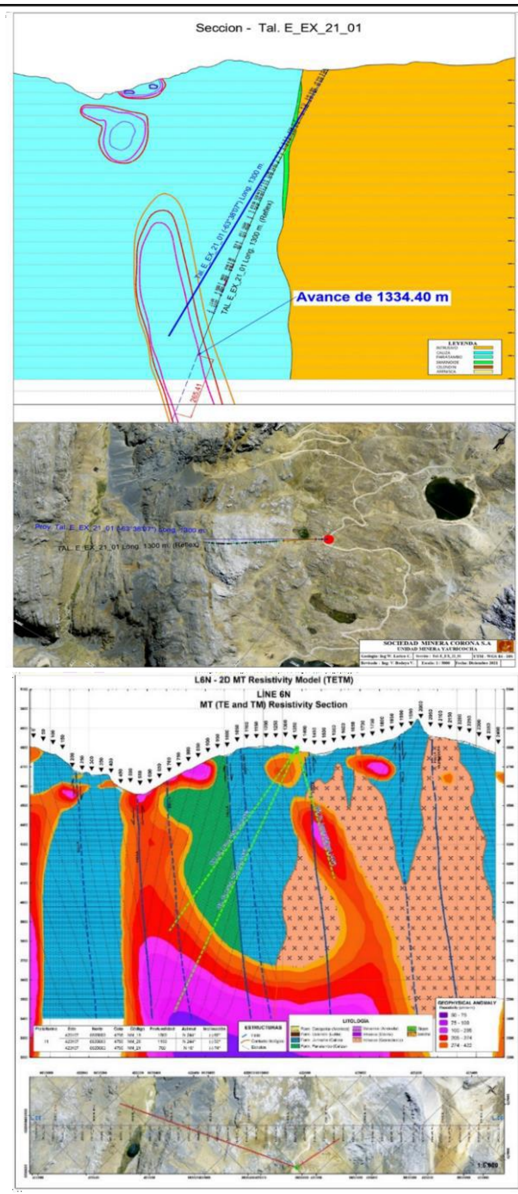
In the surrounding area geochemical sampling have yielded results of 95 to 10,000 ppm lead, 76 to 10,000 ppm zinc and 50 to 490 ppm copper. These geochemical results are lower than the results at other exploration targets and the largest geophysical anomaly is significantly deeper than the other exploration target areas. Therefore, the El Paso-Éxito exploration target is of a lower priority for exploration.

Figure 9-2: Doña Leona Exploration Target Areas and Conceptual Drilling Plan



Source: SRK, 2022

Figure 9-3: El Paso-Éxito 2021 Exploration Target Area and 2021 Drilling Plan

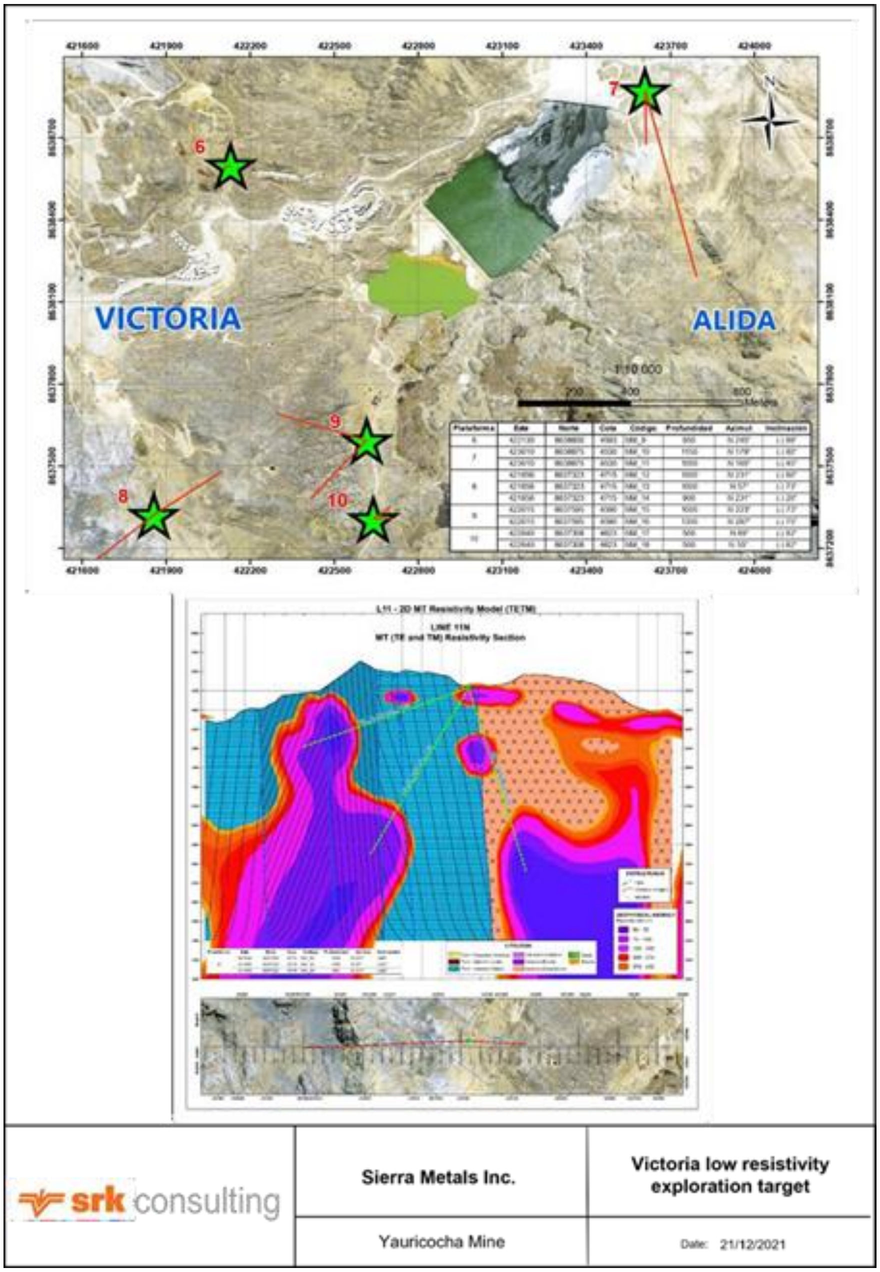


srk consulting	Sierra Metals Inc.	El Paso-Éxito low resistivity exploration target
	Yauricocha Mine	Date: 21/12/2021

Source: SRK, 2022

The Victoria and Alida exploration areas are in the proximity to the northwest – southeast trending Yauricocha Fault. Extensive outcrops of granodiorites have been observed in contact with the Jumasha Formation limestones. Argillic and phyllic alteration occur at these contacts. Historically, narrow veins were mined in the area yielding grades in the region of 2.80% copper, 0.70% zinc, 0.60% lead and 6.00% arsenic. The arsenic values could pose a future mining issue as it is a deleterious element. Surface quartz veins and stockwork have been geochemically sampled producing grades as high as 3.00% zinc, 1.00% lead and 0.60% copper. Marble and skarn outcrop geochemical sampling have yielded values as high as 8.30% lead, 6.80% zinc, 0.80% copper and 93.3 g/t silver. A large low resistivity geophysical anomaly is an exploration drilling target area to be considered in the future (Figure 9-4).

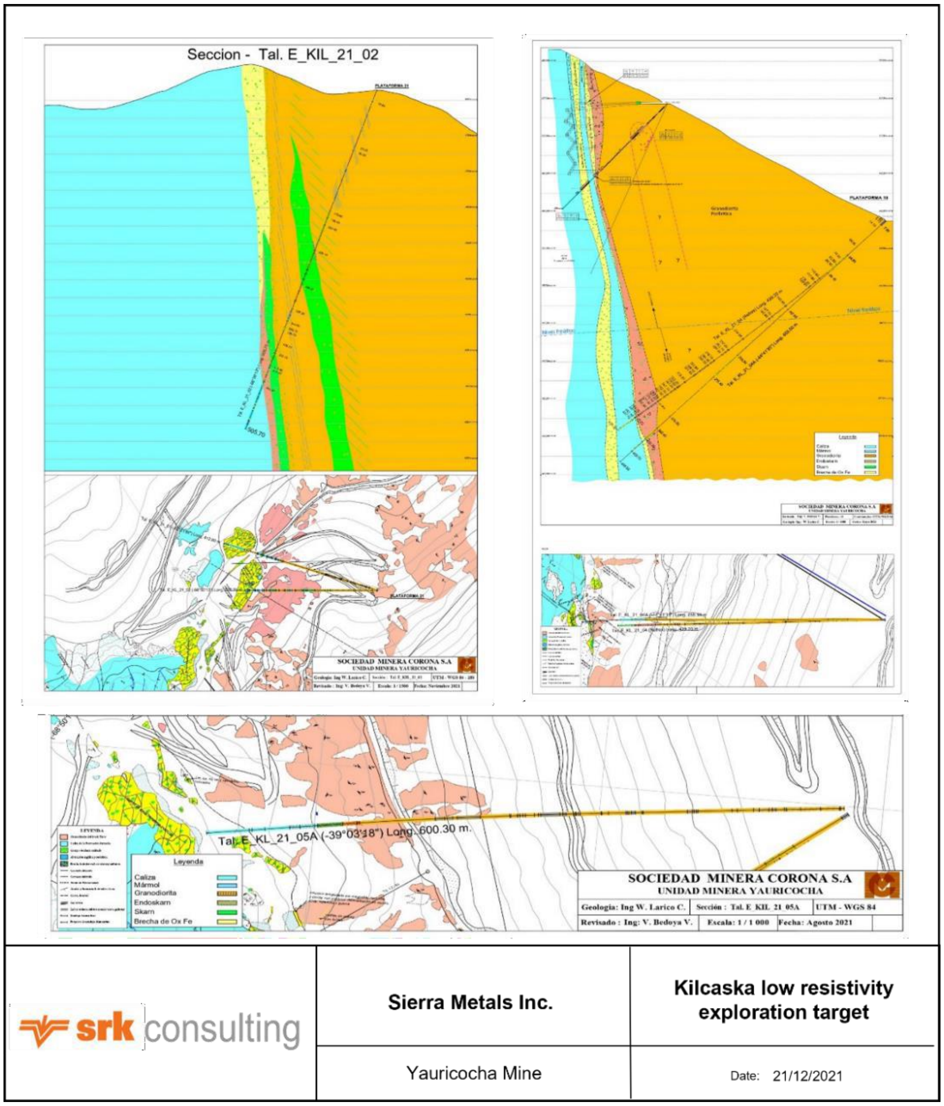
Figure 9-4: Victoria and Alida Exploration Target Areas and Conceptual Drilling Plan



Source: SRK, 2022

Additional mapping and sampling have been conducted in the South Yauricocha Fault and South Kilcasca areas (Figure 9-5). The Éxito granodiorite intrusives are in contact with the calcareous rocks of the Jumasha Formation.

Figure 9-5: Kilcasca 2021 Exploration Target Area and 2021 Drilling Plan

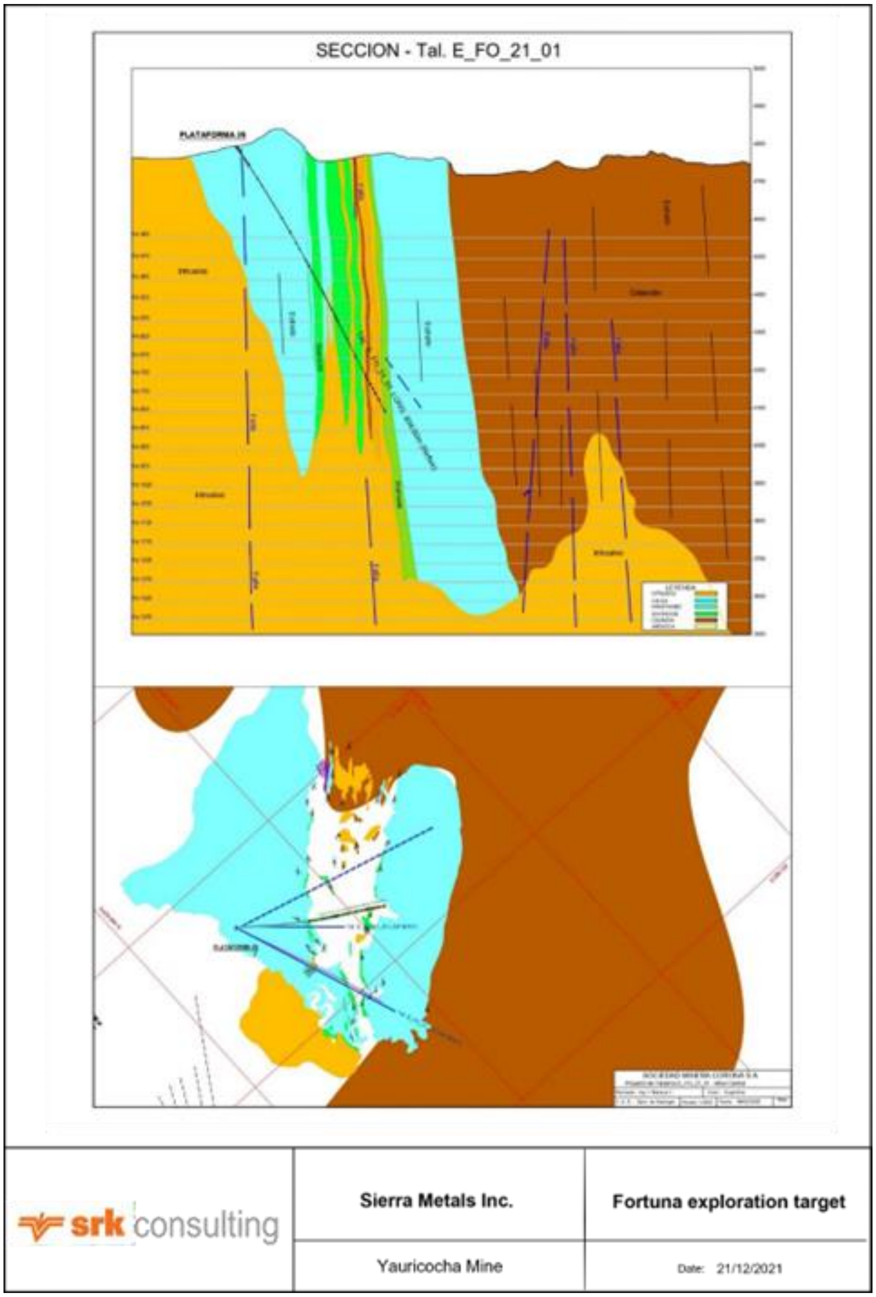


Source: SRK, 2022

Hydrothermal breccias in conjunction with the development of marbles and skarns within the limestones have been observed in the area. Argillic and phyllic alteration occurs along vein contacts. The hydrothermal breccias outcrop and are intensely oxidized and leached. Historically, the mineralized bodies of Francolina and Felicidad have been mined at average grades of 4.27% zinc, 2.15% lead, 0.30% copper and 23.30 g/t silver. Recent surface geochemical sampling results yielded values as high as 0.99% lead, 0.97% zinc, 1.00% copper and 97.0 g/t silver. Polymetallic mineralization similar to the Éxito mine is the focus of the exploration drilling at Kilcasca.

Geological exploration area at Fortuna is focused on the contact between the Jumasha Formation and granodiorite intrusions associated with the Yauricocha fault, where garnet rich skarns have been identified in rock outcrop (Figure 9-6).

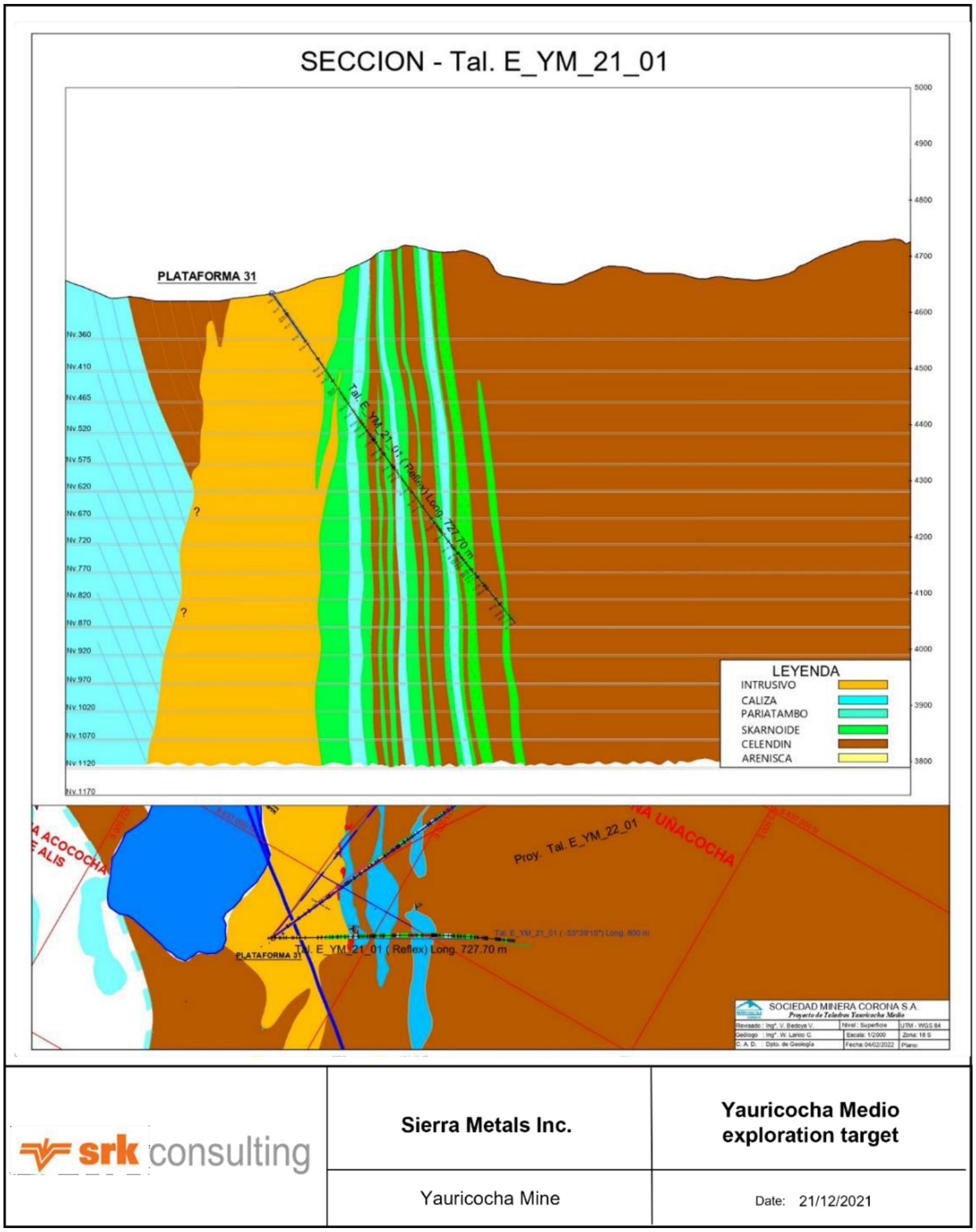
Figure 9-6: Fortuna 2021 Exploration Target Area and 2021 Drilling Plant



Source: SRK, 2022

The Yauricocha Medio exploration target area is focussed on the contact between the Celendín Formation and granodiorite intrusion associated with the Yauricocha Fault, exploring for sulphide polymetallic mineralization (Figure 9-7). Skarns containing oxidized copper mineralization is apparent in rock outcrop at this contact zone on surface. Historical mining in the area yielded average grades of 1.60% copper, 2.6% zinc, 1.02% lead and 71.5 g/t silver.

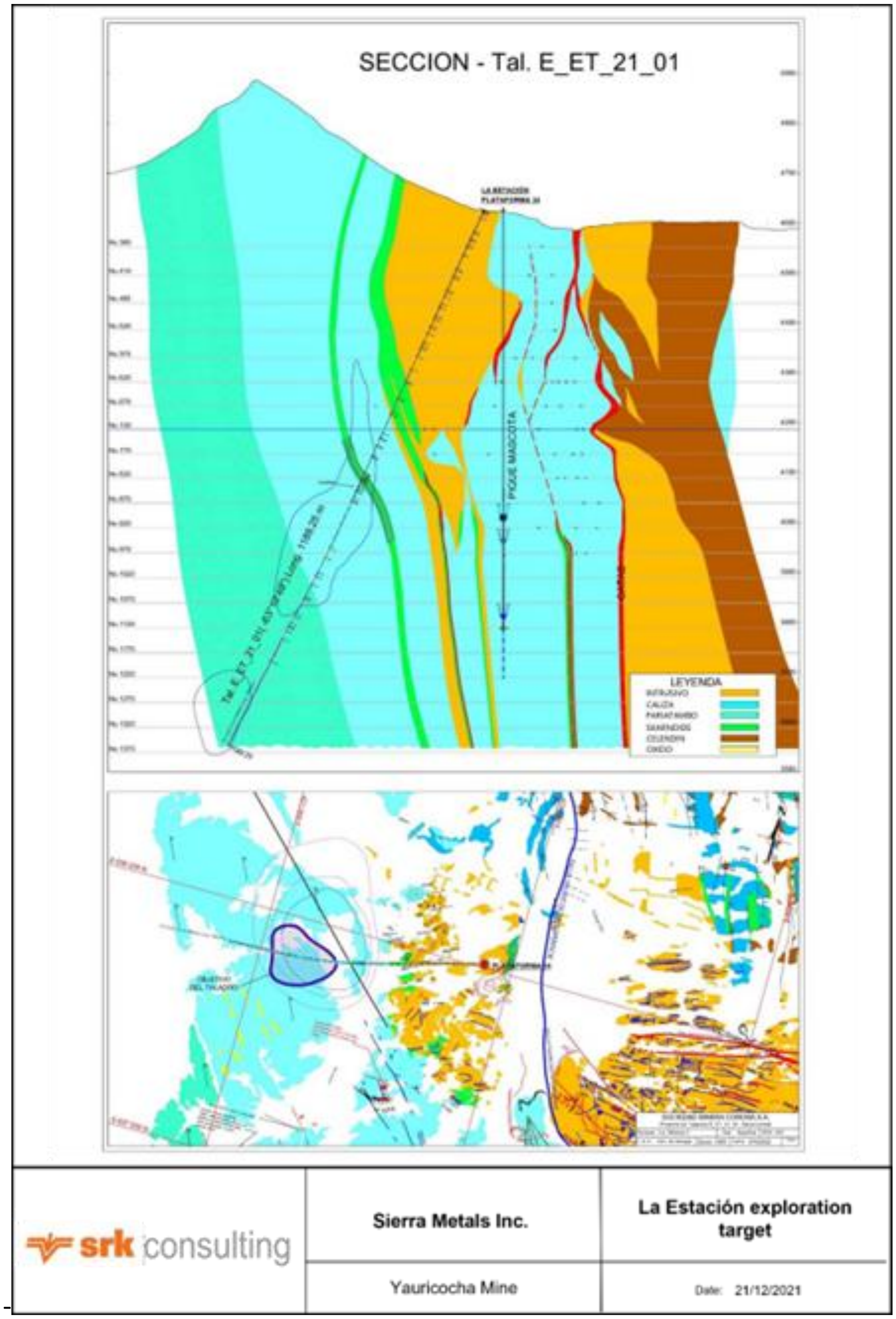
Figure 9-7: Yauricocha Medio Exploration Target Area and 2021 Drilling Plan



Source: SRK, 2022

The La Estación exploration area is focussed between the contact of the Jumasha Formation limestones and granodiorite intrusions (Figure 9-8). Skarns with polymetallic sulphide mineralization have been identified in small bodies within the historical mine by Yauricocha staff. Historical mining produced average grades of 248.8 g/t silver, 15.00% zinc, 9.00% lead and 0.20% copper.

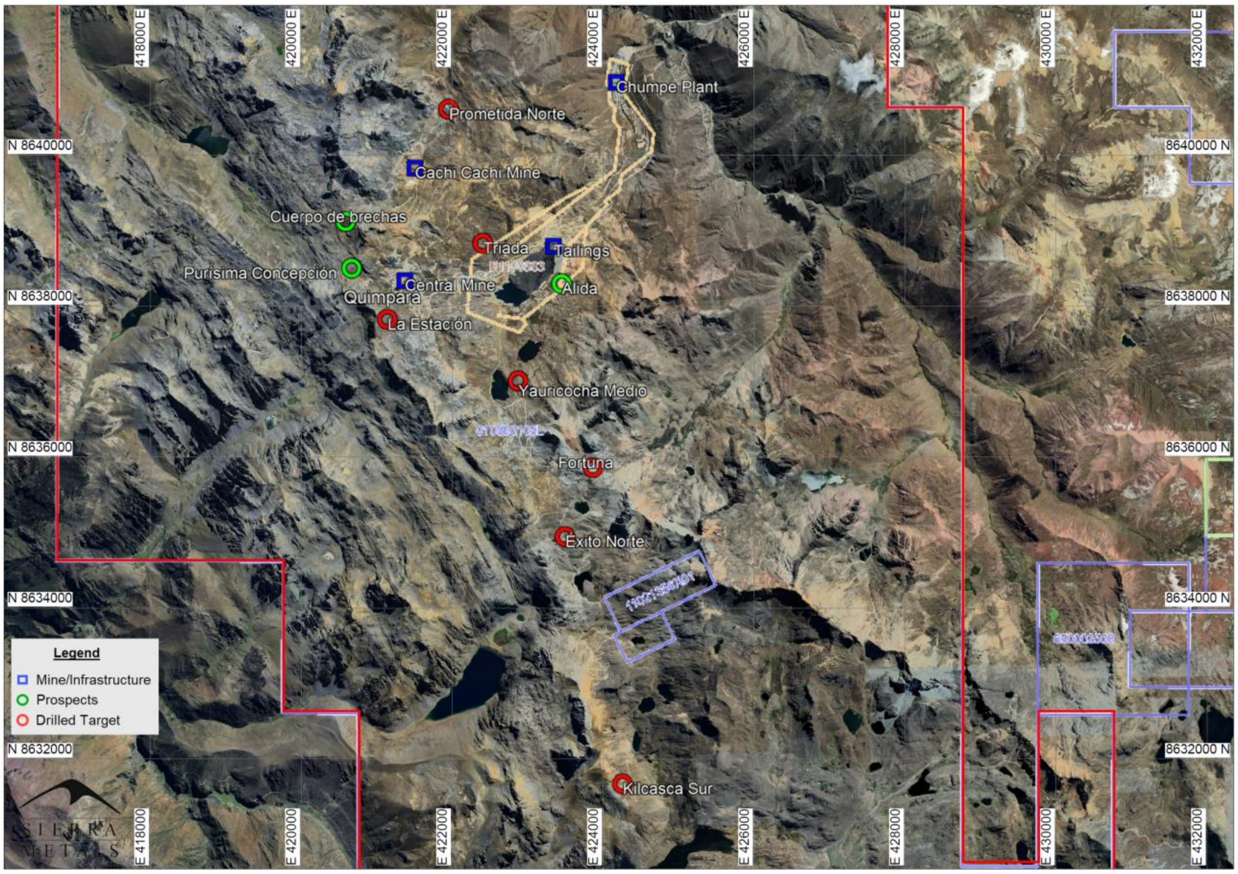
Figure 9-8: La Estación Exploration Target Area and 2021 Drilling



Source: SRK, 2022

Between 2021 and 2023 diamond drilling work has been carried out in the following areas: Kilcasca, Éxito, Fortuna, Yauricocha Medio, La Estación and Triada; a total of 11,464 m were drilled in 15 holes. These were executed by the companies G&G Group and MDH SAC. The samples obtained from the drills were analyzed in the laboratories of ALS Chemex. The drilling targets evaluated known areas and new areas with evidence of surface mineralization in outcrops or past mining works with strong concentrations of base metals, in addition, geophysical anomalies recommended by Quantec were also evaluated.

Figure 9-9: Yauricocha Surface Exploration Targets 2021-2023 and Drilling Areas



Source: Sierra Metals (2024)

During 2021 surface exploration has focused more on areas surrounding the Central mine, mainly to the southeast in the areas of Kilcasca Sur, Fortuna, Exito Norte, Yauricocha Medio and La Estacion.

9.3.1 Kilcasca Sur (Skarn)

The Kilcasca Sur comprises the Felicidad and Francolina areas, located 7.5 km southeast of the Yauricocha Mine. In the past, it was explored by means of short diamond drilling and mining operations carried out by the Cerro de Pasco Corporation, CENTROMIN PERU and SIMSA. The metasomatic contact or skarn mineralized bodies follow the granodiorite-limestone contact discontinuously for more than 1,500 m with widths varying between 0.5 m and 30 m, the mineralized bodies both in outcrop and in the crowns of the mining works expose yellowish-brown to blackish tones with green patinas due to the presence of copper oxides with galena and sphalerite nests; together, they form massive textures, hydrothermal and porous breccias with strong silicification plus occurrence of veined garnets and enclaves of calcite and barite. The most important polymetallic concentrations of a population of 418 surface samples in oxidized material report good anomalies in zinc, silver and lead: 0.4% to 10% Zn, 2 to 100 g/t Ag, 0.1% to 1.0% Pb.

9.3.2 Mining Work Felicidad Area

The Felicidad mining work comprises crossings and workings that run through the 30 m long by 8 m wide skarn body, the fill of the mineralized body consists of a range of iron oxides with inclusions of sphalerite, galena, pyrite, chalcopyrite. 31 systematic samples report on average: 23 g/t Ag, 2.15% Pb, 4.27% Zn, 0.3% Cu and 0.3 g/t Au. The three-dimensional model of the polymetallic body suggests a southeast plunge.

9.3.3 Fortuna (Skarn)

The Fortuna is located southeast of the Yauricocha Central Mine on the topographic high of Cerro Astomarca between the roof of the Jumasha Formation and the base of the Celendín Formation. The most relevant structural feature is the possible projection of the Yauricocha Fault, exposing a brownish-yellowish fault zone plus the occurrence of dikes of an intermediate nature. The geology of the area comprises layers of marbled folded limestone with restricted skarn zones around granodiorite and intrusive dikes. There are isolated mine explorations developed on vetiform structures with evident mineralization in Zn, Pb and Cu. Adding the results of resistivity-type geophysics on the geology of the site, an exoskarn-type exploratory target was constructed. To test the conceptual model, two drill holes were developed accumulating 1637 linear m of drilling, the results were negative in the search for polymetallic bodies. Only a narrow structure of 1.5 m was intercepted with 10 g Ag, 1.6% Pb, 1.0% Cu and 2.3% Zn.

9.3.4 Yauricocha Medio (Skarn)

The Yauricocha Medio encompasses three mineralized segments of exoskarn and endoskarn at an interval of 230 m, running at the contact between the granodiorite and a limestone horizon belonging to the lower member of the Celendín Formation that in this sector build the western limb of the Poderosa Syncline in its southeast extension. The skarn bodies exhibit a granoblastic texture made up of andradite-type garnets followed by pyroxenes, calcite, magnetite, specularite, martite (variety of hematite) and iron oxides; visual copper mineralization is related to the occurrence of lesser malachite, chrysocolla and chalcocite with pyrite and chalcopyrite relicts, body widths ranging from 2.30 m to 9.30 m. 36 surface samples, 11 samples report more than 1.0% Cu with zinc and silver credits. Five drill holes with a total length of 4267 m were drilled, the results were positive with grades of 0.6 to 5.9% Zn, 0.4% to 1.6% Cu, 0.3% to 2.4% Pb.

During 2022 surface exploration has focused on areas surrounding the Central mine, mainly to the East side in the areas of Alida and Prometida.

9.3.5 Alida (Porphyry-Skarn)

The Alida prospect is part of the porphyry-skarn Triada complex in its southeastern portion with a strong polymetallic plus molybdenum geochemical signature in leachate outcrops covering an area of 800 m long by 400 m wide. The geological environment exposes clastic lithologies of the Celendín Formation that build the eroded architecture of the Poderosa Syncline and Maricielo Anticline, cut by intrusives of the Triada complex plus dikes of an intermediate nature. Most of the clastic units are hornfelsed with intercalations of garnets and pyroxenes, at the same time, they host a group of veins and fill structures forming a structural network type of network. We conjecture that the structures that manifest themselves at the southern edge of the Yauricocha tailings dam within the Celendín, projected towards levels of the Jumasha Formation, could correspond to skarn-type blind body escape structures replacing limestones. The faults flanking the area of interest correspond to the second-order structural system N 20°W with normal sinistral motion. A third system forms echelon N 60°W structures with normal dextral movement forming negative flower structures, which outcrop filled with iron oxides, quartz, ground rock, patinas of copper oxides plus sporadic relicts of chalcocite, tenorite, pyrite and sphalerite. Due to the nature of the supergene alteration, we assume strong leaching is a trait that must be considered when interpreting leachate outcrops with possible enrichment zone. Likewise, the potential for polymetallic sulphides and a possible porphyry-like Cu-Mo environment at depth is kept open. A total of 466 samples were collected, 306 by systematic channels and 160 by chip sampling, which were tested in ALS Chemex Laboratory. The results show interesting values with a distribution: 0.04% to >1.0% Zn, 0.04% to >1.0% Pb, 0.03% to 0.65% Cu and 25 ppm to 291 ppm Mo.

9.3.6 Triada (Cu- Mo Porphyry)

The hydrothermal system corresponds to a complex of igneous and subvolcanic pulses that gave rise to a Cu-Mo porphyry system with a hydrothermal footprint of 1,000 m long by 800 m wide. The composition of the bodies varies between granodiorite and monzonite, including monzonitic quartz and diorite pulses. These bodies exhibit fine, serial, and porphyritic phaneritic textures. Most of the bodies were emplaced as tabular bodies, and emplacement on the anterior pulses occurred in a plastic to semi-rigid state. Therefore, the contacts between them tend to be sinuous and assimilative and with fragments with partially assimilated edges. The host rock corresponds to the granodioritic intrusive, which is observable in several sections between the different pulses. The alteration is characterized by the presence of traces of the potassium order, superimposed by early and late sericite and alunite events.

The largest exploration effort with five diamond drill holes was carried out in the period from 2018 to 2020. During 2022, complementary mapping work was carried out at a scale of 1/1000 and systematic sampling in a mesh of 50 m per side. Sierra Metals collected 184 samples, additionally, Sumitomo Mining Metals Peru collected 216 samples, the total samples were tested in the ALS Chemex laboratories, in parallel, the mineralogies of hydrothermal alteration were determined with the use of Terraspec. The structural network groups two families that control the mineralization, the largest population are fractures and veins of quartz plus iron oxides, ferromolybdenite with relicts of pyrite and molybdenite oriented from East to West with high angle throws to the South evidencing normal dextral movement, the second system corresponds to the Andean system oriented N 40 to 60 W plus sub-vertical dip to the Southwest with sinistral movement, These structures contain quartz, pyrite with oxide patinas and copper sulphates, in addition, there are network and stockwork areas with halos of phyllic alteration. The network of veins is like to the classic "E", "D" and "B" veins in porphyritic environments. On the other hand, the most relevant alterations are of a hydrothermal nature, where the intermediate argillic is widely distributed with clay minerals, illite, kaolinite and smectite; Meanwhile, phyllic alteration is restricted to fracture zones and quartz veinlets with clay and sericite halos. Towards the margins it surrounds extensive chloritization with disseminated pyrite.

Surface geochemistry shows two anomalous areas with concentrations of 0.01% to 0.07% Cu and 16 ppm to 2000 ppm Mo with a greater presence in Alida. In the last quarter of 2022, geophysical prospecting studies were carried out using 43 lines spaced every 100 metres with a total of 125.76 linear km, the consulting firm Deep Sounding was in charge of carrying out the study. The results found highlight important positive magnetic anomalies surrounding a depressed core that coincides with the location of the porphyry Triada, it should be added, the positive anomalies surround the igneous complex fitting with the sedimentary units of the Jumasha, Celendín and Casapalca formations. Apparently, it would correspond to bodies with magnetic mineralogies and basic. The best cuts were recorded in the boreholes marked ETR2014 and POR10180, the first registering 680 m with 0.21% Cu, 65 ppm Mo and 0.9 g Ag, the next 786 m @ 0.2% Cu, 124 ppm Mo, 1.39 g Ag. The potential in volume and grade is open, due to core of the system has not been drilled.

During 2023 surface exploration has focused on areas surrounding the Central mine, mainly to the Northwest in the area of Purisima Concepcion, to the North in the areas of Prometida Norte and Cuerpos de Brecha.

9.3.7 Prometida Norte (Skarn)

The Prometida Norte area is located 2 km northeast of the Yauricocha Central Mine. The geological environment and mineralization are similar to the Cachi Cachi Mine, exposing oxidized ridges with inclusions and patinas of carbonates plus copper silicates at the intrusive – limestone contact, occasionally remnants of pyrite, galena, and chalcopyrite. The yellowish-brown ridges reach widths between 1.0 m and 5.0 m along 750 linear m. Mining work or searches are frequent along the layout of the structure. The target Prometida is located 600 m northeast of the Cachi Cachi Mine, additionally, the front of the nearest mining work on level 720 is about 350 m away. On the central portion of the body, 06 DDH have been performed from the interior of the mine and surface (2008 and 2013), the results were positive, reporting on average: 2.96 m with 3.61 oz Ag, 0.77% Pb, 2.70% Cu and 6.19% Zn in oxidized, secondary and primary material. 60 surface samples from the eastern sector of the area were assayed: 0.01 to 7.5% Pb, 0.01 to 27% Zn and 0.01 to 11% Cu.

9.3.8 Cuerpos de Brechas (Huamanripa Hydrothermal)

Located 800 m northwest of the Yauricocha Central Mine, calcareous rocks of the Jumasha Formation outcrop in the area with gossan structures, mainly iron oxide, manganese oxides with inclusions of sphalerite, galena and chalcopyrite associated with low-temperature silica, which are continuously congruent with the stratification and sub-vertical faults oriented to the Northeast. Northeast and East-West. The area covers approximately 110 ha covering the areas of Huamanripa, Carmencita, La Guera and Guiliana. A total of 25 breccia bodies of varying diameters located at different elevations have been recorded. Three clear examples with systematic sampling are the oxidized bodies Mascota Oeste, Mascota Oeste Intermedio and Giliana; the first two concentrate: West Pet Body: 0.54 g/t Au, 41.70 g/t Ag, 0.54% Pb (n=109 samples). Intermediate West Pet Body: 0.27 g/t Au, 46.58 g/t Ag, 0.9% Bp (n=245 samples). 32 new selective samples were taken from the oxidized outcrops over the Huamanripa area, the assays reach maximums: 5.28 oz/t Ag, 3.44% Pb, 1.03% Cu, 30.61% Zn and 0.8 g/t Au.

9.3.9 Purísima Concepción (Replacement Bodies)

Located 0.7 km northwest of the Central Mine, the mantles and gold bodies of the Purísima Concepción are located on the dome and limbs of the anticline, affecting bituminous clastic levels of the Jumasha Formation. It has oxidized outcrops with values between 1.0 and 10 g/t Au, associated with bituminous horizons with widths varying between 2.0 m and 6.0 m thick. There are 20 diamond boreholes that were drilled from the surface (CENTROMIN Peru, 1987 and Corona, 2012) descending to 4400 metres above sea level. Drilling corroborated the deepening of the bituminous horizons with low-temperature silica replacement plus several pyrite paragenesis. Precious metal contents range from 0.22 to 51.3 g/t Au and from 2 to 528 g/t Ag. Complementary geological evaluation work has identified a system of vein and mantle-type structures that run northwest for more than 600 m cutting the Purísima Concepción Anticline. The most important being the Mother Vein. New 35 samples from the northwest projection of the drilled area report significant concentrations with maximum limits: 21 g/t Au, 14.40 oz/t Ag, 1.0% Pb and 2.0% Zn. The reinterpretation of the 12 holes of 2014 confirms the continuity of the Mother Vein at depth, showing an interval of 400 m long with widths between 2 and 9 m, open at its ends. Considering, cut-off >3 g/t Au we find a segment of 300 m @ 6.53 g/t Au for an intercept width of 4.80 metres.

The Near mine exploration work has been scheduled in the Cuerpos de Brecha, Purísima Concepción and Alida areas, with the aim of defining new target of drilling.

The QP considers the exploration techniques employed by Yauricocha mine suitable in exploration for oxide and sulphide polymetallic mineralization (i.e. primarily Ag, Au, Cu, Pb and Zn) hosted in skarns, carbonate replacement bodies and veins. It should be noted that exploration results indicate exploration potential only and, in such form, do not have any reasonable prospects of eventual economic extraction.

10 DRILLING

As of the Effective Date, 31 December 2023, Sierra Metals has completed approximately 663,013 m of diamond drilling in 4,502 holes. Drill holes are categorized as exploration and development, drilling by contractor, and drilling by the Company (Table 10-1). Since the effective date of the previous technical report (SRK, 2022), Sierra Metals has completed 73,913 m of drilling in 568 diamond drill holes (Table 10-2). Drilling is ongoing on the Project.

Plan and section views showing the four main Mine Areas and the traces of diamond drilling to date are provided in Figure 10-1 and Figure 10-2.

10.1 Type and Extent

For the 2021 through 2023 diamond drilling, Sierra Metals (Minera Corona) contracted the work to G&G Perforaciones (GyG Group S.A.C.) based in Lima, Peru. Previous to 2021 (2002 to 2020), the Company used a combination of their own drilling equipment and contractors to complete the drilling campaigns. Exploration (establishing continuity of mineralization) and development (reserve and production definition) drilling conducted by Minera Corona from 2002 to 2023 is detailed in Table 10-1. Drilling completed since the 31 March 2021 effective date of the last technical report (PEA) complete by SRK (2022) is provided in Table 10-2.

Until 2020, the Geology Department of Sierra Metals Minera Corona owned and operated two electro-hydraulic drilling rigs, whose reach varies between 80 m and 150 m in length and with a core diameter of 3.5 centimetres. The mine also used the services of drilling contractors (MDH and REDRILSA) for deeper drilling, reaching up to 900 m in length, and with core diameters of generally HQ and NQ.

Table 10-1: Yauricocha Exploration and Development Diamond Drilling by the Company and Contractor

Year	Exploration and Development (m)	Drilling by Company (m)	Drilling by Company (No. Holes)	Drilling by Contractor (m)	Drilling by Contractor (No. Holes)
2002	3,886	1,887	24	-	-
2003	4,955	3,415	38	-	-
2004	4,023	2,970	40	-	-
2005	4,034	3,160	32	8,043	47
2006	2,786	2,999	31	10,195	52
2007	2,466	4,751	43	6,196	37
2008	2,380	5,379	45	13,445	64
2009	1,912	4,955	52	13,579	60
2010	1,086	4,615	44	3,527	26
2011	1,611	5,195	47	9,071	56
2012	1,530	11,532	201	31,257	120
2013	2,569	10,653	169	16,781	70
2014	1,011	9,357	121	30,455	154
2015	342	9,735	166	33,214	202
2016	6,239	9,145	138	42,020	248

Year	Exploration and Development (m)	Drilling by Company (m)	Drilling by Company (No. Holes)	Drilling by Contractor (m)	Drilling by Contractor (No. Holes)
2017	8,520	7,384	214	49,715	351
2018	6,193	5,103	103	36,771	213
2019	4,182	4,653	96	45,983	274
2020	2,712	1,076	18	18,693	106
2021	1,925	0	0	51,410	303
2022	3,012	0	0	35,776	263
2023	2,346	0	0	29,197	234
Totals:	**69,720**	**107,964**	**1,622**	**485,329**	**2,880**

Table 10-2: Yauricocha Drilling Completed since March 31, 2021.

Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
D_CAT_18_21_04	23891.59	15229.96	3786.74	100.00	61.84	16.78	2021	April	Catas
D_CAT_18_21_05	23892.35	15224.61	3786.90	85.00	81.65	15.02	2021	April	Catas
D_CAT_18_21_06	23893.01	15225.53	3786.99	95.00	97.33	11.79	2021	April	Catas
D_CAT_18_21_07	23889.22	15229.66	3786.90	136.90	10.36	18.03	2021	April	Catas
D_CAT_18_21_08	23891.26	15229.99	3786.91	95.80	31.18	14.35	2021	April	Catas
D_CAT_18_21_09	23891.69	15229.88	3786.81	90.00	49.23	16.37	2021	April	Catas
D_CAT_18_21_10	23892.63	15225.02	3786.94	88.60	90.02	13.15	2021	April	Catas
D_CAT_18_21_11	23892.21	15224.42	3787.06	113.20	115.55	8.59	2021	April	Catas
D_CAT_19_21_01	23926.82	15083.63	3749.31	120.00	79.69	13.47	2021	April	Catas
D_CAT_19_21_02	23926.88	15084.26	3749.17	120.00	66.95	17.71	2021	April	Catas
D_CAT_19_21_03	23926.79	15084.84	3749.13	116.90	54.28	16.33	2021	April	Catas
D_CAT_19_21_04	23926.37	15086.08	3749.21	130.00	39.64	15.14	2021	April	Catas
D_CAT_19_21_05	23926.80	15084.84	3749.48	105.30	53.17	4.26	2021	April	Catas
D_CAT_19_21_06	23926.77	15083.64	3749.52	120.45	79.04	5.90	2021	April	Catas
D_ESC_16_21_01	23713.30	16464.13	3900.95	200.00	139.99	29.73	2021	April	Escondida
D_ESPNII_17_21_01	23591.20	15916.59	3839.16	180.00	47.75	-0.35	2021	April	Esperanza Norte II
D_ESPNII_17_21_02	23591.27	15916.46	3839.16	173.60	52.51	0.17	2021	April	Esperanza Norte II
D_PRIV_16_21_02	23712.78	16463.72	3900.88	154.70	168.43	29.21	2021	April	Privatizadora
D_PRIV_16_21_03	23712.80	16463.61	3901.14	200.00	168.08	16.68	2021	April	Privatizadora
D_PRIV_16_21_04	23712.79	16463.72	3901.33	200.00	168.09	11.41	2021	April	Privatizadora
GEOMET_CAT_18_21_01	23892.54	15224.86	3786.97	105.90	108.46	15.48	2021	April	Catas
GEOMET_CAT_19_21_01	23926.88	15084.27	3749.47	105.00	67.13	7.30	2021	April	Catas
D_CAT_18_21_01A	23928.34	15105.72	3798.17	131.65	33.50	1.46	2021	May	Catas
D_CAT_18_21_02A	23928.57	15105.44	3798.14	120.00	42.66	2.85	2021	May	Catas
D_CAT_18_21_03A	23928.86	15104.76	3798.20	100.00	51.74	1.27	2021	May	Catas
D_CAT_18_21_04A	23928.89	15104.87	3798.18	100.00	61.17	0.61	2021	May	Catas
D_CAT_18_21_05A	23929.15	15104.21	3798.17	100.00	73.83	1.12	2021	May	Catas
D_CAT_18_21_06A	23927.76	15103.49	3798.21	105.00	83.94	1.71	2021	May	Catas
D_CAT_18_21_07A	23929.01	15103.03	3798.20	120.00	95.15	1.65	2021	May	Catas
D_CAT_18_21_08A	23928.87	15102.77	3798.19	130.00	103.00	1.48	2021	May	Catas

Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
D_ESC_16_21_02	23712.95	16464.68	3901.47	180.00	139.77	16.81	2021	May	Escondida
D_ESC_16_21_03	23713.37	16464.05	3901.39	197.20	138.92	10.98	2021	May	Escondida
D_ESC_16_21_04	23713.73	16465.06	3901.28	200.00	128.57	29.98	2021	May	Escondida
D_ESPN_17_21_14	23567.13	16089.41	3842.06	90.00	102.54	-38.36	2021	May	Esperanza Norte
D_ROS_15_21_09	24087.52	14848.08	3948.12	141.05	18.50	50.85	2021	May	Rosaura
E_PRIVS_17_21_01	23582.95	16267.17	3841.29	120.20	138.04	0.00	2021	May	Privatizadora
E_PRIVS_17_21_02	23583.35	16267.60	3841.29	150.00	125.38	-0.49	2021	May	Privatizadora
E_PRIVS_17_21_03	23583.56	16268.24	3841.28	150.00	115.62	-0.36	2021	May	Privatizadora
E_PRIVS_17_21_04	23583.94	16268.78	3841.28	150.00	104.71	-1.71	2021	May	Privatizadora
E_PRIVS_17_21_05	23584.14	16269.35	3841.32	150.00	94.75	-1.80	2021	May	Privatizadora
E_PRIVS_17_21_06	23584.02	16269.91	3841.32	150.00	83.81	-3.58	2021	May	Privatizadora
D_ANT_15_21_01	23988.25	14949.90	3938.64	200.00	51.10	37.21	2021	June	Antacaca
D_ANT_15_21_02	23989.22	14949.57	3938.57	120.00	58.24	40.16	2021	June	Antacaca
D_ANT_15_21_03	23989.96	14949.32	3938.51	120.00	66.09	36.00	2021	June	Antacaca
D_ANT_15_21_04	23990.40	14948.87	3938.55	120.00	75.32	36.77	2021	June	Antacaca
D_ANT_15_21_05	23990.84	14948.73	3938.46	120.00	83.43	35.86	2021	June	Antacaca
D_ANT_15_21_06	23991.41	14947.60	3938.08	131.70	91.86	34.38	2021	June	Antacaca
D_ESC_16_21_05	23713.66	16465.12	3901.63	172.40	128.62	17.67	2021	June	Escondida
D_ESC_16_21_06	23713.70	16465.08	3901.72	170.40	129.21	10.44	2021	June	Escondida
D_ESC_16_21_07	23713.87	16465.95	3901.63	200.00	112.59	29.56	2021	June	Escondida
D_ESC_16_21_08	23714.27	16465.78	3901.66	190.00	112.65	17.06	2021	June	Escondida
D_ESC_16_21_09	23714.24	16465.80	3901.81	191.30	112.85	9.64	2021	June	Escondida
D_ESPN_17_21_15	23567.12	16091.09	3842.03	100.00	82.46	-36.26	2021	June	Esperanza Norte
D_ESPN_17_21_16	23566.60	16092.35	3841.99	100.00	63.89	-33.70	2021	June	Esperanza Norte
D_ESPN_17_21_17	23566.12	16093.69	3841.57	119.10	46.95	-24.09	2021	June	Esperanza Norte
D_ROS_15_21_10	24088.14	14847.92	3948.06	110.00	29.75	46.75	2021	June	Rosaura
D_ROS_15_21_11	24088.65	14847.36	3948.14	105.00	42.53	46.46	2021	June	Rosaura
D_ROS_15_21_12	24089.01	14846.84	3948.21	101.20	55.25	47.08	2021	June	Rosaura
D_ROS_15_21_13	24089.10	14846.49	3948.24	105.00	70.67	46.31	2021	June	Rosaura
D_ROS_15_21_14	24089.25	14846.21	3948.50	105.00	81.81	42.54	2021	June	Rosaura
D_ROS_15_21_15	24089.55	14845.75	3948.28	135.15	93.59	37.72	2021	June	Rosaura
E_PRIVS_17_21_07	23665.38	16366.02	3841.59	107.90	154.88	-1.13	2021	June	Privatizadora
E_PRIVS_17_21_08	23666.15	16366.73	3841.63	200.00	133.67	-0.09	2021	June	Privatizadora
E_PRIVS_17_21_09	23666.62	16367.22	3841.66	166.30	117.27	-0.62	2021	June	Privatizadora
E_PRIVS_17_21_10	23666.24	16368.00	3841.65	170.80	101.70	-1.56	2021	June	Privatizadora
E_PRIVS_17_21_11	23667.43	16368.68	3841.66	206.80	89.13	0.04	2021	June	Privatizadora
D_ANT_15_21_07	23990.23	14946.35	3937.94	157.15	98.00	29.48	2021	July	Antacaca
D_ANT_15_21_08	23988.10	14950.14	3938.58	120.00	43.01	37.11	2021	July	Antacaca
D_CSM_18_21_01	23815.93	14949.86	3801.65	199.60	184.98	0.34	2021	July	Csm
D_ESPC_18_21_01	23620.35	15618.33	3825.85	90.00	67.26	25.47	2021	July	Esperanza
D_ESPC_18_21_02	23620.34	15617.94	3825.90	104.65	75.05	22.91	2021	July	Esperanza
D_ESPC_18_21_03	23620.35	15617.49	3825.97	140.40	85.29	20.35	2021	July	Esperanza

Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
D_ESPC_18_21_04	23620.34	15617.00	3825.96	144.90	95.63	19.37	2021	July	Esperanza
D_ESPC_18_21_05	23620.34	15616.46	3826.00	166.50	107.39	17.18	2021	July	Esperanza
E_ANG_15_21_01	24017.82	16679.74	3975.97	130.70	142.31	11.50	2021	July	Angelita
E_ANG_15_21_02	24018.37	16680.22	3975.00	196.00	134.61	13.22	2021	July	Angelita
E_PRIVS_17_21_12	23666.36	16371.96	3841.61	200.00	44.44	-0.30	2021	July	Privatizadora
E_PRIVS_17_21_13	23667.35	16370.52	3841.58	204.40	63.83	-0.47	2021	July	Privatizadora
E_PRIVS_17_21_14	23667.29	16368.67	3840.00	181.90	89.27	29.12	2021	July	Privatizadora
E_PRIVS_17_21_15	23667.18	16368.27	3841.69	207.05	109.24	0.36	2021	July	Privatizadora
D_ANT_18_21_01	23936.94	15012.64	3807.43	135.45	79.98	9.06	2021	August	Antacaca
D_ANT_18_21_02	23936.99	15012.43	3807.45	140.05	87.34	7.40	2021	August	Antacaca
D_CSM_18_21_02	23817.00	14949.34	3801.67	209.80	175.04	1.43	2021	August	Csm
D_CSM_18_21_03	23817.36	14949.03	3801.70	206.00	166.20	0.20	2021	August	Csm
D_ESPC_18_21_06	23620.24	15615.97	3826.01	146.10	117.23	14.05	2021	August	Esperanza
D_ESPC_18_21_07	23619.98	15615.61	3825.98	148.25	126.37	19.49	2021	August	Esperanza
D_ESPC_18_21_08	23620.12	15620.09	3825.81	115.00	35.09	19.14	2021	August	Esperanza
D_ESPC_18_21_09	23619.50	15615.15	3825.36	80.00	137.56	42.25	2021	August	Esperanza
D_ESPC_18_21_10	23619.34	15615.01	3825.52	90.00	148.49	37.72	2021	August	Esperanza
D_PRIVS_17_21_02A	23584.21	16270.31	3841.97	250.00	87.76	-14.18	2021	August	Privatizadora
E_ANG_15_21_03	24018.71	16680.92	3976.02	129.70	125.58	12.16	2021	August	Angelita
E_ANG_15_21_04	24019.05	16681.03	3976.02	203.60	113.77	10.94	2021	August	Angelita
E_PRIVS_17_21_16	23583.52	16267.89	3841.26	407.20	119.62	0.09	2021	August	Privatizadora
D_ANT_18_21_03	23936.95	15011.67	3807.48	147.30	92.11	7.48	2021	September	Antacaca
D_ANT_18_21_04	23936.80	15011.44	3807.51	160.50	100.20	6.43	2021	September	Antacaca
D_ANT_18_21_05	23937.16	15011.10	3807.51	197.20	107.49	6.43	2021	September	Antacaca
D_ANT_18_21_06	23936.84	15011.19	3807.50	226.20	110.86	6.43	2021	September	Antacaca
D_ANTS_15_21_01	24131.45	14786.11	3941.37	81.20	48.47	27.59	2021	September	Antacaca Sur
D_ANTS_15_21_02	24131.97	14785.44	3941.26	100.00	63.37	25.73	2021	September	Antacaca Sur
D_ANTS_15_21_03	24132.04	14785.24	3941.36	115.20	78.70	22.65	2021	September	Antacaca Sur
D_ANTS_15_21_04	24132.12	14784.38	3941.42	121.60	91.19	18.94	2021	September	Antacaca Sur
D_ANTS_15_21_05	24132.03	14783.96	3941.47	135.60	101.88	18.08	2021	September	Antacaca Sur
D_ANTS_15_21_06	24131.63	14783.29	3941.58	142.00	110.78	17.87	2021	September	Antacaca Sur
D_ANTS_15_21_07	24131.47	14782.71	3941.59	154.50	115.87	17.23	2021	September	Antacaca Sur
D_ANTS_15_21_08	24131.45	14782.88	3941.60	170.00	120.19	17.17	2021	September	Antacaca Sur
D_ESC_17_21_01	23797.20	16492.68	3841.57	90.00	104.96	50.09	2021	September	Escondida
D_ESC_17_21_02	23797.20	16491.48	3841.70	95.50	120.60	47.70	2021	September	Escondida
D_ESC_17_21_03	23796.47	16491.17	3842.44	90.70	135.55	42.52	2021	September	Escondida
D_ESPC_18_21_11	23596.07	15708.62	3787.94	80.00	106.43	1.75	2021	September	Esperanza
D_ESPC_18_21_12	23596.20	15709.41	3787.97	60.60	91.45	0.32	2021	September	Esperanza
E_17_21_01	23562.47	16310.60	3841.06	250.50	51.18	0.04	2021	September	Contacto NW
E_ELI_15_21_01	23873.56	16582.12	3966.90	149.10	178.29	44.75	2021	September	Elissa
E_ELI_15_21_02	23873.78	16582.67	3967.21	148.50	170.32	47.59	2021	September	Elissa
E_ELI_15_21_03	23873.97	16582.64	3966.82	150.00	159.10	52.03	2021	September	Elissa

Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
E_ELI_15_21_04	23874.56	16582.57	3966.51	144.00	143.39	56.29	2021	September	Elissa
D_ANTS_15_21_09	24131.51	14786.04	3941.09	118.80	55.48	36.75	2021	October	Antacaca Sur
D_ANTS_15_21_10	24131.93	14785.51	3941.20	110.20	71.47	33.83	2021	October	Antacaca Sur
D_ANTS_15_21_11	24132.19	14784.62	3941.23	117.00	84.77	29.84	2021	October	Antacaca Sur
D_ANTS_15_21_12	24132.20	14784.19	3941.32	135.15	95.92	27.81	2021	October	Antacaca Sur
D_ANTS_15_21_13	24131.47	14783.75	3941.67	134.10	106.30	25.20	2021	October	Antacaca Sur
D_ANTS_15_21_14	24131.87	14783.24	3941.39	159.65	112.80	20.04	2021	October	Antacaca Sur
D_ANTS_15_21_15	24131.45	14786.16	3941.14	136.30	48.22	43.66	2021	October	Antacaca Sur
D_ANTS_15_21_16	24131.96	14785.44	3941.21	131.10	63.61	40.94	2021	October	Antacaca Sur
D_ANTS_15_21_17	24132.04	14785.24	3941.36	139.45	79.40	39.60	2021	October	Antacaca Sur
D_ESC_17_21_04	23796.18	16490.38	3842.24	110.00	143.72	35.60	2021	October	Escondida
D_ESC_17_21_05	23795.89	16490.14	3842.36	130.50	153.64	30.39	2021	October	Escondida
D_ESC_17_21_06	23798.32	16492.44	3843.20	100.20	104.85	-0.10	2021	October	Escondida
D_ESC_17_21_07	23794.60	16489.64	3842.30	135.00	168.87	26.37	2021	October	Escondida
D_GA_II_18_21_01	23596.13	15709.85	3788.00	133.00	73.62	0.85	2021	October	Gallito II
D_GA_II_18_21_02	23593.39	15712.48	3787.98	182.70	10.46	0.76	2021	October	Gallito II
D_GA_II_18_21_03	23594.04	15712.33	3787.96	180.70	20.06	1.41	2021	October	Gallito II
D_GA_II_18_21_04	23594.69	15712.05	3787.98	159.70	32.84	1.76	2021	October	Gallito II
D_GA_II_18_21_05	23595.22	15711.60	3787.98	146.50	41.71	-0.42	2021	October	Gallito II
D_GA_II_18_21_06	23595.48	15711.12	3788.02	130.20	53.89	-0.07	2021	October	Gallito II
D_GA_II_18_21_07	23595.95	15710.52	3787.94	107.70	61.02	1.02	2021	October	Gallito II
D_PRIV_17_21_01	23793.81	16489.99	3842.66	185.10	167.98	17.54	2021	October	Privatizadora
D_PRIV_17_21_02	23793.08	16490.02	3842.56	185.10	153.95	18.91	2021	October	Privatizadora
D_PRIVS_17_21_01	23583.92	16270.98	3841.82	250.00	87.18	-1.13	2021	October	Privatizadora
D_PRIVS_17_21_02	23583.82	16270.92	3841.82	128.30	87.45	-13.11	2021	October	Privatizadora
E_CAR_15_21_01A	23872.25	16582.33	3966.56	210.00	165.13	44.02	2021	October	Carmencita
E_CAR_15_21_02A	23872.57	16582.16	3966.71	210.15	173.41	52.12	2021	October	Carmencita
E_GL_10_21_01	23316.41	15124.46	4185.80	274.00	51.37	-0.72	2021	October	Juliana
E_GL_10_21_02	23316.07	15124.91	4185.79	280.20	38.37	0.06	2021	October	Juliana
E_GL_10_21_03	23315.67	15125.56	4185.81	291.70	26.73	-0.19	2021	October	Juliana
E_GL_10_21_04	23316.51	15124.31	4185.80	217.80	63.02	0.33	2021	October	Juliana
E_SAS_17_21_01	24035.98	14827.63	3839.48	373.70	250.21	-0.41	2021	October	Sasacaca
E_VAN_15_21_01	24016.09	16678.25	3975.92	193.95	171.95	18.49	2021	October	Vanessa
D_ANT_17_21_01	23997.86	14955.46	3839.07	101.30	29.77	-13.88	2021	November	Antacaca
D_ANT_17_21_02	23998.89	14954.14	3839.08	85.20	57.84	-14.81	2021	November	Antacaca
D_ANT_17_21_03	23999.22	14952.87	3838.88	115.60	78.48	-13.18	2021	November	Antacaca
D_ANT_17_21_04	23999.67	14951.59	3838.89	115.60	93.46	-12.48	2021	November	Antacaca
D_ANTS_15_21_18	24131.85	14784.53	3941.47	141.70	91.83	37.00	2021	November	Antacaca Sur
D_ANTS_15_21_19	24131.54	14784.02	3941.69	159.50	102.58	29.70	2021	November	Antacaca Sur
D_ANTS_15_21_20	24131.91	14783.48	3941.39	157.50	70.78	28.97	2021	November	Antacaca Sur
D_ANTS_15_21_21	24131.34	14782.73	3941.44	172.80	114.53	28.03	2021	November	Antacaca Sur
D_ANTS_15_21_22	24131.46	14782.82	3941.49	204.40	120.59	25.91	2021	November	Antacaca Sur

Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
D_ANTS_15_21_23	24131.17	14785.87	3941.44	119.70	55.15	47.21	2021	November	Antacaca Sur
D_ROS_17_21_01	24056.08	14890.93	3839.51	79.40	55.70	-14.95	2021	November	Rosaura
D_ROS_17_21_02	24057.19	14889.40	3839.58	76.95	72.61	-16.16	2021	November	Rosaura
D_ROS_17_21_03	24057.26	14889.14	3839.47	81.70	84.21	-12.16	2021	November	Rosaura
D_ROS_17_21_04	24057.34	14888.93	3839.41	110.35	94.45	-10.83	2021	November	Rosaura
D_ROS_17_21_05	24057.23	14888.44	3839.36	133.70	102.01	-9.83	2021	November	Rosaura
D_ROS_17_21_06	24057.48	14889.51	3838.38	115.45	73.80	21.84	2021	November	Rosaura
D_ROS_17_21_07	24057.67	14889.24	3838.36	116.65	84.06	19.97	2021	November	Rosaura
D_ROS_17_21_08	24057.65	14888.87	3838.42	141.25	94.82	16.78	2021	November	Rosaura
D_ROS_17_21_09	24057.43	14888.27	3838.54	150.00	102.27	16.79	2021	November	Rosaura
D_ROS_17_21_10	24056.06	14891.04	3838.96	81.50	53.57	-0.07	2021	November	Rosaura
D_ROS_17_21_11	24056.96	14890.15	3838.98	102.30	71.89	-0.07	2021	November	Rosaura
D_ROS_17_21_12	24057.36	14888.34	3838.96	123.10	92.44	0.24	2021	November	Rosaura
D_ROS_17_21_13	24057.00	14890.68	3838.10	116.55	63.75	32.74	2021	November	Rosaura
D_ROS_17_21_14	24057.47	14889.54	3838.45	125.15	73.76	26.89	2021	November	Rosaura
E_CAR_17_21_01	23796.50	16490.68	3842.67	64.30	127.91	-0.44	2021	November	Carmencita
E_CAR_17_21_02	23796.11	16490.16	3842.68	85.90	141.93	-0.70	2021	November	Carmencita
E_CAR_17_21_03	23795.97	16490.16	3842.38	84.30	128.32	15.30	2021	November	Carmencita
E_PC_10_21_01	23311.63	15123.47	4186.39	181.60	80.44	-14.75	2021	November	Purisima Concepcion
E_PRIVS_17_21_17	23748.30	16305.02	3847.16	126.65	92.06	49.79	2021	November	Privatizadora
E_PRIVS_17_21_18	23748.46	16305.01	3849.51	100.15	94.48	-37.45	2021	November	Privatizadora
E_PRIVS_17_21_19	23748.42	16305.86	3847.14	130.50	81.54	46.93	2021	November	Privatizadora
E_SAS_17_21_02	24036.50	14826.87	3839.45	400.00	238.15	-0.45	2021	November	Sasacaca
E_SAS_17_21_03	24037.37	14825.84	3839.48	400.00	214.97	-0.40	2021	November	Sasacaca
E_SAS_17_21_04	24039.05	14824.74	3839.54	400.25	167.05	-0.75	2021	November	Sasacaca
E_VAN_15_21_02	24016.64	16678.47	3976.09	200.00	179.64	13.54	2021	November	Vanessa
GEOMET_ROS_17_21_01	24056.31	14891.15	3838.39	88.00	56.08	23.65	2021	November	Rosaura
D_ANTS_17_21_01	24152.85	14791.03	3840.30	80.00	87.44	-14.41	2021	December	Antacaca Sur
D_ANTS_17_21_02	24152.41	14790.58	3840.20	103.90	99.23	-14.08	2021	December	Antacaca Sur
D_ANTS_17_21_03	24151.73	14790.34	3840.12	109.55	109.40	-12.48	2021	December	Antacaca Sur
D_ANTS_17_21_04	24151.16	14789.86	3840.00	139.50	120.33	-9.80	2021	December	Antacaca Sur
D_ANTS_17_21_05	24153.00	14793.69	3840.41	76.60	62.99	-17.95	2021	December	Antacaca Sur
D_ANTS_17_21_06	24151.27	14794.75	3840.35	77.40	37.99	-17.88	2021	December	Antacaca Sur
D_ANTS_17_21_07	24151.01	14794.80	3840.26	79.85	23.11	-15.80	2021	December	Antacaca Sur
D_ANTS_17_21_08	24152.03	14794.49	3839.80	85.30	42.53	-1.18	2021	December	Antacaca Sur
D_ANTS_17_21_09	24152.70	14794.21	3839.79	97.55	50.51	-1.26	2021	December	Antacaca Sur
D_ANTS_17_21_10	24153.23	14793.61	3839.74	80.00	60.24	-0.93	2021	December	Antacaca Sur
D_ROS_17_21_15	24057.61	14889.27	3838.41	136.60	83.54	27.56	2021	December	Rosaura
D_ROS_17_21_16	24057.64	14888.86	3838.53	143.85	91.08	21.43	2021	December	Rosaura
D_ROS_17_21_17	24057.54	14888.44	3838.54	161.45	97.56	20.24	2021	December	Rosaura
D_ROS_17_21_18	24057.49	14888.31	3838.53	150.20	102.12	21.30	2021	December	Rosaura
D_ROS_17_21_19	24056.17	14891.18	3838.35	116.95	52.31	31.20	2021	December	Rosaura

Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
D_ROS_17_21_20	24057.51	14888.51	3839.00	128.10	98.55	0.32	2021	December	Rosaura
D_ROS_17_21_21	24057.37	14888.37	3839.00	137.70	104.64	-0.10	2021	December	Rosaura
D_ROS_17_21_22	24056.83	14890.23	3839.65	108.20	64.43	-15.24	2021	December	Rosaura
E_CAR_17_21_04	23796.20	16490.38	3842.42	92.20	137.14	14.86	2021	December	Carmencita
E_CAR_17_21_05	23795.81	16490.05	3842.44	82.60	37.24	12.59	2021	December	Carmencita
E_CAR_17_21_06	23796.47	16490.60	3842.07	84.20	128.56	32.16	2021	December	Carmencita
E_CAR_17_21_07	23795.78	16489.96	3842.07	109.75	141.21	30.26	2021	December	Carmencita
E_CAR_17_21_08	23795.89	16489.93	3842.09	93.20	146.11	27.96	2021	December	Carmencita
E_CAR_17_21_09	23795.72	16490.22	3842.48	99.40	146.35	12.11	2021	December	Carmencita
E_PRIVS_17_21_20	23748.13	16304.40	3847.13	140.30	74.78	50.63	2021	December	Privatizadora
E_PRIVS_17_21_21	23747.26	16303.24	3847.48	105.70	115.72	39.58	2021	December	Privatizadora
E_PRIVS_17_21_22	23747.19	16303.17	3847.55	110.05	130.19	39.58	2021	December	Privatizadora
E_PRIVS_17_21_24	23748.42	16305.69	3847.27	96.55	86.48	31.54	2021	December	Privatizadora
E_PRIVS_17_21_25	23748.46	16305.91	3847.28	85.30	81.41	28.66	2021	December	Privatizadora
E_PRIVS_17_21_26	23748.15	16304.35	3847.39	75.30	104.96	32.10	2021	December	Privatizadora
E_PRIVS_17_21_27	23747.63	16303.09	3847.30	75.45	119.67	-27.04	2021	December	Privatizadora
E_PRIVS_17_21_28	23747.49	16302.89	3847.31	90.40	130.81	-23.23	2021	December	Privatizadora
E_SAS_17_21_05	24035.85	14827.86	3839.59	406.10	265.80	-0.51	2021	December	Sasacaca
E_SAS_17_21_06	24039.90	14825.07	3839.56	399.30	177.47	-1.02	2021	December	Sasacaca
E_SUL_17_21_01	23705.13	16442.67	3841.79	148.30	124.38	10.46	2021	December	Sulma
E_SUL_17_21_02	23705.13	16442.66	3841.49	123.20	126.56	33.09	2021	December	Sulma
E_SUL_17_21_03	23705.44	16443.00	3841.77	165.00	106.05	11.86	2021	December	Sulma
GEOMET_ANTS_17_21_01	24153.42	14792.83	3840.14	75.05	77.30	-11.45	2021	December	Antacaca Sur
D_ANTS_17_22_28	24151.96	14794.47	3838.84	110.80	42.11	35.59	2022	April	Antacaca Sur
D_ANTS_17_22_29	24152.77	14793.85	3838.71	106.95	50.71	34.77	2022	April	Antacaca Sur
D_ANTS_17_22_30	24153.05	14793.25	3838.73	116.40	62.28	39.79	2022	April	Antacaca Sur
D_ANTS_17_22_31	24153.13	14792.46	3838.94	108.30	76.45	34.43	2022	April	Antacaca Sur
D_ANTS_17_22_32	24153.40	14791.68	3838.91	114.00	87.15	31.09	2022	April	Antacaca Sur
D_ANTS_17_22_33	24153.35	14791.38	3838.88	127.50	97.50	32.14	2022	April	Antacaca Sur
D_ANTS_17_22_34	24152.21	14790.79	3839.18	126.60	109.63	25.20	2022	April	Antacaca Sur
D_ESPC_18_22_03	23636.55	15636.24	3808.20	58.05	29.35	-0.16	2022	April	Esperanza
D_ESPC_18_22_04	23637.44	15636.13	3807.78	59.50	44.71	22.52	2022	April	Esperanza
D_ESPC_18_22_05	23638.58	15635.05	3807.77	67.55	60.76	22.93	2022	April	Esperanza
D_GA_18_22_01	23610.41	15628.57	3808.72	60.50	118.82	-0.90	2022	April	Gallito
D_GA_18_22_02	23608.71	15628.71	3808.73	80.00	134.82	0.39	2022	April	Gallito
D_GA_18_22_03	23606.97	15629.21	3808.79	80.50	148.44	0.48	2022	April	Gallito
D_GA_18_22_04	23610.80	15628.37	3807.73	66.25	120.40	32.48	2022	April	Gallito
D_GA_18_22_05	23608.63	15628.83	3808.28	70.00	134.45	21.35	2022	April	Gallito
D_GA_18_22_06	23607.06	15629.23	3808.48	93.80	147.77	15.57	2022	April	Gallito
E_ADR_17_22_06	24156.82	14584.02	3843.31	145.00	123.09	14.46	2022	April	Adrico
E_AM_17_22_06	24123.22	14664.44	3841.06	136.75	75.83	22.80	2022	April	Amoeba
E_AM_17_22_06A	24123.01	14665.28	3841.04	226.10	75.61	23.06	2022	April	Amoeba

Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
E_AM_17_22_07	24123.18	14664.59	3841.18	204.30	88.82	18.39	2022	April	Amoeba
E_AM_17_22_08	24123.65	14662.98	3840.94	186.70	108.06	22.47	2022	April	Amoeba
E_CF_10_22_01A	23526.11	16127.59	4184.67	277.00	131.61	-0.93	2022	April	Fortuna
E_CF_10_22_02A	23525.50	16127.31	4184.66	258.95	135.38	-1.04	2022	April	Fortuna
E_CF_10_22_03A	23524.79	16127.14	4184.67	270.30	139.31	-0.54	2022	April	Fortuna
E_CF_10_22_04A	23526.63	16128.02	4184.65	270.00	126.75	0.55	2022	April	Fortuna
E_CF_10_22_05	23253.10	16057.15	4184.68	467.70	97.14	-9.38	2022	April	Fortuna
E_CF_10_22_06	23253.18	16055.91	4185.29	471.40	99.20	-25.64	2022	April	Fortuna
E_CF_10_22_07	23253.35	16055.87	4184.69	458.05	99.46	-8.90	2022	April	Fortuna
D_ANT_17_22_01	23999.13	14953.66	3839.30	94.75	67.74	-12.45	2022	May	Antacaca
D_ANT_17_22_02	23999.29	14953.04	3839.24	95.00	87.39	-11.69	2022	May	Antacaca
D_CSM_17_22_07	23826.96	14916.89	3837.55	50.80	218.60	-17.61	2022	May	Csm
D_CSM_17_22_08	23826.58	14913.51	3837.74	107.10	211.04	-16.51	2022	May	Csm
D_CSMII_17_22_07	23877.86	14926.26	3840.98	41.05	59.87	-50.27	2022	May	Csm
D_ELI_15_22_01	23818.40	16507.95	3969.63	107.50	83.73	38.03	2022	May	Elissa
D_ELI_15_22_02	23818.52	16507.97	3969.97	96.80	83.50	24.41	2022	May	Elissa
D_ESPNII_17_22_01	23617.52	15805.55	3838.74	141.40	65.86	-0.30	2022	May	Esperanza Norte II
D_GA_18_22_07	23611.76	15628.85	3807.50	59.30	108.52	41.66	2022	May	Gallito
D_GA_18_22_08	23605.77	15629.01	3808.78	128.35	156.70	-0.05	2022	May	Gallito
E_CF_10_22_05A	23526.12	16127.51	4185.06	262.80	131.56	-10.50	2022	May	Fortuna
E_CF_10_22_06A	23525.74	16127.28	4184.71	273.40	120.16	-0.55	2022	May	Fortuna
E_CF_10_22_07A	23525.60	16127.29	4185.06	280.15	135.09	-10.16	2022	May	Fortuna
E_CF_10_22_08	23253.06	16057.28	4184.71	466.00	94.12	-10.51	2022	May	Fortuna
E_CF_10_22_08A	23526.79	16127.95	4184.37	268.85	126.27	11.70	2022	May	Fortuna
E_CF_10_22_09A	23525.87	16127.35	4184.38	290.60	132.50	13.91	2022	May	Fortuna
E_ESPNII_10_22_01	23311.09	15948.40	4195.38	186.50	104.82	0.40	2022	May	Esperanza
D_ELI_15_22_03	23817.99	16507.93	3969.59	105.50	82.31	52.26	2022	June	Elissa
D_ELI_15_22_04	23818.18	16507.72	3970.32	109.20	85.01	12.84	2022	June	Elissa
D_ESPNII_17_22_02	23617.37	15805.96	3838.73	150.00	76.02	0.74	2022	June	Esperanza Norte II
D_ESPNII_17_22_03	23617.57	15805.59	3840.17	149.50	64.45	-27.97	2022	June	Esperanza Norte II
D_ESPNII_17_22_04	23617.50	15805.99	3840.55	136.00	75.66	-32.42	2022	June	Esperanza Norte II
D_ESPNII_17_22_05	23617.47	15806.34	3838.76	68.00	54.11	-1.42	2022	June	Esperanza Norte II
D_ESPNII_17_22_06	23617.23	15806.17	3842.11	95.35	53.18	-52.90	2022	June	Esperanza Norte II
D_ESPNII_17_22_07	23616.95	15807.43	3838.82	86.40	32.52	-0.89	2022	June	Esperanza Norte II
D_ESPNII_17_22_08	23616.86	15807.16	3841.11	103.30	33.50	-39.90	2022	June	Esperanza Norte II
D_ESPS_17_22_01	23631.59	15505.60	3837.12	175.00	78.18	-0.03	2022	June	Esperanza Sur
D_ESPS_17_22_02	23631.67	15504.76	3837.11	221.80	94.19	0.17	2022	June	Esperanza Sur
D_ESPS_17_22_03	23631.74	15505.70	3837.55	179.50	77.97	-9.87	2022	June	Esperanza Sur
D_ESPS_17_22_04	23631.48	15504.75	3837.51	231.50	94.66	-10.24	2022	June	Esperanza Sur
D_FOR_10_22_01	23525.63	16127.60	4185.11	280.60	124.12	-14.02	2022	June	Fortuna
D_FOR_10_22_02	23525.69	16127.64	4184.92	280.00	123.66	-7.22	2022	June	Fortuna
D_FOR_10_22_03	23523.69	16127.78	4184.99	288.10	138.44	-10.00	2022	June	Fortuna

Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
E_CF_10_22_10A	23525.71	16127.37	4184.20	315.80	132.77	-25.91	2022	June	Fortuna
E_CF_10_22_11A	23526.66	16128.04	4184.07	305.00	126.95	28.25	2022	June	Fortuna
E_FN_10_22_01	23574.71	16139.66	4185.58	100.00	64.15	-34.97	2022	June	Fortuna Norte
E_FN_10_22_02	23574.73	16139.65	4184.22	90.85	64.70	10.45	2022	June	Fortuna Norte
E_FN_10_22_03	23574.67	16139.43	4185.60	91.80	87.65	-35.62	2022	June	Fortuna Norte
D_ELI_15_22_05	23818.23	16507.77	3970.35	115.00	75.73	13.62	2022	July	Elissa
D_ESP_18_22_01	23618.42	15652.35	3791.16	140.90	65.91	-1.02	2022	July	Esperanza
D_FOR_10_22_04	23524.09	16127.81	4184.59	281.00	125.94	5.47	2022	July	Fortuna
D_FOR_14_22_01	23577.28	15932.18	4014.25	191.00	75.22	-14.49	2022	July	Fortuna
D_FOR_14_22_02	23577.23	15931.91	4014.77	184.10	68.73	-27.11	2022	July	Fortuna
D_FOR_14_22_03	23577.22	15932.07	4015.25	198.40	72.67	-34.41	2022	July	Fortuna
D_FOR_14_22_04	23576.20	15933.21	4015.48	281.00	67.12	-31.35	2022	July	Fortuna
D_FOR_14_22_05	23576.36	15932.49	4015.89	207.10	76.76	-40.81	2022	July	Fortuna
E_ESPNII_10_22_01A	23311.22	15948.71	4195.39	464.90	105.28	-0.28	2022	July	Esperanza
E_FN_10_22_04	23574.02	16139.99	4184.28	91.60	87.91	6.82	2022	July	Fortuna Norte
E_FN_10_22_05	23574.40	16139.03	4185.52	111.70	111.02	-33.71	2022	July	Fortuna Norte
E_FN_10_22_06	23574.57	16139.05	4184.26	108.60	110.53	9.09	2022	July	Fortuna Norte
E_FN_10_22_07	23574.48	16138.69	4185.39	130.00	128.22	-30.81	2022	July	Fortuna Norte
E_FN_10_22_08	23574.57	16138.59	4184.28	130.05	128.94	10.25	2022	July	Fortuna Norte
E_FN_10_22_09	23574.53	16139.20	4185.49	115.00	101.67	-33.32	2022	July	Fortuna Norte
E_FN_10_22_10	23574.57	16138.85	4185.42	120.00	118.43	-31.38	2022	July	Fortuna Norte
D_ELI_15_22_06	23816.74	16506.37	3970.30	115.00	67.11	13.75	2022	August	Elissa
D_ESP_18_22_02	23618.53	15651.80	3791.19	140.00	73.98	-1.12	2022	August	Esperanza
D_ESP_18_22_03	23618.39	15651.19	3791.19	140.00	88.04	-0.76	2022	August	Esperanza
D_ESP_18_22_04	23618.23	15650.81	3791.21	153.50	95.29	-1.00	2022	August	Esperanza
D_ESP_18_22_05	23618.22	15650.70	3791.23	160.00	103.18	-0.67	2022	August	Esperanza
D_ESP_18_22_06	23618.30	15652.54	3790.99	140.00	66.54	8.94	2022	August	Esperanza
D_ESP_18_22_07	23617.94	15650.56	3791.23	158.20	108.78	-1.52	2022	August	Esperanza
D_ESP_18_22_08	23618.54	15651.56	3791.26	136.30	81.23	-2.38	2022	August	Esperanza
D_ESP_18_22_09A	23618.30	15652.70	3791.41	158.00	62.98	-4.70	2022	August	Esperanza
D_ESP_18_22_10A	23618.48	15652.40	3791.41	141.20	71.02	-4.06	2022	August	Esperanza
D_KAR_15_22_01	23965.62	16604.79	3971.86	118.80	97.20	-1.44	2022	August	Karlita
D_KAR_15_22_02	23965.62	16604.79	3972.05	102.50	97.50	-8.46	2022	August	Karlita
D_KAR_15_22_03	23965.58	16604.47	3971.85	108.10	105.61	-1.05	2022	August	Karlita
D_KAR_15_22_04	23965.57	16604.48	3972.04	120.40	105.42	-8.05	2022	August	Karlita
D_KAR_15_22_05	23965.64	16605.04	3971.81	115.90	81.68	-0.55	2022	August	Karlita
E_KAT_17_22_01	23837.45	15095.98	3835.32	140.00	237.29	18.18	2022	August	Katty
E_KAT_17_22_02	23837.07	15096.39	3835.31	140.10	246.24	19.15	2022	August	Katty
E_KAT_17_22_03	23836.92	15097.25	3835.41	145.55	253.16	17.90	2022	August	Katty
E_KAT_17_22_04	23838.70	15095.89	3835.32	110.00	229.61	17.91	2022	August	Katty
E_KAT_17_22_05	23836.96	15098.34	3835.41	165.10	266.17	18.19	2022	August	Katty
D_ESP_18_22_11A	23618.51	15651.81	3791.48	151.00	78.26	-5.91	2022	September	Esperanza

Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
D_ESP_18_22_12A	23618.53	15651.66	3791.45	135.00	85.23	-5.23	2022	September	Esperanza
D_ESP_18_22_13A	23618.49	15651.36	3791.42	135.00	92.30	4.20	2022	September	Esperanza
D_ESP_18_22_14A	23618.39	15652.48	3791.36	150.00	67.59	-4.77	2022	September	Esperanza
D_ESP_18_22_15A	23618.55	15651.90	3791.35	135.70	88.78	-4.44	2022	September	Esperanza
D_ESP_18_22_16A	23618.52	15651.55	3791.31	106.50	83.66	-3.59	2022	September	Esperanza
D_KAR_15_22_06	23965.62	16605.04	3972.11	122.30	82.31	-10.70	2022	September	Karlita
D_MAS_18_22_01	23701.33	15372.15	3805.86	40.00	39.54	-0.46	2022	September	Mascota
D_MAS_18_22_02	23702.42	15367.22	3805.94	60.20	67.67	-0.09	2022	September	Mascota
D_MAS_18_22_03	23701.23	15372.13	3806.54	45.50	39.13	-20.58	2022	September	Mascota
E_KAT_17_22_06	23837.28	15096.19	3835.86	87.00	236.94	-1.17	2022	September	Katty
E_KAT_17_22_07	23837.12	15096.37	3835.84	90.30	246.11	-0.71	2022	September	Katty
E_KAT_17_22_08	23838.55	15095.76	3835.73	90.00	229.02	-0.42	2022	September	Katty
E_KAT_17_22_09	23836.90	15097.25	3835.80	90.50	253.62	-0.99	2022	September	Katty
E_KAT_17_22_10	23837.41	15096.26	3836.45	80.50	237.35	-18.11	2022	September	Katty
E_VIO_18_22_01	23935.25	15006.05	3807.34	35.00	171.06	-1.18	2022	September	Violeta
E_VIO_18_22_02	23933.26	15008.30	3807.52	40.00	190.77	-1.42	2022	September	Violeta
D_ESC_16_22_01	23801.57	16425.01	3923.63	56.00	157.59	-0.47	2022	October	Escondida
D_ESC_16_22_02	23801.93	16424.85	3923.64	50.05	172.23	0.53	2022	October	Escondida
D_ESC_16_22_03	23800.54	16425.29	3923.72	43.10	144.66	0.48	2022	October	Escondida
D_MAS_18_22_04	23723.60	15340.19	3806.91	45.25	37.10	-0.16	2022	October	Mascota
D_MAS_18_22_05	23698.98	15384.60	3823.42	30.00	56.27	-0.89	2022	October	Mascota
D_MAS_18_22_06	23703.87	15378.06	3823.63	40.00	54.17	-0.17	2022	October	Mascota
D_MAS_18_22_07	23712.10	15364.49	3823.58	45.00	63.90	-0.94	2022	October	Mascota
D_MAS_18_22_08	23716.14	15357.89	3790.44	38.75	41.57	-0.50	2022	October	Mascota
D_MAS_18_22_09	23727.66	15345.23	3790.93	35.60	57.10	-0.10	2022	October	Mascota
D_MAS_18_22_10	23684.24	15369.84	3788.70	60.90	49.88	0.00	2022	October	Mascota
D_MAS_18_22_11	23685.95	15369.24	3788.70	56.00	67.95	-0.33	2022	October	Mascota
D_YOS_15_22_01	23757.54	16372.06	3931.90	30.00	275.71	-0.37	2022	October	Yoselin
D_YOS_15_22_02	23758.70	16373.09	3931.71	35.00	292.12	0.26	2022	October	Yoselin
D_YOS_15_22_03	23756.56	16370.81	3931.98	40.00	264.57	0.07	2022	October	Yoselin
E_BUT_18_22_01	23743.23	15324.76	3791.22	120.00	95.24	-0.56	2022	October	Butz
E_VIO_18_22_03	23931.82	15009.02	3807.55	35.00	211.50	0.82	2022	October	Violeta
E_VIO_18_22_04	23930.32	15010.07	3807.70	38.80	232.73	-0.13	2022	October	Violeta
E_VIO_18_22_05	23918.40	15015.46	3807.99	30.00	280.56	-0.81	2022	October	Violeta
E_VIO_18_22_06	23929.67	15015.20	3807.56	31.00	290.95	-0.09	2022	October	Violeta
D_MAS_18_22_12	23742.77	15326.22	3791.23	146.00	58.78	0.13	2022	November	Mascota
D_PRIV_15_22_01	23754.57	16366.15	3932.11	60.00	213.79	0.19	2022	November	Privatizadora
D_ROS_17_22_01A	24136.45	14848.30	3872.48	34.30	43.41	-0.25	2022	November	Rosaura
D_ROS_17_22_02A	24132.01	14846.09	3872.21	45.70	15.97	-0.15	2022	November	Rosaura
D_ROS_17_22_03A	24135.77	14844.65	3872.19	47.30	80.05	-0.22	2022	November	Rosaura
D_ROS_17_22_04A	24096.49	14853.82	3872.12	70.50	18.08	-0.53	2022	November	Rosaura
D_ROS_17_22_05A	24095.90	14854.36	3872.14	81.50	9.91	-0.37	2022	November	Rosaura

Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
D_ROS_17_22_06A	24101.51	14848.33	3871.97	65.50	23.84	-0.71	2022	November	Rosaura
D_ROS_17_22_07A	24102.15	14847.69	3871.94	51.80	38.29	-0.57	2022	November	Rosaura
D_ROS_17_22_08A	24133.94	14805.88	3872.52	65.90	33.83	-0.14	2022	November	Rosaura
D_ROS_17_22_09A	24134.55	14805.35	3872.51	69.50	44.40	-0.12	2022	November	Rosaura
D_ROS_17_22_10A	24135.23	14804.98	3872.53	70.25	54.45	-0.44	2022	November	Rosaura
D_ROS_17_22_11A	24136.78	14804.39	3872.54	77.50	69.71	0.40	2022	November	Rosaura
E_BUT_18_22_02	23742.47	15323.85	3791.21	151.90	112.18	-0.46	2022	November	Butz
E_BUT_18_22_03	23741.45	15322.72	3791.24	130.00	129.57	-1.37	2022	November	Butz
E_BUT_18_22_04	23740.95	15322.55	3791.24	174.00	147.66	0.29	2022	November	Butz
E_BUT_18_22_05	23739.12	15321.80	3791.30	130.00	181.55	-0.34	2022	November	Butz
E_BUT_18_22_06	23743.13	15324.79	3791.69	95.25	95.91	-11.02	2022	November	Butz
E_BUT_18_22_07	23740.91	15322.52	3791.26	173.00	159.26	-0.48	2022	November	Butz
E_BUT_18_22_08	23743.06	15325.81	3791.33	68.10	81.46	-2.67	2022	November	Butz
E_BUT_18_22_09	23742.77	15326.19	3791.47	166.00	69.06	-6.40	2022	November	Butz
E_HUA_10_21_01	23091.96	15885.14	4184.83	497.90	206.34	0.13	2022	November	Huamanrripa
D_PRIV_16_22_01	23761.62	16439.34	3893.04	94.50	173.44	3.12	2022	December	Privatizadora
D_PRIV_16_22_02	23760.88	16439.47	3892.97	89.30	189.75	0.11	2022	December	Privatizadora
D_ROS_16_22_01	24165.94	14822.86	3893.98	30.00	352.02	-1.10	2022	December	Rosaura
D_ROS_16_22_02	24167.34	14822.90	3893.96	20.00	9.93	-0.42	2022	December	Rosaura
D_ROS_16_22_03	24172.54	14824.25	3893.93	20.20	55.95	0.34	2022	December	Rosaura
D_ROS_16_22_04	24169.80	14819.60	3893.93	35.00	97.54	-0.72	2022	December	Rosaura
D_ROS_16_22_05	24123.27	14879.28	3893.88	25.00	21.76	-0.11	2022	December	Rosaura
D_ROS_16_22_06	24124.00	14875.97	3893.91	20.00	76.25	0.07	2022	December	Rosaura
D_VAN_15_22_01	23973.56	16629.68	3973.59	75.00	157.81	3.71	2022	December	Vanessa
D_VAN_15_22_02	23973.01	16629.57	3973.49	75.00	170.07	8.76	2022	December	Vanessa
D_VAN_15_22_03	23973.94	16629.72	3973.72	80.00	149.78	-1.08	2022	December	Vanessa
D_VAN_15_22_04	23975.28	16629.60	3973.73	100.00	135.25	-2.06	2022	December	Vanessa
E_HUA_10_21_02	23091.39	15886.41	4184.88	500.70	231.53	0.09	2022	December	Huamanrripa
D_ESPS_17_23_03	23631.93	15505.64	3837.35	202.10	100.33	-5.48	2023	April	Esperanza Sur
D_ESPS_17_23_04	23631.56	15504.97	3837.33	211.70	105.19	-5.49	2023	April	Esperanza Sur
D_ESPN_18_23_04	23639.76	15780.12	3791.12	54.30	69.55	-10.78	2023	April	Esperanza Norte
E_FN_10_23_01	23493.09	16095.78	4188.74	210.20	84.59	-30.73	2023	April	Fortuna Norte
E_FN_10_23_02	23493.25	16095.39	4188.83	210.50	90.20	-31.43	2023	April	Fortuna Norte
E_FN_10_23_03	23492.97	16095.16	4188.70	220.50	96.43	-32.31	2023	April	Fortuna Norte
E_FN_10_23_04	23492.95	16095.76	4189.29	231.10	84.44	-41.99	2023	April	Fortuna Norte
E_SUL_18_23_03	23769.83	16467.75	3825.42	90.30	198.34	-0.43	2023	April	Sulma
D_CAR_18_23_01	23773.73	16468.69	3825.52	100.00	102.71	-2.05	2023	April	Carmencita
D_CAR_18_23_02	23773.48	16468.55	3825.48	100.00	116.39	-1.07	2023	April	Carmencita
D_CAR_18_23_03	23773.41	16468.55	3825.50	100.00	121.94	-1.62	2023	April	Carmencita
D_PAM_10_23_04	23626.13	15917.76	4189.57	7.80	295.58	-0.05	2023	April	Pamela
D_PAM_10_23_03	23628.59	15924.16	4189.78	11.60	342.55	0.25	2023	April	Pamela
D_PAM_10_23_02	23632.56	15925.60	4189.80	4.40	68.94	0.37	2023	April	Pamela

Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
D_PAM_10_23_01	23633.83	15934.93	4189.59	4.50	2.08	0.00	2023	April	Pamela
D_PAM_10_23_05	23624.33	15910.78	4189.90	5.60	191.62	-1.52	2023	April	Pamela
D_PAM_10_23_06	23605.62	15917.62	4193.44	40.00	64.76	-29.16	2023	April	Pamela
D_PAM_10_23_07	23605.47	15917.54	4192.08	59.10	65.16	29.81	2023	April	Pamela
D_PAM_10_23_08	23605.36	15916.42	4193.35	40.00	92.16	-29.87	2023	April	Pamela
D_PAM_10_23_09	23605.35	15916.39	4191.87	70.00	92.92	51.12	2023	April	Pamela
E_FN_10_23_05	23493.14	16095.37	4189.37	247.20	90.81	-42.65	2023	April	Fortuna Norte
D_FOR_09_23_01	23576.31	16054.21	4234.10	93.75	71.77	7.45	2023	April	Fortuna Norte
E_FN_10_23_06	23492.45	16096.03	4189.27	229.70	76.95	-45.19	2023	May	Fortuna Norte
D_FOR_09_23_02	23575.81	16054.55	4234.06	105.20	53.55	12.02	2023	May	Fortuna Norte
D_FOR_09_23_03	23576.73	16053.35	4234.18	96.70	91.73	6.94	2023	May	Fortuna Norte
D_FOR_09_23_04	23575.87	16054.65	4234.27	106.70	49.58	1.58	2023	May	Fortuna Norte
D_FOR_09_23_05	23575.88	16054.79	4234.34	98.25	67.03	-1.15	2023	May	Fortuna Norte
D_FOR_09_23_06	23576.59	16052.27	4234.42	142.30	93.77	-4.19	2023	May	Fortuna Norte
D_FOR_09_23_07	23575.96	16054.50	4234.61	107.40	50.25	-10.57	2023	May	Fortuna Norte
D_FOR_10_23_01	23530.32	15998.70	4230.20	160.00	84.70	-3.19	2023	May	Fortuna
D_FOR_10_23_02	23530.38	15999.15	4230.26	194.50	78.13	-3.89	2023	May	Fortuna
D_FOR_09_23_08	23576.12	16054.18	4234.77	119.70	72.92	-16.98	2023	May	Fortuna Norte
D_FOR_09_23_09	23576.55	16052.77	4235.10	102.55	91.66	-22.04	2023	May	Fortuna Norte
D_FOR_10_23_03	23530.22	15998.46	4230.87	215.00	78.88	-17.62	2023	May	Fortuna
D_COC_18_23_01	23844.70	15071.40	3817.50	75.35	3.46	0.00	2023	June	Contacto Occidental
D_COC_18_23_02	23844.89	15071.51	3817.51	74.70	11.41	-1.30	2023	June	Contacto Occidental
D_KAT_18_23_01	23842.48	15067.44	3816.73	81.00	269.17	39.87	2023	June	Katty
D_KAT_18_23_02	23842.70	15066.36	3816.64	77.80	259.42	40.10	2023	June	Katty
D_FOR_09_23_10	23576.53	16054.12	4234.07	120.00	81.79	20.97	2023	June	Fortuna
E_FOR_10_23_01A	23530.18	15997.83	4230.58	250.30	87.39	-11.89	2023	June	Fortuna
E_FOR_10_23_02A	23530.15	15997.74	4230.32	250.20	91.93	-15.99	2023	June	Fortuna
E_FOR_10_23_03A	23530.12	15997.49	4230.63	234.50	91.84	-13.12	2023	June	Fortuna
E_FOR_10_23_04A	23529.97	15997.24	4230.07	161.70	104.54	-0.24	2023	June	Fortuna
D_FOR_10_23_01A	23563.82	16019.93	4185.08	100.80	67.84	19.86	2023	June	Fortuna
D_FOR_10_23_02A	23563.97	16019.21	4185.11	94.10	83.40	21.88	2023	June	Fortuna
D_FOR_10_23_03A	23563.92	16019.82	4184.99	92.85	71.67	27.34	2023	June	Fortuna
D_COC_18_23_03	23844.31	15072.11	3817.57	75.00	356.24	-0.19	2023	June	Contacto Occidental
D_COC_18_23_04	23845.14	15071.41	3817.62	68.80	20.24	-1.81	2023	June	Contacto Occidental
D_COC_18_23_05	23845.10	15071.28	3817.10	107.10	20.88	39.72	2023	June	Contacto Occidental
D_COC_18_23_06	23844.64	15071.45	3817.02	125.70	4.06	39.50	2023	June	Contacto Occidental
D_FOR_10_23_04	23530.27	15998.03	4230.90	251.85	86.36	-17.92	2023	June	Fortuna
E_FOR_10_23_05A	23530.23	15997.87	4231.60	250.90	86.25	-28.66	2023	July	Fortuna
E_FOR_10_23_06A	23528.77	15998.12	4230.68	248.90	78.57	-27.67	2023	July	Fortuna
D_FOR_10_23_04A	23563.89	16018.95	4185.09	97.10	82.82	27.23	2023	July	Fortuna
E_CAR_18_23_01	23792.49	16506.20	3828.84	77.90	124.37	0.24	2023	July	Carmencita
D_ESPS_A_17_23_01	23766.83	15518.54	3839.39	35.00	70.90	-0.44	2023	July	Esperanza Sur

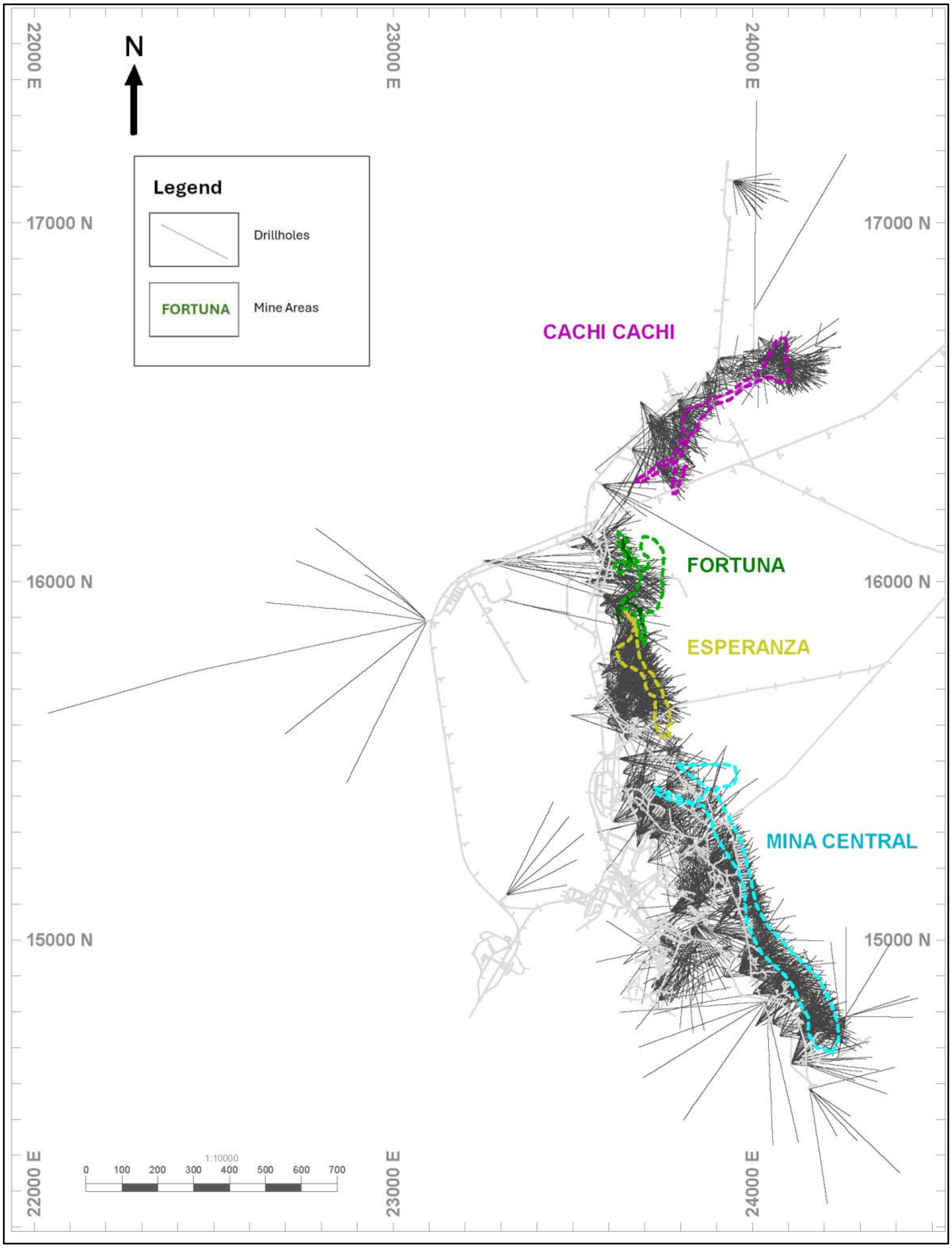
Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
E_CAR_18_23_02	23792.79	16506.88	3828.84	110.70	115.38	0.40	2023	July	Carmencita
E_CAR_18_23_03	23793.12	16507.57	3828.83	110.40	104.80	0.41	2023	July	Carmencita
E_CAR_18_23_04	23793.03	16507.54	3829.52	102.40	104.54	-19.90	2023	July	Carmencita
E_CAR_18_23_05	23792.67	16506.90	3829.48	99.30	114.74	-19.98	2023	July	Carmencita
E_CAR_18_23_06	23793.27	16507.89	3828.88	97.10	94.63	-0.18	2023	July	Carmencita
D_FOR_10_23_05A	23561.47	16021.10	4184.95	99.30	61.86	24.03	2023	July	Fortuna
D_FOR_10_23_06A	23563.33	16020.17	4184.65	100.40	76.78	26.57	2023	July	Fortuna
D_FOR_10_23_07A	23562.59	16020.65	4184.68	120.00	65.16	37.53	2023	July	Fortuna
D_FOR_10_23_08A	23563.22	16020.05	4184.54	120.00	73.29	37.56	2023	July	Fortuna
D_FOR_10_23_09A	23563.54	16019.37	4184.50	130.00	80.95	37.84	2023	July	Fortuna
E_FOR_10_23_07A	23530.33	15998.79	4231.84	267.65	83.32	-35.17	2023	July	Fortuna
E_FOR_10_23_08A	23529.88	15997.20	4230.23	206.20	98.37	-3.92	2023	July	Fortuna
E_FOR_10_23_09A	23529.66	15996.93	4230.25	200.40	118.74	-3.71	2023	July	Fortuna
D_ESPS_A_17_23_02	23766.65	15517.68	3839.36	34.50	97.31	0.14	2023	August	Esperanza Sur
D_ESPS_A_17_23_03	23767.20	15516.08	3834.28	50.80	112.42	-0.03	2023	August	Esperanza Sur
D_ESPS_A_17_23_04	23766.91	15518.48	3834.35	42.40	34.80	-0.35	2023	August	Esperanza Sur
D_ESPS_A_17_23_05	23766.16	15518.67	3834.39	43.90	20.54	-0.02	2023	August	Esperanza Sur
D_ESPS_A_17_23_06	23767.02	15518.53	3835.43	55.50	36.03	-24.69	2023	August	Esperanza Sur
D_ESPS_A_17_23_07	23765.93	15517.99	3835.02	55.40	20.82	-20.68	2023	August	Esperanza Sur
D_PAM_10_23_10	23584.37	15962.79	4185.25	89.50	138.74	7.06	2023	August	Pamela
D_PAM_10_23_11	23585.22	15964.56	4185.00	128.75	113.47	19.10	2023	August	Pamela
D_PAM_10_23_12	23582.08	15964.52	4184.71	50.25	125.00	19.00	2023	August	Pamela
D_PAM_10_23_13	23585.19	15964.57	4184.89	130.75	113.16	26.08	2023	August	Pamela
D_PAM_10_23_14	23584.89	15963.58	4184.81	129.90	126.01	27.02	2023	August	Pamela
D_PAM_10_23_15	23585.12	15964.57	4184.71	160.00	112.78	38.22	2023	August	Pamela
D_ESPS_A_17_23_08	23766.41	15517.66	3840.24	38.60	72.76	-25.87	2023	August	Esperanza Sur
D_ESPS_A_17_23_09	23766.04	15516.52	3840.24	63.20	112.06	-24.93	2023	August	Esperanza Sur
D_ESPS_A_17_23_10	23764.40	15518.93	3834.57	44.00	4.75	-1.43	2023	August	Esperanza Sur
D_ESPS_A_17_23_11	23809.97	15446.36	3841.61	25.00	34.79	-1.47	2023	August	Esperanza Sur
D_ESPS_A_17_23_12	23811.11	15444.34	3841.60	35.00	81.97	-1.07	2023	August	Esperanza Sur
D_PAM_10_23_16	23585.20	15965.31	4184.99	160.00	100.89	27.73	2023	August	Pamela
D_PAM_10_23_17	23585.33	15964.51	4185.41	160.20	113.47	4.18	2023	August	Pamela
D_ESPS_A_18_23_01	23789.79	15477.02	3821.95	50.20	70.01	-0.61	2023	August	Esperanza Sur
D_ESPS_A_18_23_02	23790.42	15476.10	3822.01	51.20	98.72	-1.17	2023	August	Esperanza Sur
D_PAM_10_23_18	23584.00	15963.11	4185.06	208.60	138.61	30.01	2023	August	Pamela
E_PAM_10_23_01	23585.04	15964.54	4184.66	166.90	113.70	46.19	2023	August	Pamela
D_ESPS_A_18_23_03	23789.25	15478.50	3821.95	50.80	33.96	-0.35	2023	August	Esperanza Sur
E_PAM_10_23_02	23584.67	15963.73	4184.41	132.60	127.05	54.33	2023	August	Pamela
D_ESPS_A_18_23_04	23788.40	15479.62	3821.97	56.65	10.02	-0.78	2023	August	Esperanza Sur
E_PAM_10_23_03	23584.51	15963.18	4184.53	197.70	133.26	47.21	2023	September	Pamela
D_PAM_10_23_19	23585.13	15964.60	4185.99	140.00	95.26	-10.31	2023	September	Pamela
D_PAM_10_23_20	23584.86	15963.58	4184.73	135.00	126.63	39.99	2023	September	Pamela

Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
D_BUT_17_23_01	23777.89	15438.85	3841.05	95.00	186.87	-0.20	2023	September	Butz
D_BUT_17_23_02	23777.67	15438.53	3841.04	105.10	181.41	-0.01	2023	September	Butz
D_ESPS_A_17_23_13	23766.69	15518.54	3833.79	55.80	34.46	26.90	2023	September	Esperanza Sur
D_ESPS_A_17_23_14	23767.69	15517.48	3833.89	50.00	62.15	25.32	2023	September	Esperanza Sur
D_ESPS_A_17_23_15	23765.95	15518.71	3833.90	54.30	11.90	25.10	2023	September	Esperanza Sur
D_ESPS_A_17_23_16	23775.60	15442.62	3841.00	26.00	279.47	0.25	2023	September	Esperanza Sur
D_ESPS_A_17_23_17	23776.45	15439.02	3841.03	30.00	218.55	-0.27	2023	September	Esperanza Sur
D_FOR_8_10_23_01	23555.35	16023.22	4184.51	231.00	110.04	36.33	2023	September	Fortuna 8
D_FOR_8_10_23_02	23555.41	16023.18	4184.26	214.10	110.64	41.16	2023	September	Fortuna 8
D_FOR_8_10_23_03	23554.99	16023.64	4185.19	200.30	114.00	19.12	2023	September	Fortuna 8
D_FOR_8_10_23_04	23555.73	16022.81	4185.05	207.30	97.33	18.33	2023	September	Fortuna 8
D_FOR_8_10_23_05	23555.46	16023.00	4185.30	146.35	85.38	11.84	2023	September	Fortuna 8
D_ESPS_A_18_23_05	23760.86	15427.87	3823.94	90.00	59.35	0.16	2023	September	Esperanza Sur
D_ESPS_A_18_23_06	23761.25	15426.54	3823.95	96.10	75.18	0.07	2023	September	Esperanza Sur
D_ESPS_A_18_23_07	23760.97	15425.21	3823.95	86.40	86.54	-0.06	2023	September	Esperanza Sur
D_ESPS_A_18_23_08	23760.98	15425.22	3823.74	105.00	86.01	11.47	2023	September	Esperanza Sur
D_ESPS_A_18_23_09	23760.82	15424.66	3823.75	100.55	96.31	9.82	2023	September	Esperanza Sur
D_ESPS_A_18_23_10	23761.43	15426.58	3823.76	100.30	75.55	11.76	2023	October	Esperanza Sur
D_ESPS_A_18_23_11	23761.43	15426.69	3823.75	87.65	66.74	9.97	2023	October	Esperanza Sur
D_ESPS_A_18_23_12	23760.90	15427.24	3823.91	106.40	50.74	12.61	2023	October	Esperanza Sur
D_ESPS_A_18_23_13	23760.62	15427.85	3823.80	105.25	39.10	11.04	2023	October	Esperanza Sur
D_ESPS_A_18_23_14	23760.01	15427.93	3823.79	105.70	28.04	11.13	2023	October	Esperanza Sur
D_ESPS_A_18_23_15	23759.65	15428.03	3823.84	120.10	19.93	8.31	2023	October	Esperanza Sur
D_ESPS_A_18_23_16	23759.10	15427.99	3823.81	136.40	12.28	8.17	2023	October	Esperanza Sur
E_ESPS_A_18_23_01	23761.48	15427.64	3823.36	140.05	52.87	24.20	2023	October	Esperanza Sur
D_FOR_8_10_23_06	23555.33	16023.19	4184.85	230.50	115.24	31.30	2023	October	Fortuna 8
D_FOR_8_10_23_07	23555.36	16022.91	4184.90	233.30	95.03	29.06	2023	October	Fortuna 8
E_PAM_10_23_04	23584.88	15964.63	4184.59	148.60	95.28	39.65	2023	October	Pamela
E_PAM_10_23_05	23584.15	15962.85	4184.37	185.50	137.23	38.16	2023	October	Pamela
E_PAM_10_23_06	23584.15	15962.98	4184.13	177.25	137.11	47.56	2023	October	Pamela
E_PAM_10_23_07	23584.55	15963.20	4184.58	202.70	133.09	31.99	2023	October	Pamela
E_PAM_10_23_08	23584.93	15964.05	4184.64	148.60	130.69	29.19	2023	October	Pamela
E_ESPS_A_18_23_02	23761.25	15425.61	3823.58	140.70	80.99	23.12	2023	October	Esperanza Sur
E_ESPS_A_18_23_03	23761.11	15425.48	3823.66	147.30	91.22	22.56	2023	October	Esperanza Sur
E_PAM_10_23_09	23584.73	15963.47	4184.66	162.40	148.51	28.82	2023	October	Pamela
E_PAM_10_23_10	23584.27	15963.01	4184.57	165.40	159.78	28.98	2023	October	Pamela
E_PAM_10_23_11	23584.63	15963.56	4184.39	161.80	149.56	39.86	2023	October	Pamela
E_PAM_10_23_12	23585.01	15964.34	4184.35	170.00	121.62	44.93	2023	November	Pamela
E_ESPS_A_18_23_04	23760.72	15424.33	3823.72	148.75	112.69	15.81	2023	November	Esperanza Sur
E_ESPS_A_18_23_05	23760.70	15423.87	3823.81	159.30	119.19	14.26	2023	November	Esperanza Sur
E_ESPS_A_18_23_06	23760.59	15423.42	3823.84	160.05	123.57	13.93	2023	November	Esperanza Sur
E_ESPS_A_18_23_07	23761.14	15425.46	3823.72	120.30	97.09	21.84	2023	November	Esperanza Sur

Drill Hole	X (m)	Y (m)	Z (m)	Length (m)	Azimuth (°)	Dip (°)	Year	Month	Structure
E_PAM_10_23_13	23585.21	15964.39	4185.25	156.30	94.17	6.57	2023	November	Pamela
E_PAM_10_23_14	23585.02	15963.80	4185.27	143.60	102.48	7.59	2023	November	Pamela
D_FOR_8_11_23_02	23582.93	16046.27	4162.50	201.40	94.39	26.79	2023	November	Fortuna 8
D_FOR_8_11_23_03	23582.94	16046.51	4162.54	202.80	84.96	26.72	2023	November	Fortuna 8
E_CAR_18_23_07	23792.57	16506.92	3828.06	85.00	114.72	35.36	2023	November	Carmencita
E_CAR_18_23_08	23792.71	16507.67	3828.22	80.50	104.39	35.59	2023	November	Carmencita
E_CAR_18_23_09	23792.13	16506.12	3828.07	86.40	131.10	32.34	2023	November	Carmencita
E_CAR_18_23_10	23791.70	16505.88	3828.46	107.40	143.09	21.98	2023	November	Carmencita
E_CCS_A_09_23_01	23524.41	16088.64	4257.12	192.65	39.76	-0.97	2023	November	Cachi Cachi Sur
E_CCS_A_09_23_02	23524.87	16087.80	4257.13	177.50	56.41	-0.86	2023	November	Cachi Cachi Sur
E_CCS_A_09_23_03	23524.83	16087.66	4257.88	180.20	57.56	-24.96	2023	November	Cachi Cachi Sur
D_FOR_8_11_23_04	23582.78	16046.58	4162.33	196.05	85.39	38.98	2023	November	Fortuna 8
D_FOR_8_11_23_05	23582.83	16046.27	4162.31	185.60	94.24	36.76	2023	November	Fortuna 8
D_FOR_8_11_23_06	23583.39	16045.08	4163.08	175.70	118.67	3.59	2023	November	Fortuna 8
E_CAR_18_23_11	23791.44	16505.74	3828.43	120.70	154.21	22.61	2023	November	Carmencita
E_CCS_A_09_23_04	23523.79	16089.57	4257.14	250.75	32.06	-0.30	2023	November	Cachi Cachi Sur
D_FOR_8_11_23_01	23583.00	16045.98	4162.47	180.90	105.47	23.11	2023	December	Fortuna 8
D_PAM_11_23_01	23643.81	15953.03	4156.20	83.70	99.60	-0.91	2023	December	Pamela
D_PAM_11_23_02	23643.40	15952.13	4156.23	81.85	112.68	-0.43	2023	December	Pamela
D_PAM_11_23_03	23641.41	15951.22	4156.16	43.45	142.86	-0.36	2023	December	Pamela
D_FOR_8_11_23_07	23583.21	16044.82	4163.08	181.35	124.21	3.85	2023	December	Fortuna 8
D_FOR_8_11_23_08	23583.24	16044.80	4163.38	169.40	124.06	-3.32	2023	December	Fortuna 8
D_FOR_8_11_23_09	23583.32	16045.03	4163.37	128.90	118.89	-4.03	2023	December	Fortuna 8
D_FOR_8_11_23_10	23582.97	16045.23	4162.88	185.80	118.84	11.30	2023	December	Fortuna 8
D_PRO_10_23_02	23949.44	17116.91	4188.18	131.30	111.41	0.04	2023	December	Prometida
D_PRO_10_23_03	23949.53	17115.53	4188.22	100.00	125.80	-0.09	2023	December	Prometida
D_PRO_10_23_04	23949.30	17114.92	4188.18	100.05	135.00	-1.20	2023	December	Prometida
D_PRO_10_23_05	23948.88	17114.42	4188.21	128.20	144.00	-0.27	2023	December	Prometida
D_PRO_10_23_06	23948.03	17114.04	4188.19	104.50	154.23	-1.24	2023	December	Prometida
D_FOR_8_11_23_11	23583.25	16044.78	4162.79	187.10	124.50	10.99	2023	December	Fortuna 8
D_PAM_11_23_04	23643.71	15953.35	4156.11	80.20	90.51	0.00	2023	December	Pamela
D_PAM_11_23_05	23643.92	15953.95	4156.18	55.00	75.52	-0.15	2023	December	Pamela
D_FOR_09_23_11	23592.47	16058.50	4249.18	102.35	89.34	-8.08	2023	December	Fortuna 7
D_FOR_09_23_12	23592.50	16058.58	4249.18	120.05	99.95	-8.19	2023	December	Fortuna 7

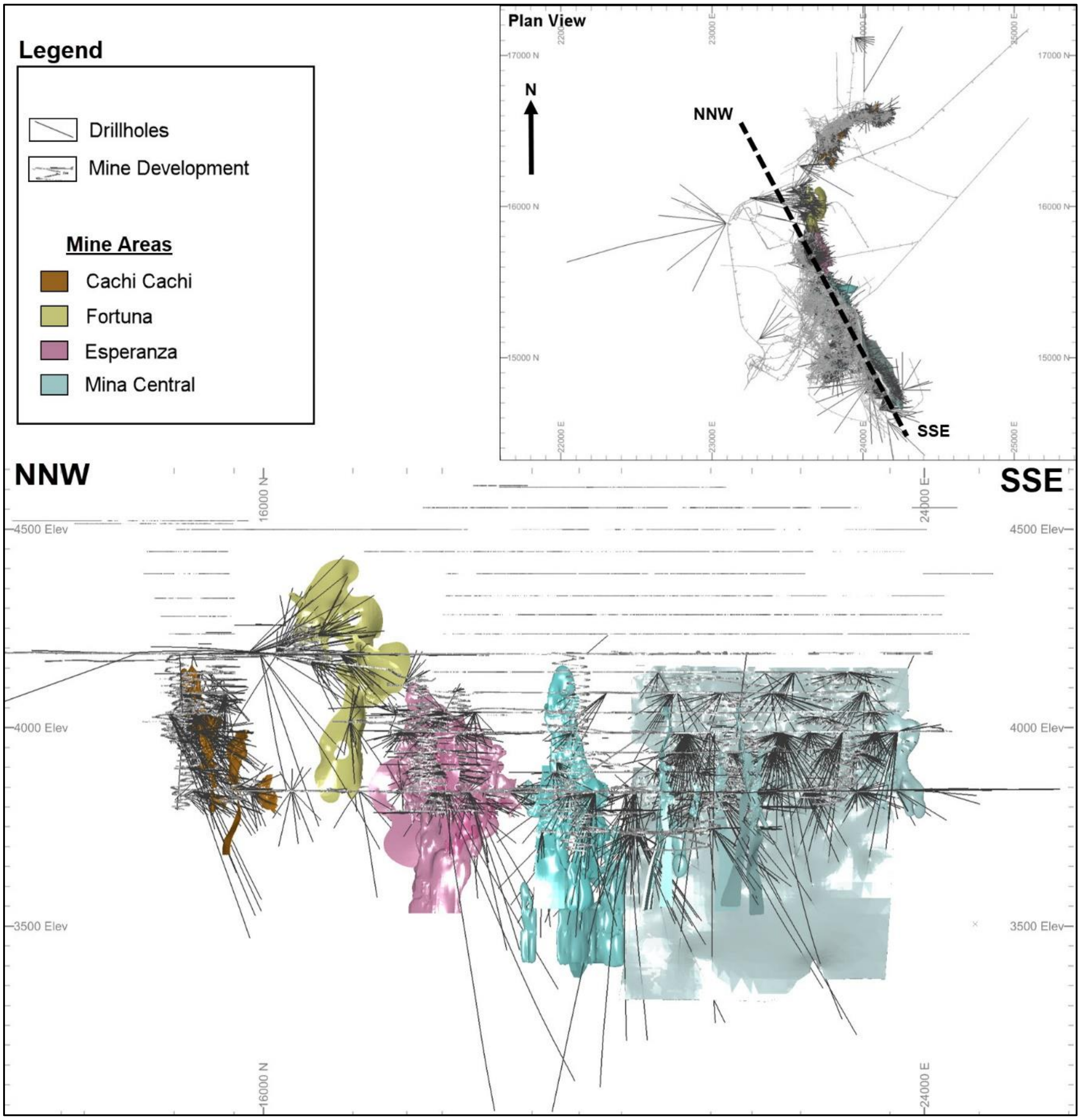
In addition to the drilling at Yauricocha, extensive channel sampling of the mineralized bodies has been completed for grade control and development purposes. Channel sampling is conducted on perpendicular lines crossing the various mineralized bodies. Spacing between the samples is variable, but generally the spacing is 2 m to 4 m. Material is collected on tarps across the channel sampling intervals and is then transferred to bags marked with the relevant interval. These data points are not utilized in the Mineral Resource Estimation.

Figure 10-1: Extent of Yauricocha Diamond Drilling in 3D View (pseudo-plan) within the Four Main Mine Areas



Source: Sierra Metals (2024)

Figure 10-2: Extent of Diamond Drilling within the Four Main Mine Areas (looking northeast)



Source: Sierra Metals (2024)

10.2 Procedures

10.2.1 Drill Hole Surveys

Modern drill collar locations are surveyed underground by the mine survey team. Where these types of surveys have been completed, collar locations are assumed to be accurate to less than 0.1 metres.

Historical drilling was not surveyed to the same level of detail, potentially decreasing the accuracy of the collar positions in space compared to modern holes. This effect would potentially decrease the accuracy of the geological model and resource estimation in these areas, but the QPs note that the majority of the areas supported by this historical drilling have already been mined.

While drill holes are currently surveyed down-hole for all new exploration drilling, this has not always been the case. Historical drill holes, as well as selected more recent holes that were not deemed to be long enough or otherwise designated non-critical for surveying, were not surveyed down-hole and the collar azimuth and dip are the only points of reference for the drill hole. The QPs note that all new holes now have down-hole surveys, and that most of these are in areas which are incorporated in the current update to the Mineral Resource estimation. While the nominal spacing of the survey has been 50 m, several newer holes have been surveyed every 5.0 m to discern any potential risk of deviation affecting the accuracy of the interpretation.

SRK (2022), pointed out that in their 2019 data review of the down-hole drill hole surveys, the average deviations (of more than 3,500 measurements) down-hole are only -0.06° bearing and 0.09° inclination. This would indicate that the lack of down-hole survey information is not necessarily a risk at Yauricocha, although the QPs recommend continuing the practice of surveys and nominal intervals of 25 to 50 m to ensure quality of information.

10.2.2 Core Logging

Logging is conducted on paper and transferred to Excel® worksheets. Details recorded include geotechnical information such as recovery and RQD, geologic information (lithology, alteration, mineralization, etc.), sampling information, as well as other parameters, which may not get incorporated into the digital database. Samples, along with a bar-coded sample ticket for tracking, are selected by the geologist and placed in numbered plastic bags. Bags are tied tightly to prevent contamination during handling and transport.

10.2.3 Core Sampling

Drill core recovery is generally over 97%, and there appears to be no relationship between grade distribution and recovery.

Drill holes are split by hydraulic or manual methods where core is broken or poorly indurated and is sawn by rotary diamond saw blade when the core is competent. In both scenarios, care is taken to ensure that the sample is collected in a consistent and representative manner. The QPs note that sampling is only conducted in segments of core that are noted as having obvious mineralization during logging. This results in several occurrences where the first sample in a drill hole may be a very high grade one, or that there may be multiple high-grade samples with un-sampled intervals in between. These intervals have been considered as un-mineralized based on the assumptions made for the sampling or lack thereof and are flagged with a lowest-limit-of-detection value.

10.2.4 Channel Sampling

Underground channel samples are collected by the geology staff. Samples are collected via hammer and chisel, with rock chips collected on a tarp for each sample and transferred to sample bags. Typical sample intervals are 1.0 m along the ribs of crosscuts within stopes for the large, mineralized zones, and 2.0 m across the back of the stopes for the small, mineralized zones. Ideal sample weights are between 2.5 kg and 3 kg. The samples are placed in a plastic bag labeled with a permanent marker on the outside. A sample ticket displaying the number and bar code is then inserted into the bag. The bags are securely tied to prevent outside contamination during their handling and transportation to the assay lab.

The QPs note that samples are not weighed to ensure representativeness, but geologists are involved in the channel sampling efforts to direct samplers to collect samples which visually are representative of the mineralization.

10.3 Interpretation and Relevant Results

Drilling and sampling results are interpreted by Minera Corona site geologists and are reviewed in cross sections and plan / level maps. The relevant results featuring significant intervals of geologic or economic interest are then followed-up by further drilling or exploration development. The QPs have reviewed this approach and finds it acceptable for the development of any reasonable exploration and geological model for the Yauricocha mine.

The QPs note that other sampling types are described in the documentation at Yauricocha mine, such as point samples, muck samples, and others. These sampling types are used for specialized purposes only and are not used in the resource estimation.

11 SAMPLE PREPARATION, ANALYSES, AND SECURITY

11.1 Security Measures

Core and channel sample material is stored at the mine site in a secure building and the boxes are well-labeled and organized. The entire mine site is securely access controlled. Samples submitted to third-party laboratories are transported by mine staff to the preparation laboratory in Lima. The channel samples are processed at Minera Corona's Chumpe laboratory located in the Concentrator Plant under the supervision of company personnel.

The on-site laboratory currently is certified. Channel sample locations are surveyed underground by mine survey staff. Sample start and end-point locations are assumed to be accurate to centimetre accuracy.

11.2 Sample Preparation for Analysis

Samples are generally prepared by a primary and secondary laboratory:

- Primary: Chumpe Laboratory –Yauricocha Mine Site; ISO 9001:2015 Certified
- Secondary: ALS Minerals (ALS) – Lima; ISO 9001:2008 Certified

The majority of the sample preparation is completed at the Chumpe laboratory, except in cases where checks on the method of preparation are desired and ALS conducts sample prep on duplicate check assays.

11.2.1 Chumpe Laboratory

Most historical (i.e. pre-2016) core samples, and effectively all channel samples, have been prepared and analyzed by the Chumpe laboratory. Detailed procedures have been documented by Minera Corona and are summarized below.

11.2.2 Sample Reception

Channel samples and selected mine infill drilling are collected in the field by the geology staff and transported by Yauricocha personnel from the Yauricocha Mine or Klepetko Adit and are received at the reception counter at the Chumpe laboratory entrance. A log entry is made to record the number of samples being received. These samples are generally between 1.5 and 3.0 kg in weight and are damp and received in plastic bags.

11.2.3 Preparation

Equipment used in sample preparation includes:

- 1 – primary jaw crusher (Denver): jaw capacity – 5” x 6”, output – 70%, passing ¼ inch
- 1 – secondary jaw crusher (FIMA): Jaw capacity – 5” x 6”, output – 80%, passing no. 10 mesh
- 1 – pneumatic pulverizer, make – Tmandina
- 2 – sample dryers, with temperature regulator

- 1 – ½ inch stainless steel splitter, make – Jones
- five compressed air nozzles
- stainless steel trays, 225 x 135 x 65 mm
- stainless steel trays, 300 x 240 x 60 mm
- plastic or impermeable cloth
- 2-inch brushes

11.2.4 Preparation Procedure

Prior to beginning sample preparation, workers verify that:

- equipment is clean and free from contamination
- crushers and pulverizers are functioning correctly
- regarding the numbering of the sample bags, that all bags are unique and identifiable

The procedure at Chumpe to reduce the sample to a pulp of 150 g with 85% passing 200 mesh is:

- transfer the sample to the appropriate tray, depending on the volume of the sample, noting the tray number on the sample ticket
- insert a blank sample (silica or quartz) in each batch
- place in the Sample Dryer at a temperature of 115° C
- code the sample envelopes with the information from the sampling ticket noting the sample code, the tray number, date and the quantity of samples requested on the sample ticket
- once dry, remove and place the tray on the worktable to cool
- pass 100% of the sample through the Primary Jaw Crusher when particle sizes exceed 1 inch, the resulting product is 70% passing ¼ inch
- pass the sample through the secondary crusher, the resulting product 80% passing -10 mesh
- clean all equipment after crushing of each sample using compressed air
- weigh the -10-mesh coarse material and record
- dump the complete sample into the Jones Splitter and split/homogenize to obtain an approximate 150 g split. Clean the splitter after each sample with compressed air
- put the 150 g sample in numbered envelopes in the tray for the corresponding sample sequence
- pulverize sample using the cleaned ring pulverizer until achieving a size fraction of 85% - 200 mesh; clean the ring apparatus after each sample with the compressed air hose
- transfer the pulverized sample to the impermeable sample mat, homogenize and pour into the respective coded envelope
- clean all materials and the work area thoroughly

11.2.5 ALS Minerals

For core samples, bagged split samples are transported by the internal transport service from the core logging facility. Samples are transported by truck to Lima for submission to the ALS Minerals laboratory in Lima. ALS records samples received and weights for comparison to the Yauricocha geologist's records for sampling.

Samples prepared at ALS Minerals exclusively include the 2016 to present exploration diamond drilling. The facilities of ALS Minerals in Lima were not visited but it is noted that ALS Minerals-Lima is an ISO-Certified preparation and analysis facilities and adheres to the most stringent standards in the industry. The PREP-31 method of sample preparation was used for all samples processed through ALS Minerals. This includes jaw crushing to 70% less than 2 mm, with a riffle split of 250 g, then pulverized using ring pulverizers to >85% passing 75 micrometres. Samples are tracked in barcoded envelopes throughout the process using internal software tracking and control measures. ALS is an industry leader in sample preparation and analysis and uses equipment that meets or exceeds industry standards.

11.3 Sample Analysis

Samples are generally analyzed by a primary and secondary laboratory:

- Primary: Chumpe Laboratory –Yauricocha Mine Site; ISO 9001:2015 Certified
- Secondary: ALS Minerals – Lima; ISO 9001:2008 Certified
- ALS is the primary laboratory for all diamond exploration drilling samples

11.3.1 Chumpe Laboratory

Core and channel samples from the mine are assayed utilizing two procedures. Silver, lead, zinc, and copper are assayed by atomic absorption (AA) after an aqua-regia digestion. Gold is assayed by fire assay (FA) with an AA finish. Lower limits of detection (LLD) are shown in Table 11-1 and are higher than those for ALS Minerals as Chumpe does not run the same multi-element analysis.

Table 11-1: Chumpe LLD

Element	LLD	Unit (by weight)
Ag	3.43	ppm
Au	0.03	ppm
Cu	0.01	%
Pb	0.01	%
Zn	0.01	%

Source: Sierra Metals, 2021

11.3.2 ALS Minerals Laboratory

The core samples analyzed at ALS are analyzed for a suite of 35 elements using inductively coupled plasma atomic emission spectroscopy (ICP-AES) after an aqua-regia digestion, generally used to discern trace levels of multiple elements. Samples are also analyzed using an AA method after an aqua-regia digestion for accuracy at mineralized material grade ranges. Au is analyzed using FA with an AA finish. Lower limits of detection for the critical elements are shown in Table 11-2.

Table 11-2: ALS Minerals LLD

Element	LLD	Unit (by weight)
Ag	0.2	ppm
Au	0.005	ppm
Cu	0.0001	%
Pb	0.0001	%
Zn	0.0001	%

11.4 Quality Assurance/Quality Control Procedures

Part of this section has been excerpted from the NI 43-101-compliant Technical Report on the Yauricocha Mine, prepared by Gustavson Associates, report date May 11, 2015; standardizations have been made to suit the format of this report.

Prior to 2012, Minera Corona did not utilize the services of an independent lab for data verification. The company used an internal QA/QC procedure at its assay lab (Chumpe) located in the Concentration Plant. Historically, the results have compared well with the metal contained in concentrates and further work on a formal external QA/QC procedure had not been pursued. Beginning in 2012, Minera Corona began to use external check assays as part of the validation system for the Chumpe lab data stream.

The current procedure includes certified reference material (“standards”), blanks, pulp duplicates, and sample preparation size review. These are processed at approximately one per 20 samples. External labs receive approximately one sample for each 15 processed internally. Gustavson did not have the opportunity to fully observe the laboratory operation; however, Gustavson had examined QA/QC records of certified standards for 2011 through 2014.

The results of the historical QA/QC show that the Chumpe laboratory generally performed well with respect to the standard blanks and duplicates submitted from the exploration department, but it is noted that this has not been the case over the entire project history, with the Chumpe lab consistently missing targets for certain types of QA/QC. This resulted in a limited program of pulverized duplicate samples for every sample interval being submitted to ALS Minerals in Lima as a check on the Chumpe lab, where the results showed a consistent bias. Historically, Chumpe lab appeared to under-report Ag compared to ALS duplicates, although other metals appeared to be relatively consistent. For this reason, the mine abandoned the use of the Chumpe lab for the new exploration drilling, with all samples being sent to ALS Mineral in Lima prior to 2018. Several improvements were implemented since 2018 at the Chumpe laboratory to improve the historical poor performance and increase its sample through put. There is a noticeable improvement in the Chumpe laboratory performance since 2018; however, activities were severly impacted during the later part of 2020 and 2021 by the COVID 19 epidemic.

Currently, Minera Corona uses a very aggressive program of QA/QC for new exploration areas to mitigate uncertainty in analytical results. A subsequent and more detailed review of the QA/QC applied to new exploration efforts focused on underground Esperanza and Cuye areas, as well as Fortuna and Kimberly areas.

11.4.1 Certified Reference Material ("Standards")

Minera Corona currently inserts certified reference materials (CRMs) into the sample stream at a rate of about 1:20 samples, although the insertion rate is adjusted locally to account for particular mineralogical observations in the core. Ten standards have been generated by Minera Corona and certified via round robin analysis for the current exploration programs. These standards have been procured from Yauricocha material, and homogenized and analyzed by Target Rocks Peru S.A., a commercial laboratory specializing in provision of CRM to clients in the mining industry.

Each CRM undergoes a rigorous process of homogenization and analysis using aqua-regia digestion and AA or ICP finish, from a random selection of 10 packets of blended pulverized material. The six laboratories participating in the round robin for the Yauricocha CRM are:

- ALS Minerals, Lima
- Inspectorate, Lima
- Acme, Santiago
- Certimin, Lima
- SGS, Lima
- LAS, Peru

The mean and between-lab standard deviations (s) are calculated from the received results of the round robin analysis, and the certified means and tolerances are provided in certificates from Target Rocks. The certified means and expected tolerances from the historical CRMs used are shown in Table 11-3.

Table 11-3: Historical CRM Certified Means and Tolerances

CRM Element	Certified Mean				Two Standard Deviations			
	Ag (g/t)	Pb (%)	Cu (%)	Zn (%)	Ag (g/t)	Pb (%)	Cu (%)	Zn (%)
MAT-04	29.1	0.70	0.16	0.28	2.1	0.03	0.01	0.01
MAT-05	128.2	2.37	0.58	2.50	7.7	0.06	0.02	0.12
MAT-06	469.0	7.75	2.53	7.98	13.0	0.20	0.12	0.23
MCL-02	40.8	0.65	1.58	2.49	3.4	0.05	0.08	0.09
PLSUL-03	192.0	3.09	1.03	3.15	4.0	0.08	0.04	0.13
PLSUL-04	6.7	0.09	0.24	0.23	0.5	0.01	0.01	0.01
PLSUL-05	13.6	NA	0.49	0.47	1.0	NA	0.03	0.02
PLSUL-06	30.3	1.94	0.21	1.60	2.9	0.04	0.01	0.11
PLSUL-07	79.2	5.94	0.45	4.67	4.5	0.27	0.02	0.20
PLSUL-08	248.0	12.46	0.98	12.54	14.0	0.39	0.04	0.55

Starting during the 2018 campaign of drilling an additional eleven (11) CRMs were inserted into the sample stream at the Chumpe laboratory. Another CRM (MRISi81) was created specifically for Au inspection; details for its results are not included herein. The additional CRMs and their expected tolerances are shown in Table 11-4 while the mean analytical analyses for those CRMs in actual practice are shown in Table 11-5.

It is noted that the CRMs are adequate for QA/QC monitoring and that in 2018 a rigorous QA/QC program was set in place and maintained, including the recently included CRM for Au. Minera Corona submitted 177 samples of CRM to ALS Minerals between 2015 and 2017 for new drilling (average insertion rate of about 5%). From 2018 onward, a total of 21 CRM's are reported as being sent to ALS for independent checking and the Chumpe laboratory analyzed a total of 992 during that same timeframe. The set of CRMs sent to ALS were reviewed herein.

Table 11-4: 2018 – 2023 CRM Certified Means and Tolerances

			Certified Mean				Standard Deviation (s)			
CRM	Period	n	Ag (g/t)	Pb (%)	Cu (%)	Zn (%)	Ag (g/t)	Pb (%)	Cu (%)	Zn (%)
PLSUL-10	2018	49	84.66	5.7	0.608	5.39	2.99	0.06	0.02	0.11
PLSUL-14	2018	46	25.51	0.857	0.032	5.17	0.44	0.03	1.29	0.08
PLSUL-15	2018	44	22.71	0.6	0.041	0.97	0.82	0.01	0.001	0.02
PLSUL-22	2018 - 2019	84	83	1.22	0.147	3.13	2.4	0.04	0.005	0.08
PLSUL-24	2018 - 2019	101	114	3.69	0.272	7.72	2	0.1	0.008	0.13
PLSUL-32	2019 - 2023	179	42.5	0.53	0.429	1.04	1.8	0.02	0.01	0.015
PLSUL-33	2019 - 2023	203	51.1	0.65	0.738	2.35	1.85	0.015	0.019	0.05
PLSUL-34	2019 - 2023	149	109	1.6	1.454	5.19	2.65	0.03	0.035	0.15
PLSUL-63	2023	45	32.7	0.162	0.168	1.16	1.1	0.004	0.002	0.02
PLSUL-64	2023	63	93.7	0.581	0.305	4.52	2.25	0.01	0.005	0.085
PLSUL-65	2023	50	194	1.18	0.673	10	5	0.025	0.011	0.14

Table 11-5: 2018 – 2023 CRM Analytical Means and Tolerances

			Analytical Mean				Standard Deviation (s)			
CRM	Period	n	Ag (g/t)	Pb (%)	Cu (%)	Zn (%)	Ag (g/t)	Pb (%)	Cu (%)	Zn (%)
PLSUL-10	2018	49	72.6	5.39	0.56	5.3	1.53	0.09	0.02	0.08
PLSUL-14	2018	46	24.88	0.84	106.52	5.16	0.95	0.04	32.67	0.11
PLSUL-15	2018	44	21.26	0.6	0.04	0.84	0.82	0.01	0.01	0.03
PLSUL-22	2018 - 2019	84	72.49	1.24	0.16	3.21	2.74	0.04	0.02	0.17
PLSUL-24	2018 - 2019	101	99.18	3.75	0.27	7.78	4.04	0.14	0.02	0.29
PLSUL-32	2019 - 2023	179	44.12	0.55	0.43	1.1	3.23	0.02	0.01	0.04
PLSUL-33	2019 - 2023	203	49.89	0.65	0.7	2.37	3.32	0.025	0.034	0.142
PLSUL-34	2019 - 2023	149	104.9	1.61	1.47	5.32	3.82	0.03	0.03	0.09
PLSUL-63	2023	45	35.95	0.18	0.174	1.16	0.59	0.004	0.005	0.022
PLSUL-64	2023	63	92.03	0.572	0.304	0.457	1.17	0.008	0.006	0.089
PLSUL-65	2023	50	198.59	1.224	0.668	10.12	4.33	0.024	0.011	0.169

11.4.2 Performance: Chumpe Laboratory

A nominal +/-3 s criteria for evaluating failures of the CRM has been used. The s used is the between-lab s, as provided in the certificates from Target Rocks. It is noted that failure rates for the CRM as provided are very high for Cu, which are due to rounding differences between lab certificates and CRM values. All other elements have minimal failure results, although CRM PLSUL-10 reports low results for Pb, which will need to be monitored in the future if that particular CRM continues to be used.

In 2018 Corona instigated a rigorous QA/QC program whereby CRMs ("Standards"), Duplicates and Blanks were routinely inserted into the assay sample stream. Monthly QA/QC reports were generated onsite, and the results confirm the improved performance of the Chumpe laboratory in more recent years whereby CRM failure rates have been significantly reduced. The performance of the 2019 and 2020 CRMs at the Chumpe Laboratory are summarized in Table 11-6. Significant under reporting of Pb, Cu and Zn were, however, still a problem for certain CRMs in 2018. CRM results in 2019 - 2020 appear to be significantly improved. However, Ag continues to return negative bias results for three of the four CRMs in use at Yauricocha. Laboratory reporting limits account for most of the Cu discrepancies, whereas CRM sample mix-ups also accounted for several of the failures.

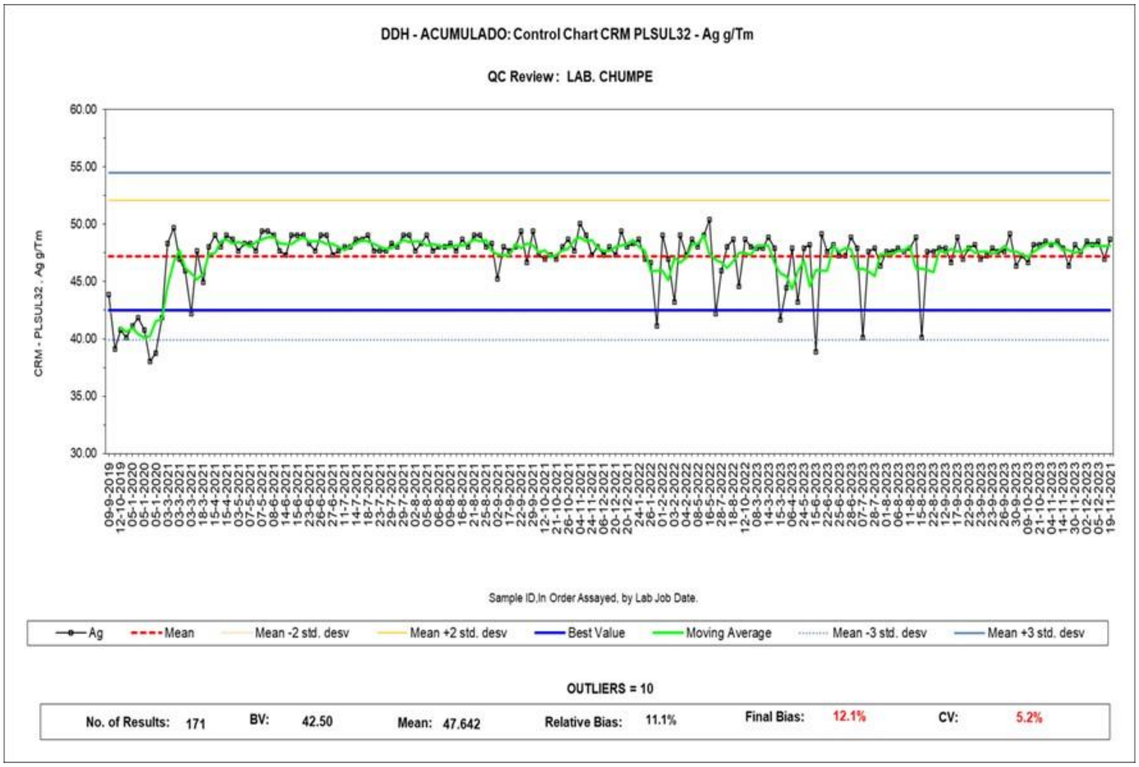
The performance of PLSUL-24 (42 samples), a polymetallic CRM, was tracked during the 2019 and 2020 underground definition and exploration drilling campaigns. Silver results indicate a slight negative bias, with the negative bias increasing over time. This indicates that the instrumentation may require additional calibration for the determination of the Ag analyte. The remaining sample batches are unbiased and distributed evenly about the expected value. Two Pb and three Zn values lie slightly above the upper 3rd standard deviation limit; however, this is not deemed to be material. Additional CRMs used during the specified period include PLSUL-22 (39 samples), PLSUL-32 (10 samples), PLSUL-33 (8 samples) and PLSUL-34 (3 samples). These CRMs performed in a similar manner to PLSUL-24. CRM samples that repeatedly occur above or below the 3 standard deviations limit (+/-3 s) should be repeated along with samples above and below the erroneous CRM interval. Typical examples of analyses for Ag over time are shown in Figure 11-1 to Figure 11-3.

Table 11-6: 2018 to 2020 CRM Performance Summary – Chumpe Lab

		2018			
CRM	Total	Low 3 s	High 3 s	% Low	% High
Ag					
PLSUL-10	97	1	0	1.03%	0.00%
PLSUL-14	77	0	58	0.00%	75.32%
PLSUL-15	94	0	3	0.00%	3.19%
All Ag	268	1	61	0.37%	22.76%
Pb					
PLSUL-10	97	87	0	89.69%	0.00%
PLSUL-14	77	0	0	0.00%	0.00%
PLSUL-15	94	0	1	0.00%	1.06%
All Pb	268	87	1	32.46%	0.37%
Cu					
PLSUL-10	97	30	0	30.93%	0.00%
PLSUL-14	77	76	1	98.70%	1.30%
PLSUL-15	94	3	48	3.19%	51.06%
All Cu	268	109	49	40.67%	18.28%

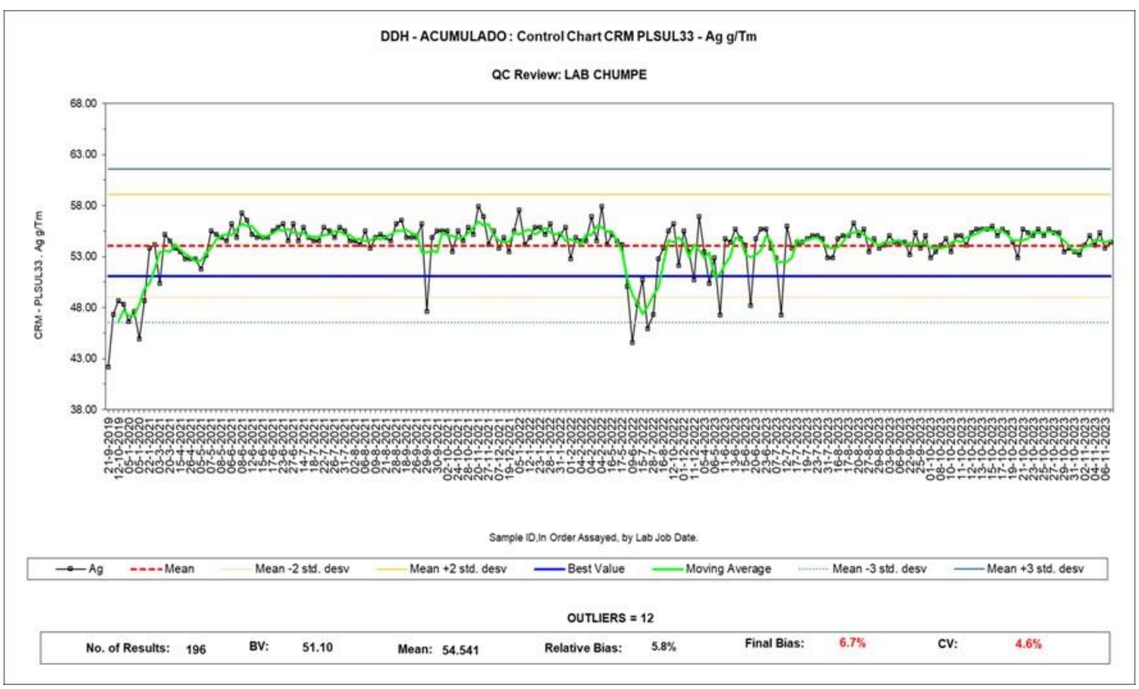
Zn					
PLSUL-10	97	1	1	1.03%	1.03%
PLSUL-14	77	0	2	0.00%	2.60%
PLSUL-15	94	85	4	90.43%	4.26%
All Zn	268	86	7	32.09%	2.61%
			2019 - 2020		
CRM	**Total**	**Low 3 s**	**High 3 s**	**% Low**	**% High**
Ag					
PLSUL-22	39	4	0	10.26%	0.00%
PLSUL-24	41	16	2	37.50%	5.00%
PLSUL-32	10	0	0	0.00%	0.00%
PLSUL-33	8	1	0	33.33%	0.00%
PLSUL-34	5	4	0	100.00%	0.00%
All Ag	103	25	2	25.00%	2.27%
Pb					
PLSUL-22	39	0	0	0.00%	0.00%
PLSUL-24	41	2	3	5.00%	7.50%
PLSUL-32	10	0	0	0.00%	0.00%
PLSUL-33	8	0	0	0.00%	0.00%
PLSUL-34	5	0	0	0.00%	0.00%
All Pb	103	2	3	2.27%	3.41%
Cu					
PLSUL-22	39	0	3	0.00%	7.69%
PLSUL-24	41	0	2	0.00%	5.00%
PLSUL-32	10	0	1	0.00%	0.00%
PLSUL-33	8	1	0	33.33%	0.00%
PLSUL-34	5	0	1	0.00%	50.00%
All Cu	103	1	7	1.14%	6.82%
Zn					
PLSUL-22	39	0	7	0.00%	17.95%
PLSUL-24	41	3	3	7.50%	7.50%
PLSUL-32	10	1	5	0.00%	50.00%
PLSUL-33	8	1	0	0.00%	0.00%
PLSUL-34	5	0	0	0.00%	0.00%
All Zn	103	5	15	3.41%	13.64

Figure 11-1: Chumpe Lab CRM PLSUL32 Analyses Over Time



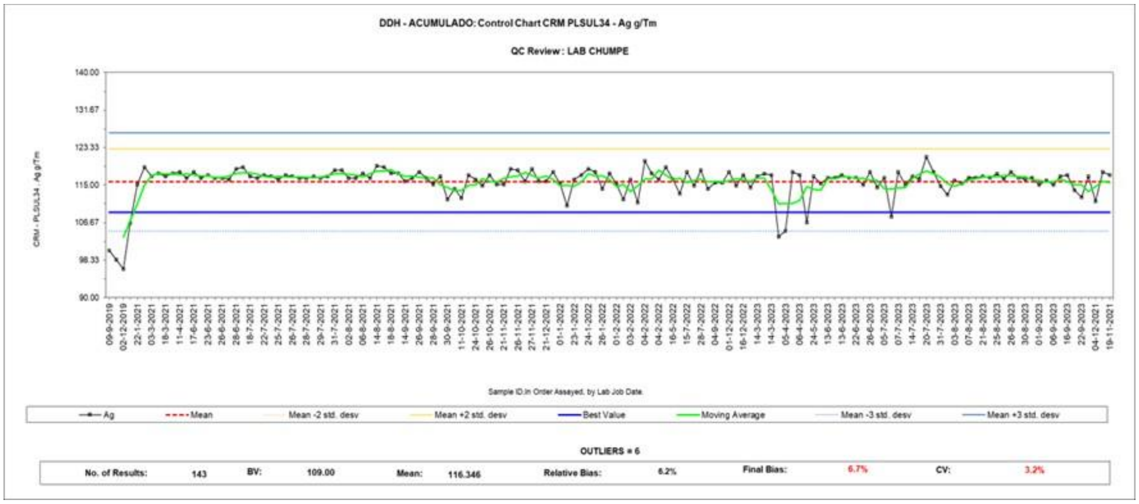
Source: Sierra Metals (2024)

Figure 11-2: Chumpe Lab CRM PLSUL33 Analyses Over Time



Source: Sierra Metals (2024)

Figure 11-3: Chumpe Lab CRMPLSUL34 Analyses Over Time



Source: Sierra Metals (2024)

11.4.3 Performance: ALS Minerals

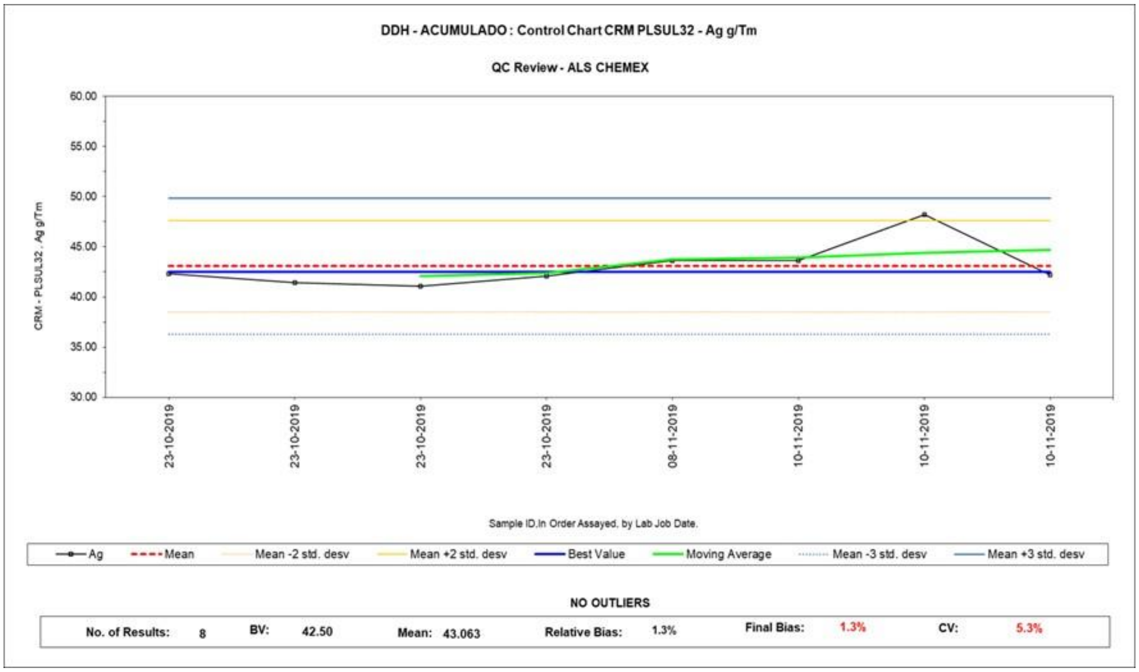
The tabulated QA/QC results for the 2018 drilling campaign using ALS as the testing laboratory are shown in Table 11-7. In 2018, Corona submitted a total of 269 samples to ALS laboratories for independent checking. Subsequently some of the diamond drill core was analyzed at ALS with the results for 21 samples including various of the eleven CRMs reported over various time periods (see Tables 11-4 and 11-5). Results have generally exhibited good precision over time with occasional time-related events. Typical examples of analyses for Ag over time are shown in Figure 11-4.

Table 11-7: 2018 CRM Performance Summary – ALS Minerals

CRM	Total	Low 3 s	High 3 s	Failure % Low	Failure % High
Ag					
PLSUL-22	99	0	0	0.00%	0.00%
PLSUL-24	109	2	0	1.83%	0.00%
PLSUL-10	13	0	0	0.00%	0.00%
PLSUL-14	36	0	34	0.00%	94.44%
PLSUL-15	12	0	0	0.00%	0.00%
All Ag	269	2	34	0.74%	12.64%
Pb					
PLSUL-22	99	0	0	0.00%	0.00%
PLSUL-24	109	2	0	0.00%	0.00%
PLSUL-10	13	9	1	69.23%	7.69%
PLSUL-14	36	0	0	0.00%	0.00%
PLSUL-15	12	1	0	8.33%	0.00%
All Pb	269	12	1	3.72%	5.77%
Cu					
PLSUL-22	99	0	6	0.00%	6.06%
PLSUL-24	109	1	19	0.00%	17.43%
PLSUL-10	13	0	1	0.00%	7.69%
PLSUL-14	36	36	0	100.00%	0.00%
PLSUL-15	12	0	1	0.00%	8.33%
All Cu	269	37	27	13.38%	10.04%
Zn					
PLSUL-22	99	1	2	1.01%	2.02%
PLSUL-24	109	4	1	3.67%	0.92%
PLSUL-10	13	1	0	7.69%	0.00%
PLSUL-14	36	2	1	5.56%	2.78%
PLSUL-15	12	2	0	16.67%	0.00%
All Zn	269	10	4	3.72%	1.49%

Source: SRK, 2021

Figure 11-4: ALS Labs CRM PLSUL32 Analyses Over Time



Source: Sierra Metals (2024)

11.5 Blanks

Minera Corona currently inserts unmineralized quartz sand blanks into the sample stream at a rate of 1:20 samples, or adjusted as necessary, to ensure smearing of grade is not occurring immediately after higher grade intervals. Blanks are generally about 0.5 kg of silica sand, bagged and submitted in the sample stream along with the normal core samples. The results of the analysis of blank samples in 2019 and 2020, show that based on a failure criterion of 5 times the LLD, there are only two gold systematic failures for the Chumpe diamond drilling samples (Table 11-7). LLD data for the Chumpe laboratory is presented in Table 11-1.

Between 2017 and 2020, a total of 6,897 Blanks were inserted into the sample stream at the Chumpe laboratory. The performance of 93 blank samples used during exploration and definition drilling completed within lead, zinc and copper dominant mineralization, all of which are well below the 5 times LLD failure criteria, except Au which has two failures, indicating possible contamination. This contamination is not evident in the primary metals.

The “failure” count of Blank samples sent to ALS is tabulated in Table 11-8 and presented over time in Figure 11-5 to Figure 11-12 (Au is presented in Figures 11-26 and 11-27). Coarse material has a higher failure rate and was only used in QA/QC submissions in 2023. Failures appear to have a possible relationship to periods of time, suggesting that contamination, albeit very minor, may be occurring at certain times during the sampling/analytical cycle.

Table 11-8: 2019 - 2020 Chumpe Blank Failures

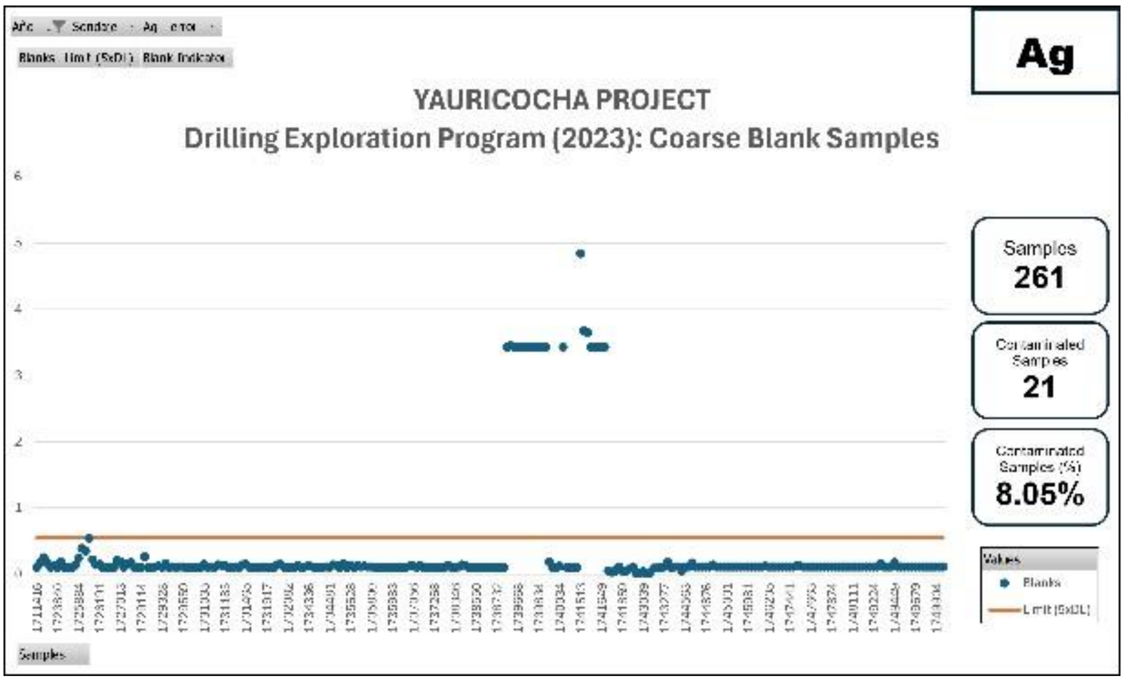
Lab	Count	Failures				
		Ag	Pb	Cu	Zn	Au
Chumpe	93	0	0	0	0	2

Source: SRK, 2021; Failures assessed on a 5X LLD basis.

Table 11-9: Coarse (2023) and Fine (2018 – 2023) ALS Blank Failures

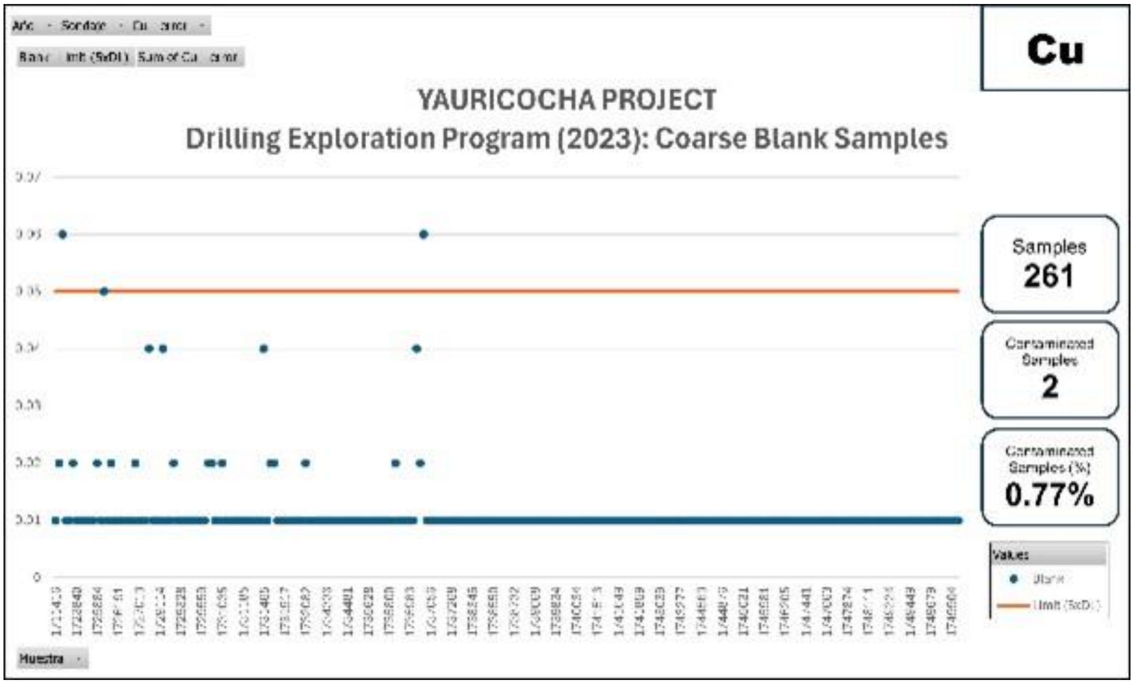
Lab	Count	Failures				
		Ag	Pb	Cu	Zn	Au
Coarse	261	21	6	2	10	1
Fine	542	2	3	4	8	8

Figure 11-5: Ag Analyses Coarse Blank Samples 2023



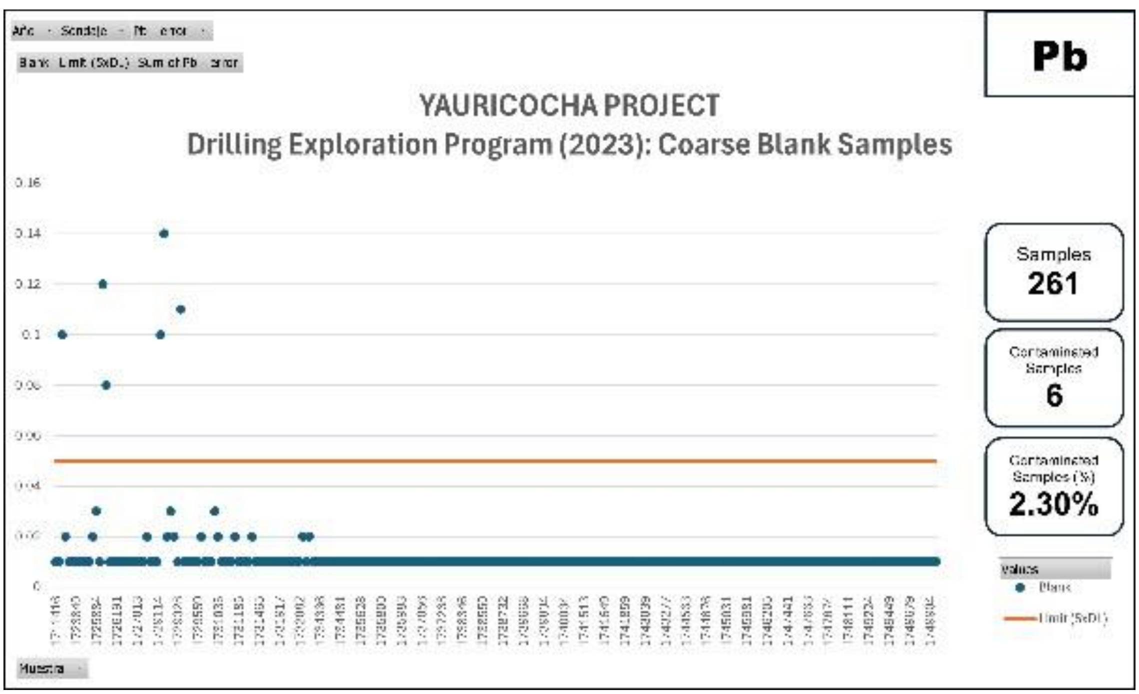
Source: Caracle Creek (2024)

Figure 11-6: Cu Analyses Coarse Blank Samples 2023



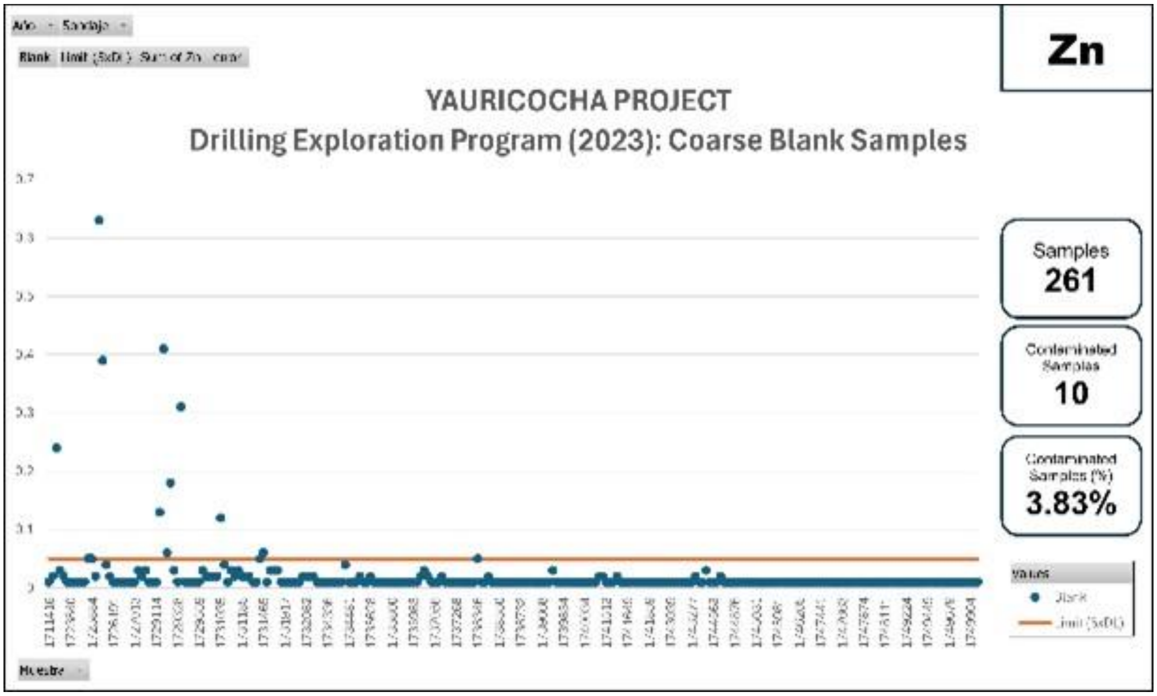
Source: Caracle Creek (2024)

Figure 11-7: Pb Analyses Coarse Blank Samples 2023



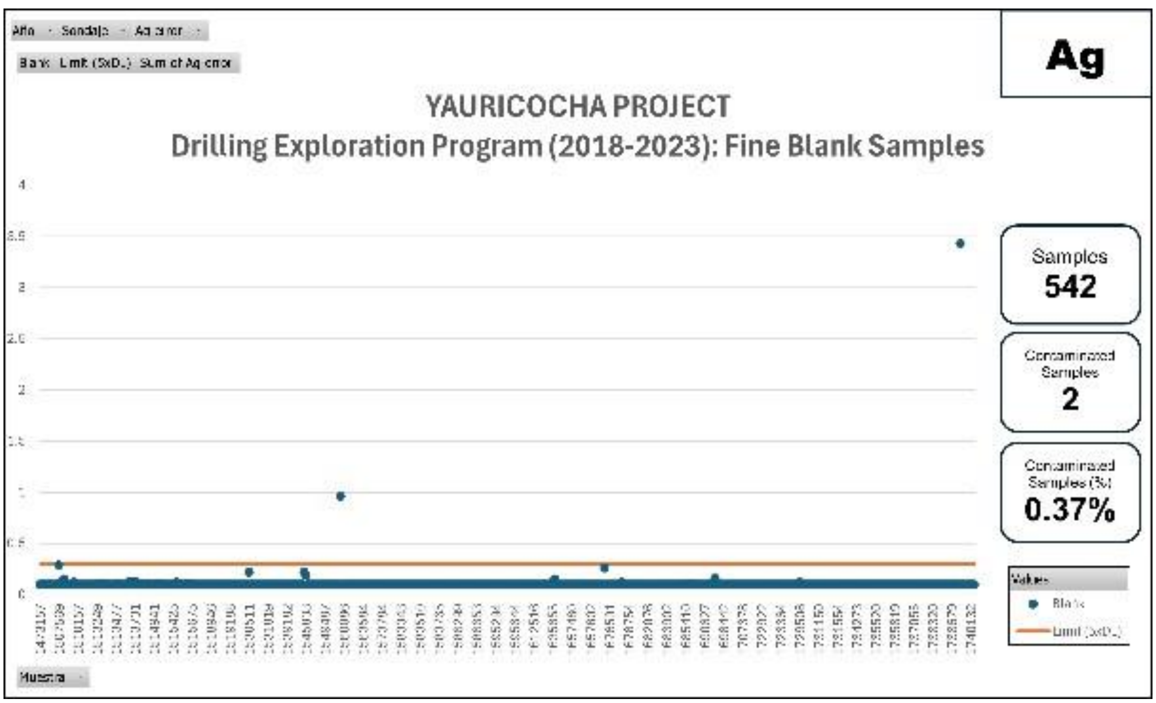
Source: Caracle Creek (2024)

Figure 11-8: Zn Analyses Coarse Blank Samples 2023



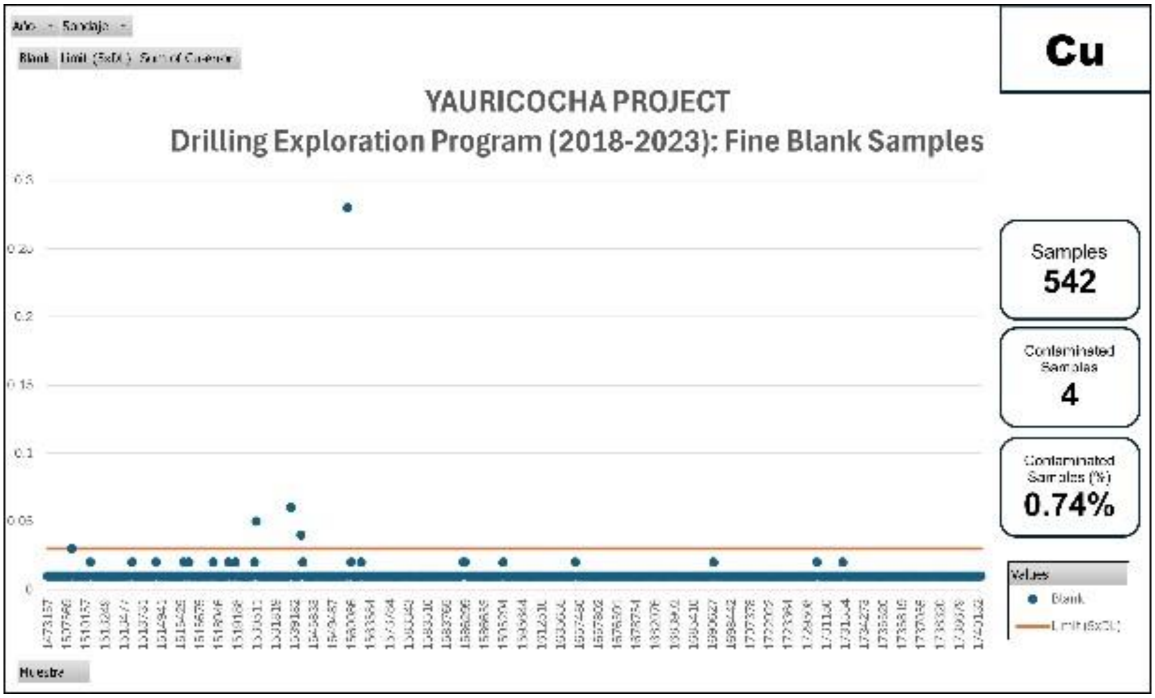
Source: Caracle Creek (2024)

Figure 11-9: Ag Analyses Fine Blank Samples 2018 – 2023



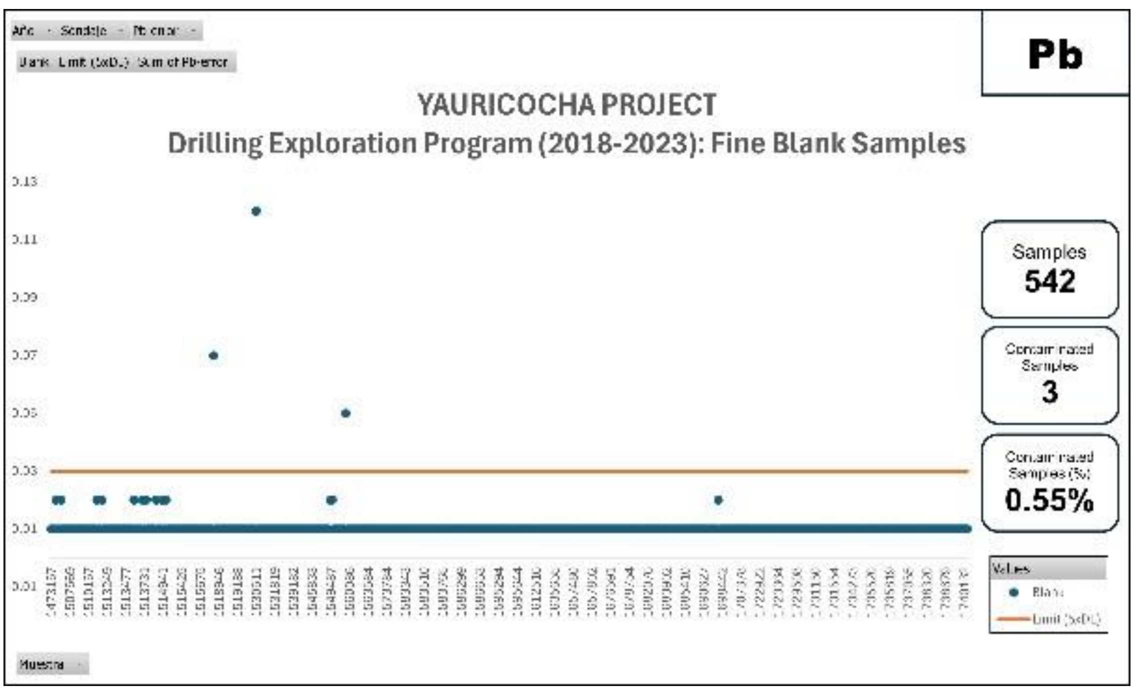
Source: Caracle Creek (2024)

Figure 11-10: Cu Analyses Fine Blank Samples 2018 – 2023



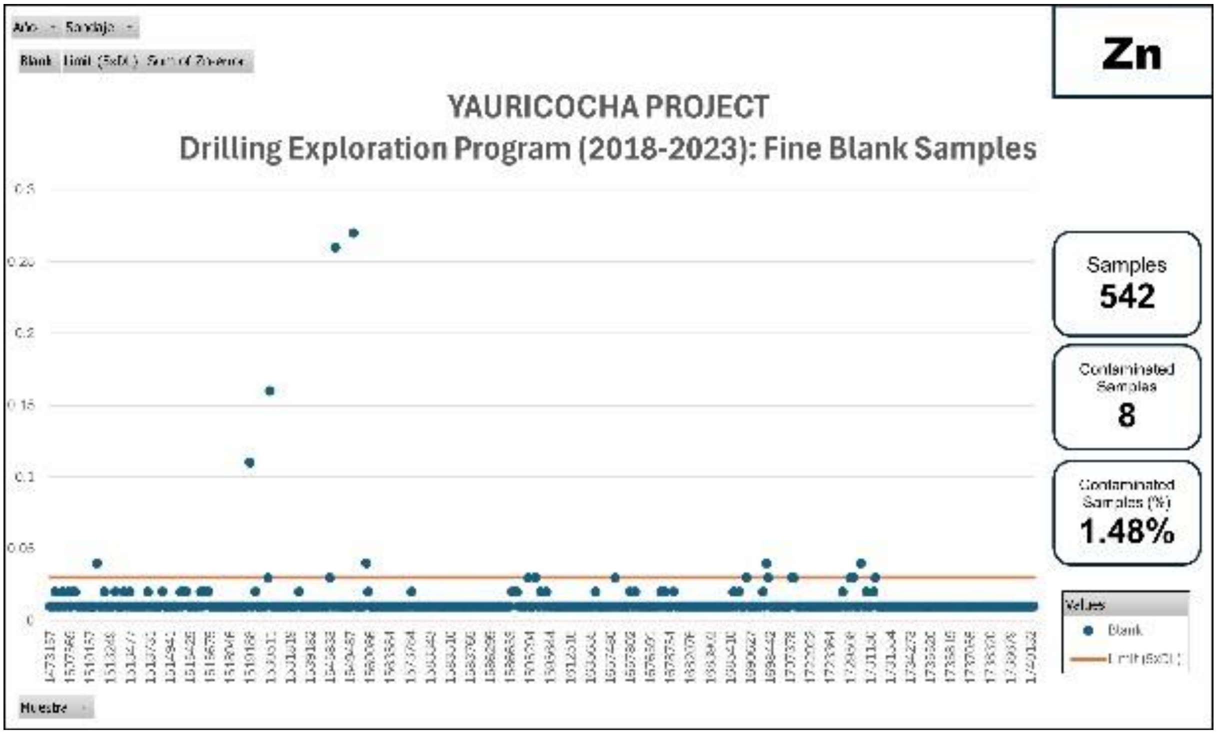
Source: Caracle Creek (2024)

Figure 11-11: Pb Analyses Fine Blank Samples 2018 – 2023



Source: Caracle Creek (2024)

Figure 11-12: Zn Analyses Fine Blank Samples 2018 – 2023



Source: Caracle Creek (2024)

11.5.1 Duplicates (Check Samples)

Duplicate samples such as the other half of split core or a crushed/pulverized sample resubmitted to the same laboratory are common practice for normal QA/QC programs but become less critical once development and mining continues. These samples are designed to check the primary assay laboratory's ability to repeat sample values or to check the nugget effect of the deposit very early on, but the inherent variability of the deposit is typically known at the production stage.

Minera Corona uses three types of check samples in the QA/QC program. These include twin (core) duplicates ("Field Duplicates"), prepared crushed rejects ("Coarse Duplicates"), and pulverized pulp duplicates ("Fine Duplicates") and are used to assess repeatability at the different phases of preparation between the site lab and third-party ALS lab.

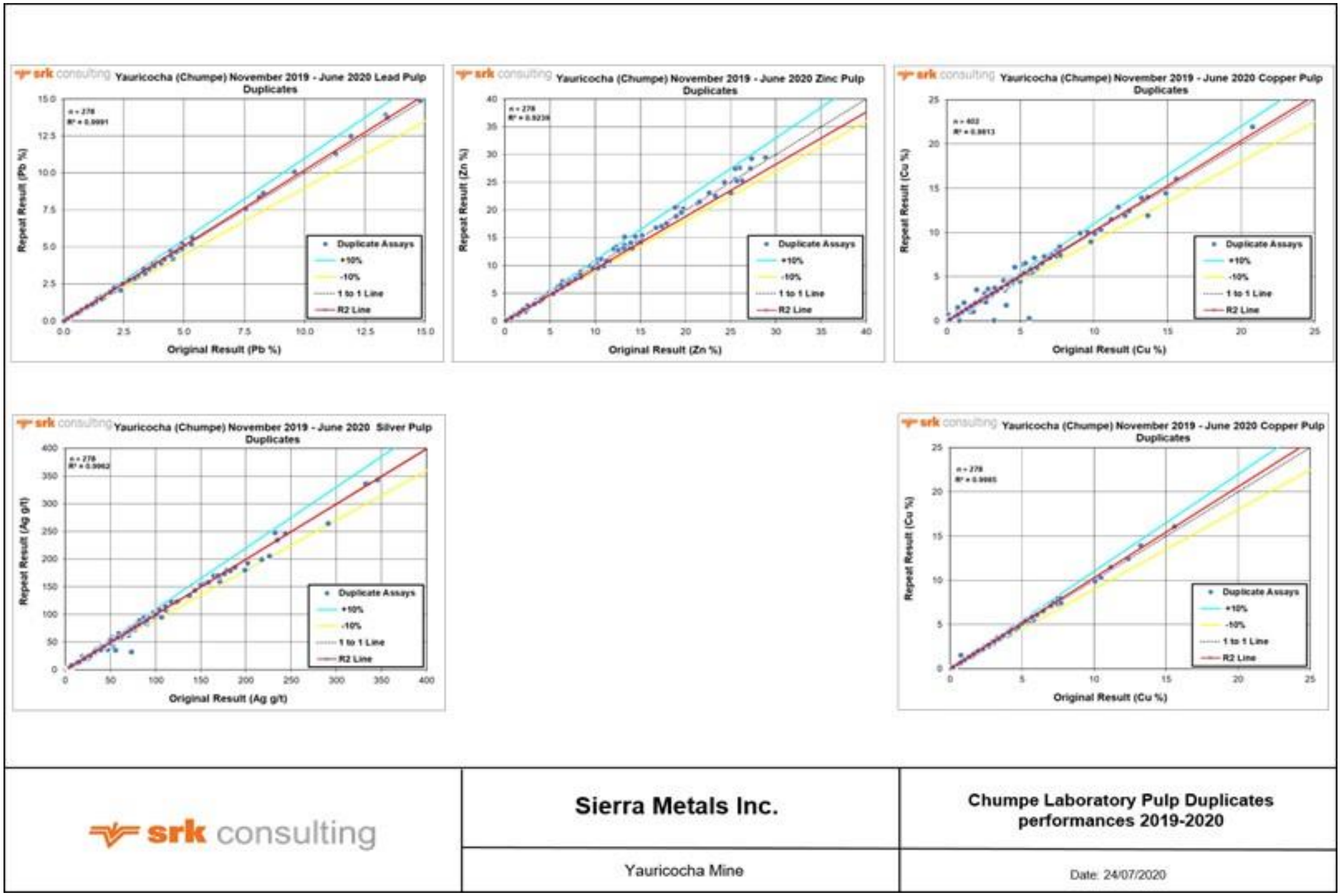
Fine and Field Duplicate data became available starting in 2018 with Coarse Duplicate data starting in 2020. No duplicate samples where available for the later part of 2020 and the beginning of 2021 due to the impact of the Covid Pandemic on the Yauricocha operation.

While Minera Corona did not submit true duplicate samples for the years preceding 2017, these intra-lab repeatability checks were commenced for the 2018 and 2019 drilling campaigns, for a combined total of 2,652 samples.

In 2018 and 2019, pulp and core duplicate samples were routinely performed on all assay batches submitted to both ALS and Chumpe laboratory, for a total of 7,517 samples. Agreement between original samples and duplicate samples were found to be within acceptable limits for Ag, Pb and Zn.

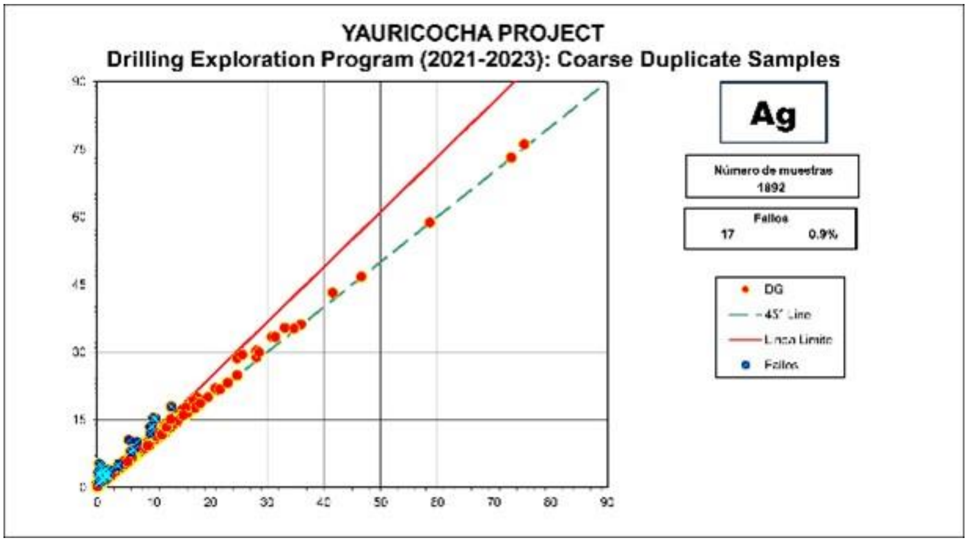
For the period November 2019 to June 2020, 278 pulp and 125 core duplicates where processed (Figure 11-13). Agreement between original samples and duplicate samples were found to be within acceptable limits for Ag, Cu, Pb, Zn (Figure 11-14 through Figure 11-25) and also for Au (Figure 11-26 through Figure 11-31).

Figure 11-13: Yauricocha mine Chumpe Duplicate analyses' performances



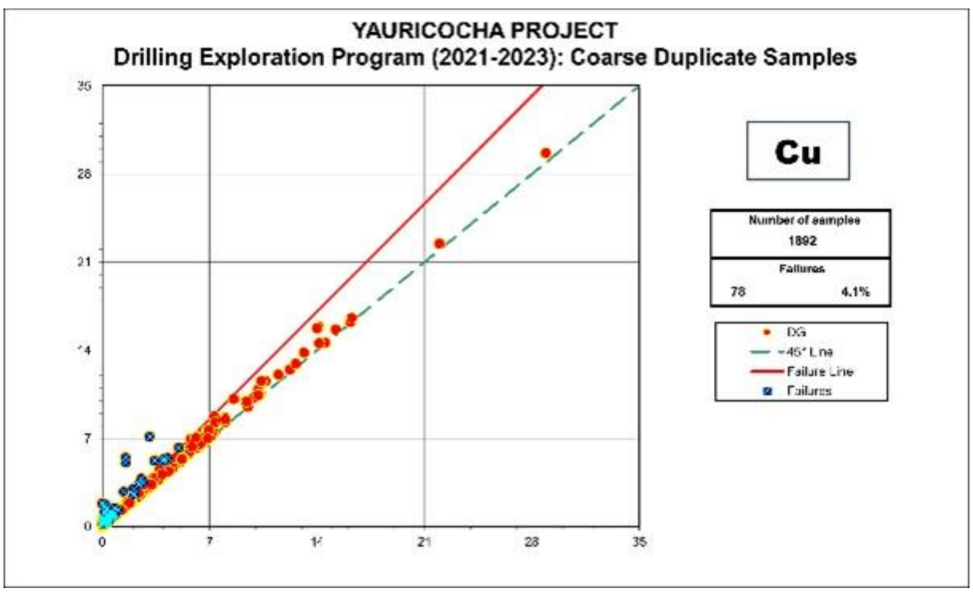
Source: SRK, 2021

Figure 11-14: Ag Analyses Coarse Duplicate Samples 2021 – 2023



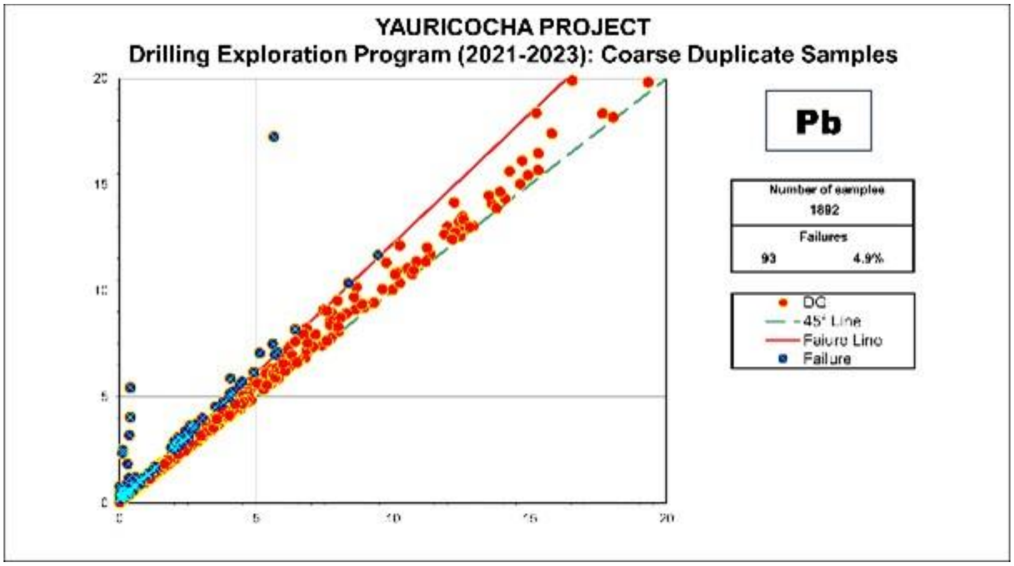
Source Caracle Creek (2024)

Figure 11-15: Cu Analyses Coarse Duplicate Samples 2021 – 2023



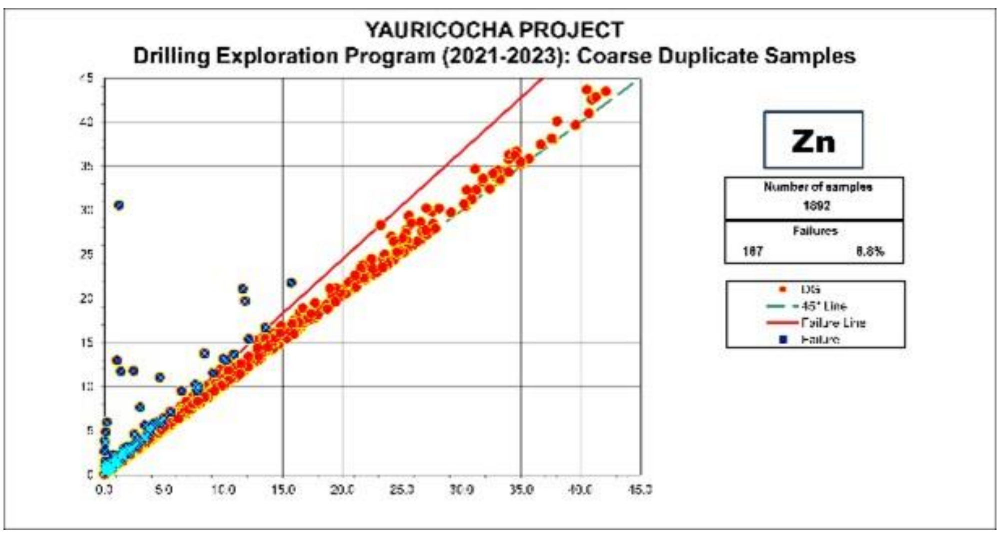
Source: Caracle Creek (2024)

Figure 11-16: Pb Analyses Coarse Duplicate Samples 2021 – 2023



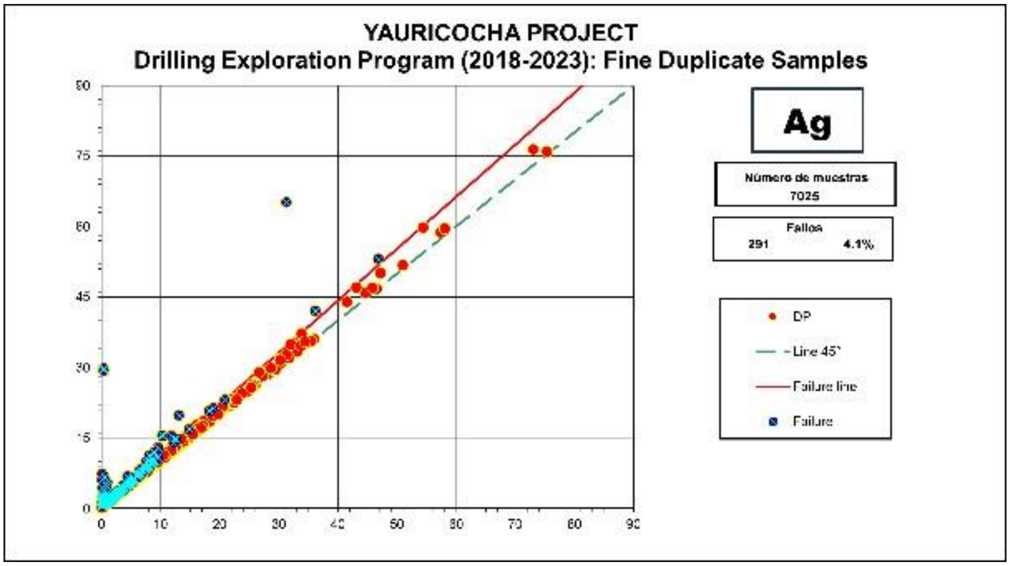
Source: Caracle Creek (2024)

Figure 11-17: Zn Analyses Coarse Duplicate Samples 2021 – 2023



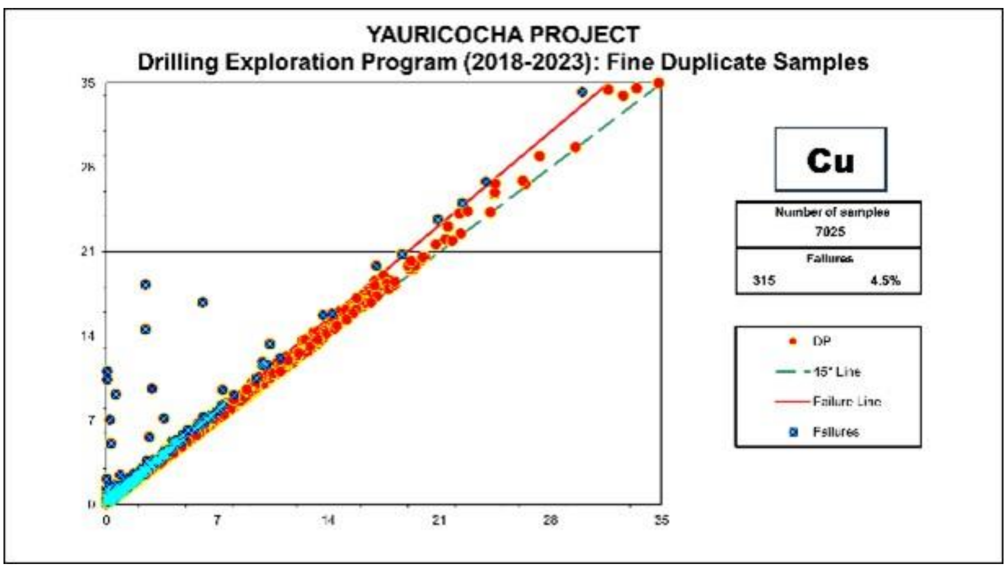
Source: Caracle Creek (2024)

Figure 11-18: Ag Analyses Fine Duplicate Samples 2018 – 2023



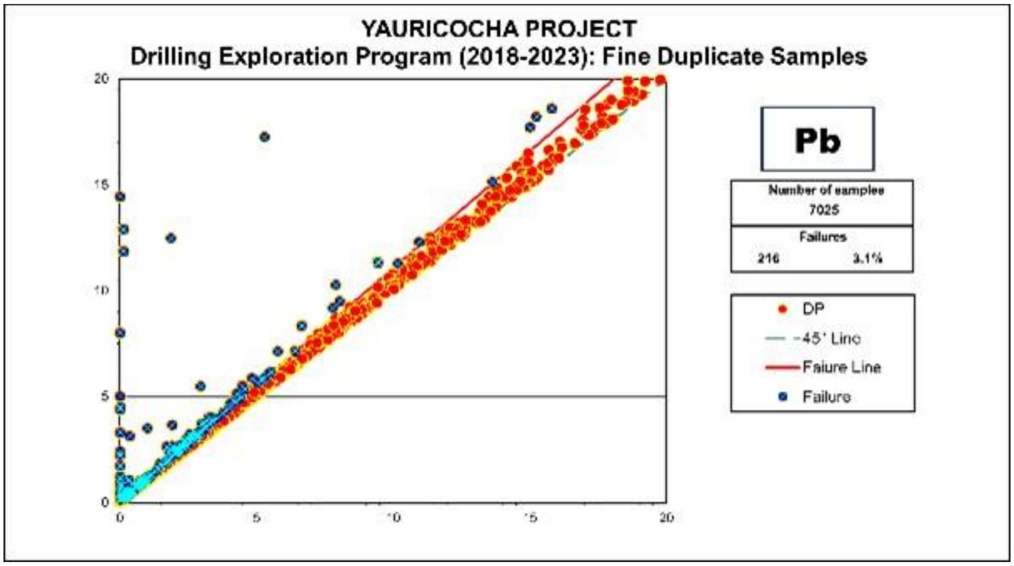
Source: Caracle Creek (2024)

Figure 11-19: Cu Analyses Fine Duplicate Samples 2018 – 2023



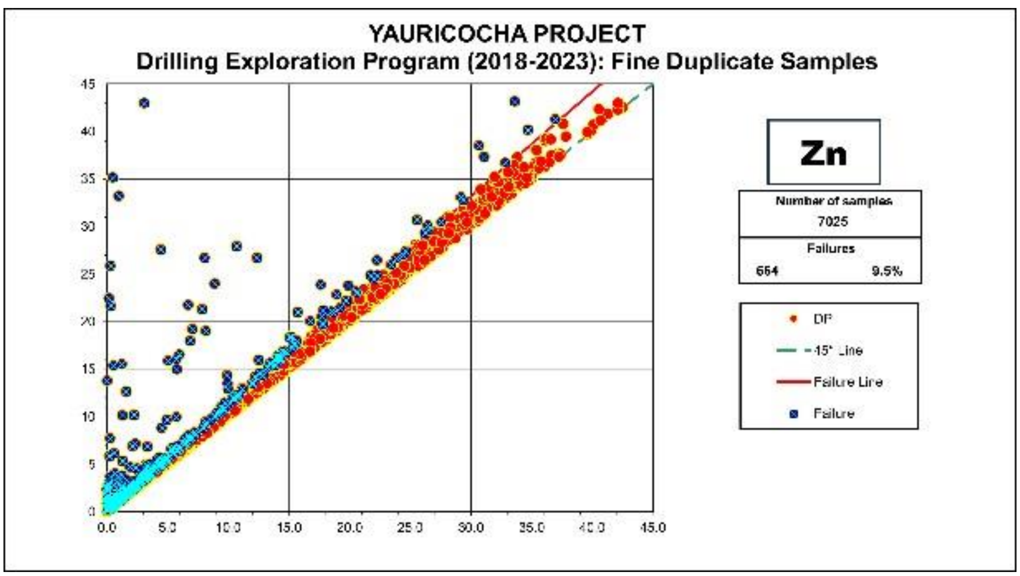
Source: Caracle Creek (2024)

Figure 11-20: Pb Analyses Fine Duplicate Samples 2018 – 2023



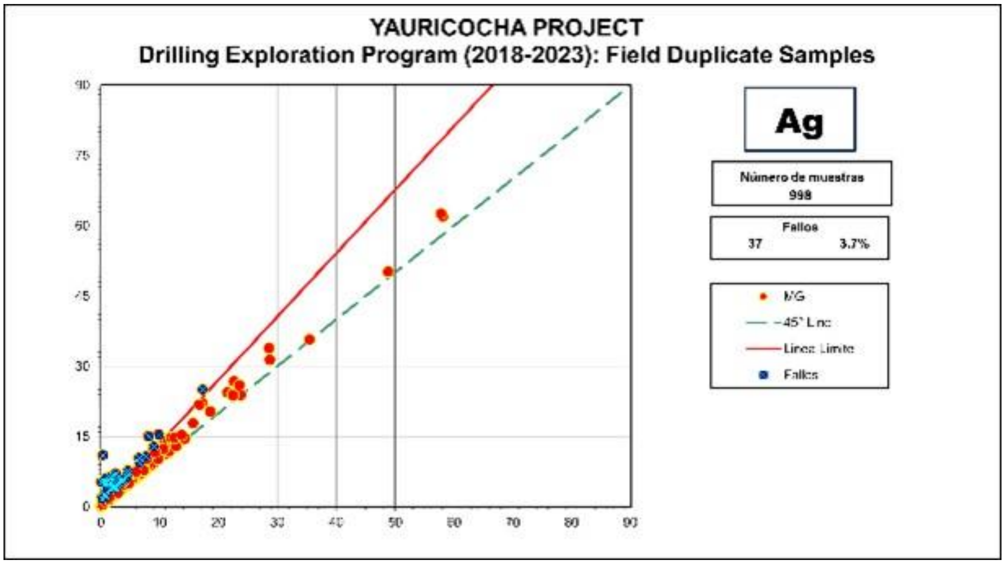
Source: Caracle Creek (2024)

Figure 11-21: Zn Analyses Fine Duplicate Samples 2018 – 2023



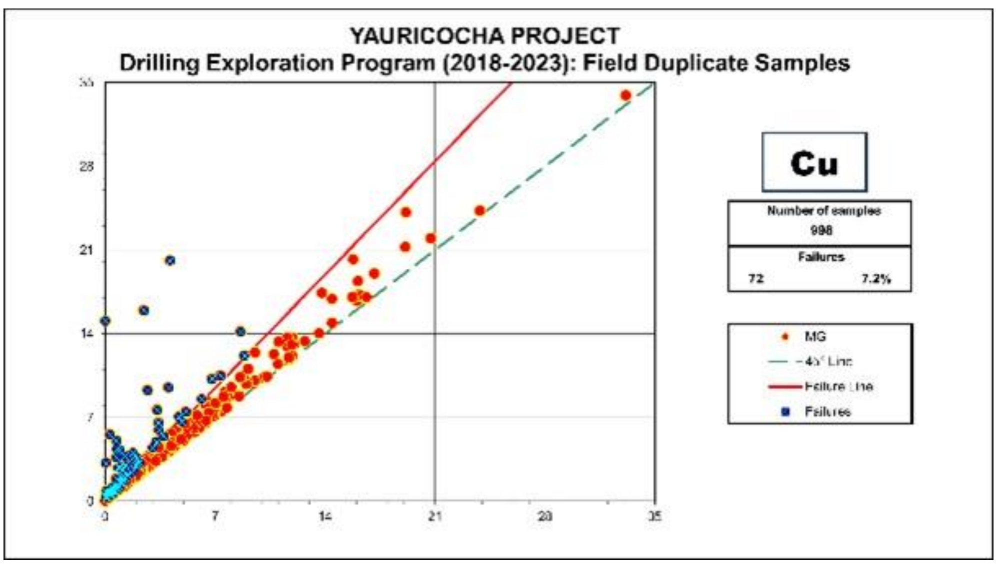
Source: Caracle Creek (2024)

Figure 11-22: Ag Analyses Field Duplicate Samples 2018 – 2023



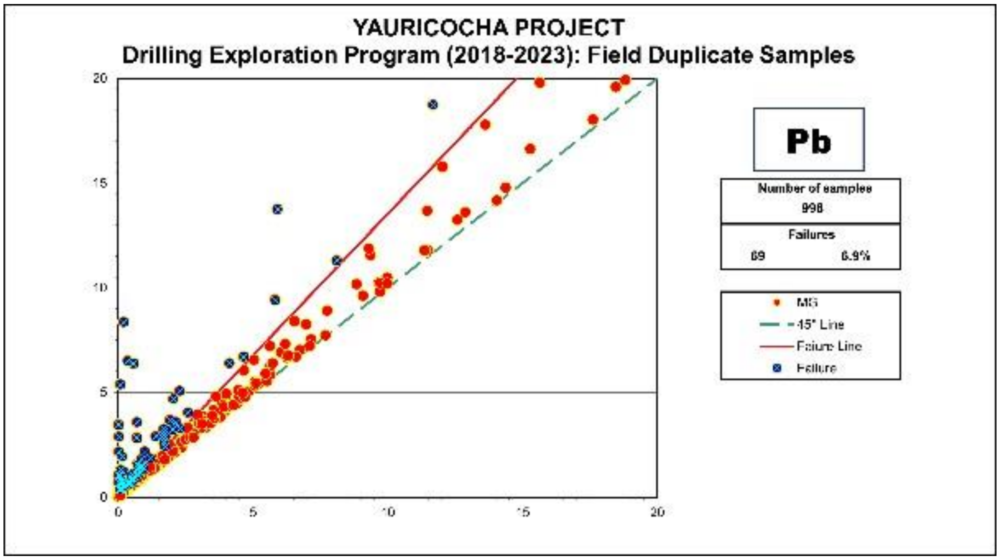
Source: Caracle Creek (2024)

Figure 11-23: Cu Analyses Field Duplicate Samples 2018 – 2023



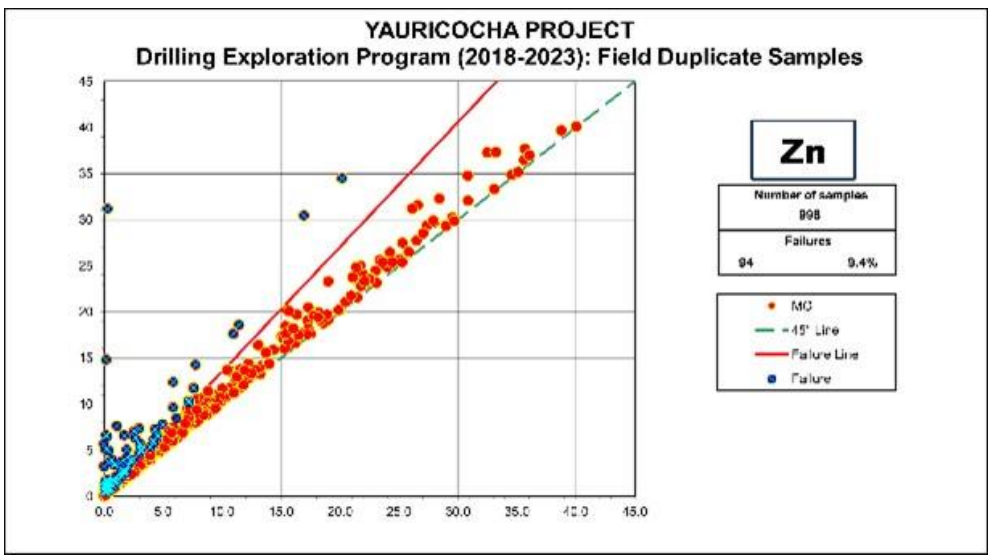
Source: Caracle Creek (2024)

Figure 11-24: Pb Analyses Field Duplicate Samples 2018 – 2023



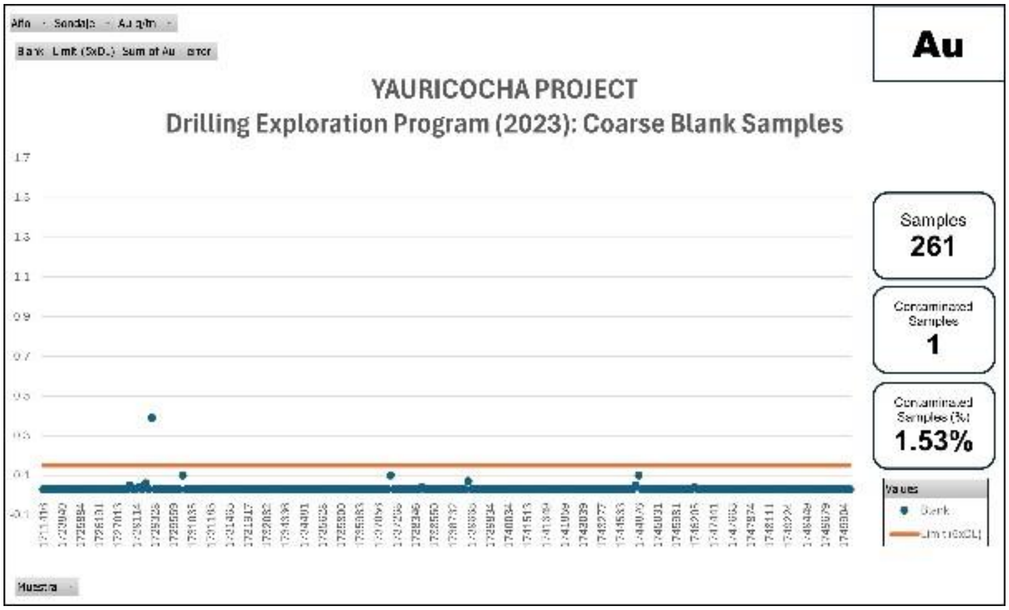
Source: Caracle Creek (2024)

Figure 11-25: Zn Analyses Field Duplicate Samples 2018 – 2023



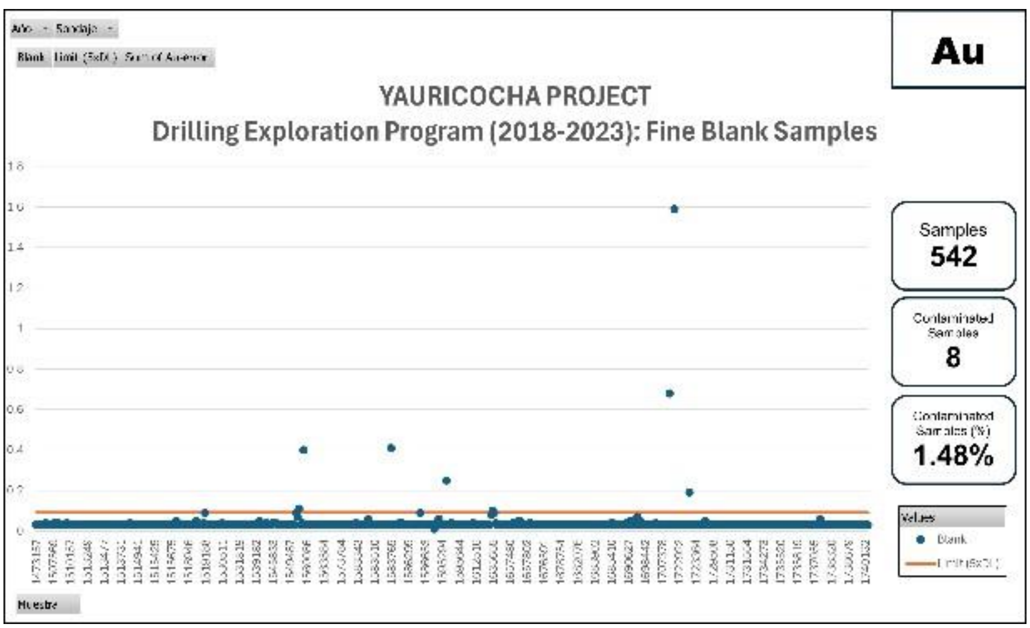
Source: Caracle Creek (2024)

Figure 11-26: Au Analyses Coarse Blank Samples 2023



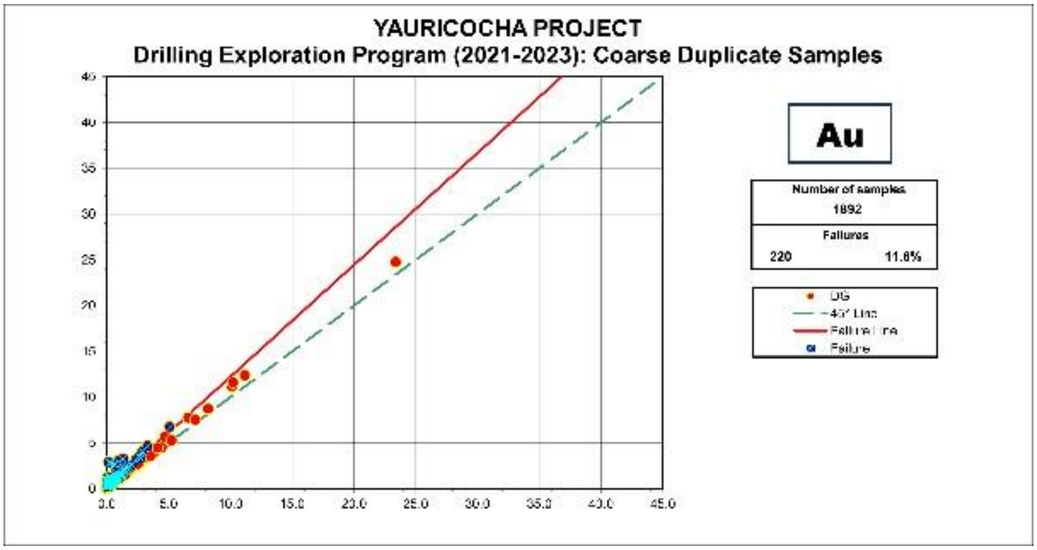
Source: Caracle Creek (2024)

Figure 11-27: Au Analyses Fine Blank Samples 2018 – 2023



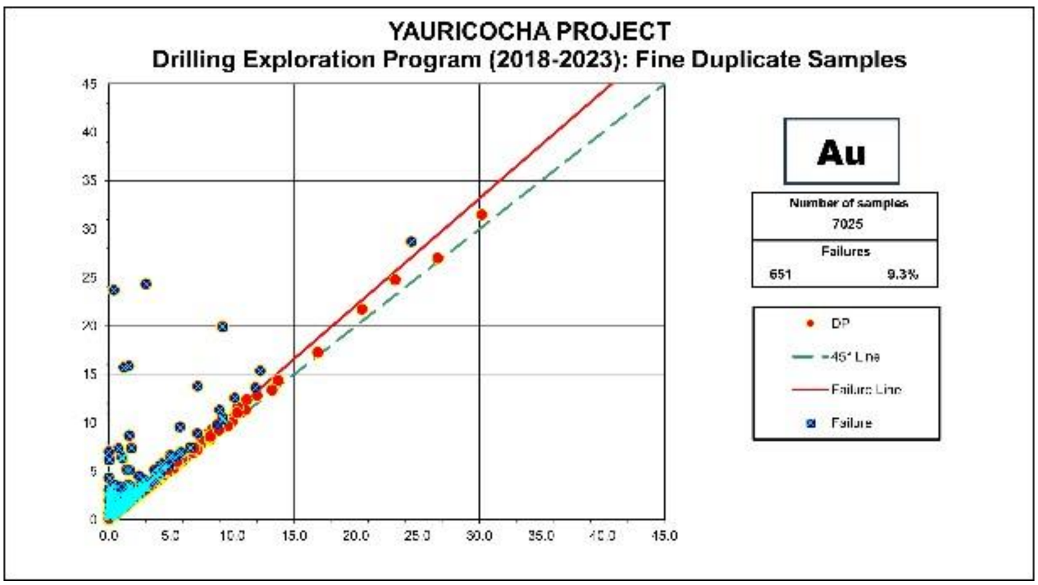
Source: Caracle Creek (2024)

Figure 11-28: Au Analyses Coarse Duplicate Samples 2021 – 2023



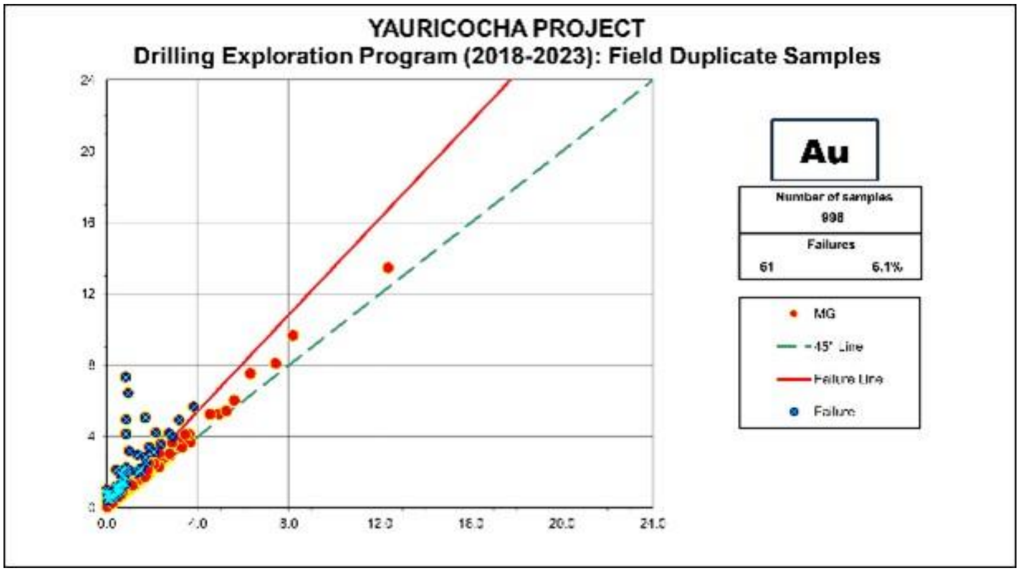
Source: Caracle Creek (2024)

Figure 11-29: Au Analyses Fine Duplicate Samples 2018 – 2023



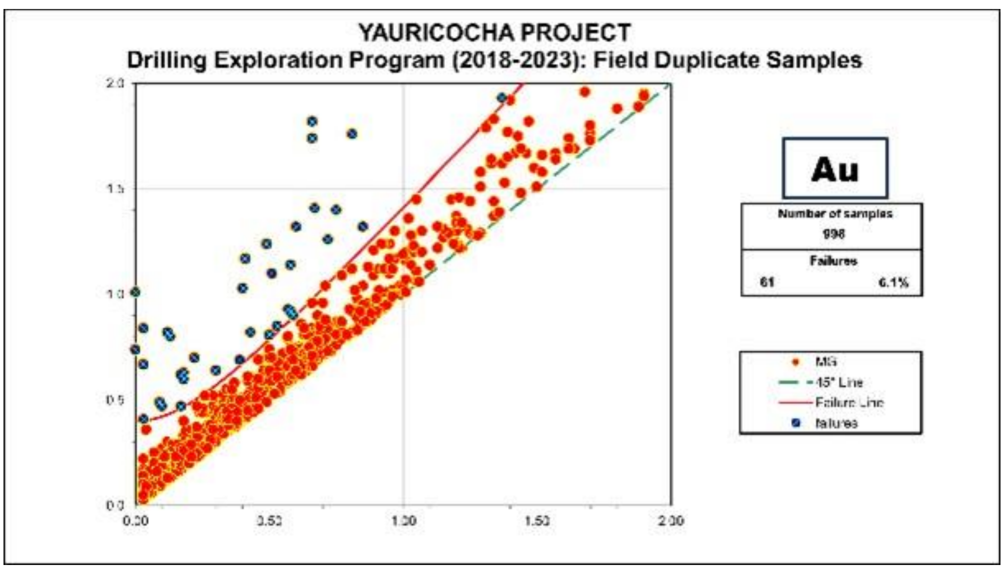
Source: Caracle Creek (2024)

Figure 11-30: Au Analyses Field Duplicate Samples 2018 – 2023



Source: Caracle Creek (2024)

Figure 11-31: Au Analyses Field Duplicate Samples 2018 – 2023 (Low Tenor Distribution)



Source: Caracle Creek (2024)

11.5.2 Actions

The actions taken by the exploration team at Yauricocha is documented in the QA/QC procedures for the mine. In the event that a failure is noted, the laboratory is contacted, and the source of the failure is investigated. There is no formal documentation for procedures involving re-runs of batches at this time, but the QP understands that this is the process being used. It was noted that the QA/QC reports are not amended to reflect the new passing QA/QC and batch, and only reflect the initial failure and batch to track laboratory performance rather than the performance of reruns.

The above actions are not consistent with industry best practice, which generally features a program of reanalysis upon failure of a CRM in a batch of samples. Subsequent to this was the incorporation of the revised samples into both the database and QA/QC analysis. It is noted that this program is implemented at other Sierra Metals sites but is not well documented at Yauricocha.

11.5.3 Results

The results of the recent QA/QC program described above show relatively high incidence of failures for CRM samples. It is considered that the CRM failures are potentially due to ongoing sample mix- ups, but that this inherently represents a failure in the process that must be reviewed. The CRM performance has been evaluated using more lenient tolerances than the CRM themselves recommend (+/-3 s vs +/-2 s) as the certified performance ranges result in extreme failure rates.

If the s and performance criteria for the CRM as calculated by Target Rocks is considered to be reasonable, and it is determined that the laboratories should be able to meet the performance criteria, then this is a more serious matter. The laboratories are not capable of analyzing to the precision needed for these CRM, and the laboratory practices should be reviewed. Uncertainty in the accuracy and precision of the analyses would be introduced through this process, requiring some action in terms of the classification of the Mineral Resources.

A bias with respect to results from the Chumpe laboratory compared to ALS has been previously noted and that changes in procedures and hardware are still being implemented at Chumpe to better approximate the preparation and analysis methodology employed by ALS. QA/QC methods have been adjusted in recent years and the results from the 2018 to 2023 reflect the positive changes.

11.6 Opinion on Adequacy

It is believed that the database is supported by adequate QA/QC to have reasonable confidence to estimate Mineral Resources. It is recommended that QA/QC failures be addressed as soon as possible through review of the original CRM / Blanks and their performance limits, as well as reasons for consistent bias observed between the site Chumpe lab and ALS Minerals. These biases are conservative given that Chumpe is the source for the historical drilling database and current channel samples, and that the nature of the bias is not such that the entire resource would be under or over-stated.

There are no consistent performance issues noted over time (2018 - 2023) at either lab, but rather noted isolated and apparently random failures for the CRM and blanks. As noted, many of these can be attributed to sample mixing during QA/QC submittal or potential issues with the CRM, both problems in and of themselves. It is recommended that more attention be given to sampling and QA/QC in the future to continue to mitigate potential uncertainty in the analyses supporting the Mineral Resource.

Although the performance and monitoring of the QA/QC samples is not consistent with industry best practices, it is believed that any lack of precision in the analyses will be less critical due to the nature of the mineralization and mining criteria at Yauricocha mine. Precision issues between 0.1% to 0.2% in the base metals is likely not enough to cause material issues in deciding whether material is mined or not, and these decisions are generally made with ongoing development samples and grade control entirely unsupported by detailed QA/QC. Thus, much of the risk associated with the analyses has already borne by the active mining of multiple areas at Yauricocha and mitigated by ongoing profitable production. It is opined that while certain issues should be addressed going forward, they represent little risk to the statement of Mineral Resources at this time.

12 DATA VERIFICATION

The Authors have reviewed the data and information regarding past and current exploration work on the Property, as provided by the Issuer and available in the public domain. The Authors have no reason to doubt the adequacy of current and historical sample preparation, security and analytical procedures for the exploration work completed by the Issuer or past operators, and the Authors maintain a high level of confidence in the current and historical data and information as reviewed.

Having reviewed and verified the database and information provided by the Issuer, it is the Authors' opinion that this data and information is suitable to be used for the purposes of the Report as outlined in Section 2.1.

The Authors have no reason to doubt the adequacy of the historical sample preparation, security and analytical procedures and have complete confidence in all historical information and data that was reviewed.

12.1 Personal Inspection of the Property

A personal inspection (site visit) to the Project was completed by the Co-Author (Qualified Person), Mr. Simon Mortimer, arriving on the 6th and leaving on the 8th of November 2023, spending two full days on the Project. During the site visit, the Author spent time underground within the active mine operations, spent time in the geology office, in the core storage facilities, and in the on-site laboratory.

As part of the inspection, the QP, confirmed access to the project, verified the presence of the mining operation, the historical and the ongoing exploration work, visited the underground drilling sites and the extractive front, examined diamond drill core, reviewed sampling and analysis protocols at the onsite laboratory, and reviewed data management procedures for the exploration sampling and assay data.

Mr. Mortimer was accompanied on site by:

- Mr. Ricardo Salazar, Manager Technical Services for Sierra Metals
- Mr. Vladimir Bedoya, Chief Project Geologist for Minera Corona
- Ms. Jeimy Salas, Modeller Geologist, for Minera Corona

All information and data relating to the historical and current exploration work completed on the Project was made available to the QP before and during the personal inspection of the Property. The data reviewed, was compiled within the Leapfrog geological modelling software, and consisted of underground geological maps, wireframes of the underground workings, drill core logging data, sample, and assay data for both underground channels and drilling. The data compiled in the modelling software were compared to the data captured from the underground sampling and mapping and the data captured from the drill core logging and sampling. It was determined that the compiled data for modelling was a "good match" to the information being captured by the Minera Corona geological team. The assay analysis certificates were also reviewed against the compiled assay results within the geological modelling platform, and it was determined that the analytical information being used in the modelling process is a good representation of the assay results emitted by the laboratory.

12.2 Comments on Data Verification by QPs

It is the opinion of the Authors that the procedures, policies and protocols for sampling and drilling verification are sufficient and appropriate and that the core sampling, core handling and core assaying methods used are consistent with good exploration and operational practices such that the data is reliable for the purpose of mineral resource estimation, and for a preliminary economic assessment or other future economic study and for the purposes of the Report as outlined in Section 2.1.

The QP, Simon Mortimer, reviewed some of the field data supporting the Mineral Resource estimation during a Yauricocha mine site visit, by observing and verifying the capture and interpretation of geological data and checking the data chain of custody, from the original logged values recorded in the mine, through to the modelling platform and the Mineral Resource estimation process.

The drillholes, channel samples, mine development and the respective geological models were visually inspected in Leapfrog Software by the QP, Simon Mortimer, to determine whether there were any material issues with respect to spatial data location, or interpretation. The QP found no fatal flaws to the estimation, however, several issues were identified with respect to the creation of the estimation domain wireframes. These issues and their respective solutions have been detailed in Section 14.2.

The QP, Simon Mortimer, notes that the data verification process, from the initial field data capture to the model development and resource estimation was not that easily traceable due to the lack of a compiled and well-ordered database. However, verification checks between the field data capture sheets and the modelling and estimation platform, indicated that the chain of data communication appears to be robust. The reporting on the data verification will be dramatically improved when the new data management system is fully implemented.

The QP, John Siriunas, has reviewed aspects of the quality assurance and control (QA/QC) applied to the sampling and analytical techniques used by the Company in their drilling programs between 2018 and 2023. The QP has found no issues that would impact the drill results as they were used for the purposes of the Report.

The QP, Dr. Jobin-Bevans, reviewed, in general, the data and information provided by the Company as it pertained to the writing of the sections for which he was responsible. The QP found no issues with the data and information as it is to be used for the purposes of the Report (see Section 2.1).

12.3 QA/QC Procedures

Procedures for the analysis of the QA/QC with respect to the project have been referred to in Section 11.4 by QP John Siriunas. It was noted that no previous errors or omittances had been reported in comparisons between analytical certificates and the working database(s).

12.4 Database Verification

The database verification of drill hole information was conducted by Sierra Metals mineral resource staff and audited by the QP, Oscar Retto, reviewing collar, down-hole survey and assay data.

The drill hole database used for the MRE contains 3,204 diamond drill holes for 390,004 metres drilled from surface and underground works and 100,573 assays analyzed for Ag, Pb, Cu, Zn, Au, As and Fe. Channel samples were not used for the MRE as important mean grade and variance differences were observed when comparing drill hole and channel sample populations.

The QP, Oscar Retto prepared a second drill hole database verification for Esperanza, Mina Central, Cuye and Catas mineralized structures that includes missing out of range coordinate data, missing downhole surveys, sample overlaps and zero-length intervals. No important errors were detected.

Based on the database verification performed, the QP, Oscar Retto consider that the database reviewed is adequate for the purposes used in the resource estimate.

12.5 Limitations

The QP, Simon Mortimer, has not reviewed 100% of the analyses used in the resource calculation against the relevant assay certificates, nor have all of the geological tables been reviewed against all of the field data capture sheets.

12.6 Opinion on Data Adequacy

The QP, Simon Mortimer, has relied upon the verification conducted by others previously and has conducted independent verification of assays to analytical certificates from ALS Minerals for the recent project history. The QP, Simon Mortimer, notes that the implementation of the proposed SQL Server based drill data management system would facilitate an auditable and reliable QA/QC management system and produce a verified analytical database for mineral resource estimates. The ability to process QA/QC in real time would allow for the identification of laboratory or sampling issues long before the mineral resource estimation process.

The QP, Simon Mortimer, has reviewed and accepted the supplied information and considers it to be geologically appropriate and adequate for use in the mineral resource estimate as outlined in this Report.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Overview

The Yauricocha process plant currently treats ore via conventional flotation process to produce copper, zinc, and lead concentrates. The plant has been in operation for several years and has been treating over 1Mt/a ore since 2017.

Production drill core from current and future mining areas are routinely sampled and tested at the onsite metallurgical laboratory to confirm the metallurgical response of the ore via the existing flowsheet. Sierra Metals periodically uses third party metallurgical laboratories to complete specialized tests such as comminution, optical microscopy, and mineralogy.

The main mining areas are listed below and expected to have similar metallurgical responses based on current geometallurgical practices:

- Angelita
- Mascota
- Esperanza
- Catas
- Cachi-Cachi

13.2 Metallurgical Recoveries

Global metallurgical recovery performance of copper, zinc, lead, gold, and silver during 2019-2023 are summarized in Figure 13.1, to Figure.5.

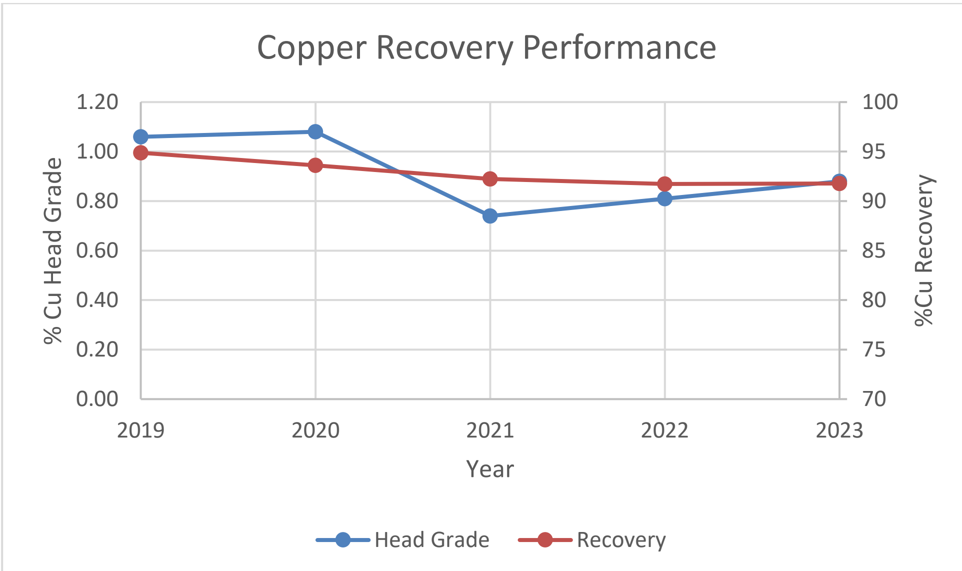
Overall copper recovery has remained +92% while copper head grade has lowered from 1.06% to 0.88% Cu during 2022-2023.

Overall zinc recovery has lowered slightly from approximately 97% to 95% and overall lead recovery has lowered from approximately 96% to 91% during 2022-2023. Both zinc and lead recoveries are related to the lower metal grade trends in the ore.

Overall gold recovery has generally remained consistent over the last five years at approximately 25% recovery.

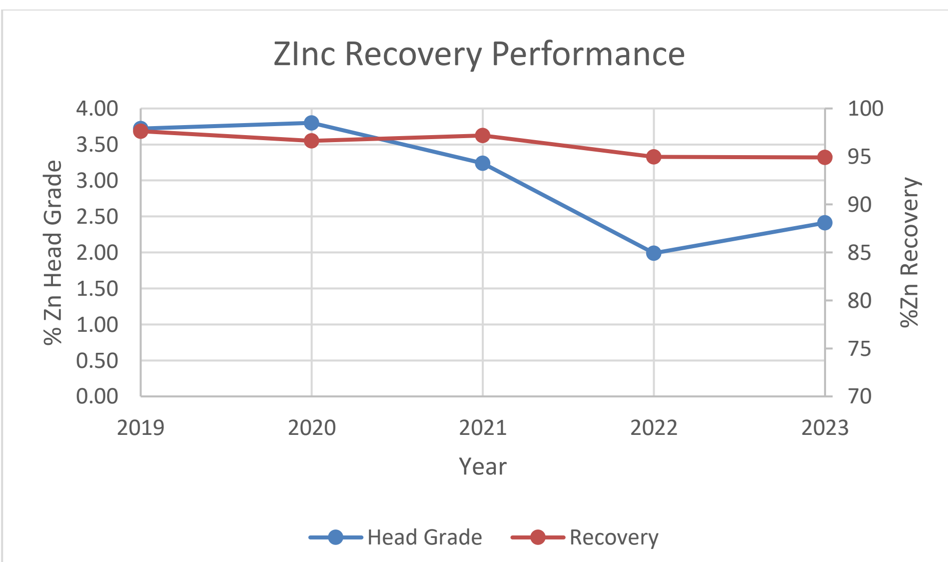
Overall silver recovery has lowered from approximately 80% to 72% and generally follows the similar trend of silver grade of the ore.

Figure 13-1: Overall Copper Recovery Performance Summary (2019-2023)



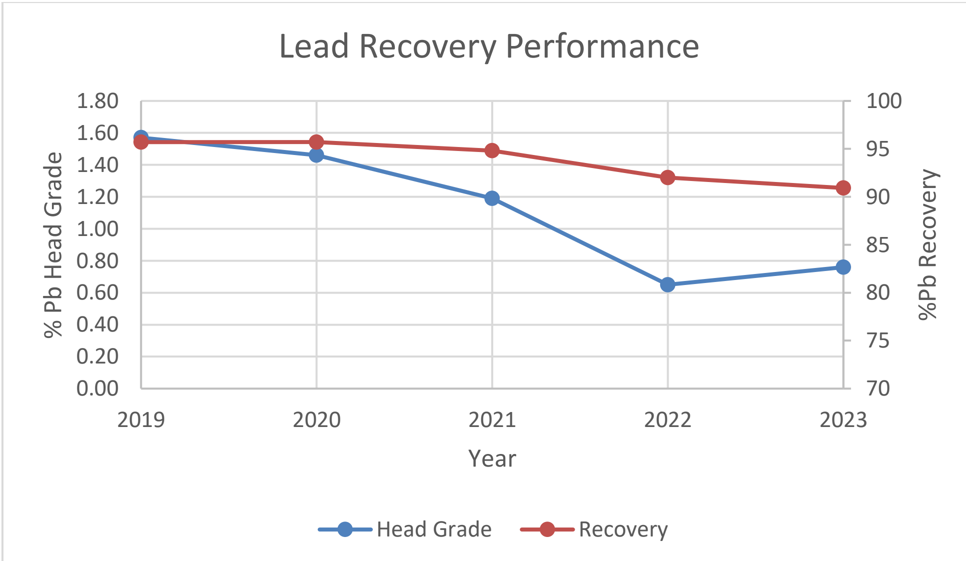
Source: AGP (2024)

Figure 13-2: Overall Zinc Recovery Performance Summary (2019-2023)



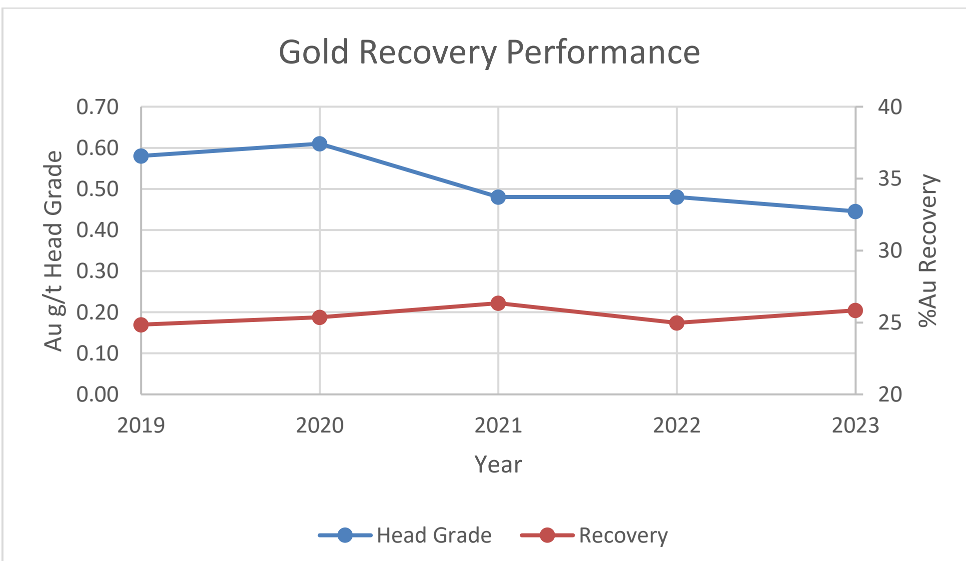
Source: AGP (2024)

Figure 13-3: Overall Lead Recovery Performance Summary (2019-2023)



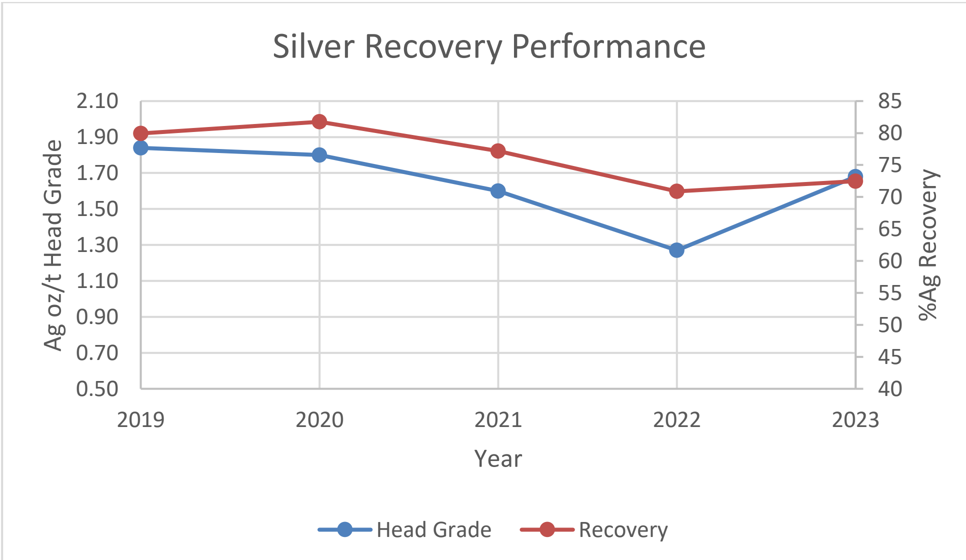
Source: AGP (2024)

Figure 13-4: Overall Gold Recovery Performance Summary (2019-2023)



Source: AGP (2024)

Figure 13-5: Overall Silver Recovery Performance Summary (2019-2023)



Source: AGP (2024); Note silver grade is reported as oz/t

14 MINERAL RESOURCE ESTIMATES

14.1 Summary

This section discloses the mineral resources for the Yauricocha Mine, prepared and disclosed in accordance with the CIM Standards and Definitions for Mineral Resources and Mineral Reserves (CIM, 2014).

The QP responsible for the geological model and the auditing of wireframes and other information relating to the mineral resources is Mr. Simon Mortimer (FAIG), Principal Resource Geologist for Atticus and Caracle Creek. Software utilized by the QP includes Leapfrog Edge.

The QP responsible for the Mineral Resource Estimate (MRE) is Mr. Oscar Retto (MAIG), Principal Resource Estimator for AGP. Software utilized by the QP for review and audit the estimate includes Isatis. Neo Mining ™ version 2023.04.1.

The MRE has been prepared using interpreted mineralized domains that comprise the Yauricocha Mine. The effective date for the MRE is 31 December 2023.

The QPs have undertaken detailed reviews of the geology models and wireframing, database, domain interpretation, estimation parameters, and validation of the block models from the Yauricocha Mine for all stages of the mineral resource estimate. The QPs are of the opinion that Sierra Metals has adopted a generally prudent and acceptable approach to their mineral resource estimates. The QPs have audited the block model and mineral resource estimates that make up the MRE for the Yauricocha Mine and confirm that the reporting of all mineral resources is in compliance CIM (2014) and conforms to NI 43-101.

14.2 Database

The drill hole database used for the MRE contains 3,204 diamond drill holes for 390,004 metres drilled from surface and underground and 100,573 assays analysed for Ag, Pb, Cu, Zn, Au, As and Fe. Channel samples were not used for the resource calculation as important mean grade and variance differences were observed when comparing drill hole and channel sample populations, however the channel samples were used in the construction of the geological models and the estimation domains.

The data validation of drill hole information was conducted by Sierra Metals mineral resource staff and audited by the QPs, reviewing collar, down-hole survey, assay, and lithology data and information. The cut-off date (effective date) for the MRE database was 31 December 2023.

The data preparation, block modeling and grade interpolations were performed by Sierra Metals in Datamine RM software version 1.13.202.0 and the statistical and variographic analysis in Supervisor software version 8.15.2.0.

A list summary of the raw sample mean is presented in Table 14-1.

Table 14-1: Descriptive Statistics for Mean Metal Grades by Mineralized Domain

Area	Model	Model Prefix	Code	Count	Ag (ppm)	Pb (%)	Cu (%)	Zn (%)	Au (ppm)	As (%)	Fe (%)	Length* (m)
Mina Central	Mina Central	mc	100	10056	39.06	0.49	0.88	2.18	0.75	0.15	29.10	1.01
	Cuye	cye	101	1220	30.71	0.19	1.59	2.17	0.68	0.15	30.87	0.97
	Cuye Sur	cyes	102	192	11.36	0.03	1.18	0.60	0.31	0.08	38.65	1.00
	Contacto Sur Medo	csm	103	48	269.96	8.02	0.20	11.74	0.74	0.07	17.55	0.97
	Contacto Sur Medo I	csmi	104	57	245.32	12.69	0.13	17.19	0.18	0.05	6.37	0.93
	Contacto Sur Medo II	csmii	105	130	286.76	8.54	0.21	11.40	0.31	0.13	10.31	0.93
	Contacto Oriental	ori	108	424	110.91	2.07	0.52	10.00	0.40	0.25	22.73	0.97
	Contacto Occi.	occ	109	235	116.22	1.97	0.34	8.54	0.59	0.11	17.08	0.97
	Contacto Occi. Lateral	occl	110	6	220.12	4.82	0.42	13.90	1.35	0.06	13.44	1.26
	Katty	kat	111	29	182.14	6.30	0.17	14.70	0.51	0.07	13.70	0.87
	Mascota Poli. Norte	mspn	114	132	164.29	9.76	0.80	16.84	0.97	0.11	11.22	0.92
	Mascota Poli. Norte	mspnii	115	41	124.88	8.44	0.13	12.86	0.43	0.09	13.17	0.83
	Mascota Poli. Norte	mspe	116	217	121.77	2.20	1.94	9.28	0.83	0.15	23.39	0.98
	Mascota Poli. Norte	msps	117	79	65.30	0.35	0.21	6.93	0.46	0.10	18.54	1.03
	Mascota Poli. Norte	mspsii	118	45	46.78	0.33	0.53	4.74	0.49	0.10	23.56	0.94
	Mascota Sur Oxido	msso	119	172	8.89	0.14	4.57	17.65	0.05	0.15	19.58	0.98
	Mascota Sur Oxido Econ.	msoe*	120	3994	142.11	4.24	2.41	3.89	1.13	0.25	23.55	1.03
	Oxido Anatacaca Sur	oants*	138	1463	93.66	0.92	0.59	1.61	0.91	0.25	28.33	0.98
	Esperanza Sur	esps*	140	344	35.97	0.40	0.37	5.36	0.43	0.17	21.55	0.96
	Butz Bx	btbx	149	88	99.93	3.05	0.40	12.71	1.38	0.09	15.03	0.94
Esperanza	Gallito	glls	106	193	58.78	1.72	0.29	3.04	0.16	0.11	10.94	0.95
	Gallito	vgll	107	115	62.02	2.83	1.00	8.14	0.23	0.21	13.75	0.92
	Esperanza	espe*	121	10067	66.04	0.88	1.84	2.30	0.57	0.24	27.13	0.98
	Esperanza Distal	espd	122	1337	94.20	4.00	0.97	8.72	0.29	0.25	18.89	1.01
Fortuna	Fortuna 7	fc7	135	77	46.20	0.94	1.66	4.99	0.40	0.43	15.45	0.90
	Fortuna 8	fc8	141	636	82.23	0.67	1.08	1.83	0.46	0.21	26.37	0.97
	Fortuna Norte	fn*	146	154	69.08	2.72	0.60	8.84	0.40	0.22	14.00	0.95
	Fortuna Pamela	pam	147	571	64.74	1.01	2.39	3.42	0.72	0.49	23.86	0.96
Cachi Cachi	Kimberly	kim	112	163	32.85	0.02	1.78	0.08	0.30	0.02	25.15	0.95
	Karlita	kar*	126	1838	66.18	0.87	0.67	3.08	0.61	0.14	31.27	1.00
	Privatizadora	priv	129	314	54.26	1.60	0.18	5.30	0.48	0.11	24.89	1.03

Area	Model	Model Prefix	Code	Count	Ag (ppm)	Pb (%)	Cu (%)	Zn (%)	Au (ppm)	As (%)	Fe (%)	Length* (m)
	Carmencita	car	130	220	91.30	1.14	0.59	3.87	0.91	0.18	24.08	1.02
	Sulma	sul	132	137	77.69	2.80	0.15	4.92	0.78	0.23	14.35	0.99

Notes: Occi. – 'Occidental'; Poli. – 'Polimetalico'; Econ. – 'Economico'; *- Length weighting not applied

14.3 Drill Hole/Channel Database

At the time when the QP (Simon Mortimer) was reviewing the process of data capture and on-site data management, a new SQL database system was being implemented. All the data capture procedures, the data management processes, and the reporting and data export protocols were all implemented for the new system. However, the system was not yet fully operational and the data that was used in this iteration of resource modelling was processed using the pre-existing data management protocols.

The new SQL based data management system, designed by ASPI Systems, has been set up to capture the geological and geotechnical logging and sample information direct in digital format with validation protocols applied upon entry and in upload to the central SQL data store. The new data management system is set up to connect directly to the on-site laboratory, which will automatically generate QA/QC reports and allow for timely interrogation and potential intervention on assay result failures. The data management system is also set up to directly import third party assay certificates, verify all geological data, and export validated drilling and sample data ready for direct import into both Datamine and Leapfrog modelling software platforms.

The drill hole and channel sample data used in the current geological modelling and resource evaluation did not pass through the new data management system, the information was collected and compiled using excel spreadsheets and then imported into Datamine software where it was reviewed and validated for errors and inconsistencies by the Minera Corona geologists. The collar, survey, assay, and lithology data tables, for drill holes and channel samples, exported from Datamine were imported into Leapfrog software for geological modelling.

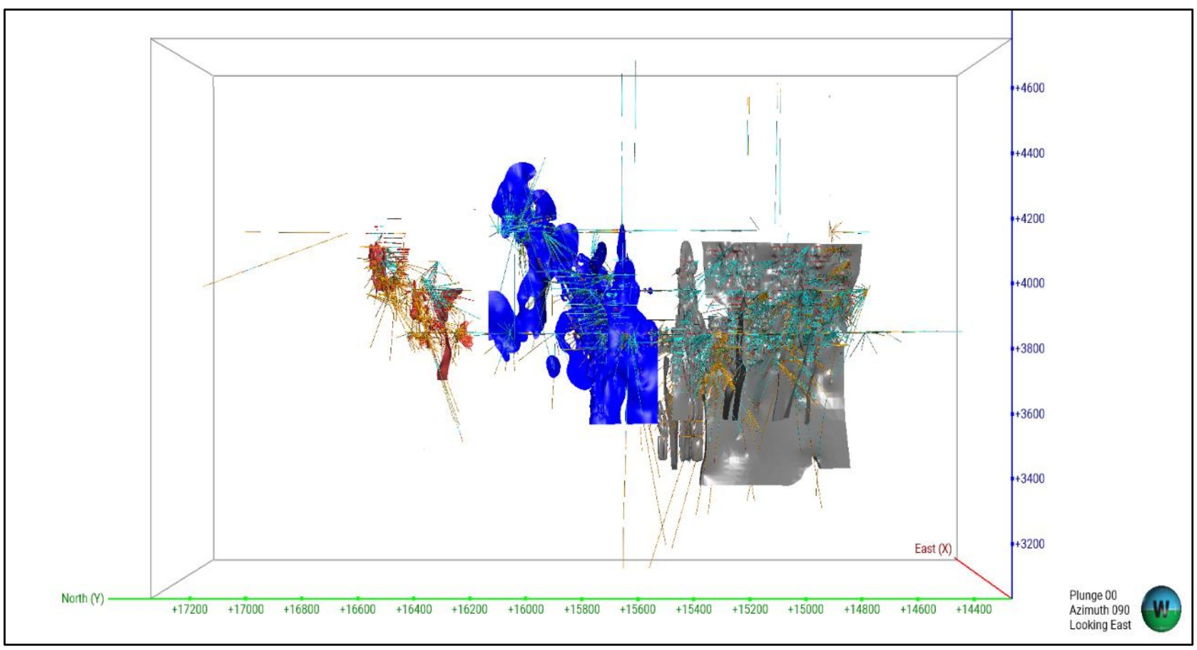
14.4 Geologic Model

The geological models that were used in the definition of the estimation domains were constructed using Leapfrog Geo software and were built by Minera Corona geologists. For logistical purposes the geological modelling of the Yauricocha Mine has been split into three project areas; Mina Central, Esperanza/Fortuna and Cachi-Cachi, with each area being modelled within a different Leapfrog Project file. Table 14-2 lists the individual mineralised bodies that exist within each zone.

Table 14-2: Summary of Mineralization Wireframes Within Each of the Mine Zones, Yauricocha Mine.

Mine Area	Model	Mine Area	Model
Mina Central	Mina Central	Esperanza/ Fortuna	Gallito Sur
	Cuye		Veta Gallito
	Cuye Sur		Esperanza
	Contacto Sur Medio		Esperanza Distal
	Contacto Sur Medio I		Fortuna 7
	Contacto Sur Medio II		Fortuna 8
	Contacto Oriental		Fortuna Norte
	Contacto Occi.		Fortuna Pamela
	Contacto Occi. Lateral	Cachi-Cachi	Kimberly
	Katty		Karlita
	Mascota Polimetálico Norte		Privatizadora
	Mascota Polimetálico Norte II		Carmencita
	Mascota Polimetálico Este		Sulma
	Mascota Polimetálico Sur		
	Mascota Polimetálico Sur II		
	Mascota Sur Óxido		
	Mascota Sur Óxido Económico		
	Óxido Anatacaca Sur		
	Esperanza Sur		
	Butz Bx		

Figure 14-1: Modeled Mineralized Areas Estimated at Yauricocha Mine



Source: Atticus (2024)

The three-dimensional (3D) models were derived from both drilling and channel sample lithological logging and analytical results, as well as incorporating mapping from mine levels.

The QP (Simon Mortimer) noted that the geometry of some of the mineralized zone wireframes exhibited inconsistencies with the geological interpretation in that they did not always follow the structural or lithological trends depicted by the hosting lithology. Also, the wireframes were constructed to honour the input data contacts but were based on conflicting lithology data between adjacent drilling and the channel samples which generated further inconsistencies in the resultant wireframe. The mineralised zone wireframes which exhibited the greatest amount of the inconsistencies were remodelled by the QP (Simon Mortimer); removing conflicts in the input data, basing the model on the channel sample data over that of the drilling, and constructing a three-dimensional lithology and structural model to assist with the definition of the geometry of the modelled mineralisation distal from the input drillhole and channel sample data points. The lithology and structural models were completed in the Esperanza and Fortuna regions of the mine and the mineralised zone wireframes that were remodelled for the estimation were Gallito Sur, Veta Gallito, Esperanza, Esperanza Distal, Esperanza Norte, Fortuna 7, Fortuna 8, Fortuna Norte, and Fortuna Pamela.

14.4.1 Mina Central Zone

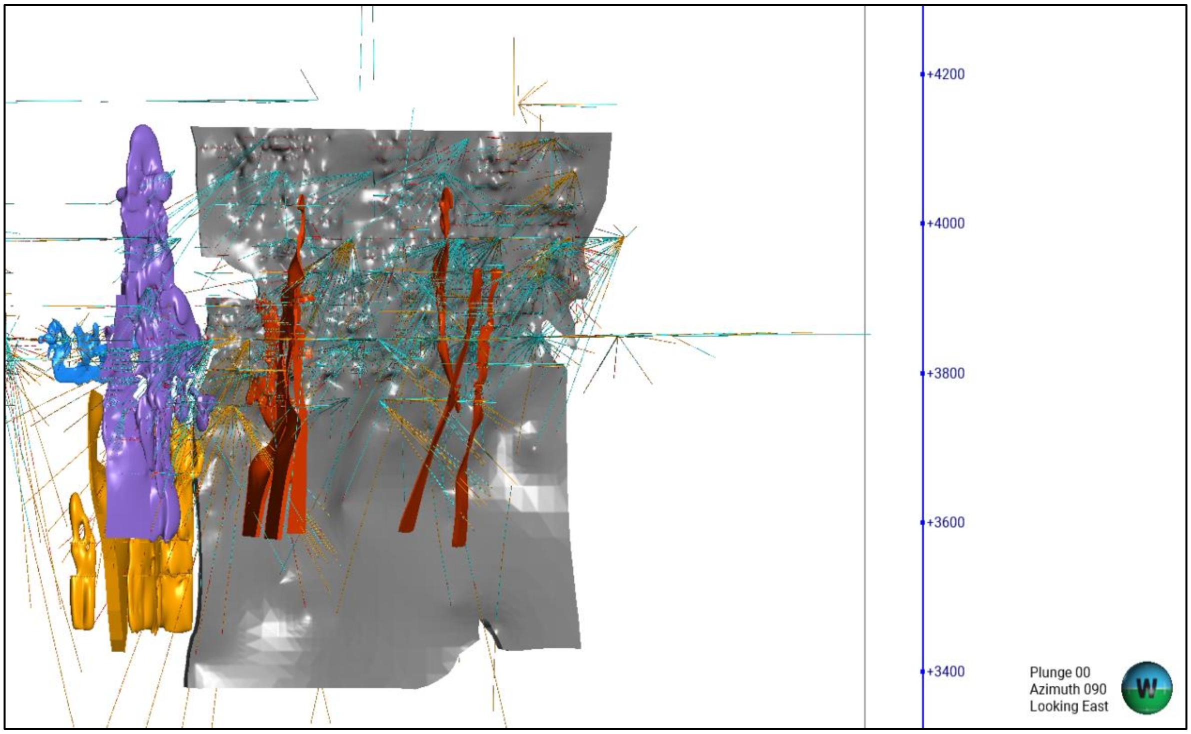
The mineralisation wireframes for the Mina Central Zone have been constructed by Minera Corona site geologists. The wireframes were built using implicit modelling of drilling and channel sampling, using a lithological parameter to define the mineralised zone. None of the wireframes in this zone were remodelled by the QP (Simon Mortimer).

The zone comprises the main Mina Central ore body, which is essentially a continuous mineralised structural contact between the intrusive and the limestone, and other smaller less continuous contact zones between different intrusive bodies and the host limestone.

The QP (Simon Mortimer) has reviewed the Mina Central wireframes, and although they could benefit from being remodelled to follow more closely the 3d lithological and structural interpretation, they are overall a reasonable representation of the polymetallic sulphide and oxide mineralization as logged and sampled in this area. However, conflicts have been noted within the input data which has developed erroneous geometries in the wireframes, and the extrapolation of certain wireframes away from the input data has generated inconsistent volumes, lowering confidence away from the input data on certain ore bodies.

The different mineralisation wireframes of the Mina Central geological model are shown in Figure 14-2. The main Mina Central wireframe coloured in grey, the smaller mineralised wireframes of the Contactos (see Table 14-2) in dark red, the Cuya wireframes in orange, the Mascota wireframes in purple and the Esperanza Sur wireframe coloured in blue.

Figure 14-2: Mina Central Zone Mineralized Model



Source: Atticus (2024)

14.4.2 Esperanza/Fortuna Zones

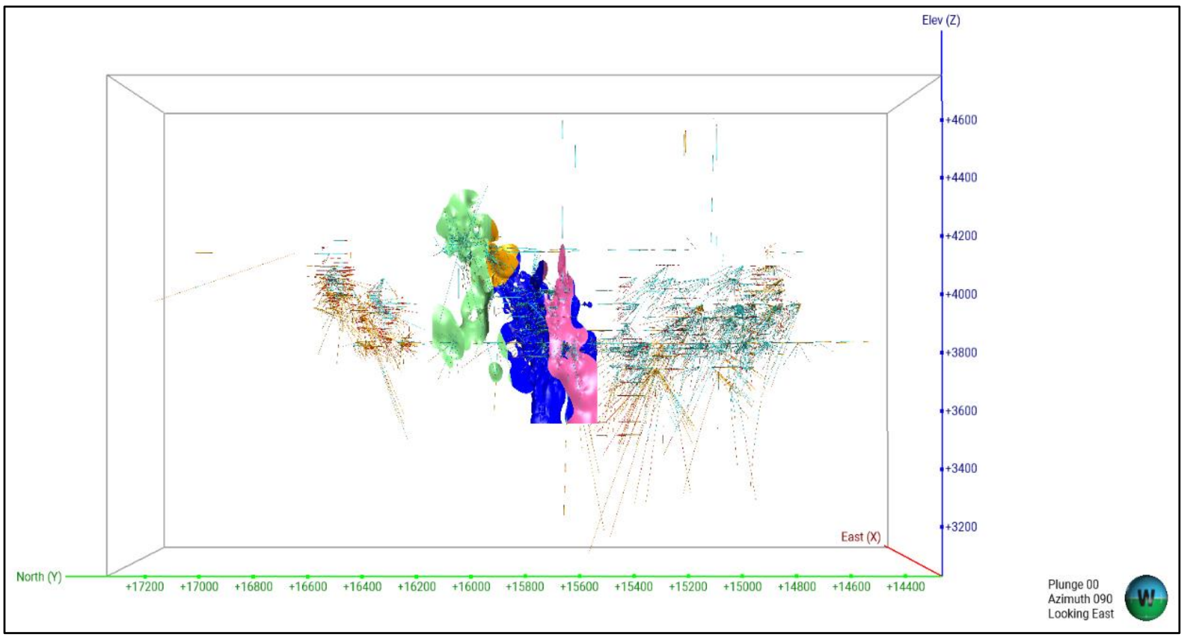
The mineralisation model for Esperanza/Fortuna was originally constructed by Minera Corona site geologists, but then was remodelled by the QP (Simon Mortimer), removing inconsistencies, and developing wireframes that were more representative of the geology. The mineralised wireframes are based on drilling and channel sample data and are a component of an integrated 3D geological model which incorporates cross-sectional interpretations and level mapping. The wireframes were implicitly modeled following structural and lithological trends that were interpreted from cross sections and level plans.

The mineralisation wireframes encompass all logged sulphide types, containing zones dominant in pyrite, chalcopyrite, and sphalerite. The mineralisation wireframes have been internally divided into sulphide dominant solids, generating domains for copper (chalcopyrite dominant) and zinc (sphalerite dominant). As the sulphides are not mutually exclusive, two separate sub models were created to define the final copper and zinc estimation domains, both using the same mineralisation solid as the sub-model boundary.

The zinc domain model used a threshold of 0.3% Zn for the low-grade domain and a threshold of 2% Zn for the high-grade zinc domain. The wireframes surfaces were created using implicit modelling following the same structural and lithological trends that were used in the modelling of the mineralisation, but with parameters fitting the grade distribution of the sub models. The copper domain model used a threshold of 0.3% Cu for the low-grade domain boundary and a threshold of 1.0% Cu to define the limits of the high-grade copper domain. The copper domain was constructed using implicit modelling, applying similar parameters as the mineralisation solids but were adjusted for the copper distribution.

The development of the structural-lithostratigraphic model as a base to the mineralisation model within the Esperanza/Fortuna zone has created a very robust model, which has confidently defined mineralised volumes more distal from the input data, has captured and explained grade variability and aided in brownfield exploration. The Esperanza/Fortuna geological model is shown in Figure 14-3, with the Fortuna wireframes coloured in green, Fortuna-Pamela in orange, Esperanza in blue, and Gallito coloured in pink.

Figure 14-3: Esperanza/Fortuna Zones Mineralized Model



Source: Atticus (2024)

14.4.3 Cachi-Cachi

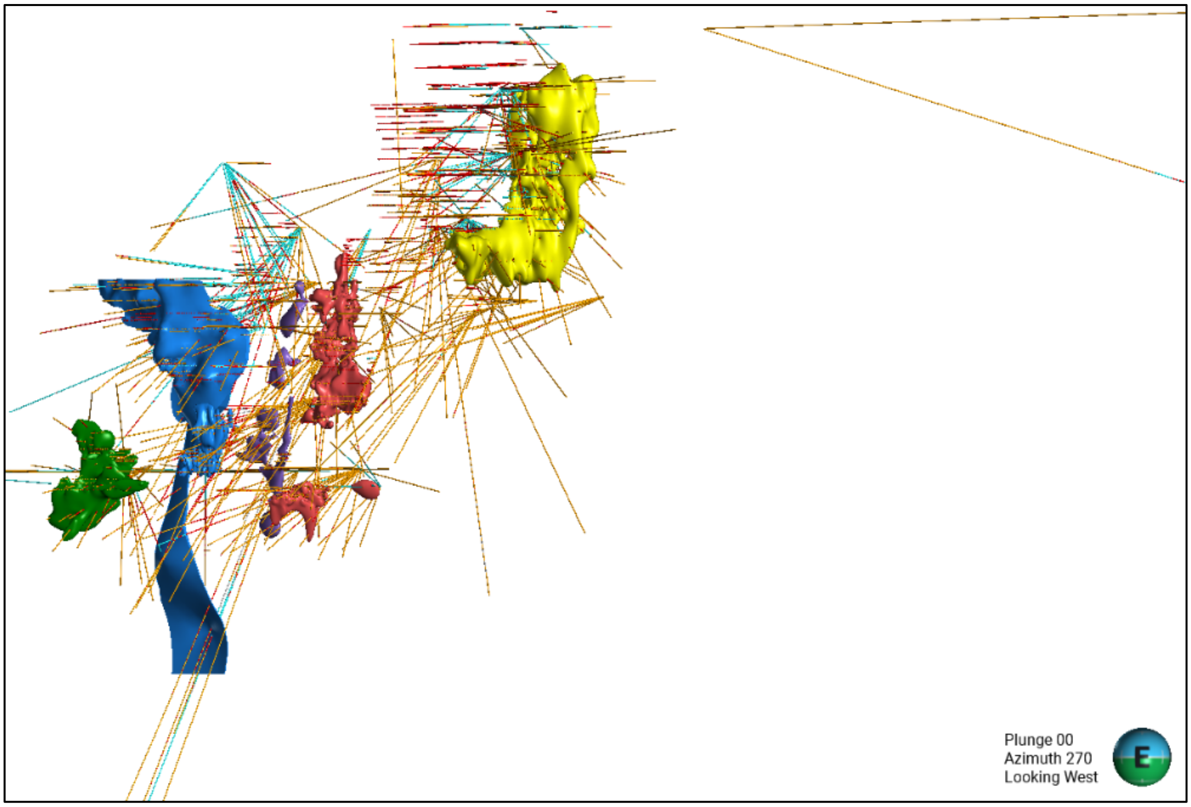
The mineralisation wireframes for the Cachi-Cachi Zone have been constructed by Minera Corona site geologists. The wireframes were built using implicit modelling of drilling and channel sampling, using a lithological parameter to define the mineralised zone. None of the wireframes in this zone were remodelled by the QP (Simon Mortimer).

The zone consists of skarn type bodies with irregular geometries, and approximate contact orientations striking southwest-northeast to east-west. The zone comprises of Carmencita, Karlita, Kimberly, Privatizadora, and Sulma.

The QP (Simon Mortimer) has reviewed the Cachi-Cachi wireframes, and although they could benefit from being remodelled to follow more closely the 3d lithological and structural interpretation, they do demonstrate an adequate representation of the polymetallic sulphide and oxide mineralization within a restricted distance of the input data.

The different mineralised wireframes of the Cachi-Cachi geological model are shown in Figure 14-4, with Carmencita mineralised wireframe coloured in red, Karlita in yellow, Kimberly in green, Privatizadora in blue, and the Sulma wireframe coloured in purple.

Figure 14-4: Cachi-Cachi Zone Mineralized Model



Source: Atticus (2024)

14.4.4 Geology Model and Resource Domains

The mineralisation model solids have been used as the resource domains considering the model contact surfaces as hard boundaries for the purposes of the resource estimation process. The QP (Simon Mortimer) has reviewed the geological models generated by Minera Corona and those remodelled by the QP (Simon Mortimer) and is of the opinion that these wireframes are acceptable as resource domains for the purposes of mineral resource estimation.

14.5 Assay Capping and Compositing

Assay capping is the process of reducing extreme grade values within a sample population that are regarded as statistically anomalous with respect to the entire population. The risk in including statistically extreme grade values in a resource estimate is that their contribution to the estimated grade will be disproportionate to the mineral resource.

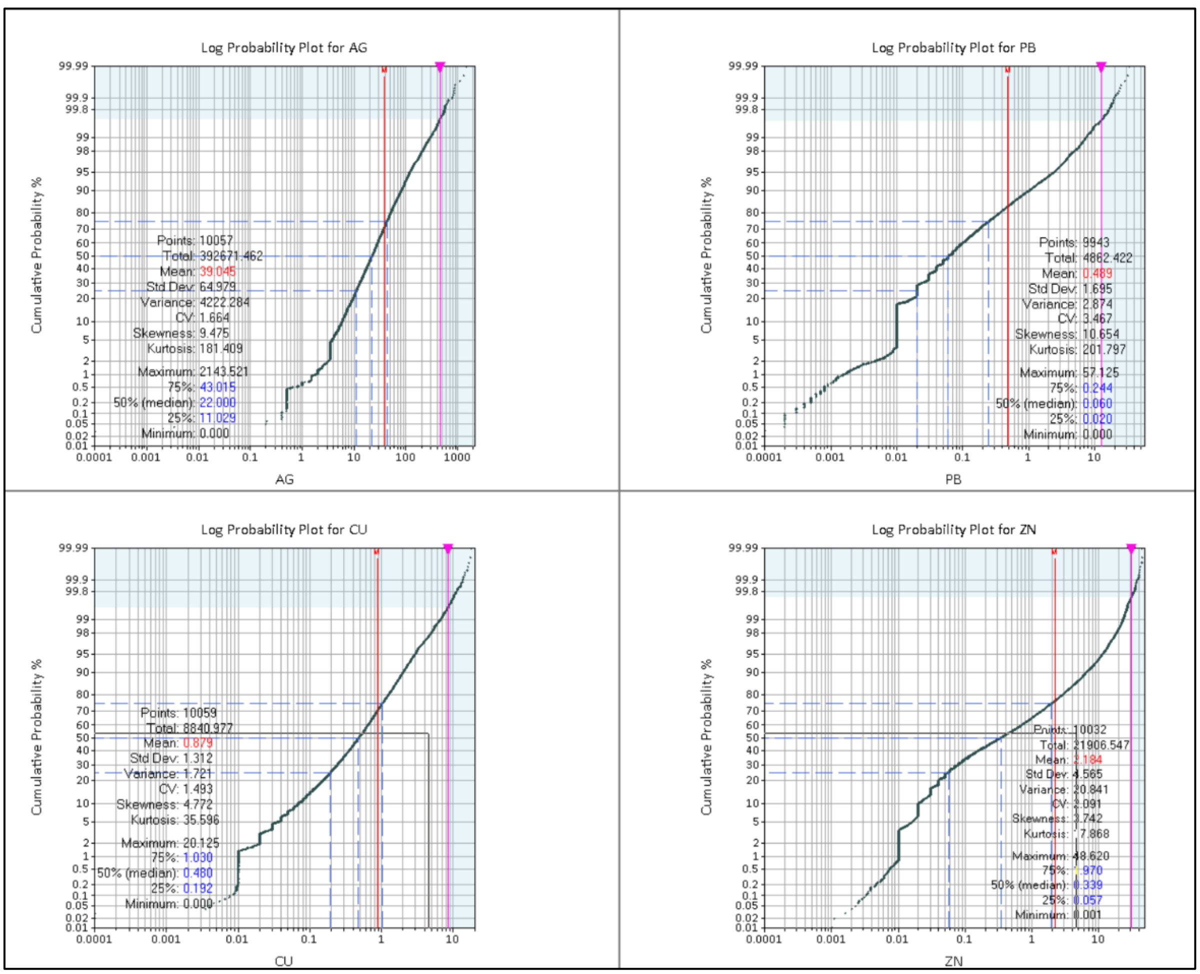
Compositing of samples is done to overcome the influence of different sample length on the contribution of sample grade. From a kriging perspective, compositing satisfies the similar support size requirement from geostatistical theory.

14.5.1 Outliers

The outliers for the original sample data in each domain were reviewed as a combination of histograms, log probability plots, and descriptive statistics to establish their spatial influence. An example of the cumulative probability plots for Mina Central for Ag, Pb, Cu and Zn are shown in Figure 14-5.

The capping analysis evaluated the potential impact of outliers with respect to the total reduction in contained metal, percentage of samples capped, and reduction to the coefficient of variation (CV). Capping limits were assigned to each of the individual mineralized domains. Table 14-3 records the capping threshold by mineralized domain.

Figure 14-5: Cumulative Probability Plots for Capping Analysis – Mina Central Zone



Source: Sierra Metals (2024)

Table 14-3: Descriptive Statistics of Capping Limits

Area	Model	Model Prefix	Code	Ag (ppm)	Pb (%)	Cu (%)	Zn (%)	Au (ppm)	As (%)	Fe (%)
Mina Central	Mina Central	mc	100	455	12.5	10.0	30.0	11.0	1.3	54.0
	Cuye	cye	101	135	1.8	7.0	25.0	2.7	0.8	53.0
	Cuye Sur	cyes	102	28	0.1	3.7	4.9	1.0	0.3	54.8
	Contacto Sur Medo	csm	103	850	30.0	0.7	31.0	2.0	-	28.0
	Contacto Sur Medo I	csmi	104	600	35.0	0.5	42.0	0.5	-	21.0
	Contacto Sur Medo II	csmii	105	900	30.0	1.0	31.0	1.0	-	30.0
	Contacto Oriental	ori	108	550	19.0	4.0	37.0	3.3	-	45.0
	Contacto Occi.	occ	109	460	13.0	1.9	36.0	2.8	-	40.0
	Contacto Occi. Lateral	occl	110	735	27.0	0.9	39.5	2.0	0.2	31.5
	Katty	kat	111	585	26.2	0.6	33.5	1.2	0.2	33.0
	Mascota Poli. Norte	mspn	114	730	40.0	6.0	33.0	4.0	-	26.0
	Mascota Poli. Norte	mspnii	115	450	27.0	0.4	40.0	1.0	-	27.0
	Mascota Poli. Norte	mspe	116	310	12.0	8.0	31.0	3.0	0.5	44.0
	Mascota Poli. Norte	msps	117	240	1.6	1.6	35.0	2.0	-	44.0
	Mascota Poli. Norte	mspsii	118	140	1.5	2.0	27.0	2.0	-	34.0
	Mascota Sur Oxido	msso	119	17	0.3	13.0	31.0	0.2	-	30.0
	Mascota Sur Oxido Econ.	msoe*	120	2 100	50.0	23.0	27.0	16.0	2.0	55.0
	Oxido Anatacaca Sur	oants*	138	1 110	12.0	8.5	16.0	6.5	-	57.0
	Esperanza Sur	esps*	140	136	3.0	3.2	30.5	1.6	0.6	42.2
	Butz Bx	btbx	149	450	23.0	1.5	35.5	4.0	0.3	38.5
Esperanza	Gallito	glls	106	270	11.0	2.0	15.0	0.8	-	39.0
	Gallito	vgll	107	350	12.0	11.0	29.0	1.0	1.0	40.0
	Esperanza	espe*	121	690	12.0	23.0	28.0	5.0	3.0	46.0
	Esperanza Distal	espd	122	330	19.0	6.0	34.0	1.0	2.2	44.0
Fortuna	Fortuna 7	fc7	135	112	3.8	5.5	25.0	0.9	1.0	39.4
	Fortuna 8	fc8	141	517	5.3	5.0	16.0	1.7	1.1	44.0
	Fortuna Norte	fn*	146	250	11.0	5.3	28.5	1.0	2.5	34.6
	Fortuna Pamela	pam	147	250	8.0	13.0	23.0	2.6	3.0	46.0
Cachi Cachi	Kimberly	kim	112	85	0.1	6.0	0.4	1.0	0.1	42.0
	Karlita	kar*	126	334	21.3	5.5	30.0	7.6	1.6	47.0
	Privatizadora	priv	129	266	10.0	1.3	24.0	2.4	0.4	44.2
	Carmencita	car	130	490	6.0	4.2	16.5	5.0	1.0	39.0
	Sulma	sul	132	260	1.3	1.2	25.0	2.8	1.3	36.0

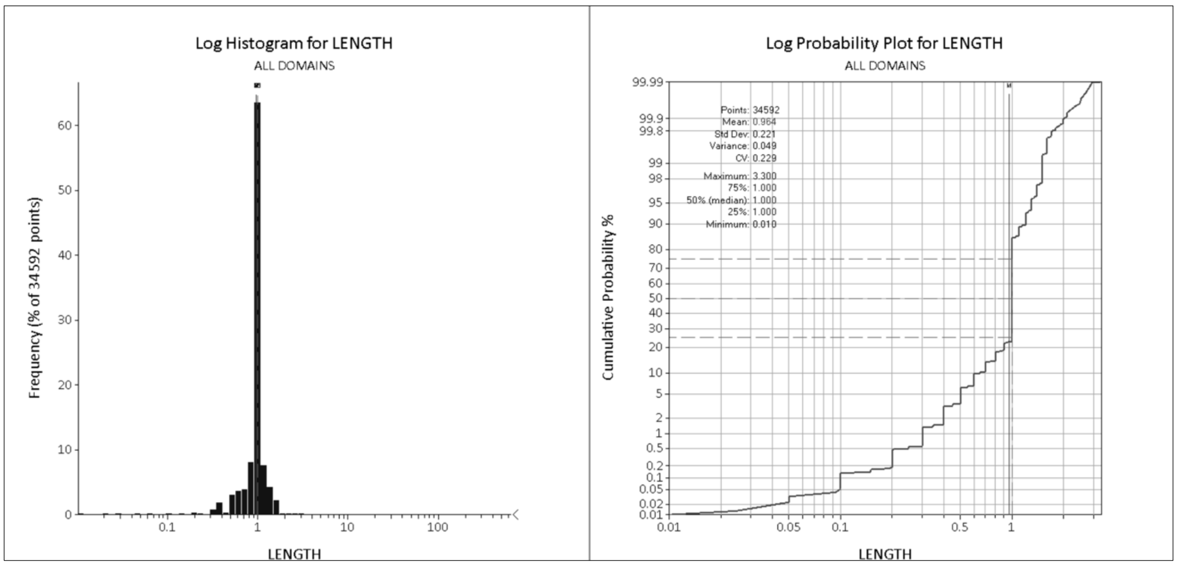
Notes: Occi. – 'Occidental'; Poli. – 'Polimetalico'; Econ. – 'Economico'; *- from Sierra Metals

14.5.2 Compositing

Compositing of samples is done to overcome the influence of different sample length on the contribution of sample grade. These composite lengths vary between the various mineralized domains, but the analysis is the same to ensure that the composites are representative of the chosen block size.

Approximately 85% of all raw samples are equal to 1 m or less in length, and 99.8% of all samples are equal to 2 m or less in length as shown in Figure 14-6. All intervals without values were populated with trace values as only mineralized material is sampled by the mine geological staff. In the Mina Central, Esperanza, and Cuye models, values were composited to 2 m. The remaining domains were composited to 1 m. Composites were created within the intersection of the mineralized domain and adjusted across the interval. Table 14-4 presents the descriptive statistics for the composite lengths by mineralized domain.

Figure 14-6: Raw Sample Length Histogram for all Mineralized Domains



Source: Sierra Metals 2024

Table 14-4: Descriptive Statistics for Interval Values by Mineralized Domain

Area	Model	Model Prefix	Code	Composite Length (m)	Min (m)	Max (m)	Mean (m)
Mina Central	Mina Central	mc	100	2	1.00	2.95	1.99
	Cuye	cye	101	2	1.00	2.95	1.98
	Cuye Sur	cyes	102	1	0.50	1.00	0.99
	Contacto Sur Medio	csm	103	1	0.90	1.30	1 .01
	Contacto Sur Medio I	csmi	104	1	0.55	1.20	0.97
	Contacto Sur Medio II	csmii	105	1	0.75	1.45	0.98
	Contacto Oriental	ori	108	1	0.60	1.13	0.99
	Contacto Occi.	occ	109	1	0.55	1.40	0.99
	Contacto Occi. Lateral	occl	110	1	0.60	1.02	0.89
	Katty	kat	111	1	0.50	1.10	0.99
	Mascota Poli. Norte	mspn	114	1	0.50	1.30	0.98
	Mascota Poli. Norte	mspnii	115	1	0.60	1.20	0.95
	Mascota Poli. Este	mspe	116	1	0.90	1.40	1 .01
	Mascota Poli. Sur	msps	117	1	0.65	1.10	0.98
	Mascota Poli. Sur II	mspsii	118	1	0.94	1.10	1.01
	Mascota Sur Oxido	msso	119	1	0.80	1.30	0.99
	Mascota Sur Oxido Econ.	msoe*	120	1	0.50	1.40	0.99
	Oxido Anatacaca Sur	oants*	138	1	0.50	1.45	1.00
	Esperanza Sur	esps*	140	1	0.50	1.45	0.98
	Butz Bx	btbx	149	1	0.75	1.30	0.97
Esperanza	Gallito Sur	glls	106	1	0.83	1.20	0.99
	Gallito	vgll	107	1	0.50	1.15	0.97
	Esperanza	espe*	121	2	1 .00	2.95	1.92
	Esperanza Distal	espd	122	1	0.83	1.40	1.00
Fortuna	Fortuna 7	fc7	135	1	0.75	1.45	0.97
	Fortuna 8	fc8	141	1	0.70	1.45	1.00
	Fortuna Norte	fn*	146	1	0.65	1.30	0.99
	Fortuna Pamela	pam	147	1	0.50	1.40	1.00
Cachi Cachi	Kimberly	kim	112	1	0.80	1.15	1.00
	Karlita	kar*	126	1	0.50	1.45	0.99
	Privatizadora	priv	129	1	0.55	1.30	0.99
	Carmencita	car	130	1	0.50	1.40	1.00
	Sulma	sul	132		0.75	1.40	0.98

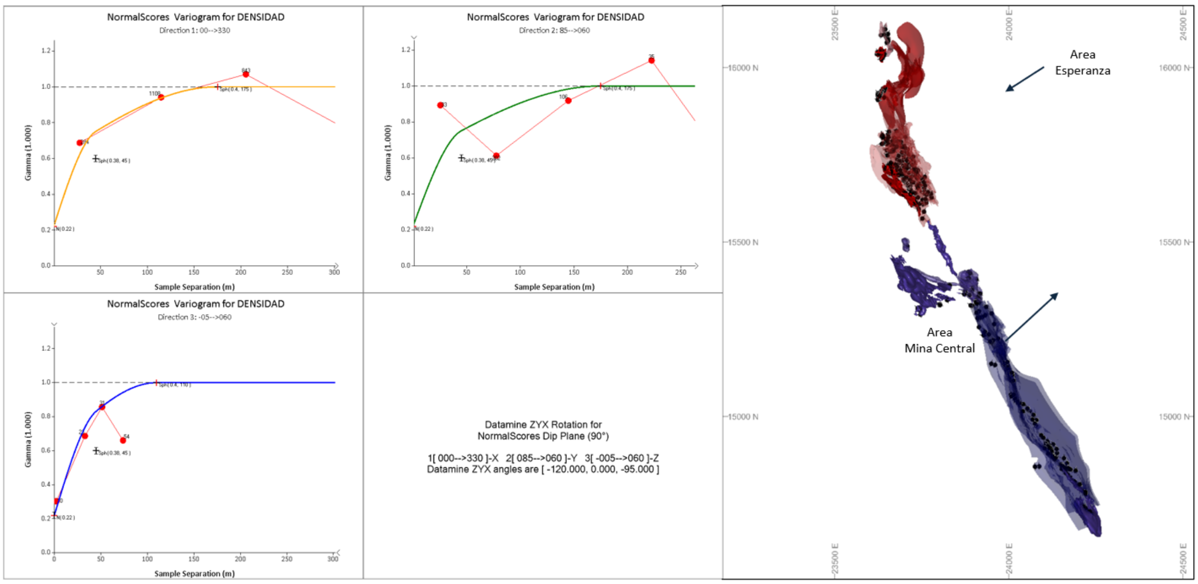
Notes: Occi. – 'Occidental'; Poli. – 'Polimetalico'; Econ. – 'Economico'

14.6 Density

Sierra Metals compiled historic and current density information and created a 3D spatial database consisting of 771 density determinations that correspond to the larger mineralized domains. The density database was used to interpolate block model densities by inverse distance squared (ID2).

A global density variogram was created for the most representative mineralized domains, Esperanza and Mina Central, where most of the 3D density data are located and used their variogram range as the maximum interpolation search limits (Figure 14-7). The ID2 interpolation process uses two passes as shown in the parameters Table 14-5. The empty blocks that are further than the two pass search distances were populated with mean density values. Mineralized domains of minor wireframe volumes and with few or no representative density data, were assigned with referenced density values based on the experience of the Sierra Metals site geologists as shown in Table 14-6.

Figure 14-7: Density Variogram for Esperanza and Mina Central zones



Source: Sierra Metals (2024)

Table 14-5: Interpolation Parameters for Density

								PASS 1				PASS 2			
Area	Model	SDIST X (m)	SDIST Y (m)	SDIST Z (m)	Angle 1 (°)	Angle 2 (°)	Angle 3 (°)	Factor SDIST	Min. Comps	Max. Comps	Max. Sample	Factor SDIST	Min. Comps	Max. Comps	Max. Sample
Mina Central	Mina Central	45	30	10	-120	80	-90	2	1	16	1	3	1	8	1
	Cuye	30	30	10	50	-50	-90	2	1	16	1	3	1	8	1
	Cuye Sur														
	Contacto Sur Medio	25	25	10	50	-80	0	2	1	16	1	3	1	8	1
	Contacto Sur Medio I														
	Contacto Sur Medio II	23	23	9	100	70	0	2	1	16	1	3	1	8	1
	Contacto Oriental	20	20	7	167	76	0	2	1	16	1	3	1	8	1
	Contacto Occi.	22	18	6	0	-90	110	2	1	16	1	3	1	8	1
	Contacto Occi. Lateral														
	Katty	10	10	5	140	80	0	2	1	16	1	3	1	8	1
	Mascota Poli. Norte														
	Mascota Poli. Norte														
	Mascota Poli. Este														
	Mascota Poli. Sur														
	Mascota Poli. Sur II														
	Mascota Sur Oxido	25	25	7	0	-90	210	2	1	16	1	3	1	8	1
	Mascota Sur Oxido Econ.							2							
	Oxido Anatacaca Sur	20	17	7	56	-20	79	2	1	16	1	3	1	8	1
	Esperanza Sur	20	20	10	156	-90	0	2	1	16	1	3	1	8	1
	Butz Bx	10	7	3	-90	90	30	2	1	16	1	3	1	8	1
Esperanza	Gallito Sur	14	14	4	0	-90	0	2	1	16	1	3	1	8	1
	Gallito														
	Esperanza	45	20	13	-103	59	71	2	1	16	1	3	1	8	1
	Esperanza Distal	48	47	9	155	-75	0	2	1	16	1	3	1	8	1
Fortuna	Fortuna 7	13	14	6	5	80	0	2	1	16	1	3	1	8	1
	Fortuna 8														
	Fortuna Norte	25	25	6	170	80	0	2	1	16	1	3	1	8	1
	Fortuna Pamela	10	11	6	15	110	0	2	1	16	1	3	1	8	1
Cachi Cachi	Kimberly	10	10	5	20	-100	0	2	1	16	1	3	1	8	1
	Karlita	16	21	7	224	-90	0	2	1	16	1	3	1	8	1
	Privatizadora	18	18	7	-40	10	-90	2	1	16	1	3	1	8	1
	Carmencita	11	11	6	0	-90	256	2	1	16	1	3	1	8	1
	Sulma	20	20	10	240	-90	0	2	1	16	1	3	1	8	1

Notes: Occi. – 'Occidental'; Poli. – 'Polimetalico'; Econ. – 'Economico'

Table 14-6: Descriptive Statistics for Density Mean Values by Mineralized Domain

Area	Model	Model Prefix	Code	No. of Samples	Min (t/m3)	Max (t/m3)	Mean (t/m3)	Method
Mina Central	Mina Central	mc	100	113	2.11	4.78	3.68	ID2
	Cuye	cye	101	25	3.04	4.55	3.87	ID2
	Cuye Sur	cyes	102				3.62	assigned
	Contacto Sur Medio	csm	103	17	2.57	7.26	4.78	ID2
	Contacto Sur Medio I	csmi	104				3.85	assigned
	Contacto Sur Medio II	csmii	105	17	2.60	5.60	3.88	ID2
	Contacto Oriental	ori	108	15	2.32	4.12	3.36	ID2
	Contacto Occi.	occ	109	15	2.67	4.58	3.53	ID2
	Contacto Occi. Lateral	occl	110				3.38	assigned
	Katty	kat	111	22	2.47	4.64	3.39	ID2
	Mascota Poli. Norte	mspn	114				3.48	assigned
	Mascota Poli. Norte	mspnii	115				3.51	assigned
	Mascota Poli. Este	mspe	116				3.48	assigned
	Mascota Poli. Sur	msps	117				3.47	assigned
	Mascota Poli. Sur II	mspsii	118				3.51	assigned
	Mascota Sur Oxido	msso	119	6	1.91	3.39	2.60	ID2
	Mascota Sur Oxido Econ.	msoe*	120				3.06	assigned
	Oxido Anatacaca Sur	oants*	138	29	1.39	5.04	3.09	ID2
	Esperanza Sur	esps*	140	11	2.62	4.04	3.16	ID2
	Butz Bx	btbx	149	12	2.65	5.70	3.49	ID2
Esperanza	Gallito Sur	glls	106	20	2.86	5.78	4.08	ID2
	Gallito	vgll	107				3.47	assigned
	Esperanza	espe*	121	169	1.31	4.80	3.62	ID2
	Esperanza Distal	espd	122	35	1.59	4.33	3.53	ID2
Fortuna	Fortuna 7	fc7	135	15	2.36	4.18	3.56	ID2
	Fortuna 8	fc8	141				3.52	assigned
	Fortuna Norte	fn*	146	13	1.65	4.85	2.87	ID2
	Fortuna Pamela	pam	147	21	2.84	5.21	3.98	ID2
Cachi Cachi	Kimberly	kim	112	39	2.71	5.63	4.06	ID2
	Karlita	kar*	126	60	2.11	4.78	3.68	ID2
	Privatizadora	priv	129	49	2.20	5.77	3.98	ID2
	Carmencita	car	130	42	2.40	5.42	3.49	ID2
	Sulma	sul	132	26	2.94	5.47	4.12	ID2

Notes: Occi. – 'Occidental'; Poli. – 'Polimetalico'; Econ. – 'Economico'

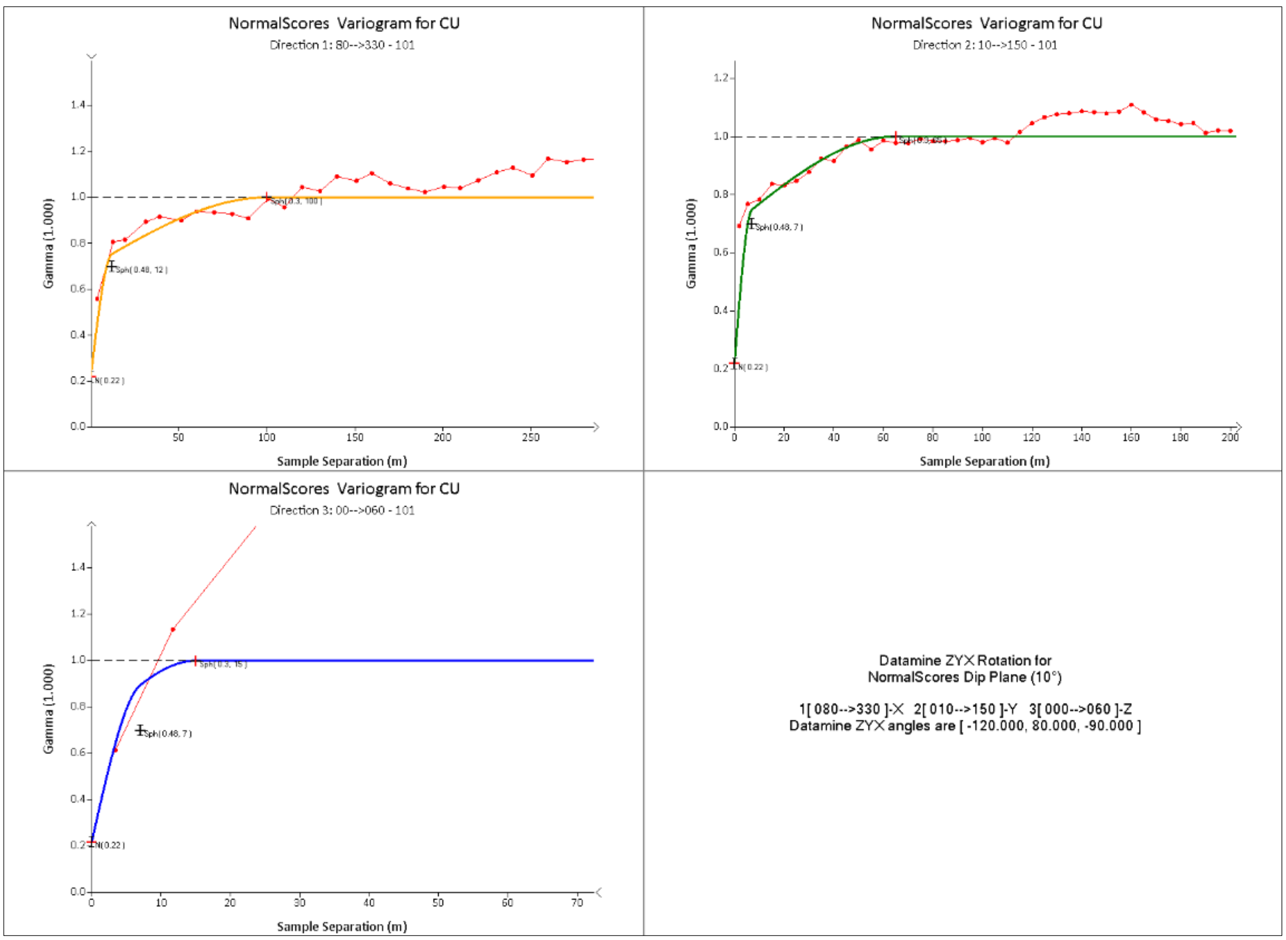
14.7 Variogram Analysis and Modelling

Variography was completed using Supervisor software to assess orientations and ranges of continuity within the main mineralized domains. The variograms were modeled by Sierra Metals using the Gaussian (or normal scores) transformation of composites and then back transformed. The QP (Oscar Retto) is in agreement that a more anisotropic variogram definition is achieved using this technique and accepts this methodology for estimation purposes.

Directional variograms were calculated and modelled with anisotropic and spherical variograms for copper and zinc. The nugget effects were determined from downhole variograms then used in the directional fitted variograms. The generated ellipsoids were reviewed against the 3D data distribution to ensure reasonableness and consistency. For mineralized domains with limited or poor variogram representation, a global variogram is used. All variograms were normalized for estimation purposes.

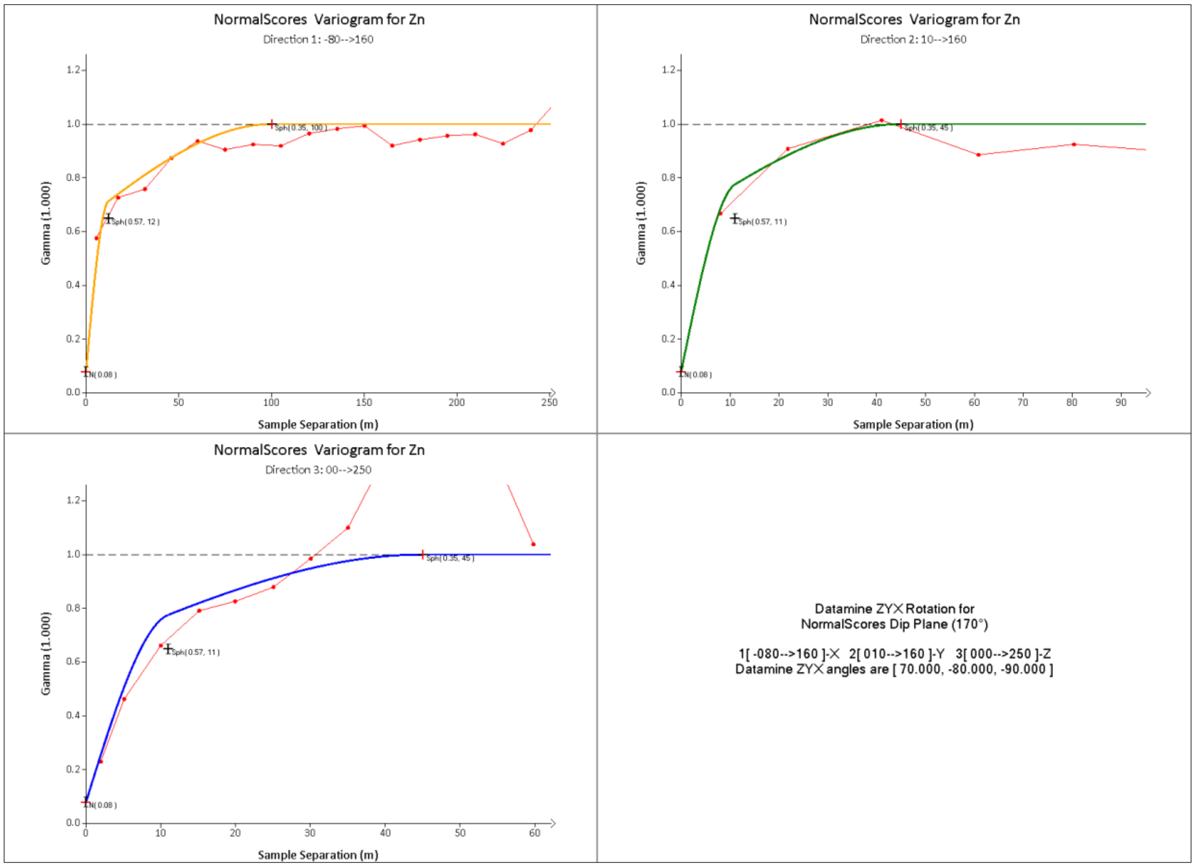
Figure 14-8 and Figure 14-9 shows examples of Sierra Metals modeled variograms for Mina Central copper and Esperanza zinc, respectively. Table 14-7 and Table 14-8 present the details for the modeled variograms from all mineralized domains.

Figure 14-8: Example of Modelled Variograms for Mina Central – Copper



Source Sierra Metals (2024)

Figure 14-9: Examples of Modelled Variograms for Esperanza – Zinc



Source Sierra Metals (2024)

Table 14-7: Datamine Normalized Modeled Semi-Variogram Models, Mina Central and Esperanza Zones

Area	Model	VDESC	VANGLE1 (°)	VANGLE2 (°)	VANGLE3 (°)	NUGGET	STIPAR1 (m)	STIPAR2 (m)	STIPAR3 (m)	STIPAR4	ST2PAR1 (m)	ST2PAR2 (m)	ST2PAR3 (m)	ST2PAR4	SILL
Mina Central	Mina Central	Ag	-120	40	-90	0.169	14	14	10	0.584	100	75	20	0.247	1.00
		Pb	-120	40	-90	0.189	14	14	10	0.584	100	75	20	0.247	1.02
		Cu	-120	8	-90	0.306	12	7	7	0.489	100	65	15	0.205	1.00
		Zn	-120	40	-90	0.169	14	14	10	0.584	100	75	20	0.247	1.00
		Au	-120	8	-90	0.306	12	7	7	0.489	100	65	15	0.205	1.00
		As	-120	40	-90	0.169	14	14	10	0.584	100	75	20	0.247	1.00
		Fe	-120	80	-90	0.306	12	7	7	0.409	100	65	15	0.205	0.92
	Cuye	Ag	42	39	103	0.057	25	25	20	0.659	70	95	25	0.284	1.00
		Pb	42	39	103	0.057	25	25	20	0.659	70	95	25	0.284	1.00
		Cu	42	39	103	0.102	16	16	16	0.340	70	70	20	0.558	1.00
		Zn	42	39	103	0.057	25	25	20	0.659	70	95	25	0.284	1.00
		Au	42	39	103	0.102	16	16	16	0.340	70	70	20	0.558	1.00
		As	42	39	103	0.102	16	16	16	0.340	70	70	20	0.558	1.00
		Fe	42	39	103	0.102	16	16	16	0.340	70	70	20	0.558	1.00
	Mascota Sur Oxido Economico	Ag	0	-90	210	0.266	7	8	5	0.303	53	55	14	0.431	1.00
		Pb	0	-90	210	0.233	8	9	6	0.678	53	55	14	0.089	1.00
		Cu	0	-90	210	0.168	8	10	6	0.343	53	55	14	0.489	1.00
		Zn	0	-90	210	0.075	10	13	7	0.396	53	55	14	0.529	1.00
		Au	0	-90	210	0.097	7	9	6	0.535	53	55	14	0.368	1.00
		As	0	-90	210	0.107	19	11	11	0.357	53	55	14	0.536	1.00
		Fe	0	-90	210	0.127	7	6	6	0.453	53	55	14	0.420	1.00
	Oxido Antacaca Sur	Ag	56	-20	79	0.153	25	10	10	0.488	45	40	15	0.360	1.00
		Pb	56	-20	79	0.153	25	10	10	0.488	45	40	15	0.360	1.00
		Cu	56	-20	79	0.153	25	10	10	0.488	45	40	15	0.360	1.00
		Zn	56	-20	79	0.153	25	10	10	0.488	45	40	15	0.360	1.00
		Au	56	-20	79	0.153	25	10	10	0.488	45	40	15	0.360	1.00
		As	56	-20	79	0.153	25	10	10	0.488	45	40	15	0.360	1.00
		Fe	56	-20	79	0.153	25	10	10	0.488	45	40	15	0.360	1.00
Esperanza	Gallito Sur	Ag	0	-90	0	0.108	9	10	4	0.440	32	35	12	0.452	1.00
		Pb	0	-90	0	0.088	11	12	6	0.472	40	42	15	0.440	1.00
		Cu	0	-90	0	0.700	9	15	6	0.273	41	43	13	0.657	1.63
		Zn	0	-90	0	0.092	12	10	6	0.447	42	44	15	0.461	1.00
		Au	0	-90	0	0.247	8	14	8	0.432	39	43	16	0.321	1.00
		As	0	-90	0	0.200	10	12	7	0.286	37	40	18	0.514	0.81
		Fe	0	-90	0	0.184	20	15	4	0.037	38	39	15	0.779	0.74

Table 14-8: Datamine Normalized Modeled Semi-Variogram Models, Esperenza and Cachi Cachi Zones

Area	Model	VDESC	VANGLE1 (°)	VANGLE2 (°)	VANGLE3 (°)	NUGGET	STIPAR1 (m)	STIPAR2 (m)	STIPAR3 (m)	STIPAR4	ST2PAR1 (m)	ST2PAR2 (m)	ST2PAR3 (m)	ST2PAR4	SILL
Esperanza	Gallito	Ag	0	-90	200	0.108	9	10	4	0.440	32	35	12	0.452	1.00
		Pb	0	-90	200	0.088	11	12	6	0.472	40	42	15	0.44	1.00
		Cu	0	-90	200	0.700	9	15	6	0.273	41	43	13	0.657	1.63
		Zn	0	-90	200	0.092	12	10	6	0.447	42	44	15	0.461	1.00
		Au	0	-90	200	0.247	8	14	8	0.432	39	43	16	0.321	1.00
		As	0	-90	200	0.200	10	12	7	0.286	37	40	18	0.514	1.00
		Fe	0	-90	200	0.184	20	15	4	0.037	38	39	15	0.779	1.00
	Esperanza	Ag	-110	-90	90	0.103	16	14	12	0.602	75	30	30	0.295	1.00
		Pb	-110	5	90	0.103	16	14	12	0.602	75	30	30	0.295	1.00
		Cu	-110	50	90	0.103	16	14	12	0.602	75	30	30	0.295	1.00
		Zn	-110	50	90	0.103	16	14	12	0.602	75	30	30	0.295	1.00
		Au	-110	50	90	0.103	16	14	12	0.602	75	30	30	0.295	1.00
		As	70	-80	-90	0.103	16	14	12	0.602	100	45	45	0.245	0.95
		Fe	70	-80	-90	0.103	16	14	12	0.602	100	45	45	0.245	0.95
	Esperanza	Ag	152	74	0	0.103	10	7	5	0.220	37	29	13	0.66	0.98
	Distal	Pb	152	74	0	0.103	5	6	4	0.446	35	25	13	0.446	1.00
		Cu	152	74	0	0.103	16	5	3	0.402	34	27	12	0.272	0.78
		Zn	152	74	0	0.103	4	10	4	0.333	31	27	10	0.333	0.77
		Au	152	74	0	0.103	7	8	6	0.540	34	28	12	0.311	0.95
		As	152	74	0	0.103	18	12	7	0.154	38	26	13	0.738	1.00
		Fe	152	74	0	0.103	11	6	6	0.650	32	30	12	0.24	0.99
Cachi	Karlita	Ag	0	-90	136	0.181	15	9	6	0.651	39	45	16	0.168	1.00
Cachi		Pb	0	-90	136	0.241	8	12	8	0.325	38	49	17	0.434	1.00
		Cu	0	-90	136	0.148	8	9	8	0.601	40	47	17	0.251	1.00
		Zn	0	-90	136	0.138	8	5	5	0.483	38	41	16	0.379	1.00
		Au	0	-90	136	0.113	6	10	7	0.679	36	43	17	0.208	1.00
		As	0	-90	136	0.229	10	9	8	0.539	40	49	17	0.232	1.00
		Fe	0	-90	136	0.143	8	10	9	0.659	37	50	17	0.199	1.00
	Privatizadora	Ag	-40	10	-90	0.089	10	10	7	0.429	55	55	20	0.482	1.00
		Pb	-70	-30	-90	0.214	9	6	6	0.429	45	40	20	0.319	0.96
		Cu	-40	10	-90	0.089	10	10	7	0.467	55	55	20	0.482	1.04
		Zn	-40	10	-90	0.089	10	10	7	0.429	55	55	20	0.482	1.00
		Au	-40	10	-90	0.089	10	10	7	0.429	55	55	20	0.482	1.00
		As	-40	10	-90	0.089	10	10	7	0.429	55	55	20	0.482	1.00
		Fe	-40	10	-90	0.089	10	10	7	0.429	55	55	20	0.482	1.00

14.8 Block Model

Block models were generated by Sierra Metals in Datamine software with a parent cell size approximating the selective mine unit (SMU). The block matrices were mainly based on a 2 m x 2 m x 2 m. Only in Mina Central, Cuye and Esperanza employed a larger block matrix of 4 m x 4 m x 8 m. All models are sub-celled to a minimum size of 0.5 m x 0.5 m x 0.5 m. No rotation has been applied.

Details of block model parameters used for resource estimation are summarized in Table 14-9.

Table 14-9: Block Model Parameters for all Mineralized Domains; no rotation

		Block Model Origin			Block Size (m)			Subcell Minimum (m)		
Area	**Model**	**X**	**Y**	**Z**	**X**	**Y**	**Z**	**X**	**Y**	**Z**
Mina Central	Mina Central	23 790	14 550	3 290	4	4	8	0.5	0.5	0.5
	Cuye	23 680	15 300	3 390	4	4	8	0.5	0.5	0.5
	Cuye Sur	23 770	15 420	3 360	2	2	2	0.5	0.5	0.5
	Contacto Sur Medio	23 760	14910	3 720	2	2	2	0.5	0.5	0.5
	Contacto Sur Medio I	23 780	14970	3 530	2	2	2	0.5	0.5	0.5
	Contacto Sur Medio II	23 720	14840	3 520	2	2	2	0.5	0.5	0.5
	Contacto Oriental	23 890	15 150	3 620	2	2	2	0.5	0.5	0.5
	Contacto Occi	23 740	15 140	3 530	2	2	2	0.5	0.5	0.5
	Contacto Occi Lateral	23 790	15 130	3 540	2	2	2	0.5	0.5	0.5
	Katty	23 770	15 040	3 760	2	2	2	0.5	0.5	0.5
	Mascota Poli Norte	23 650	15 380	3 540	2	2	2	0.5	0.5	0.5
	Mascota Poli Norte II	23 670	15 430	3 660	2	2	2	0.5	0.5	0.5
	Mascota Poli Este	23 710	15 340	3 530	2	2	2	0.5	0.5	0.5
	Mascota Poli Sur	23 760	15 300	3 700	2	2	2	0.5	0.5	0.5
	Mascota Poli Sur II	23 770	15 350	3 540	2	2	2	0.5	0.5	0.5
	Mascota Sur Óxido	23 720	15 280	3 690	2	2	2	0.5	0.5	0.5
	Mascota Sur Óxido Econ	23 670	15 200	3 400	2	2	2	0.5	0.5	0.5
	Óxido Anatacaca Sur	24 150	14650	3 750	2	2	2	0.5	0.5	0.5
	Esperanza Sur	23 760	15 400	3 770	2	2	2	0.5	0.5	0.5
	Butz Bx	23 750	15 340	3 760	2	2	2	0.5	0.5	0.5
Esperanza	Gallito Sur	23 630	15 570	3 740	2	2	2	0.5	0.5	0.5
	Gallito	23 610	15 640	3 700	2	2	2	0.5	0.5	0.5
	Esperanza	23 600	15 540	3 530	4	4	8	0.5	0.5	0.5
	Esperanza Distal	23 630	15 570	3 670	2	2	2	0.5	0.5	0.5
Fortuna	Fortuna 7	23 610	16 010	4 140	2	2	2	0.5	0.5	0.5
	Fortuna 8	23 600	15 910	3 810	2	2	2	0.5	0.5	0.5
	Fortuna Norte	23 620	16 020	4 190	2	2	2	0.5	0.5	0.5
	Fortuna Pamela	23 620	15 820	4 050	2	2	2	0.5	0.5	0.5
Cachi Cachi	Kimberly	23 770	16 240	3 780	2	2	2	0.5	0.5	0.5
	Karlita	24 000	16 550	3 970	2	2	2	0.5	0.5	0.5
	Privatizadora	23 680	16 280	3 670	2	2	2	0.5	0.5	0.5
	Carmencita	23 800	16 410	3 780	2	2	2	0.5	0.5	0.5
	Sulma	23 720	16 380	3 770	2	2	2	0.5	0.5	0.5

Notes: Occi. – 'Occidental'; Poli. – 'Polimetalico'; Econ. – 'Economico'

14.8.1 Estimation Methodology

Sierra Metals used ordinary kriging (OK) and ID2 to interpolate metal grades for resource estimation. The decision to use either method was based on the confidence of the variograms where data reflects the continuity of grade within the mineralized body. When the mineralized bodies present undefined, less robust variograms or contained limited number of composites, the ID2 method was employed.

Only the drill hole composited data was used to interpolate the block models. The estimation process used three estimation passes for each mineralized domain and the variograms were focused on the major NSR contributing element for each mineralized domain. Local varying anisotropy (LVA) was used for several estimates as a static search orientation did not produce representative estimates.

The search parameters were optimized in some mineralized areas by completing a qualitative kriging neighborhood analysis (QKNA). Additional estimates were completed for validation purposes, these included, nearest neighbor (NN) and ID2 interpolation methods. Relevant details for specific areas and the complete estimation parameters are summarized in Table 14-10.

Table 14-10: Estimation Parameters by Mineralized Domain

			X	Y	Z				PASS1		PASS2			PASS3		
Model	Classifier	Method	SDIST1	SDIST2	SDIST3	ANGLE1	ANGLE2	ANGLE3	MIN	MAX	FACTOR	MIN	MAX	FACTOR	MIN	MAX
Mina Central	CUOK	LVA	35	25	15	-120	80	-70	7	16	2	5	16	3	1	8
Cuye	ZNOK	LVA	32	32	9	42	39	103	7	16	2	5	16	3	1	8
Cuye Sur	CUD	Static	37	26	6	95	-90	0	7	16	2	5	16	3	1	8
Contacto Sur Medo	CUD	Static	20	20	7	50	-80	0	7	16	2	5	16	3	1	8
Contacto Sur Medo I	ZN ID	Static	15	15	6	-40	-80	0	7	16	2	5	16	3	1	8
Contacto Sur Medo II	ZN ID	Static	18	18	7	100	70	0	7	16	2	5	16	3	1	8
Contacto Oriental	CUD	Static	20	20	7	167	90	0	7	16	2	5	16	3	1	8
Contacto Occi.	CUD	Static	25	25	6	0	-90	110	7	16	2	5	16	3	1	8
Contacto Occi. Lateral	CUD	Static	20	20	6	150	-90	0	7	16	2	5	16	3	1	8
Katty	CUD	Static	10	10	5	140	80	0	7	16	2	5	16	3	1	8
Mascota Poli. Norte	CUD	Static	20	20	7	140	-83	0	7	16	2	5	16	3	1	8
Mascota Poli. Norte	CUD	Static	20	20	6	140	-83	0	7	16	2	5	16	3	1	8
Mascota Poli. Norte	CUD	Static	20	20	6	137	-90	0	7	16	2	5	16	3	1	8
Mascota Poli. Norte	CUD	Static	12	12	6	110	80	0	7	16	2	5	16	3	1	8
Mascota Poli. Norte	CUD	Static	15	15	7	110	80	0	7	16	2	5	16	3	1	8
Mascota Sur Oxido	CUD	Static	20	20	5	0	-90	210	7	16	2	5	16	3	1	8
Mascota Sur Oxido Econ.	CUOK	Static	18	19	5	0	-90	210	7	16	2	5	16	3	1	8
Oxido Anatacaca Sur	CUOK	Static	15	13	5	56	-20	79	7	16	2	5	16	3	1	8
Esperanza Sur	CUD	LVA	17	17	7	156	-90	0	7	16	2	5	16	3	1	8
Butx Bx	CUOK	Static	10	7	3	-90	90	30	7	16	2	5	16	3	1	8
Gallito	CUOK	Static	14	14	4	0	-90	0	7	16	2	5	16	3	1	8
Gallito	CUOK	Static	14	14	4	0	-90	200	7	16	2	5	16	3	1	8
Esperanza	CUOK	LVA	35	15	15	70	-80	-90	7	16	2	5	16	3	1	8
Esperanza Distal	CUOK	LVA	16	8	7	82	-46	-61	7	16	2	5	16	3	1	8
Fortuna 7	CUD	LVA	11	12	5	5	80	0	7	16	2	5	16	3	1	8
Fortuna 8	CUD	LVA	25	15	5	0	85	0	7	16	2	5	16	3	1	8
Fortuna Norte	ZN ID	LVA	20	20	5	170	80	0	7	16	2	5	16	3	1	8
Fortuna Pamela	CUD	LVA	10	11	6	15	110	0	7	16	2	5	16	3	1	8
Kimberly	CUD	Static	10	10	5	20	-100	0	7	16	2	5	16	3	1	8
Karlita	CUOK	Static	13	16	6	224	-90	0	7	16	2	5	16	3	1	8
Privatizadora	ZNOK	LVA	18	18	7	-40	10	-90	7	16	2	5	16	3	1	8
Carmencita	CUD	Static	15	15	6	50	50	0	7	16	2	5	16	3	1	8
Sulma	CUD	Static	15	15	7	240	-90	0	7	16	2	5	16	3	1	8

Source: Sierra Metals (2024)   Notes: Occi. – 'Occidental'; Poli. – 'Polimetalico'; Econ. – 'Economico'

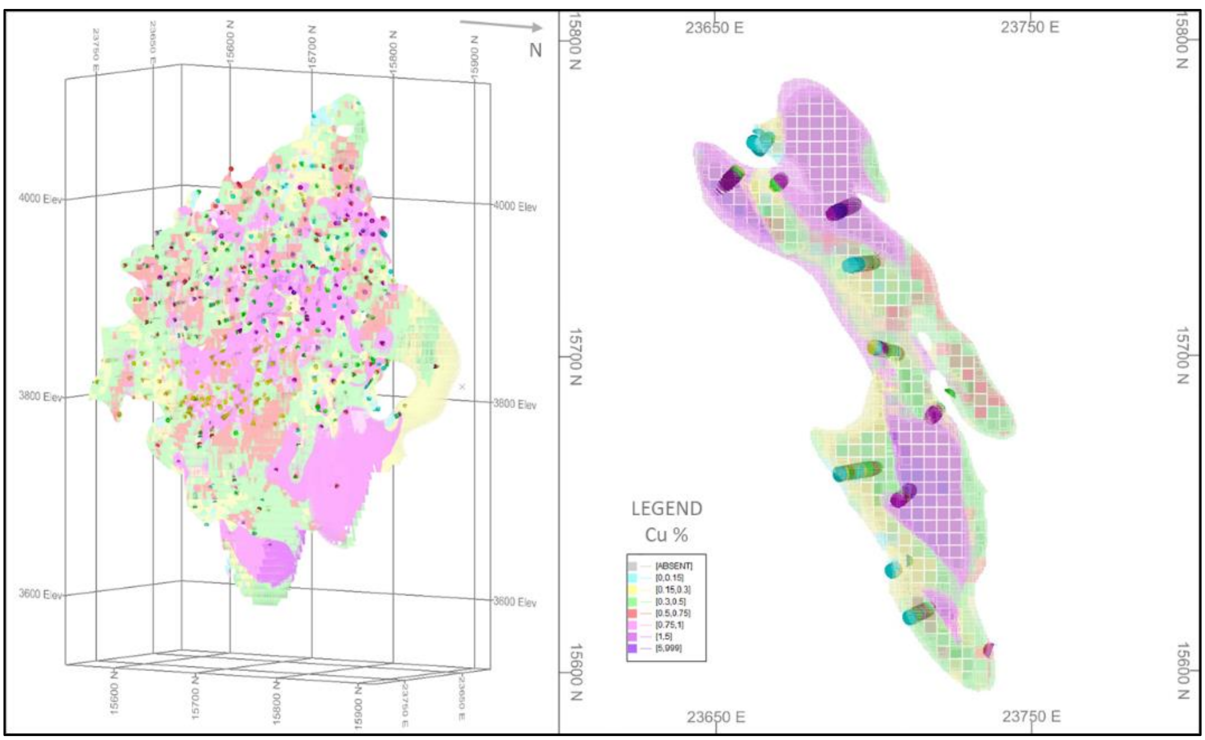
14.8.2 Model Validation

The following describes the methods and results for the validation of the estimated block models. Validation essentially involves visual sectional valuation of estimated cell grades and proximal drill hole data, global estimation comparison and construction of swath plots which show the OK results in comparison with ID2 and NN estimations. The QP (Oscar Retto) is of the opinion that the validation of the models is sufficient for relying upon them as mineral resources.

14.8.3 Visual Comparison

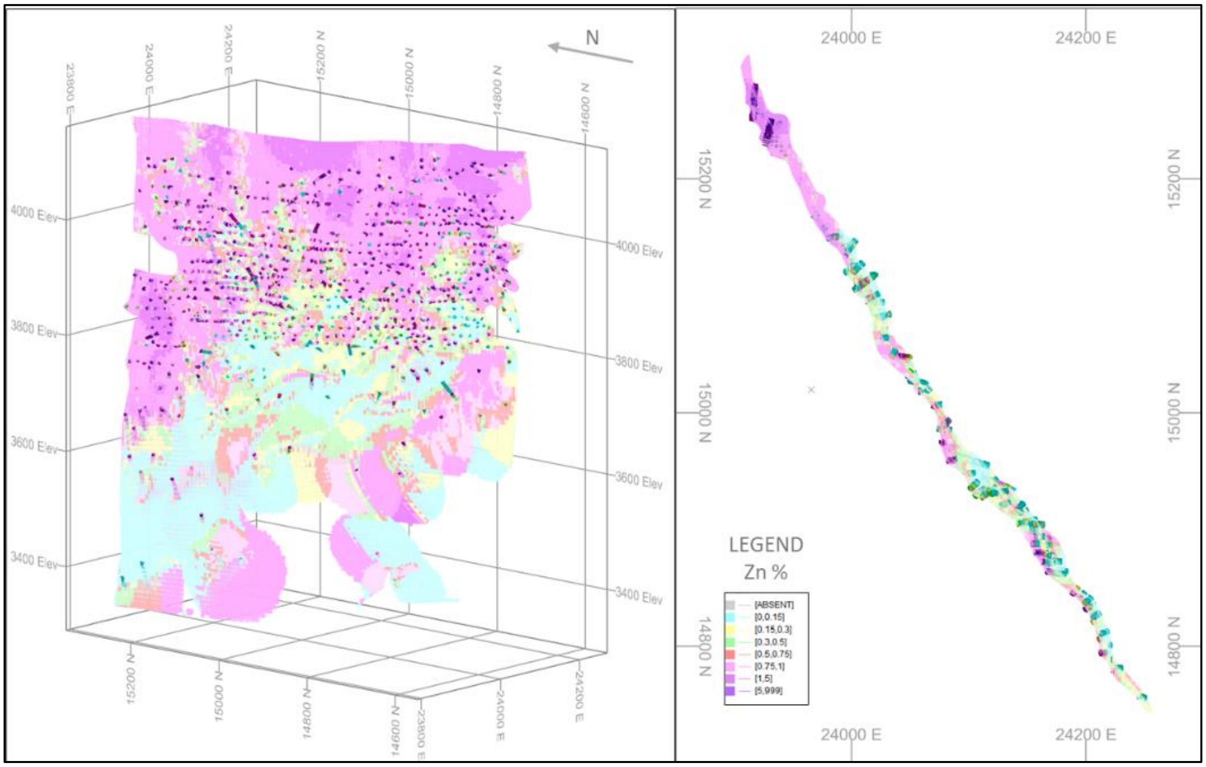
Detailed visual inspection of the block model has been conducted in both section and plan to ensure the desired results following interpolation. Comparisons on composite grades and resource model grades have been done for the different mineralized domains. There does appear to be minor smearing of higher grades on a local level, though this in not seen as a material issue due to the majority of the higher-grade composites and corresponding block grades being surrounded by lower grade material. In general, block grade distributions match well in 3D, level, and cross-section views through the various mineralized bodies. Figure 14-10 and Figure 14-11 show examples for the Esperanza and Mina Central domains, respectively.

Figure 14-10: Visual Block to Composite Comparison: Esperanza Cu, (Left) 3D View and, (Right) 3750 Plan View



Source: Sierra Metals (2024)

Figure 14-11: Visual Block to Composite Comparison: Mina Central Zn, (Left) 3D View and, (Right) 3800 Plan View



Source: Sierra Metals (2024)

14.8.4 Global Estimation Validation

Global validation of the estimate involves comparing the mean grade of the OK and the mean grade of the ID2 for each mineralized domain against the mean declustered grade generated by the NN approach. The analysis was performed to the models and included all resource categories (Measured, Indicated, and Inferred) and mined out areas. Table 14-11 and Table 14-12 show the validation results for copper and zinc respectively.

The QP (Oscar Retto) considers that the results for all categories of blocks are regarded as reasonable, with differences for the interpolation methods being generally less than +/-10%. Differences greater than +10% are due to over-estimation of grades due to the presence of inferred material and isolated high-grade composites or due to low overall grade concentrations. Any large discrepancies were investigated and were, in general, attributed to low tonnages or isolated higher-grade values. When the inferred category was removed the mean block estimation differences were reduced for most cases.

The QP (Oscar Retto) is of the opinion that these results show reasonable agreement between the models and the supporting data, with a minimal risk for global over-estimation.

Table 14-11: Global Validation Statistics for Copper (≥0% Cu)

			NN		ID		OK		Differences	
Area	Model	Count	Mean	Variance	Mean	Variance	Mean	Variance	IDvNN	OkvNN
Mina Central	Mina Central	1391655	1.05	0.98	1.05	0.49	1.01	0.37	0.10%	-3.16%
	Cuye	134813	1.54	1.36	1.56	0.63	1.54	0.44	0.90%	-0.13%
	Cuye Sur	175479	1.28	0.70	1.22	0.37			-4.25%	
	Contacto Sur Medo	29867	0.12	0.02	0.12	0.01			0.81%	
	Contacto Sur Medo I	26951	0.12	0.01	0.11	0.00			-3.54%	
	Contacto Sur Medo II	101730	0.15	0.05	0.15	0.01			-0.67%	
	Contacto Oriental	49153	0.27	0.17	0.30	0.07			11.26%	
	Contacto Occi.	111264	0.19	0.10	0.20	0.03			7.39%	
	Contacto Occi. Lateral	8540	0.18	0.04	0.24	0.05			24.90%	
	Katty	7063	0.17	0.01	0.17	0.00			-2.38%	
	Mascota Poli. Norte	41290	0.40	0.94	0.41	0.39			2.43%	
	Mascota Poli. Norte	5666	0.12	0.01	0.11	0.00			-10.19%	
	Mascota Poli. Norte	66014	0.73	1.00	0.75	0.47			2.42%	
	Mascota Poli. Norte	18089	0.20	0.03	0.23	0.01			13.10%	
	Mascota Poli. Norte	14642	0.32	0.19	0.33	0.11			4.50%	
	Mascota Sur Oxido	12490	4.80	11.40	4.70	2.79			-2.21%	
	Mascota Sur Oxido Econ.	372576	1.64	10.92	1.66	7.99	1.66	7.00	0.96%	0.84%
	Oxido Anatacaca Sur	239311	0.46	0.79	0.46	0.54	0.45	0.52	-0.66%	-1.10%
	Esperanza Sur	51279	0.30	0.19	0.33	0.10			8.31%	
	Butx Bx	10068	0.26	0.08	0.25	0.03	0.24	0.02	-1.19%	-6.22%
Esperanza	Gallito	16058	0.29	0.12	0.27	0.05	0.27	0.04	-7.46%	-8.68%
	Gallito	26669	0.79	4.29	0.89	2.57	0.78	1.66	11.29%	-0.64%
	Esperanza	1057276	1.69	6.64	1.70	3.73	1.66	3.44	0.47%	-1.93%
	Esperanza Distal	237584	0.91	1.25	0.88	0.62	0.85	0.50	-3.98%	-7.15%
Fortuna	Fortuna 7	17871	1.77	2.39	1.51	0.93			-17.27%	
	Fortuna 8	163531	0.65	0.82	0.63	0.46			-3.18%	
	Fortuna Norte	31628	0.57	0.98	0.53	0.40			-7.40%	
	Fortuna Pamela	87641	1.44	4.98	1.44	2.78			-0.14%	
Cachi	Kimberly	28069	1.79	1.79	1.81	0.53			1.32%	
Cachi	Karlita	283361	0.53	0.53	0.52	0.28	0.51	0.23	-2.32%	-4.13%
	Privatizadora	102312	0.13	0.05	0.14	0.02	0.14	0.02	4.44%	7.86%
	Carmencita	57747	0.46	0.40	0.42	0.19			-9.11%	
	Sulma	21773	0.17	0.10	0.16	0.04			-3.73%	

Source: Sierra Metals (2024) Notes: Occi. – 'Occidental'; Poli. – 'Polimetalico'; Econ. – 'Economico'

Table 14-12: Global Validation Statistics for Zinc (≥0% Zn)

			NN		ID		OK		Differences	
Area	Model	Count	Mean	Variance	Mean	Variance	Mean	Variance	IdvNN	OkvNN
Mina Central	Mina Central	1369065	1.64	12.87	1.56	5.78	1.56	4.94	-5.07%	-5.34%
	Cuye	134813	0.94	7.73	1.03	4.13	1.05	3.37	7.99%	9.92%
	Cuye Sur	175479	0.44	0.87	0.38	0.49			-15.67%	
	Contacto Sur Medo	29867	9.03	71.65	7.89	33.35			-14.39%	
	Contacto Sur Medo I	26951	15.72	178.63	15.04	90.95			4.49%	
	Contacto Sur Medo II	101730	8.81	88.43	9.24	44.93			4.69%	
	Contacto Oriental	49153	8.32	70.96	8.99	45.14			7.46%	
	Contacto Occi.	111264	3.24	30.78	3.76	14.47			13.84%	
	Contacto Occi. Lateral	8540	5.8	34.95	6.83	33.02			15.18%	
	Katty	7063	13.95	66.65	12.27	25.74			-13.67%	
	Mascota Poli. Norte	41290	11.45	83.55	12.68	36.82			9.72%	
	Mascota Poli. Norte	5666	13.61	39.23	12.16	24.44			-11.88%	
	Mascota Poli. Norte	66014	6.48	67.68	6.49	49.74			0.18%	
	Mascota Poli. Norte	18089	5.78	57.39	5.90	28.40			2.07%	
	Mascota Poli. Norte	14642	2.46	12.30	2.79	7.19			11.60%	
	Mascota Sur Oxido	12490	17.94	66.30	17.00	15.07			-5.56%	
	Mascota Sur Oxido Econ.	372576	2.78	25.52	2.81	14.97	2.86	13.01	1.14%	2.90%
	Oxido Anatacaca Sur	239311	1.37	8.71	1.46	4.43	1.47	3.67	6.63%	6.88%
	Esperanza Sur	51279	4.91	48.41	4.65	27.34			-5.72%	
	Butx Bx	10068	10.29	94.35	9.88	37.96	9.83	28.00	-4.13%	-4.63%
Esperanza	Gallito	16058	2.42	6.69	2.52	2.26	2.52	1.74	4.04%	3.93%
	Gallito	26669	8.05	73.48	8.42	34.73	8.18	23.48	4.38%	1.57%
	Esperanza	1074997	2.03	13.46	2.24	5.48	2.32	4.69	9.34%	12.62%
	Esperanza Distal	237584	7.39	84.49	7.39	40.89	7.26	32.73	0.05%	-1.81%
Fortuna	Fortuna 7	17871	3.72	20.97	4.00	10.34			6.98%	
	Fortuna 8	163531	1.66	5.90	1.78	3.56			6.90%	
	Fortuna Norte	31633	8.98	60.86	8.85	40.65			-1.54%	
	Fortuna Pamela	87641	2.69	21.28	2.58	11.35			-4.27%	
Cachi	Kimberly	28069	0.05	0.00	0.06	0.00			7.27%	
Cachi	Karlita	283340	2.32	14.97	2.33	8.27	2.32	7.04	0.69%	0.17%
	Privatizadora	102312	4.65	32.66	4.81	17.15	4.69	13.57	3.30%	0.85%
	Carmencita	57747	3.1	14.17	2.97	7.57			-4.38%	
	Sulma	21773	5.62	33.26	5.43	16.07			-3.44%	

Source: Sierra Metals (2024) Notes: Occi. – 'Occidental'; Poli. – 'Polimetalico'; Econ. – 'Economico'

14.8.5 Drift Analysis

Drift analysis is the process to evaluate the grade variations from a series of grade bands generated in several directions through the deposit. Grade variations from the OK and ID2 models are compared using the swath plot graphical display to the grade distribution derived from the declustered NN grade model.

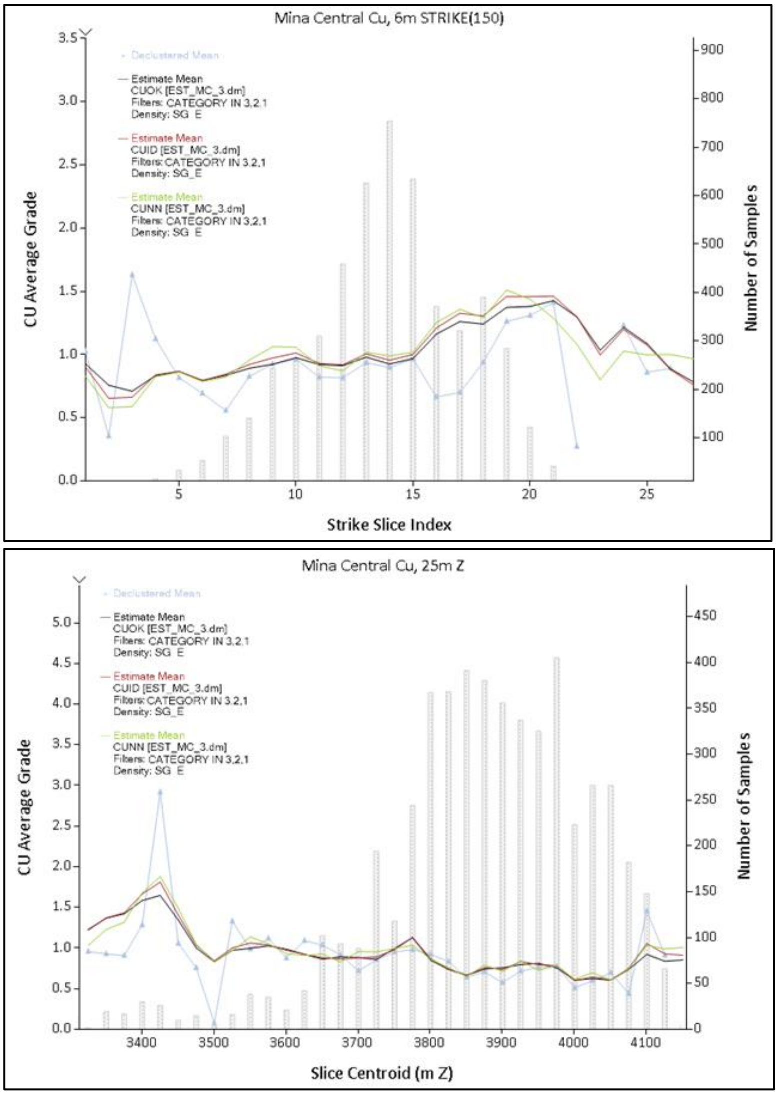
The nearest neighbor model does not provide reliable estimation grade on the local scales but, on a large scale, it represents an unbiased estimation of the grade distribution. Therefore, if the OK and the ID2 models are unbiased, the grade trends may show local fluctuations on a swath plot, but the overall trend should be similar to the NN distribution of grade.

Swath plots have been generated in the three orthogonal directions showing the distribution of grades within the most representative domains. Examples in a series of section swaths for the distribution of copper and zinc are shown in Figure 14-12 and Figure 14-13 respectively.

In general, there is a good correspondence between the models in all of these areas. The degree of smoothing in the estimated models are evident in the peaks and valleys shown in the swath plots. Deviations are attributed to the reduced tonnages near the edges of the deposit where there is a tendency to accentuate the differences in grade between models. Differences in grade become more apparent in the lower grade areas – these typically are on the flanks of the deposit where the density of drilling often decreases.

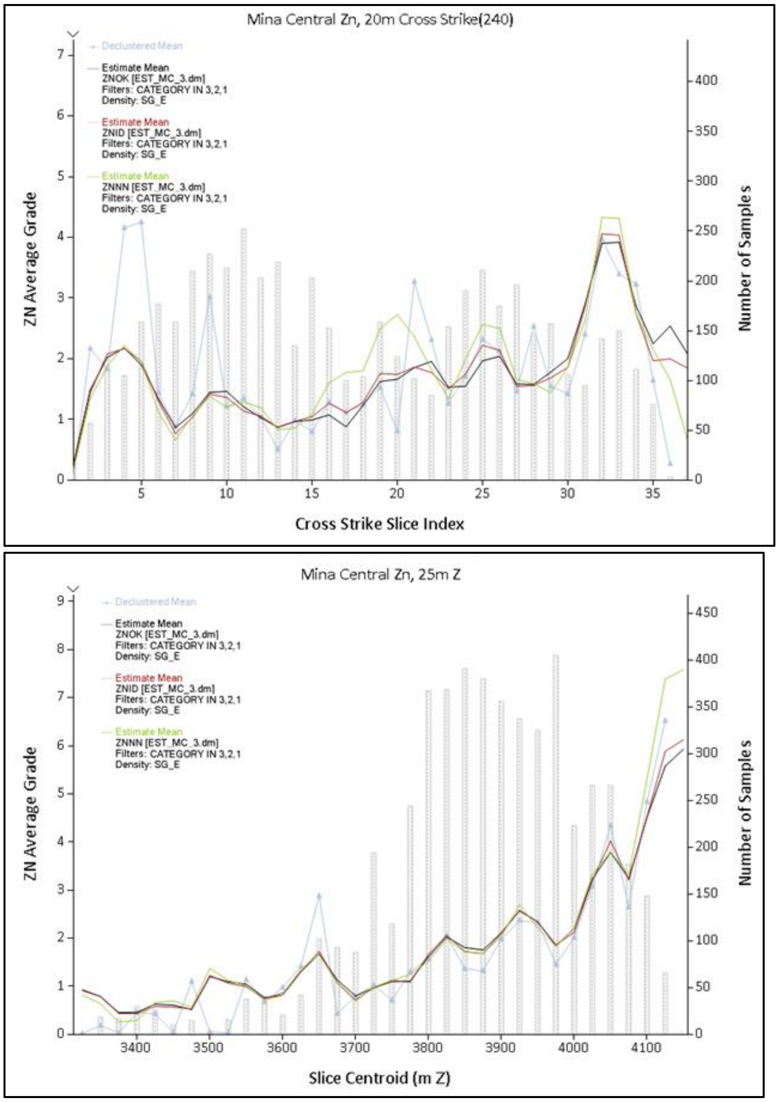
The QP (Oscar Retto) notes the estimated grades represent an acceptable approximation to the composited grades.

Figure 14-12: Mina Central Swath Plots for Copper; by Easting, Northing and Elevation, respectively



Source: Sierra Metals (2024)

Figure 14-13: Mina Central Swath Plots for Zinc; by Easting, Northing and Elevation



Source: Sierra Metals (2024)

14.9 Mineral Resources

14.9.1 Mineral Resource Classification

The mineral resource for the Yauricocha deposit were classified in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves (May 2014). The classification parameters are defined relative to the distance between grade sample data and are intended to encompass zones of reasonably continuous copper and zinc mineralization that exhibit the desired degree of confidence. These parameters are based on visual observations and statistical analysis.

The QP (Oscar Retto) considers that the location of the drill hole samples and the assay data at Yauricocha are sufficiently reliable to support mineral resources. The deposit comprises thirty-three

(33) mineralized domains which were estimated and categorized based on the search neighbourhood. Table 14-12 summarizes the resource classification criteria for each of the mineralized domains. Figure 14-14 presents an example for resource categorization for Mina Central Zone.

Measured Mineral Resource

The Yauricocha mineralization exhibiting good geological continuity investigated at an adequate spacing with reliable sampling information. Blocks estimated during the first estimation run considering variogram ranges up to a distance of 40 m, a minimum of four drill holes and seven composites are classified in the measured category.

Indicated Mineral Resource

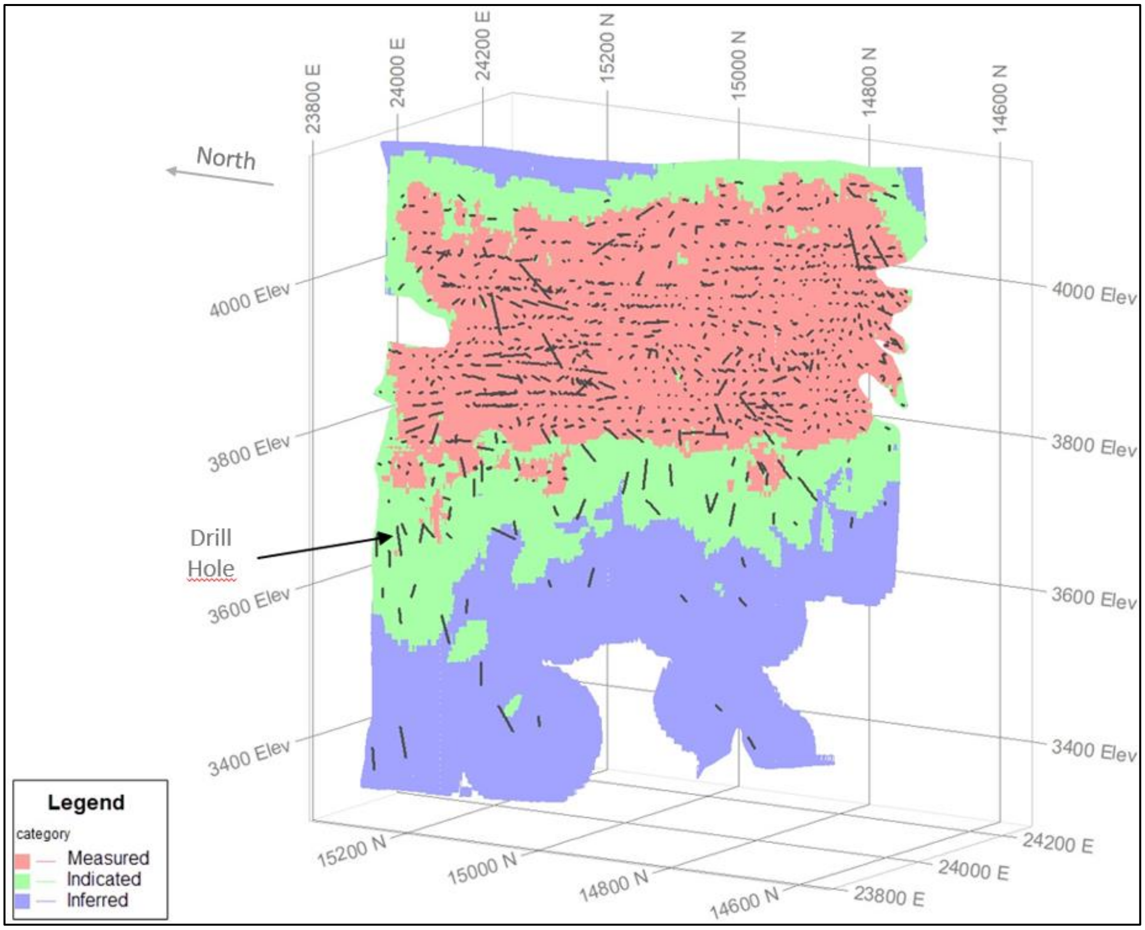
Blocks estimated during the second estimation run considering variogram ranges up to 80 m, a minimum of three drill holes and five composites are classified in the indicated category.

Inferred Mineral Resource

Blocks estimated during the third estimation run considering variogram ranges up to 115 m, a minimum of 1 drill hole and 1 composite value are classified in the inferred category because the confidence in the estimate is insufficient to allow for the meaningful application of technical and economic parameters or to enable an evaluation of economic viability.

Table 14-13 presents the resource classification criteria by mineralized domain.

Figure 14-14: Example of Resource Classification for Mina Central



Source: Sierra Metals (2024)

Table 14-13: Mineral Resource Classification Criteria

			Measured			Indicated			Inferred		
Area	Model	Primary Metal	Max Dist (m)	Min Comps	Min DHs	Max Dist (m)	Min Comps	Min DHs	Max Dist (m)	Min Comps	Min DHs
Mina Central	Mina Central	Cu	35	7	4	70	5	3	105	1	1
	Cuye	Zn	32	7	4	64	5	3	96	1	1
	Cuye Sur	Cu	37	7	4	75	5	3	112	1	1
	Contacto Sur Medo	Cu	20	7	4	40	5	3	60	1	1
	Contacto Sur Medo I	Zn	15	7	4	30	5	3	45	1	1
	Contacto Sur Medo II	Zn	18	7	4	36	5	3	54	1	1
	Contacto Oriental	Cu	20	7	4	40	5	3	60	1	1
	Contacto Occi.	Cu	25	7	4	50	5	3	75	1	1
	Contacto Occi. Lateral	Cu	20	7	4	40	5	3	60	1	1
	Katty	Cu	10	7	4	20	5	3	30	1	1
	Mascota Poli. Norte	Cu	20	7	4	40	5	3	60	1	1
	Mascota Poli. Norte	Cu	20	7	4	40	5	3	60	1	1
	Mascota Poli. Norte	Cu	20	7	4	40	5	3	60	1	1
	Mascota Poli. Norte	Cu	12	7	4	24	5	3	36	1	1
	Mascota Poli. Norte	Cu	15	7	4	30	5	3	45	1	1
	Mascota Sur Oxido	Cu	20	7	4	40	5	3	60	1	1
	Mascota Sur Oxido Econ.	Cu	19	7	4	37	5	3	56	1	1
	Oxido Anatacaca Sur	Cu	15	7	4	30	5	3	45	1	1
	Esperanza Sur	Cu	17	7	4	34	5	3	51	1	1
	Butz Bx	Cu	10	7	4	20	5	3	30	1	1
Esperanza	Gallito	Cu	14	7	4	28	5	3	41	1	1
	Gallito	Cu	14	7	4	28	5	3	41	1	1
	Esperanza	Cu	35	7	4	70	5	3	105	1	1
	Esperanza Distal	Cu	16	7	4	32	5	3	48	1	1
Fortuna	Fortuna 7	Cu	12	7	4	23	5	3	35	1	1
	Fortuna 8	Cu	25	7	4	50	5	3	75	1	1
	Fortuna Norte	Zn	20	7	4	40	5	3	60	1	1

	Fortuna Pamela	Cu	11	7	4	21	5	3	32	1	1
Cachi	Kimberly	Cu	10	7	4	20	5	3	30	1	1
Cachi	Karlita	Cu	16	7	4	33	5	3	49	1	1
	Privatizadora	Zn	18	7	4	37	5	3	55	1	1
	Carmencita	Cu	15	7	4	30	5	3	45	1	1
	Sulma	Cu	15	7	4	30	5	3	45	1	1

Source: Sierra Metals (2024 Notes: Occi. – 'Occidental'; Poli. – 'Polimetalico'; Econ. – 'Economico', DHs – 'drill holes'

14.9.2 Mineral Resource Depletion

Underground development and stopes are surveyed at Yauricocha mine as a component of monitoring the underground workings. Sierra Metals created wireframe solids based on digitized polygons projected on cross and long sections of exploited zones up to the 31 December 2023. The 3D solids were coded into the models and their correspondent blocks removed from the mineral resource.

There are mining components as pillars or lower grade peripheral material that remain in the block model that will likely never be exploited. To take account of this, different areas were identified by the mine planning department as being fully exploited, and any remnant blocks within these areas were identified in the block model using the code of ‘0’ and excluded from the reported mineral resources.

The Table 14-14 presents details of the codes stored in the resource block model and the mined zone they represent. Blocks with a zone code of one or greater are included from the reported mineral resources.

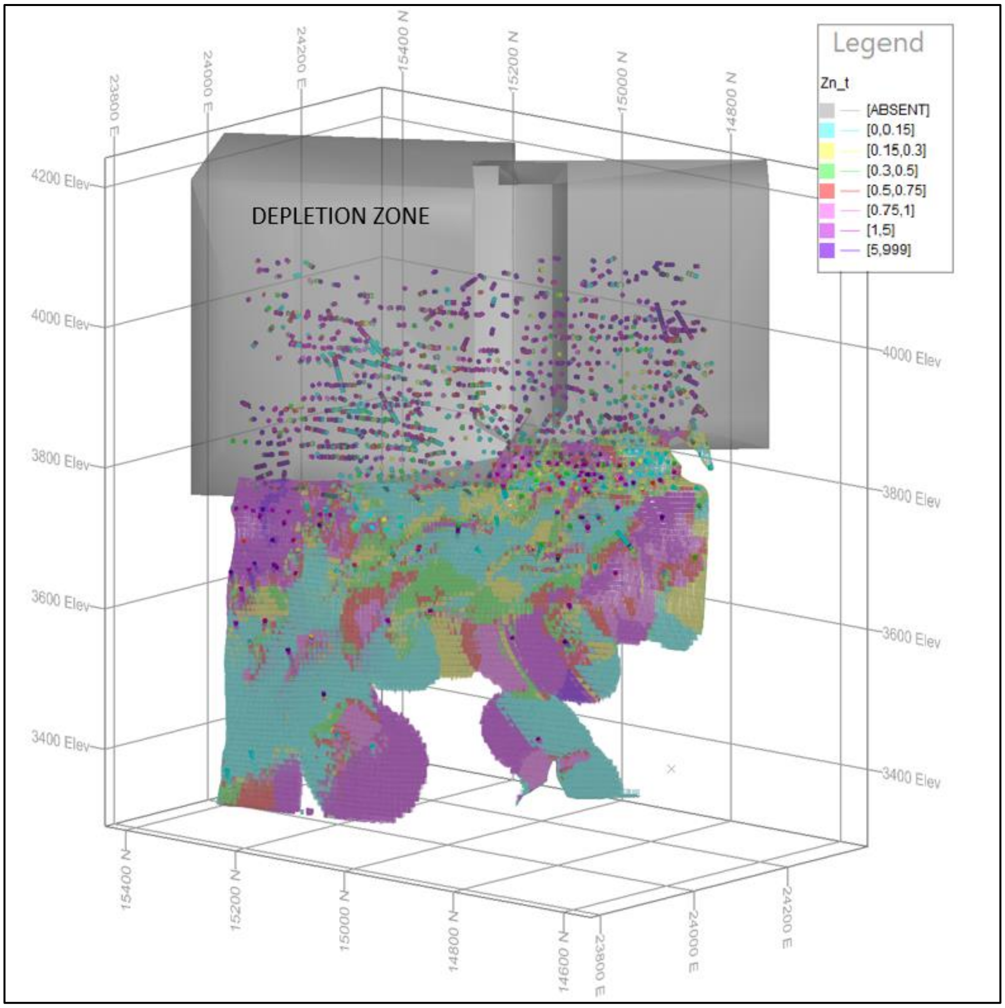
Table 14-14: Depletion Codes Stored in the Resource Block Model

Zone	Description
0	Completely mined
>1	Mineral in-situ (not extracted)

Source: Sierra Metals (2024)

An example of mining depletion being applied to Mina Central mineral resources is shown in Figure 14-15.

Figure 14-15: Example of Mining Depletion of Block Models – Mina Central Zone



Source: Sierra Metals (2024)

14.9.3 Reasonable Prospects for Eventual Economic Extraction

Mineral resources are reported based on underground mining within mineable sublevel caving (SLC3) and cut and fill (CRAM) mining methods based on actual operational costs and mining equipment sizes using NSR (net smelter return) values in the block model. The NSR values are calculated based on the projected long term metal prices, commercial terms and actual metallurgical recoveries experienced in the plant.

The NSR values take into consideration elements As, Sb, Bi, and Fe, which are considered as deleterious elements as per current smelter contracts. Generally, As is the major contributor of deleterious element penalties within the respective metal concentrates produced by the mine. All block models are regularized to their respective parent cell dimensions and diluted at zero grade. This allowed for isolated sub-cells to fall below the COV and hence, to be removed from the Mineral Resource as these blocks do not satisfy the “reasonable prospects for eventual economic extraction” as stated in the CIM definitions.

The metal price assumptions have been derived from CIBC November 2023 Consensus Commodity prices and are reasonable for the statement of Mineral Resources. These prices are summarized in Table 14-15.

Table 14-15: Unit Value Price Assumptions

Metal	Consensus Metal Price (US$)
Copper	$ 3.77 / lb
Zinc	$ 1.17 / lb
Silver	$ 22.55 / oz
Lead	$ 0.94 / lb
Gold	$ 1,711.21 / oz

Source: CIBC (2023), Sierra Metals (2024)

The metallurgical recovery factors are based on recent metallurgical recoveries for the various processes and concentrates produced by the Yauricocha mine. The mineralized bodies stated in Mineral Resource are considered as polymetallic sulphide. A summary of the recovery factors applied during the unit value calculation are shown in Table 14-16.

Table 14-16: Metallurgical Recovery Assumption

Metal	Metal Recovery (%)
Copper	78.2
Zinc	84.1
Silver	71.1
Lead	82.8
Gold	20.1

Source: Sierra Metals (2024)

The general unit value calculation can then be summarized as the estimated grade of each metal, multiplied by the price (US$/g or US$/%), multiplied by the process recovery. This yields a dollar value of the block per tonne, which can be used to report resources above the break-even variable costs for mining, processing, and G&A. Sierra Metals has provided these costs to the QP (Oscar Retto), noting that they are generalized given the flexibility of the mining methods within each area or individual mineralized body. The QP (Oscar Retto) considers the application of a single unit value cut-off to each mineralized body as reasonable. The unit value marginal NSR cut- offs based on marginal costs provided by Sierra Metals are summarized in Table 14-17.

Table 14-17: Unit Value Cut-off by Mining Method and Area (US$/t)

Description	Break Even Cost 2023*
Sub-level Caving: Mechanized, Low Water (SLCM3)	39.71
Cut and Fill: Overhead Conventional (CRAM)	62.86

Source: Sierra Metals (2024) * Based on a 3,780 tpd operation (2023)

14.10 Mineral Resource Statement

The Mineral Resources for the Yauricocha Mine are: Measured Resource of 1.9 Mt at 1.37% Cu, 2.12% Zn, 40.35 g/t Ag, 0.48% Pb, and 0.56 g/t Au. Indicated Resource of 8.4 Mt at 1.29% Cu, 2.21% Zn, 42.73 g/t Ag, 0.56% Pb, and 0.47 g/t Au; and an Inferred Resource of 13.2 Mt at 1.30% Cu, 1.59% Zn, 34.42 g/t Ag, 0.49% Pb, and 0.43 g/t Au. The effective date of the Mineral Resources is 31 December 2023.

Table 14-18 presents the Mineral Resources for the Yauricocha Mine.

Table 14-18: Consolidated Yauricocha Mine Mineral Resource Statement; effective date 31 Dec. 2023

Class	Tonnes (kt)	Metal Grade							Value	Contained Metal				
		Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%)	As (%)	Fe (%)	NSR (US$/t)	Cu (Mlb)	Au (koz)	Ag (koz)	Zn (Mlb)	Pb (Mlb)
Measured	1945.6	1.37	0.56	40.35	2.12	0.48	0.17	28.53	114.90	58.76	35.03	2523.99	90.93	20.59
Indicated	8428.7	1.29	0.47	42.73	2.21	0.56	0.18	28.07	113.84	239.71	127.36	11579.35	410.66	104.06
Mea+Ind	10374.3	1.30	0.48	42.28	2.19	0.55	0.18	28.16	114.04	297.33	160.10	14102.12	500.88	125.79
Inferred	13211.1	1.30	0.43	34.42	1.59	0.49	0.11	30.22	102.88	378.63	182.64	14619.77	463.10	142.71

Notes to Table 14-18:

- Mineral Resources have been classified in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") Definition Standards on Mineral Resources and Mineral Reserves, whose definitions are incorporated by reference into NI 43-101.
- Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
- Summation errors may occur due to rounding.
- Mineral Resources are reported at Cut-Off values (COV)'s based on 2023 actual metallurgical recoveries and 2024 smelter contracts.
- Reporting cut-off value is an NSR and are variable based on mining method: US$ 39.71/t (SLC) and US$ 62.86/t (OCF)
- NSR was calculated as follows: NSR = Cu∗47.337+Ag ∗ 0.346+Pb ∗15.448+Zn∗12.346 +Au ∗ 4.588.
- Metal prices for the NSR formula are: US$3.77/lb Cu, US$1.17/lb Zn, US$22.55/oz Ag, US$0.94/lb Pb, and US$1,711.21/oz Au
- Capping of grades for silver, gold, copper, lead, zinc, arsenic, and iron assays were applied depending on mineralized domain and where appropriate.

Tables 14-19 to Table 14-22 present the detailed Mineral Resources by Zone: Mina Central, Esperanza, Fortuna and Cachi Cachi, respectively.

Table 14-19: Mineral Resources for the Yauricocha Mine for the Mina Central Zone, by Mineralized Domain, based on NSR Cut-off Values US$39.71/t (SLC) and US$62.86/t (OCF); depending on mining method

Class	Metal Grade								Value	Contained Metal				
	Tonnes (kt)	Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%)	As (%)	Fe (%)	NSR (US$/t)	Cu (Mlb)	Au (koz)	Ag (koz)	Zn (Mlb)	Pb (Mlb)
Mina Central														
Measured	1218.0	1.04	0.54	25.41	1.38	0.14	0.15	29.93	79.54	27.93	21.15	995.04	37.06	3.76
Indicated	3310.4	1.01	0.51	21.12	1.23	0.12	0.11	29.50	74.64	73.71	54.28	2247.84	89.77	8.76
Mea+Ind	4528.4	1.02	0.52	22.27	1.27	0.12	0.12	29.61	75.96	101.83	75.71	3242.32	126.79	11.98
Inferred	7065.2	1.32	0.46	20.68	0.79	0.15	0.07	29.87	84.00	205.6	104.49	4697.49	123.05	23.36
Cuye														
Measured	191.6	1.35	0.60	21.60	1.75	0.08	0.14	28.53	96.80	5.70	3.70	133.06	7.39	0.34
Indicated	1884.6	1.46	0.54	22.11	1.24	0.09	0.14	31.56	96.16	60.66	32.72	1339.67	51.52	3.74

Class	Metal Grade								Value	Contained Metal				
	Tonnes (kt)	Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%)	As (%)	Fe (%)	NSR (US$/t)	Cu (Mlb)	Au (koz)	Ag (koz)	Zn (Mlb)	Pb (Mlb)
Mea+Ind	2076.2	1.45	0.55	22.06	1.29	0.09	0.14	31.28	96.22	66.37	36.71	1472.53	59.05	4.12
Inferred	1258.3	1.75	0.50	33.99	0.71	0.13	0.14	33.74	107.81	48.55	20.23	1375.07	19.70	3.61
Cuye Sur														
Inferred	2371.9	1.31	0.34	11.89	0.42	0.02	0.08	38.01	73.07	68.5	25.93	906.71	21.96	1.05
Contacto Sur Medio														
Inferred	36.20	0.13	0.40	59.54	8.85	0.85	0.03	16.37	150.86	0.10	0.47	69.30	7.06	0.68
Contacto Sur Medio I														
Measured	0.20	0.14	0.19	83.11	6.73	2.29	0.06	4.03	154.92	0.00	0.00	0.53	0.03	0.01
Indicated	5.30	0.14	0.20	74.54	6.02	1.73	0.07	5.36	134.52	0.02	0.03	12.70	0.70	0.20
Mea+Ind	5.60	0.14	0.20	74.86	6.05	1.75	0.07	5.31	135.29	0.02	0.04	13.48	0.75	0.22
Inferred	13.90	0.08	0.10	64.12	6.72	2.04	0.09	2.77	140.82	0.02	0.04	28.65	2.06	0.63
Contacto Sur Medio II														
Indicated	33.50	0.22	0.25	235.68	11.21	7.25	0.15	10.79	343.55	0.16	0.27	253.84	8.28	5.35
Mea+Ind	33.50	0.22	0.25	235.68	11.21	7.25	0.15	10.79	343.55	0.16	0.27	253.84	8.28	5.35
Inferred	162.70	0.16	0.24	202.96	10.90	8.38	0.14	9.18	343.16	0.57	1.26	1061.67	39.10	30.06
Contacto Oriental														
Measured	25.1	0.31	0.11	81.87	8.70	0.60	0.13	32.60	160.10	0.17	0.09	66.07	4.81	0.33
Indicated	84.80	0.30	0.11	57.51	7.57	0.56	0.12	27.26	136.55	0.56	0.30	156.79	14.15	1.05
Mea+Ind	109.90	0.30	0.11	63.08	7.83	0.57	0.12	28.48	141.93	0.73	0.39	222.88	18.97	1.38
Inferred	134.10	0.22	0.49	157.75	12.28	3.59	0.05	15.87	274.35	0.65	2.11	680.13	36.30	10.61
Contacto Occidental														
Measured	5.40	0.25	0.16	55.05	12.06	0.18	0.06	14.36	183.27	0.03	0.03	9.56	1.44	0.02
Indicated	42.60	0.31	0.29	55.98	4.39	0.42	0.10	15.84	95.79	0.29	0.40	76.67	4.12	0.39
Mea+Ind	48.00	0.3	0.27	55.88	5.25	0.39	0.09	15.68	105.60	0.32	0.42	86.24	5.56	0.41
Inferred	105.80	0.25	0.13	55.61	3.59	0.39	0.11	9.79	81.76	0.58	0.44	189.16	8.37	0.91
Contacto Occidental Lateral														
Inferred	3.90	0.26	0.58	61.06	4.41	0.15	0.04	21.55	92.89	0.02	0.07	7.66	0.38	0.01
Katty														
Inferred	4.60	0.14	0.48	47.53	10.83	1.01	0.08	16.83	174.54	0.01	0.07	7.03	1.10	0.10
Mascota Pol Norte														
Measured	1.00	2.11	0.42	156.56	13.92	7.16	0.23	13.85	438.40	0.05	0.01	5.03	0.31	0.16
Indicated	50.60	0.71	0.62	152.48	12.88	7.71	0.13	14.26	367.18	0.79	1.01	248.06	14.37	8.60
Mea+Ind	51.60	0.73	0.62	152.56	12.90	7.70	0.13	14.26	368.63	0.83	1.03	253.09	14.67	8.76
Inferred	39.60	0.27	0.49	121.51	10.83	7.20	0.09	10.63	302.07	0.24	0.62	154.70	9.45	6.29
Mascota Pol Norte II														
Inferred	9.20	0.13	0.36	137.44	14.40	10.32	0.11	16.25	392.43	0.03	0.11	40.65	2.92	2.09
Mascota Pol Este														
Indicated	108.50	0.78	0.55	98.62	6.55	1.14	0.17	18.80	172.33	1.87	1.92	344.02	15.67	2.73
Mea+Ind	108.50	0.78	0.55	98.62	6.55	1.14	0.17	18.80	172.33	1.87	1.92	344.02	15.67	2.73
Inferred	331.50	0.77	0.62	114.51	7.49	1.58	0.15	26.41	195.59	5.63	6.61	1220.44	54.74	11.55
Mascota Pol Sur														
Indicated	7.50	0.29	0.29	75.63	7.15	0.47	0.12	18.46	136.60	0.05	0.07	18.24	1.18	0.08
Mea+Ind	7.50	0.29	0.29	75.63	7.15	0.47	0.12	18.46	136.60	0.05	0.07	18.24	1.18	0.08
Inferred	18.6	0.26	0.20	74.90	7.25	0.46	0.08	13.98	135.79	0.11	0.12	44.79	2.97	0.19
Mascota Pol Sur II														
Indicated	9.60	0.59	0.37	60.24	3.57	0.36	0.14	20.27	100.12	0.12	0.11	18.59	0.76	0.08
Mea+Ind	9.60	0.59	0.37	60.24	3.57	0.36	0.14	20.27	100.12	0.12	0.11	18.59	0.76	0.08
Inferred	22.40	0.46	0.53	51.06	3.56	0.26	0.11	22.30	90.08	0.23	0.38	36.77	1.76	0.13

Class	Tonnes (kt)	Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%)	As (%)	Fe (%)	NSR (US$/t)	Cu (Mlb)	Au (koz)	Ag (koz)	Zn (Mlb)	Pb (Mlb)
	Metal Grade								Value	Contained Metal				
Mascota Sur Oxido														
Indicated	7.90	5.03	0.01	1.45	17.28	0.10	0.13	18.18	453.53	0.88	0.00	0.37	3.01	0.02
Mea+Ind	13.10	5.35	0.01	1.67	16.34	0.11	0.11	17.58	457.47	1.55	0.00	0.70	4.72	0.03
Inferred	21.00	5.23	0.01	1.59	16.69	0.11	0.12	17.80	455.99	2.42	0.01	1.07	7.73	0.05
Mascota Oxido Economico														
Measured	88.40	5.93	1.29	150.06	3.57	4.07	0.29	19.44	445.43	11.56	3.67	426.49	6.96	7.93
Indicated	58.30	5.64	0.99	142.76	3.29	4.67	0.25	22.36	433.92	7.25	1.86	267.59	4.23	6.00
Mea+Ind	146.70	5.82	1.17	147.16	3.46	4.31	0.27	20.60	440.86	18.82	5.52	694.08	11.19	13.94
Inferred	35.70	4.74	0.76	130.66	2.23	4.12	0.17	22.67	364.26	3.73	0.87	149.97	1.76	3.24
Oxido Antacaca Sur														
Indicated	1.90	0.63	1.08	122.79	0.34	0.53	0.83	37.01	89.58	0.03	0.07	7.50	0.01	0.02
Mea+Ind	1.90	0.63	1.08	122.79	0.34	0.53	0.83	37.01	89.58	0.03	0.07	7.50	0.01	0.02
Inferred	3.60	0.49	1.46	142.17	1.53	1.05	0.35	32.33	114.19	0.04	0.17	16.46	0.12	0.08
Experanza Sur														
Measured	50.00	0.36	0.42	40.78	6.45	0.42	0.18	20.12	119.27	0.40	0.68	65.56	7.11	0.46
Indicated	69.00	0.33	0.35	31.74	6.39	0.39	0.17	20.28	112.93	0.50	0.78	70.41	9.72	0.59
Mea+Ind	119.10	0.34	0.38	35.54	6.41	0.40	0.17	20.21	115.59	0.89	1.46	136.09	16.83	1.05
Inferred	3.20	0.59	0.39	15.71	2.64	0.12	0.15	22.94	69.67	0.04	0.04	1.62	0.19	0.01
Butz_Bx														
Indicated	8.3	0.33	0.54	62.74	12.35	2.32	0.1	14.58	227.92	0.06	0.14	16.74	2.26	0.42
Mea+Ind	8.3	0.33	0.54	62.74	12.35	2.32	0.1	14.58	227.92	0.06	0.14	16.74	2.26	0.42
Inferred	2.6	0.35	0.67	88.78	14.42	0.83	0.08	12.8	241.24	0.02	0.06	7.42	0.83	0.05

Note: Summation errors may occur due to rounding

Table 14-20: Mineral Resources for the Esperanza Zone, by Mineralized Domain, based on NSR Cut-off Values US$39.71/t (SLC) and US$62.86/t (OCF); depending on mining method

Class	Tonnes (kt)	Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%))	As (%)	Fe (%)	NSR (US$/t)	Cu (Mlb)	Au (Koz)	Ag (Koz)	Zn (Mlb)	Pb (Mlb)
		Metal Grade							Value	Contained Metal				
Gallito Sur														
Measured	11.70	0.24	0.18	57.64	3.75	1.88	0.10	11.68	107.31	0.06	0.07	21.68	0.97	0.48
Indicated	24.40	0.30	0.14	73.49	2.60	1.34	0.16	10.75	93.16	0.16	0.11	57.65	1.40	0.72
Mea+Ind	36.20	0.28	0.15	68.35	2.97	1.51	0.14	11.05	97.75	0.22	0.17	79.55	2.37	1.21
Inferred	2.00	0.37	0.16	129.81	1.89	1.16	0.24	10.72	104.65	0.02	0.01	8.35	0.08	0.05
Gallito														
Indicated	8.70	0.09	0.12	30.68	4.09	2.53	0.12	6.90	104.82	0.02	0.03	8.58	0.78	0.49
Mea+Ind	8.70	0.09	0.12	30.68	4.09	2.53	0.12	6.90	104.82	0.02	0.03	8.58	0.78	0.49
Inferred	2.10	0.10	0.11	31.37	3.52	2.31	0.10	5.68	95.27	0.00	0.01	2.12	0.16	0.11
Esperanza														
Measured	266.50	1.59	0.51	67.62	2.84	0.88	0.23	27.43	149.67	9.34	4.37	579.38	16.69	5.17
Indicated	1834.1	1.70	0.34	74.94	2.98	1.04	0.33	26.40	160.71	68.74	20.05	4419.03	120.50	42.05
Mea+Ind	2100.6	1.68	0.36	74.01	2.96	1.02	0.31	26.53	159.31	77.80	24.31	4998.33	137.08	47.24
Inferred	721.60	1.87	0.27	94.66	3.88	1.63	0.51	29.75	195.63	29.75	6.26	2196.11	61.73	25.93
Esperanza Distal														
Measured	28.30	1.11	0.23	102.25	6.49	2.99	0.30	22.76	215.42	0.69	0.21	93.03	4.05	1.87
Indicated	165.90	0.93	0.27	85.70	5.29	2.37	0.24	19.97	176.90	3.40	1.44	457.11	19.35	8.67
Mea+Ind	194.20	0.96	0.26	88.11	5.46	2.46	0.25	20.38	182.51	4.11	1.62	550.13	23.38	10.53
Inferred	151.80	0.74	0.22	73.38	6.08	2.78	0.21	15.03	179.30	2.48	1.07	358.13	20.35	9.30

Note: Summation errors may occur due to rounding

Table 14-21: Mineral Resources for the Fortuna Zone, by Mineralized Domain, based on NSR Cut-off Values US$39.71/t (SLC) and US$62.86/t (OCF); depending on mining method

Class	Tonnes (kt)	Metal Grade							Value	Contained Metal				
		Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%)	As (%)	Fe (%)	NSR (US$/t)	Cu (Mlb)	Au (Koz)	Ag (Koz)	Zn (Mlb)	Pb (Mlb)
Fortuna 7														
Indicated	3.60	1.62	0.36	37.09	2.44	0.60	0.44	16.12	130.57	0.13	0.04	4.29	0.19	0.05
Mea+Ind	3.60	1.62	0.36	37.09	2.44	0.60	0.44	16.12	130.57	0.13	0.04	4.29	0.19	0.05
Inferred	9.10	2.16	0.30	45.17	2.12	0.66	0.46	13.48	155.66	0.43	0.09	13.22	0.43	0.13
Fortuna 8														
Measured	43.00	1.70	0.59	79.96	0.80	0.28	0.38	34.47	125.26	1.61	0.82	110.54	0.76	0.27
Indicated	327.50	0.97	0.43	75.52	2.02	0.69	0.20	27.63	109.69	7.00	4.53	795.18	14.58	4.98
Mea+Ind	370.50	1.06	0.45	76.03	1.88	0.64	0.22	28.42	111.50	8.66	5.36	905.66	15.36	5.23
Inferred	369.10	0.56	0.46	63.98	2.67	0.73	0.12	22.59	95.20	4.56	5.46	759.24	21.73	5.94
Fortuna Norte														
Measured	0.20	0.13	0.22	36.58	7.75	1.67	0.07	6.67	141.10	0.00	0.00	0.24	0.03	0.01
Indicated	78.60	0.63	0.41	69.72	9.42	2.88	0.26	15.29	216.56	1.09	1.04	176.19	16.32	4.99
Mea+Ind	78.80	0.63	0.41	69.63	9.42	2.87	0.26	15.26	216.34	1.09	1.04	176.41	16.36	4.99
Inferred	9.90	0.30	0.38	89.14	7.99	3.67	0.14	14.16	202.17	0.07	0.12	28.37	1.74	0.80
Fortuna Pamela														
Measured	3.10	2.85	0.59	74.58	1.34	0.76	0.45	21.60	191.87	0.19	0.06	7.43	0.09	0.05
Indicated	187.90	2.01	0.55	61.48	2.81	0.83	0.37	24.42	166.60	8.33	3.32	371.41	11.64	3.44
Mea+Ind	191.00	2.03	0.55	61.70	2.79	0.82	0.37	24.37	167.01	8.55	3.38	378.89	11.75	3.45
Inferred	288.80	1.11	0.45	51.62	2.92	1.01	0.23	19.92	124.07	7.07	4.18	479.30	18.59	6.43

Note: Summation errors may occur due to rounding

Table 14-22: Mineral Resources for the Yauricocha Mine for the Cachi Cachi Zone, by Mineralized Domain, based on NSR Cut-off Values US$39.71/t (SLC) and US$62.86/t (OCF); depending on mining method

Class	Tonnes (kt)	Metal Grade								Contained Metal				
		Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%)	As (%)	Fe (%)	NSR (US$/t)	Cu (Mlb)	Au (Koz)	Ag (Koz)	Zn (Mlb)	Pb (Mlb)
Kimberly														
Measured	0.00	2.40	0.27	37.74	0.06	0.01	0.03	23.54	128.64	0.00	0.00	0.00	0.00	0.00
Indicated	41.70	1.81	0.29	34.21	0.06	0.01	0.02	24.32	99.88	1.66	0.39	45.86	0.06	0.01
Mea+Ind	41.70	1.81	0.29	34.21	0.06	0.01	0.02	24.32	99.88	1.66	0.39	45.86	0.06	0.01
Inferred	6.80	2.38	0.41	33.46	0.05	0.01	0.02	28.02	127.09	0.36	0.09	7.32	0.01	0.00
Karlita														
Measured	2.70	0.86	0.23	16.87	0.16	0.02	0.06	39.90	49.72	0.05	0.02	1.46	0.01	0.00
Indicated	22.90	0.97	0.46	42.58	1.24	0.22	0.07	38.94	81.54	0.49	0.34	31.35	0.63	0.11
Mea+Ind	25.60	0.96	0.44	39.86	1.12	0.20	0.07	39.04	78.16	0.54	0.36	32.81	0.63	0.11
Inferred	0.60	1.07	0.27	19.49	1.72	0.35	0.05	33.25	85.28	0.01	0.01	0.38	0.02	0.00
Privatizadora														
Measured	0.00	0.15	0.47	28.09	4.11	0.61	0.06	22.14	79.11	0.00	0.00	0.00	0.00	0.00
Indicated	22.80	0.24	0.51	68.20	3.53	0.73	0.10	27.01	92.28	0.12	0.37	49.99	1.77	0.37
Mea+Ind	22.80	0.24	0.51	68.12	3.53	0.73	0.10	27.00	92.25	0.12	0.37	49.93	1.77	0.37
Inferred	26.20	0.25	0.69	82.94	5.79	1.38	0.16	26.54	136.64	0.14	0.58	69.86	3.34	0.80
Carmencita														
Measured	1.40	2.12	0.54	138.64	0.63	0.30	0.20	27.46	163.47	0.07	0.02	6.24	0.02	0.01
Indicated	8.60	1.83	0.46	145.89	0.39	0.21	0.17	24.72	147.31	0.35	0.13	40.34	0.07	0.04
Mea+Ind	10.00	1.87	0.47	144.88	0.42	0.22	0.17	25.10	149.56	0.41	0.15	46.58	0.09	0.05
Inferred	0.00	2.84	0.62	219.76	0.34	0.29	0.10	22.11	222.00	0.00	0.00	0.00	0.00	0.00
Sulma														
Indicated	0.80	0.19	0.79	62.43	2.62	2.23	0.07	14.42	101.12	0.00	0.02	1.61	0.05	0.04
Mea+Ind	14.00	0.33	0.70	96.84	2.19	1.96	0.10	14.96	109.72	0.10	0.32	43.59	0.68	0.60
Inferred	14.80	0.32	0.70	94.94	2.22	1.97	0.10	14.93	109.25	0.10	0.33	45.18	0.72	0.64

Note: Summation errors may occur due to rounding

14.11 Factors That May Affect the Mineral Resource Estimate

Factors that may affect the Mineral Resource estimates include:

- metal price and exchange rate assumptions
- changes to the assumptions used to generate the copper equivalent cut-off grade
- changes in local interpretations of mineralization geometry and continuity of mineralized zones
- changes to geological and mineralization shape and geological and grade continuity assumptions
- density and domain assignments
- changes to geotechnical, mining, and metallurgical recovery assumptions
- change to the input and design parameter assumptions that pertain to the stope designs constraining the mineral resource
- assumptions and ability to permit and operate the Project
- assumptions and continued ability to access the site, retain mineral and surface rights titles, maintain environment and other regulatory permits, and maintain the social license to operate

15 MINERAL RESERVE ESTIMATES

This section encapsulates the fundamental assumptions, parameters, and methodologies employed in formulating the Mineral Reserve estimate for the Yauricocha Mine. The Mineral Reserve Statement provided herein has been meticulously developed for public disclosure purposes.

15.1 Estimation Methodology

The current reserve estimation procedure at Yauricocha is to:

1) Assessing geological data and resource block models to select suitable mining methods.
2) Identifying modifying factors based on mining method and deposit characteristics.
3) Establishing consensus forecasts for commodity prices and exchange rates.
4) Determining economic and marginal cut-off values.
5) Computing Net Smelter Return (NSR) factors to incorporate NSR value into block models.
6) Utilizing Deswik Stope Optimizer v3 (MSO) and modified block models to delineate potentially mineable areas, optimizing NSR as the field of interest.
7) Assigning NSR values of zero to Inferred blocks in accordance with CIM Guidelines, treating them as waste.
8) Implementing measures such as removal of Crown Pillars, sill pillars, and post pillars, and addition of internal connector drifts in low-grade material to ensure proper access.
9) Reviewing and eliminating isolated, uneconomic, or inaccessible shapes before combining sub-shapes into mineable stopes.
10) Exporting results to Excel on a stope-by-stope basis.
11) Applying modifying factors to each stope in Excel.
12) Evaluating stope shapes for Economic, Marginal, or Uneconomic status by comparing diluted NSR against appropriate Cut-Off Values (COV) (refer to Table 15.4).
13) Filtering for stope shapes meeting criteria for inclusion in mineral reserves: Economic or marginal status and measured or indicated resource class.
14) Refining mineable areas further by removing uneconomic, non-continuous, or isolated stope and sub-stope shapes.
15) Omitting marginal stope shapes not adjacent to economic stopes unless significant additional development is unnecessary.
16) Developing mine design, including access development and necessary infrastructure.
17) Establishing mine sequence and production schedule.
18) Providing production and development profiles to metallurgy for recovery factor application and to finance for cash flow modeling, incorporating operating and capital costs.
19) Compiling the Mineral Reserve Statement.

This reserve estimation process aligns with the latest industry best practices as outlined in the CIMVAL Code for the Valuation of Mineral Properties, adopted by the CIM Council on November 29, 2019.

Reserve estimation is conducted individually for each orebody and then amalgamated to formulate the consolidated Yauricoha Life-of-Mine (LoM) plan. The reserve estimation procedure is completed for each of the 22 ore zones.

15.1.1 Treatment of Inferred Mineral Resources

During the utilization of Mineable Stope Optimizer software, nominal quantities of inferred mineral resources may be encompassed within the resultant shapes. Subsequently, modifying factors are applied to ascertain the projected final milled tonnes and head grades. The aggregate proportion of inferred mineral resources integrated into the ultimate Mineral Reserve Estimate stands at 0.0%.

15.2 Modifying Factors

Measured and Indicated Mineral Resources were transitioned into Mineral Reserves by applying pertinent modifying factors, as elucidated herein, to the final shapes generated during the mine design phase (referred to as MSO shapes). The mining recovery and external dilution factors referenced in this report stem from historical data specific to Yauricocha and are currently utilized in the site's planning procedures.

The in-situ tonnage and grade of each potential mining block are derived from the resource block models. All mineral reserve assessments are presented in "dry" tonnes, devoid of moisture, and are founded on density values stored within the block model.

External dilution, accounting for material extracted from outside the MSO shapes including overdraw of cave material, ranges from 10% to 25% and varies depending on the mining method, geomechanical properties of the orebody, and water content. These factors are distinct from internal dilution, which is integrated within the generated MSO shapes and consequently included in the in-situ tonnes and grades. Both external and internal dilution are assigned a zero grade for the purpose of mineral reserve estimation.

Mining recovery factors determine the proportion of diluted stope material that reaches the mill, ranging from 70% to 90% based on historical records and considerations of the mining method, geomechanical attributes of the orebody, and water content, which influences mining recovery.

The generalized formula for calculating reserve tonnage in each mining block is:

- Reserve Tonnes = (Tonnes) mining block * Mining Recovery % * (1 + Dilution %)

Similarly, the generalized formula for determining reserve grade is:

- Reserve Grade = (Resource Grade) mining block / (1 + Dilution %)

Table 15.1 lists the mining recovery and external dilution factors applied to each orebody based on the mining method.

Table 15-1: Mining Recovery and Dilution Factors

Zone	Orebody	Mining Method	Mining G Area	Plan Dilution	Ops Dilution
V	ANTACACA	SLCM3	MINA CENTRAL	0.17	0.19
V	ANTACACA SUR	SLCM3	MINA CENTRAL	0.18	0.18
V	CATAS	SLCM3	MINA CENTRAL	0.12	0.24
V	ROSAURA	SLCM3	MINA CENTRAL	0.13	0.23
V	CUYE	SLCM3	MINA CENTRAL	0.12	0.24
V	CSM-I	OCF	CUERPOS PEQUEÑOS	0.55	0.27
V	CSM-II	OCF	CUERPOS PEQUEÑOS	0.22	0.15
II	GALLITO SUR	OCF	CUERPOS PEQUEÑOS	0.05	0.32
II	VETA GALLITO	OCF	CUERPOS PEQUEÑOS	0.12	0.25
V	CONTACTO ORIENTAL	OCF	CUERPOS PEQUEÑOS	0.05	0.32
V	CONTACTO OCCIDENTAL	OCF	CUERPOS PEQUEÑOS	0.04	0.19
III	KIMBERLY	OCF	CACHI CACHI	0.11	0.16
V	MASCOTA POLI NORTE	OCF	MASCOTA	0.21	0.16
V	MASCOTA POLI ESTE	OCF	MASCOTA	0.19	0.18
V	MASCOTA POLI SUR	OCF	MASCOTA	0.10	0.27
V	MASCOTA POLI SUR II	OCF	MASCOTA	0.16	0.21
II	ESPERANZA	SLCM3	ESPERANZA	0.10	0.26
II	ESPERANZA DISTAL	SLCM3	ESPERANZA	0.13	0.23
III	KARLITA	SLCM3	CACHI CACHI	0.26	0.10
III	PRIVATIZADORA	OCF	CACHI CACHI	0.21	0.08
III	CARMENCITA	OCF	CACHI CACHI	0.26	0.16
III	SULMA	OCF	CACHI CACHI	0.06	0.55
II	FORTUNA 7	OCF	CUERPOS PEQUEÑOS	0.32	0.10
V	ESPERANZA SUR	SLCM3	ESPERANZA	0.23	0.13
II	FORTUNA 8	OCF	CUERPOS PEQUEÑOS	0.14	0.22
V	FORTUNA 8	SLCM3	MINA CENTRAL	0.14	0.22
II	FORTUNA NORTE	OCF	CUERPOS PEQUEÑOS	0.09	0.27
II	FORTUNA_P	SLCM3	ESPERANZA	0.16	0.20
V	BUTZ	OCF	CUERPOS PEQUEÑOS	0.32	0.50

Source: Sierra Metals, 2023

15.2.1 Net Smelter Return

Each block model cell underwent calculation of its Net Smelter Return (NSR) value, factoring in mineral resource grades, prevailing metal prices, metallurgical recoveries, and terms stipulated in existing smelter contracts. The NSR factors utilized for this computation encompass relevant concentrate treatment charges, refining charges, payable metal content, minimum deductions, price participation, and deductions for deleterious elements. These factors exhibit variability based on concentrate and ore type, with the current production comprising three concentrates sourced from polymetallic origins, and future plans envisioning the production of two concentrates from oxide sources.

Metal Prices and Exchange Rate

The metal price assumptions, delineated in Table 15.2, are founded upon long-term consensus pricing. These assumptions have been derived from the CIBC Global Mining Group Consensus Commodity prices dated November 06, 2023, as supplied by Sierra Metals.

Table 15-2: Unit Value Metal Price Assumptions

Ag	Au	Cu	Pb	Zn
(US$/oz)	(US$/oz)	(US$/lb)	(US$/lb)	(US$/lb)
22.55	1,711	3.77	0.94	1.17

Source: Sierra Metals, 2023

Metallurgical Recoveries

Metallurgical recoveries used for polymetallic feed sources are based on 2023 actual mill production data provided by Sierra Metals. Only polymetallic feed sources are included in the LoM for the 2024 to 2029 period. Table 15.3 summarizes the metallurgical recoveries used in calculating the NSR factors.

Table 15-3: Metallurgical Recoveries (1)(2)

Process Recovery	Ag	Au	Cu	Pb	Zn
	(%)	(%)	(%)	(%)	(%)
Total Recovery (Polymetallic Feed)	71.96	20.04	78.19	82.81	84.1
Copper Concentrate	40.06	14.08	78.19	-	-
Lead Concentrate	21.55	6.06	-	82.81	-
Zinc Concentrate	9.54	-	-	-	84.1

Source: Sierra Metals, 2023

Values of 0 indicate negligible recovery or that the metal is not payable in the concentrate.

Totals may not sum due to rounding.

Smelter Terms

Table 15.4 presents a summary of the six-year average smelter terms (2024-2029) applicable to polymetallic feed. These terms encompass treatment and refining charges (TC/RC), price participation, anticipated penalties for deleterious elements, and the percentage payable for each element per concentrate. Additionally, the contracts feature clauses pertaining to price participation, with all payable metals subject to minimum deductions clauses.

Table 15-4: Summary of Smelter Terms by Concentrate

Material Type	Percent Payables				
	Ag (%)	Au (%)	Cu (%)	Pb (%)	Zn (%)
Polymetallic Feed					
Copper Concentrate	90	90	96.5	-	-
Lead Concentrate	95	95	-	95	-
Zinc Concentrate	70	-	-	-	85

Source: Sierra Metals, 2023

All payable metals are subject to minimum deduction or minimum grade in concentrate clauses Other charges including price participation and typical penalties

The NSR factors detailed in Table 15.5 were employed in computing the NSR value for each block, considering material type and estimated head grade for each block model. These factors are then applied to the estimated grades, expressed in US dollars per gram per tonne (US$/gpt) for gold and silver, and in US dollars per percent (US$/%) for lead, zinc, and copper.

Table 15-5: Summary of NSR Factors by Concentrate

	Net Smelter Return Factors by Concentrate				
Material Type	**Ag (US$/gpt)**	**Au (US$/gpt)**	**Cu (US$/%)**	**Pb (US$/%)**	**Zn (US$/%)**
Polymetallic Feed	0.346	4.588	47.337	15.448	12.346

Source: Sierra Metals, 2023

The resulting NSR equation coded into the block model was:

$$NSR = Cu*47.337 + Ag*0.346 + Pb*15.448 + Zn*12.346 + Au*4.588$$

15.2.2 Cut-off Value Estimation

The Net Smelter Return (NSR) value of each potential mining block underwent calculation and scrutiny against both economic and marginal cut-off thresholds. Economic cut-offs vary depending on the mining method and ore zone, encompassing direct and indirect mining costs, processing expenses, as well as general and administrative overheads. Blocks with an average NSR value surpassing the economic cut-off, possessing clear access, and integrated within mining areas, are categorized as economic and incorporated into reserves.

In certain instances, marginal blocks—defined as those falling below the economic cut-off but above the direct mining and processing costs—may be included in reserves if situated amidst or immediately adjacent to economic blocks, and if extraction of the marginal block necessitates no significant additional development. Blocks with an NSR value below the marginal cut-off are designated as waste.

The economic and marginal cut-offs used in this report are provided in Table 15.6.

Table 15-6: Economic and Marginal Cut-Grade Value by Mining Method (US$/t)

Mining Method	Marginal COG (US$/t)	Economic COG (US$/t)
CRAM	62.86	84.48
SLCM	39.71	61.33

Source: Sierra Metals, 2023

Note: SLCM: Sub-Level Caving, CRAM: Mechanized Cut and Fill

15.3 Reserve Estimate

The QP (Alonso Gonzales) audited the mining method, project infrastructure, environmental studies, permitting, capital and operating cost, economic analysis, and ore reserve estimates for the 22 mining zones that compose the Ore Reserves for Yauricocha Mine. QP (Alonso Gonzales) confirm that the reporting of Ore Reserve is in compliance with NI 43-101.

The QP (Alonso Gonzales) has undertaken a site visit to Yauricocha Mine. The site visit and meetings have led to a comprehensive understanding of all aspects for ore reserves estimation. QP (Alonso Gonzales) has undertaken detailed review of the mine plan, scheduling, ventilation, infrastructure requirements, geotechnical data and costing for the extraction zones within the Yauricocha Mine for all stages of the Ore Reserve Estimate. QP (Alonso Gonzales) is of the opinion that Sierra Metals has adopted a generally prudent and acceptable approach to their Ore Reserve Estimates.

Mineral Resource block models have been updated and reviewed by the Mineral Resource Competent Person. The block models contain descriptions of lithology, Mineral Resources classification, mineralisation, ore types, and other variables described in the model release. These block models were used for the underground mine design purpose using corporately approved assumptions for cost and metal prices.

Resource drilling in 2022 and 2023 has been dominated by infill, focusing on material conversion from Inferred to Indicated, and Indicated to Measured categories. Consequently, along with the depletion of 12 months of production, this has driven the change in Proved and Probable Ore Reserves.

No Inferred Mineral Resources are included in the Ore Reserves. Inferred material was assigned a zero-metal grade and only Stopes/SLC Rings able to carry this material as waste were included in the reported tonnes. Several aspects of dilution were considered, planned dilution, fill dilution and HW dilution. Planned dilution was included in the SLC rings generation.

Ground conditions at Yauricocha are generally fair with isolated areas of poor ground associated with shear zones and faults. Development ground support at this stage in the mine life of Yauricocha focuses on static stability requirements with surface support matched to the ground conditions.

All major infrastructure has been installed at Yauricocha and maintained to a high standard. There are infrastructure projects currently happening onsite for the continuous improvement of the operation and optimisation. There is high confidence that ventilation on demand infrastructure will ensure airflow requirements are met in pre-production areas.

Having been in production for several years, the mine’s operating and capital costs are understood in detail. Allowance for additional support requirements at depth and rehabilitation of development drives have been made to mitigate any under estimation of support costs. Significant change in costs is considered a low risk. Whilst the industry is in a high inflation environment, the net present value of the reserves remains positive.

Economic modelling of the total mining inventory shows positive annual operating cash flows. Applying the reviewed costs, metal prices and exchange rate, the mine has a substantially positive NPV. The discount rate is in line with Sierra Metals’ corporate economic assumptions and adjusted for any country risk premium (as applicable) based on an internal evaluation of the country risk for the location of the deposit.

The Mineral Reserves for the Yauricocha Mine are: Proven Reserve of 1.1 Mt at 0.86% copper, 0.39 g/t gold, 28.22 g/t silver, 1.71% zinc and 0.24% lead and Probable Reserves of 5.2 Mt at 1.05% copper, 0.36 g/t gold, 35.75 g/t silver, 1.85% zinc and 0.47% lead.

Mineral Reserves are reported at an NSR and are variable by mining method, the cut-off US$39.71/t for sub-level caving (SLC) and US$62.86/t for cut and fill (OCF) method. Mining recovery and dilution have been applied and are variable by mining area and proposed mining method. The effective date of the Mineral Reserves is 31 December 2023.

The consolidated Mineral Reserve statement for the Yauricocha Mine is presented in Table 15-7.The individual detailed Mineral Reserve tables by area are presented in Table 15.8.

Table 15-7: Individual Mineral Reserve Statement for Yauricocha Mine Areas as of 31 December 2023 (AGP)

Class	Tonnes (kt)	Grade							Value	Contained Metal				
		Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%)	As (%)	Fe (%)	NSR (US$/t)	Cu (Mlb)	Au (koz)	Ag (koz)	Zn (Mlb)	Pb (Mlb)
Proven	1,114	0.86	0.39	28.22	1.71	0.24	0.13	21.98	77.08	21.11	13.86	1,011	42.10	5.90
Probable	5,239	1.05	0.36	35.75	1.85	0.47	0.15	21.30	93.89	121.57	59.94	6,021	213.55	53.98
Total	**6,353**	**1.02**	**0.36**	**34.43**	**1.83**	**0.43**	**0.15**	**21.42**	**90.94**	**142.68**	**73.80**	**7,032**	**255.65**	**59.87**

Notes to Table 15-7:

- Mineral Reserves have been classified in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") Definition Standards on Mineral Resources and Mineral Reserves, whose definitions are incorporated by reference into NI 43-101.
- All figures are rounded to reflect the relative accuracy of the estimates. Totals may not sum due to rounding.
- The consolidated Yauricocha Reserve Estimate is comprised of Proven and Probable material.
- Mineral Reserves are reported at Cut-Off values (COV)'s based on 2023 actual metallurgical recoveries and 2024 smelter contracts.
- Reporting cut-off value is an NSR and are variable by mining method:
- US$39.71/t. (SLC) and US$62.86/t (OCF)
- NSR was calculated as follows:
- NSR =Cu∗47.337+Ag ∗0.346+Pb ∗15.448+Zn∗12.346 +Au ∗4.588
- Metal prices for the NSR formulas are: US$3.77/lb Cu, US$1,711.00/ oz Au; and US$22.55/ oz Ag, US$0.94/lb Pb, and US$1.17/lb Zn.
- Mining recovery and dilution have been applied and are variable by mining area and proposed mining method.

Table 15-8: Individual Mineral Reserve Statement for Yauricocha Mine Areas as of 31 December 2023 (AGP)

Class	Tonnes (kt)	Grade							Value	Contained Metal				
		Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%)	As (%)	Fe (%)	NSR (US$/t)	Cu (Mlb)	Au (koz)	Ag (koz)	Zn (Mlb)	Pb (Mlb)
Mina Central														
Proven	720.00	0.75	0.38	18.83	1.23	0.11	0.11	22.66	60.51	11.86	8.87	435.78	19.57	1.68
Probable	1,437.7	0.82	0.42	19.44	1.48	0.08	0.08	23.16	66.99	25.95	19.42	898.49	47.05	2.57
Proven + Probable	2,157.8	0.79	0.41	19.23	1.40	0.09	0.09	23.00	64.82	37.81	28.29	1,334.28	66.62	4.25
Cuye														
Proven	90.50	0.85	0.45	15.70	1.55	0.06	0.08	19.01	67.90	1.70	1.30	45.68	3.10	0.12
Probable	1,540.2	1.11	0.41	14.38	0.80	0.06	0.10	23.38	70.38	37.83	20.31	712.09	27.16	1.98
Proven + Probable	1,630.6	1.10	0.41	14.45	0.84	0.06	0.10	23.14	70.24	39.53	21.62	757.76	30.25	2.10

Class	Tonnes (kt)	Grade							Value	Contained Metal				
		Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%)	As (%)	Fe (%)	NSR (US$/t)	Cu (Mlb)	Au (koz)	Ag (koz)	Zn (Mlb)	Pb (Mlb)
Contacto Sur Medio II														
Proven														
Probable	26.50	0.16	0.19	183.87	8.40	5.73	0.12	7.64	264.22	0.09	0.16	156.58	4.91	3.35
Proven + Probable	26.50	0.16	0.19	183.87	8.40	5.73	0.12	7.64	264.22	0.09	0.16	156.58	4.91	3.35
Contacto Oriental														
Proven	16.90	0.24	0.08	66.88	7.00	0.47	0.10	24.48	128.78	0.09	0.04	36.38	2.61	0.18
Probable	53.70	0.22	0.08	45.44	5.65	0.42	0.09	19.90	102.84	0.26	0.14	78.38	6.69	0.50
Proven + Probable	70.60	0.23	0.08	50.58	5.98	0.44	0.09	21.00	109.06	0.35	0.18	114.76	9.30	0.68
Contacto Occidental														
Proven	4.40	0.15	0.09	36.92	8.55	0.12	0.04	9.27	127.76	0.01	0.01	5.18	0.82	0.01
Probable	8.70	0.16	0.15	34.51	4.49	0.09	0.05	9.46	77.05	0.03	0.04	9.65	0.86	0.02
Proven + Probable	13.10	0.16	0.13	35.31	5.85	0.10	0.04	9.40	93.98	0.05	0.05	14.83	1.68	0.03
Mascota Poli Norte														
Proven	1.30	1.12	0.24	86.47	7.92	4.08	0.13	7.67	245.06	0.03	0.01	3.64	0.23	0.12
Probable	49.90	0.51	0.46	117.11	9.44	6.04	0.09	10.02	276.83	0.57	0.74	188.06	10.39	6.65
Proven + Probable	51.30	0.53	0.46	116.33	9.40	5.99	0.09	9.96	276.02	0.60	0.75	191.70	10.62	6.77
Mascota Poli Este														
Proven														
Probable	76.30	0.58	0.41	69.43	5.02	0.83	0.12	13.00	128.07	0.97	1.02	170.31	8.45	1.40
Proven + Probable	76.30	0.58	0.41	69.43	5.02	0.83	0.12	13.00	128.07	0.97	1.02	170.31	8.45	1.40
Mascota Poli Sur														
Proven														
Probable	4.70	0.22	0.21	55.81	5.13	0.35	0.09	13.46	99.23	0.02	0.03	8.35	0.53	0.04
Proven + Probable	4.70	0.22	0.21	55.81	5.13	0.35	0.09	13.46	99.23	0.02	0.03	8.35	0.53	0.04
Mascota Poli Sur II														
Proven														
Probable	6.10	0.46	0.27	43.34	2.81	0.24	0.10	14.00	76.23	0.06	0.05	8.54	0.38	0.03
Proven + Probable	6.10	0.46	0.27	43.34	2.81	0.24	0.10	14.00	76.23	0.06	0.05	8.54	0.38	0.03
Esperanza Sur														
Proven	35.9	0.26	0.33	32.16	5.84	0.31	0.15	15.45	102.01	0.21	0.38	37.10	4.62	0.25
Probable	34.2	0.22	0.26	24.38	4.89	0.28	0.13	14.93	84.76	0.16	0.28	26.79	3.69	0.21
Proven + Probable	70.1	0.24	0.29	28.36	5.38	0.30	0.14	15.20	93.59	0.37	0.66	63.89	8.31	0.46

Class	Tonnes (kt)	Grade							Value	Contained Metal				
		Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%)	As (%)	Fe (%)	NSR (US$/t)	Cu (Mlb)	Au (koz)	Ag (koz)	Zn (Mlb)	Pb (Mlb)
Butz Bx														
Proven														
Probable	9.20	0.17	0.26	36.64	6.73	1.50	0.05	6.66	127.95	0.03	0.08	10.89	1.37	0.31
Proven + Probable	9.20	0.17	0.26	36.64	6.73	1.50	0.05	6.66	127.95	0.03	0.08	10.89	1.37	0.31
Gallito Sur														
Proven	0.80	0.32	0.11	46.98	1.52	0.68	0.10	8.42	61.08	0.01	0.00	1.14	0.03	0.01
Probable	10.80	0.31	0.11	72.67	1.63	0.87	0.16	8.33	74.01	0.07	0.04	25.35	0.39	0.21
Proven + Probable	11.60	0.31	0.11	71.00	1.62	0.85	0.15	8.33	73.17	0.08	0.04	26.49	0.41	0.22
Esperanza														
Proven	204.90	1.34	0.41	55.61	2.25	0.69	0.19	21.67	123.05	6.05	2.69	366.28	10.18	3.11
Probable	1,469.7	1.36	0.26	58.48	2.28	0.80	0.26	19.71	126.33	44.00	12.37	2,763.26	74.02	26.03
Proven + Probable	1,674.6	1.36	0.28	58.13	2.28	0.79	0.25	19.95	125.93	50.05	15.06	3,129.54	84.20	29.14
Esperanza Distal														
Proven	3.80	0.57	0.14	63.61	5.97	2.95	0.15	12.39	168.85	0.05	0.02	7.79	0.50	0.25
Probable	111.60	0.77	0.21	71.74	4.24	1.92	0.19	16.43	144.34	1.90	0.75	257.51	10.43	4.72
Proven + Probable	115.40	0.77	0.21	71.48	4.29	1.95	0.19	16.30	145.15	1.95	0.76	265.30	10.93	4.97
Fortuna 7														
Proven														
Probable	0.40	1.06	0.22	23.75	1.50	0.35	0.29	10.00	83.37	0.01	0.00	0.32	0.01	0.00
Proven + Probable	0.40	1.06	0.22	23.75	1.50	0.35	0.29	10.00	83.37	0.01	0.00	0.32	0.01	0.00
Fortuna 8														
Proven	34.80	1.39	0.46	61.87	0.55	0.20	0.31	26.55	99.48	1.07	0.52	69.26	0.42	0.16
Probable	238.00	0.76	0.33	58.51	1.55	0.53	0.16	21.09	85.33	4.01	2.51	447.80	8.14	2.79
Proven + Probable	272.90	0.85	0.35	58.94	1.42	0.49	0.18	21.79	87.14	5.08	3.03	517.06	8.57	2.94
Fortuna Norte														
Proven	0.10	0.11	0.16	27.62	6.22	1.15	0.05	4.84	109.73	0.00	0.00	0.08	0.01	0.00
Probable	41.10	0.67	0.37	53.95	7.36	2.31	0.27	13.55	178.51	0.61	0.49	71.28	6.66	2.09
Proven + Probable	41.20	0.67	0.37	53.89	7.35	2.31	0.27	13.53	178.35	0.61	0.49	71.36	6.68	2.09
Fortuna Pamela														
Proven														
Probable	85.5	2.22	0.42	46.09	1.02	0.42	0.37	18.84	142.09	4.18	1.15	126.66	1.93	0.80
Proven + Probable	85.5	2.22	0.42	46.09	1.02	0.42	0.37	18.84	142.09	4.18	1.15	126.66	1.93	0.80

Class	Tonnes (kt)	Grade							Value	Contained Metal				
		Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)	Pb (%)	As (%)	Fe (%)	NSR (US$/t)	Cu (Mlb)	Au (koz)	Ag (koz)	Zn (Mlb)	Pb (Mlb)
Kimberly														
Proven														
Probable	17.1	1.45	0.24	27.98	0.05	0.01	0.02	20.28	80.32	0.55	0.13	15.39	0.02	0.00
Proven + Probable	17.1	1.45	0.24	27.98	0.05	0.01	0.02	20.28	80.32	0.55	0.13	15.39	0.02	0.00
Privatizadora														
Proven														
Probable	3.8	0.30	0.41	57.93	2.17	0.38	0.08	21.57	68.69	0.02	0.05	7.02	0.18	0.03
Proven + Probable	3.8	0.30	0.41	57.93	2.17	0.38	0.08	21.57	68.69	0.02	0.05	7.02	0.18	0.03
Carmencita														
Proven	0.9	1.20	0.34	84.05	0.39	0.17	0.12	17.04	94.74	0.02	0.01	2.56	0.01	0.00
Probable	6.1	1.31	0.32	101.80	0.26	0.14	0.11	16.46	103.92	0.18	0.06	20.01	0.04	0.02
Proven + Probable	7.1	1.29	0.32	99.42	0.28	0.14	0.12	16.54	102.69	0.20	0.07	22.56	0.04	0.02
Sulma														
Proven	0.2	0.15	0.58	44.49	1.78	1.56	0.05	9.14	71.44	0.00	0.00	0.22	0.01	0.01
Probable	7.2	0.33	0.46	78.38	1.64	1.51	0.06	9.70	88.52	0.05	0.11	18.03	0.26	0.24
Proven + Probable	7.3	0.33	0.46	77.66	1.64	1.51	0.06	9.69	88.15	0.05	0.11	18.25	0.26	0.24

Notes to Table 15-8:

- Mineral Reserves have been classified in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") Definition Standards on Mineral Resources and Mineral Reserves, whose definitions are incorporated by reference into NI 43-101.
- All figures are rounded to reflect the relative accuracy of the estimates. Totals may not sum due to rounding.
- The consolidated Yauricocha Reserve Estimate is comprised of Proven and Probable material
- Mineral Reserves are reported at Cut-Off values (COV)'s based on 2023 actual metallurgical recoveries and 2024 smelter contracts.
- Reporting cut-off value is an NSR and are variable by mining method:

US$39.71/t. (SLC) and US$62.86/t (OCF)

- NSR was calculated as follows:

NSR =Cu∗47.337+Ag ∗0.346+Pb ∗15.448+Zn∗12.346 +Au ∗4.588

- Metal prices for the NSR formulas are:

US$3.77/lb Cu, US$1,711.00/ oz Au; and US$22.55/ oz Ag, US$0.94/lb Pb, and US$1.17/lb Zn.

- Mining recovery and dilution have been applied and are variable by mining area and proposed mining method.

15.4 Other Relevant Factors

Sierra Metals received the required permit to develop and mine below the 1120 level to the 1320 level at its Yauricocha Mine in Peru. The company announced the approval by the Peruvian government as of the 21 February 2024, allowing to access 79% of the reserves declared in this document. The preparation of the MEIA for exploration, development, and mining below the 1320 level, which includes the remaining reserves, is currently in process.

A delay to the Yauricocha Shaft project could impact the overall mine plan by reducing extraction rates or delaying extraction of lower ore bodies. Any additional shaft deepening will need to be justified by adding additional mineral reserves to the LoM plan through successful exploration programs.

An 8th expansion lift will be added to the existing tailings storage facility (TSF). Environmental Impact Studies and additional permits are required prior to beginning construction of the 8th and 9th lifts of the TSF.

The QPs are not aware of any information not already discussed in this Report, which would affect their interpretation or conclusions regarding the subject property. There is no identified material naturally occurring risks. The legal agreements are in place and there are no outstanding material legal agreements. The government agreements and approvals are in place with no unresolved material matters on which the extraction of the Ore Reserves is contingent.

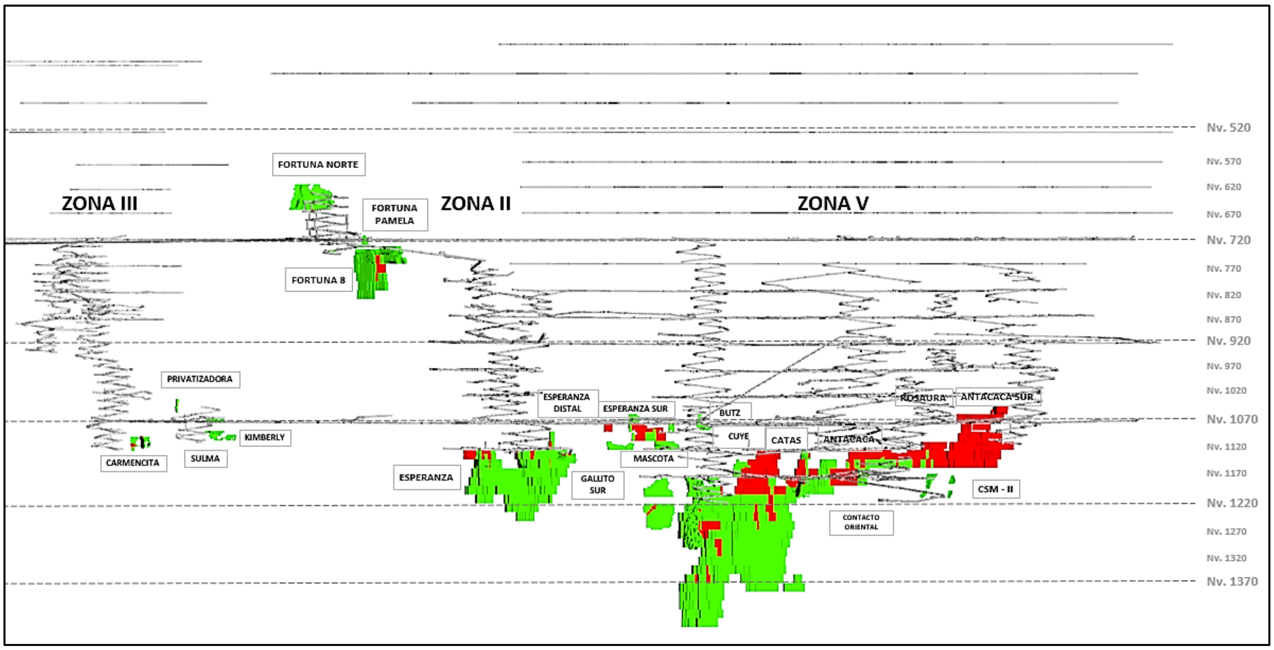
16 MINING METHODS

The mine is divided into three primary mining areas categorized by geographical location:

20) Zone III
21) Zone II
22) Zone V

The delineation of these mining areas is illustrated in plan view in Figure 16-1.

Figure 16-1: Yauricocha Mine Showing Mining Areas (Plan View)



Source: SRK, 2024

Access to the Central Mine for personnel at different operational levels is facilitated through the Central Shaft. Additionally, there is the Yauricocha Tunnel, measuring 5.0 km in length with a section of 3.50m x 3.50m, connecting the Central Shaft to the Chumpe concentrator plant (Level 720). Access to the various mineralized bodies at different levels is provided through galleries, ramps, and raises. Auxiliary services are equipped with conventional raises and raise borers.

Extraction of minerals and overburden from Levels 1070 and 1120 of the Esperanza Body is conducted via the 950 Pocket of the Central Shaft. Similarly, extraction of minerals and overburden from Levels 1020, 1070, and 1120 of different bodies (Esperanza, Rosaura, and Antacaca Sur) is carried out through the 1070 Pocket of the Mascota Shaft. It's worth noting that all mine levels are integrated with the Central and Mascota Shafts. Additionally, the Klepetko Tunnel at Level 720 serves as the main drainage and transportation conduit with locomotives.

Access to the Cachi-Cachi Mine for personnel at the operational levels located in Cachi-Cachi is facilitated through Level 720 via the Yauricocha Tunnel, from Chumpe to the Cachi-Cachi Shaft and then through it to Levels 820, 870, 920, and 970. Access to the various mineralized bodies at different levels is provided through galleries, ramps, and raises. Auxiliary services are equipped with conventional raises and raise borers.

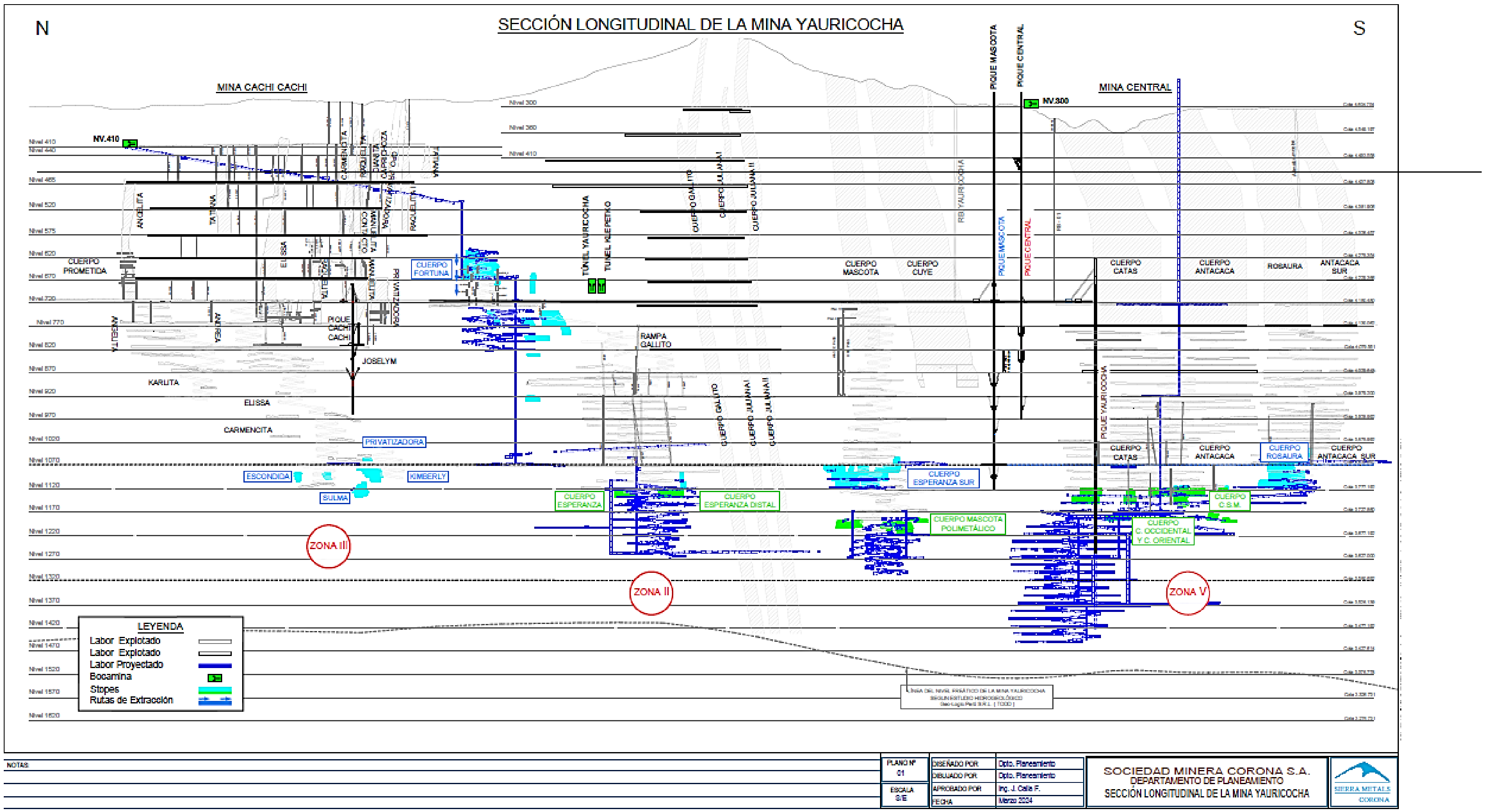
Extraction of minerals and overburden from Level 920 is conducted via the 900 Pocket of the Cachi-Cachi Shaft. This mine communicates through a 3.00 x 3.00 crosscut of 900m in length intercepting the Klepetko Tunnel and the Yauricocha Tunnel, both of which serve as drainage and provide clean air entry to the Cachi-Cachi Mine.

16.1 Mine Access and Materials Handling

Access to the mine is facilitated through the Mascota Shaft, Central Shaft, or Klepetko Tunnel at the 720 level. Ramps serve to connect levels and sub-levels within the primary mining areas, as depicted in Figure 16-2. Previously mined-out regions are delineated in pink, existing development openings are represented in black, and designed development is depicted in blue. Planning blocks for the Life of Mine (LoM) are provided for reference, color-coded according to production year.

The main levels are spaced 50 metres apart, increasing to 100 metres below the 1070 level. Ore and waste generated at Mina Central are transported to a series of level ore passes by Load-Haul-Dump (LHD) vehicles. These ore passes then load into rail cars, which are transported to the loading pockets at the Mascota Shaft for hoisting to the 720 main haulage level. At Cachi-Cachi, production from lower levels is hoisted to the 720 main haulage level via a winze. Construction of the Yauricocha Shaft is underway to facilitate mining operations at depths between the 1170 level and the 1370 level, with commissioning expected in 2022. Ore is transported to the mill by rail through the Klepetko and Yauricocha Tunnels. The recent construction of the Yauricocha Tunnel has enhanced haulage capacity to the mill by providing additional infrastructure.

Figure 16-2: Yauricocha Long Section Showing Mining Areas and Ore Zones (Looking Northeast)



Source: Sierra Metals, 2024

16.2 Current Mining Methods

The selection of mining methods across the diverse ore zones within Yauricocha is primarily driven by the specific mineralization styles present in each area. Mineralization at Yauricocha exhibits two distinct styles, characterized by variances in scale, continuity, and structural development:

- Cuerpos Massivos (Large Bodies): These bodies manifest along major structures with significant vertical extension, spanning several hundreds of metres. They demonstrate consistent geometry and substantial strike lengths, thus lending themselves to bulk mining techniques.
- Cuerpos Chicos (Small Bodies): These smaller mineralized bodies typically exhibit high grades but are often less continuous and irregular in shape compared to Cuerpos Massivos. They are commonly mined using high-selectivity methods such as overhand cut and fill. Notably, those in the Cachi-Cachi area are designated as "Cachi-Cachi," while those proximate to Mina Central are collectively termed "Cuerpos Pequeños."

The principal mining methods employed are:

- Mechanized Sub-Level Caving for Cuerpos Massivos: This method accounts for the majority, representing 80% of production. It is employed in mining operations at Mina Central and Esperanza.
- Mechanized Overhand Cut and Fill for Cuerpos Chicos: This method is utilized for mining Cuerpos Chicos, specifically in the Cachi-Cachi, Cuye and Mascota area.

16.3 Mine Method Design

The Sub Level Caving (SLC) method originated as an approach suitable for incompetent rock that collapsed immediately after support removal. Sturdily supported galleries were constructed across the mineralized body, support was removed, and the mineral spontaneously collapsed, ready for transport out of the mine.

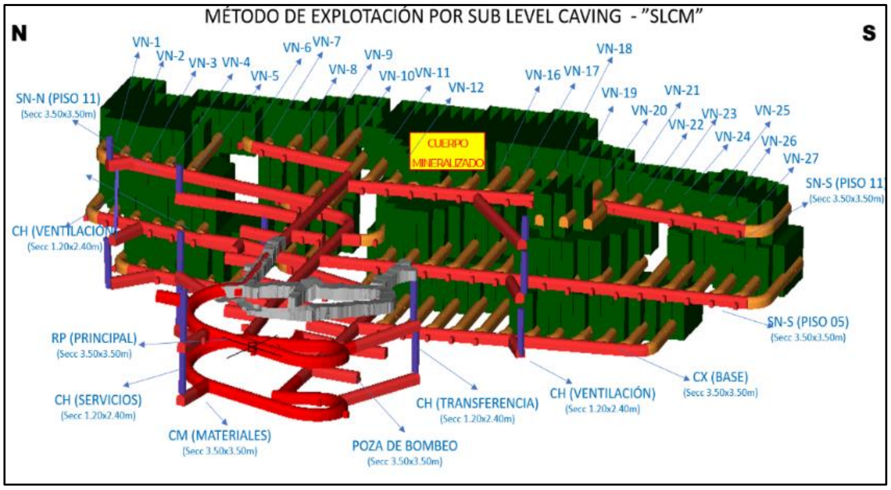
SLC is preferably applied to tabular, vertical, or sub-vertical bodies of significant dimensions in both thickness and vertical extent. It is also applicable to massive deposits.

The surrounding rock, or more specifically the overlying rock, should be poorly competent so that it collapses easily, filling the void left by the extraction of the mineralized rock. It is desirable for the mineralized rock and overlying waste material to be easily distinguishable and separable, minimizing mixing and consequently mineral dilution.

In essence, the method involves dividing the mineralized body into vertically spaced sublevels at intervals of 16.7 m. A network of horizontal excavations known as "windows," spaced 9.0 m apart (center to center), is developed on each floor, transversely crossing the body.

The 3.50 x 3.50-m windows of a particular sublevel are located between and equidistant from the windows of the immediately neighboring sublevels. Thus, the entire mineralized section is covered by a mesh of galleries arranged in a rhomboidal configuration. The developments form a ramp that provides access through crosscuts to the bypasses. These workings are parallel to the strike of the mineralized structure, preferably located in limestone sectors, spaced 10 to 15 m from the contact, generally following the contour of the mineralized body.

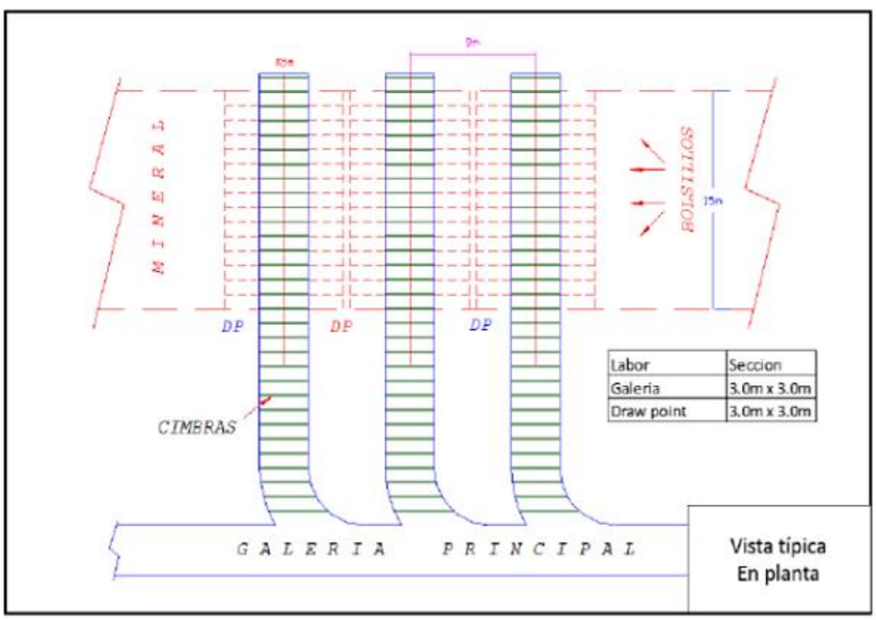
Figure 16-3: Sub-Level Caving Design



Source: Sierra Metals, 2024

The extraction operation begins at the upper sublevel, retreating from the ends towards the central access and from the farthest or hanging wall limit of the mineralized body towards the adjacent or footwall limit. The geometric design results of mining should allow for the planning of unit operations and mining sequence of the exploitation system with improved operational standards. This, in turn, maximizes production, enhances mining processes, and contributes to reducing preparation and development costs.

Figure 16-4: Mine Development Design



Source: Sierra Metals, 2024

The cut and fill mining method is proposed for the small high-grade ore bodies (Carmencita, Privatizadora, Kimberky, Fortuna Norte, Butz, Fortuna 7, Fortuna 8, and Fortuna Norte), which have a dip greater than 80°, under the following main conditions:

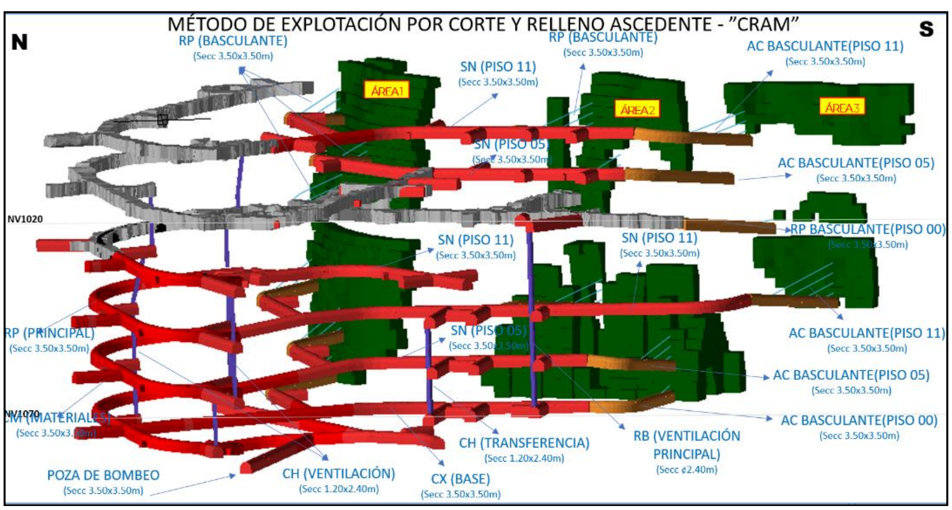
- The RMR of the surrounding walls must be greater than or equal to 40 RMR.
- Vein thickness greater than 1.50 m.

For design purposes, the following are considered:

- Detrital filling.
- Transportation means through the use of scooptrams.
- Rock resistance to determine the cutting height.
- Appropriate drilling equipment to determine the quantity of equipment.
- Size and continuity of the mineralized structure to determine the size of transport equipment.
- Access preparation to the structure with intermediate levels, with optimal spacing of 40 to 50 m.
- Estimation of production magnitude according to the length of the structure (preparation, filling, mining, and extraction).
- Access ramps with slopes of 12° to 20°.
- Design of mineral and filling chute galleries.
- Support bridges and/or pillars.

It is important to define the levels of exploitation blocks delimited by a gallery where the mineralized structure develops. The gallery has a section of 3.50x3.50m. The bench height is 3.50 m (floor), the first access to be undercut covers 5 benches, and the maximum gradient is 14%. The ore is extracted in horizontal and/or vertical strips starting from the bottom of a bench and progressing vertically. When the entire strip has been extracted, the corresponding volume is filled with waste material (filling), which serves as a working floor for the workers and at the same time supports the walls, and in some special cases, the roof.

Figure 16-5: Cut and Fill Design



Source: Sierra Metals, 2024

16.4 Mine Cycle

16.4.1 Drilling, Blasting, Loading and Hauling

Mechanized drilling will be carried out using single-boom electro-hydraulic jumbos with drilling rods of 8, 10, 12, and 14 feet, equipped with 1.1/2-inch drill bits for breast drilling in the cut and fill mining method for general sections of 4.0 x 3.5. For the Sub Level Caving (SLC) method, Muki jumbos with a length of 16 to 20 m are used according to the bench height.

For wide stopes and unstable walls, drilling will be horizontal (breasting) to control crown stability, and only in competent terrain of quality IIIA - IIIB will drilling be inclined at 60º - 70º or vertical.

To initiate blasting, a free face is drilled and then blasting is done in breast drilling across the stope; the sequence and firing order are in rows, according to the stability of the area, the length of the sections to be blasted fluctuates between 12 feet, and in SLC stopes, 03 rows are blasted with a bench length of 16 m.

For blasting, Emulnor 1000 and Emulnor 3000 dynamite will be used. Assembled guides, micro-delay guides, and Fanel electric detonators will be employed. Blasting will be controlled to reduce the effects of vibrations that weaken stope crowns. All blasting in the mine will be conducted within established firing schedules.

According to the mining method and for openings less than a 3.5 m section, the use of mechanized scaling equipment is not required; therefore, scaling is carried out with aluminum scaling bars, and for support, bolt installation equipment is used.

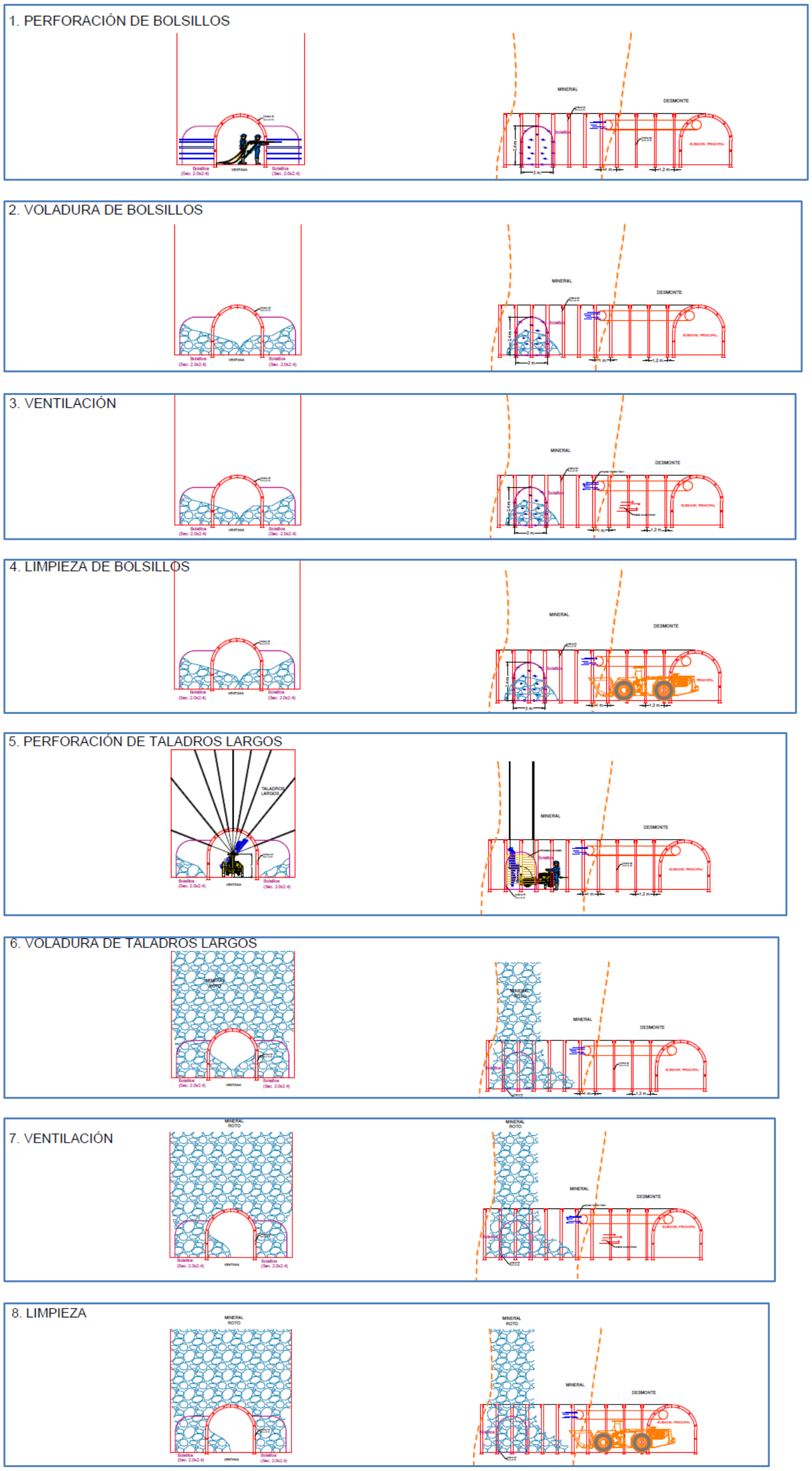
Loose rocks detected on the roof, face, and walls of the excavation or mining operation will be controlled (scaled) using scaling bars of 4, 6, 8, and 10 feet. In the Yauricocha accumulation unit, when excavating within the mineralized structure to be extracted through the SLC method, H6 sets with dimensions of 3.5 x 3.8 are used to ensure the stability of the workings during exploitation.

Ground support aims to provide stability to various mining operations such as galleries, crosscuts, sub-levels, raises, stopes, ramps, etc. This can be done in two ways. Firstly, manually using jackleg or stopper drilling equipment for the installation of friction bolts (split sets) and/or anchoring bolts (helical bolts). Secondly, using mechanized drilling equipment such as the Small Bolter jumbo.

The mucking of waste material in preparation faces is done using Load-Haul-Dump (LHD) equipment, which performs the functions of loading, hauling, and dumping material from one location to another. The equipment has capacities of 2.5 and 4.1 yd^3 and can travel a maximum distance of 150 m to dump at storage points, then assist in loading dump trucks with a capacity of 20 tons and disposing of the waste at filling points.

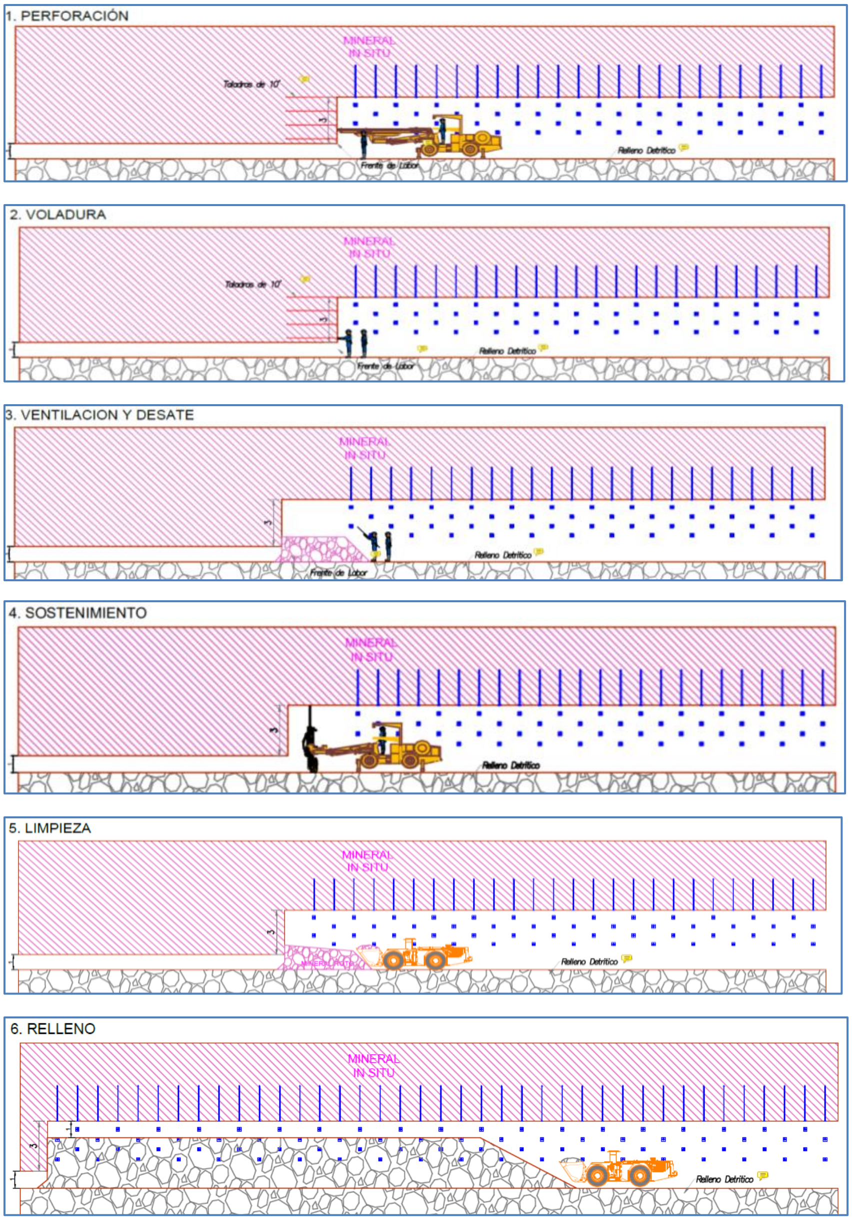
On the other hand, ore mucking follows the same procedure except that the dump trucks will transport the material to pockets in the shaft located at level 1070. The ore will then be hoisted to level 720 and loaded onto 180 ft^3 mine cars with a capacity of 7 – 8 tons, which will in turn be moved by locomotive along the trolley line allowing the material to be transported to the ore stockpiles located near the concentrator plant at Chumpe.

Figure 16-6: SLC Mining Cycle



Source: Sierra Metals, 2024

Figure 16-7: Cut and Fill Mining Cycle



Source: Sierra Metals, 2024

16.5 Mine Method Parameters

Decisions regarding the utilization of sub-level caving and cut-and-fill mining techniques hinge upon comprehensive assessments of geotechnical and hydrogeological data. Factors such as the magnitude of the ore body, characteristics of the rock mass, and anticipated water inflows are pivotal considerations in determining the most suitable mining method and establishing relevant design parameters. These factors collectively inform the selection of an optimal approach to mining, ensuring efficiency and effectiveness in operations while mitigating potential risks associated with geological and hydrological conditions.

The prevailing mining methodologies implemented at Yauricocha encompass:

- Transverse Sub-Level Caving (SLC), predominantly utilized for the larger ore bodies, constituting approximately 80% of operations.
- Overhand Cut and Fill, employed for narrower ore bodies, accounting for the remaining 20% of mining activities.

As per current plans, mining operations are projected to extend from depths of 500 metres to approximately 900 metres beneath mountain ridges. Furthermore, the available resources are estimated to extend to depths of at least 1200 metres, indicative of the mine's substantial depth potential.

16.6 Parameters Relevant to Mine Designs and Plans

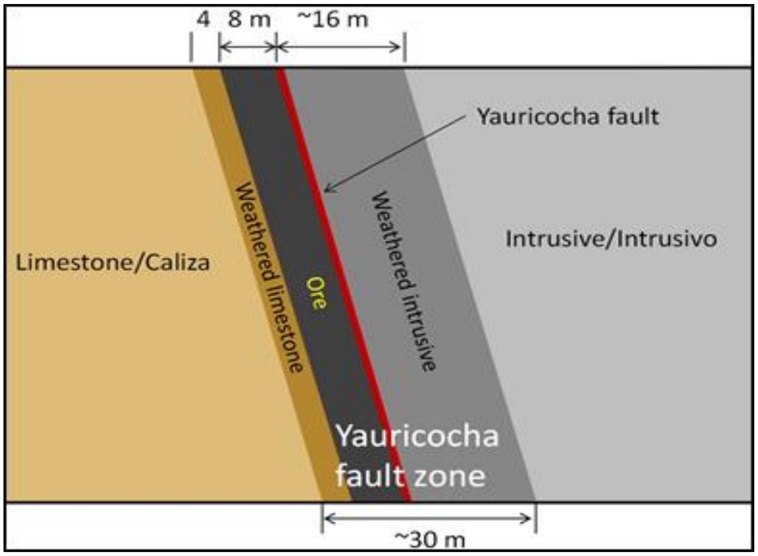
16.6.1 Geotechnical

The geological composition of the Yauricocha deposit encompasses multiple ore zones situated along dilatational structural features linked to the Yauricocha Fault. Typically, these ore zones are confined between a limestone Footwall (FW) and an intrusive Hanging Wall (HW). Characteristically, the ore zones exhibit steep dips, with true widths ranging from narrower dimensions, around 3 or 4 metres (referred to as "cuerpos chicos"), to broader extents, spanning 10 to 15 metres in the Mina Central area, and occasionally exceeding 20 metres.

The wall rocks surrounding the ore zones commonly undergo alteration, often to a significant degree. Altered limestone FW rock is characterized as a weakened breccia, exhibiting variable width. Conversely, altered intrusive HW material can reach widths of up to 20 metres and is described as a blocky, low-strength rock mass, with clay infill present within joints.

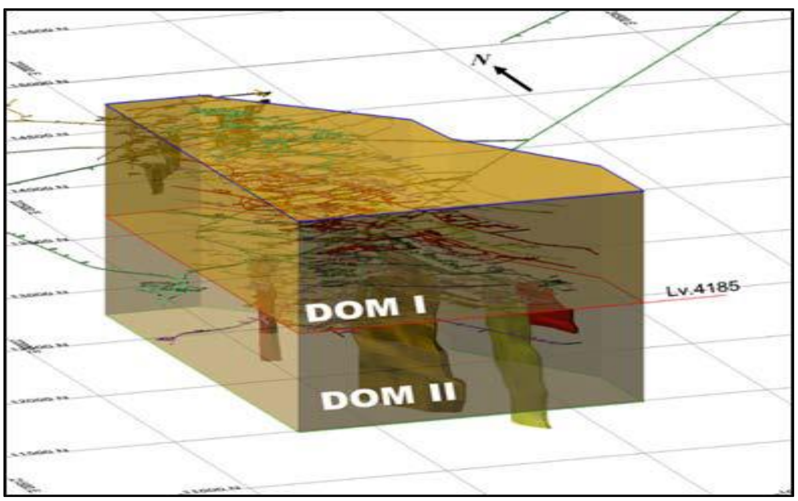
A comprehensive illustration of the fundamental geotechnical model is depicted in Figure 16-8 and Figure 16-9. This model serves as a foundational framework for understanding the geological characteristics and structural complexities inherent within the Yauricocha deposit.

Figure 16-8: Conceptual Geotechnical Rock Mass Model



Source: SRK, 2019

Figure 16-9: Conceptual Structural Domain Model (isometric view)



Source: SRK, 2019

The limestone domain predominates throughout the underground workings, encompassing a significant portion of the site. Despite geological variations within the limestone types, both the RMRB (89) assessments and laboratory testing indicate similar mechanical behavior across diverse limestone types, grouping them under a singular geotechnical unit termed "fresh limestone." Adjacent to the orebody, an altered breccia sub-domain is observed along the immediate footwall contact. This sub-domain consists of weakened altered material, characterized by field observations as discontinuous and exhibiting variable thickness.

Within the hangingwall domain, two distinct sub-domains are identified: i) Intrusive, and ii) Weathered Intrusive. The intrusive sub-domain comprises fresh rock of good to very good quality, with RMRB (89) values ranging from 54 to 65 and intact rock strength ranging between 146 MPa and 197 MPa, as indicated by data collected from drainage drillholes. Conversely, the weathered intrusive sub-domain, situated proximal to the Yauricocha fault, comprises altered intrusive material characterized by low rock quality and strength. This material is typified by cubic blocks of intrusive material with clay infilling, contributing to a significant reduction in rock mass strength. Field observations suggest that the highly weathered intrusive hanging wall extends approximately 20 metres from the fault, with increased clay infill closer to the fault.

The ore material is delineated as a distinct geotechnical domain due to its markedly weaker characteristics. Field observations, core logging, and laboratory tests collectively indicate granular behavior within this unit. To assess the impact of moisture on strength parameters, remolded multi-stage undrained triaxial tests were conducted at various moisture levels (ranging from 2% to 8%). Results illustrate a reduction in strength with increasing moisture content, particularly evident in decreased cohesion at higher moisture levels, while the internal friction angle experiences only a slight reduction.

In this technical report update, Sierra Metals provided the QPs with geological models for the Cuerpos Chicos, Esperanza, Mascota, Mina Central, and Cachi-Cachi mining areas. However, these models lack wireframes detailing the geotechnical domains and sub-domains described above. Sierra Metals indicated their omission of calibrated 3D geotechnical models from their practices. Such models, integrating lithology, structures, and rock mass, are considered standard industry practice, and should be updated to enhance understanding and management of geological complexities.

Geotechnical core logging was conducted with the primary objective of delineating structural domains within the geological formations. Various rock mass characteristics were meticulously recorded, including:

- Lithology
- Faulting and shearing
- Structure orientation for identifying joint sets.
- Estimation of intact rock strength
- Rock Quality Designation (RQD)
- Number of discontinuities (joints)
- Average fracture frequency
- Joint spacing

Furthermore, data on discontinuity characteristics were gathered, encompassing:

- Openness/aperture
- Planarity
- Roughness
- Infilling/coating
- Presence of groundwater staining

This comprehensive approach to data collection and analysis facilitates a thorough understanding of the geological and geotechnical complexities inherent within the site.

A comprehensive geotechnical database has been meticulously developed, incorporating data gathered from various sources, including:

- 500 metres of core logging, utilizing RMR76/89 methods, and mapping of 6,000 metres of underground drives as part of the 2015 technical study.
- Geotechnical logging of 3,454 metres of core obtained from 19 underground drillholes, employing RMR76/89 and Q/Q' methods.
- Geological and structural mapping was conducted across 336,459 metres of underground drives.
- Geotechnical laboratory tests conducted in 2015 and 2018, encompassing:
- 24 Triaxial Tests
- 41 Uniaxial Compressive Strength (UCS) Tests
- 34 Point Load Tests
- 58 Elastic Modulus Measurements (with specific test method details not provided)

Table 16-1 presents a concise summary of the reported geotechnical characteristics for the main country rocks, with mean values sourced from SRK (2019) and Sierra (2024). This robust geotechnical database serves as a fundamental resource for comprehensive analysis and decision-making in the mining operations at hand.

Table 16-1: Summary of Geotechnical Characteristics for Main Lithological Units (mean values)

Lithology	RMR89	UCS (MPa)	E (GPa)
Limestones	59 – 60	58	35
Skarn	59	74	87
Granodiorite	56	-	-
Monzonite	63	107	92
Breccia	-	-	17

Source: AGP Mining 2024

The latest geotechnical attributes pertaining to the ore zones and wall rock domains, as reported by Sierra Metals in 2024, have been collated and are presented in Table 16-2. These statistics provide mean values for specific sections within the mine, offering valuable insights into the current geotechnical conditions that inform operational decisions and strategic planning.

Table 16-2: Summary of Geotechnical Characteristics for Ore Zones and Wall Rock Domains

Lithology	RMR89	UCS (MPa)	mi
Limestone FW	43 - 54	58	11
Ore zones	<21 – 22		
Intrusive HW	47 - 53	164	32

Source: AGP Mining 2024

Visual representations of rock mass conditions are depicted in the accompanying photographs for the immediate footwall, ore zone, and immediate hanging wall within the D_ESPS_A_18_23_15 area. These images serve as invaluable tools for assessing geological features and structural integrity, aiding in the formulation of informed decisions regarding mining operations and geotechnical management strategies.

Figure 16-10: Limestone Immediate Footwall and Ore Zone (from 73.7 m)

Source: Sierra Metals 2024

Figure 16-11: Ore Zone

Source: Sierra Metals 2024

Figure 16-12: Intrusive Immediate Hanging wall

Source: Sierra Metals 2024

Utilizing Kriging methodologies, block models depicting Rock Mass Rating (RMR) values have been constructed based on composited core logging data. Table 16-3 provides a comprehensive summary of both the mean and median values across significant domains, offering a consolidated view of the geotechnical characteristics essential for informed decision-making and strategic planning within the mining operations.

Table 16-3: Summary of RMR89 values derived from block model

Zone	RMR89	
	Mean	Median
Central FW	42	42
Central Ore zones	29	27
Esperanza	42	43
Cachi Cachi	34	33

Source: AGP Mining 2024

Analysis of rock strength test data indicates the presence of at least two distinct types of intrusive materials, exhibiting varying strengths estimated at approximately 100 MPa and 175 MPa, respectively. Ground conditions for the country rocks have been assessed as ranging from "Poor" to "Fair", while ore zones are characterized by ratings ranging from "Very Poor" to "Poor". Notably, ore zones exhibit characteristics indicative of "soil behavior", with recorded moisture contents ranging between 10% and 18%.

To provide visual insight into typical development ground conditions, representative photographs are reproduced in Figures 16-13 through Figure 16-15. These images offer valuable illustrations of the prevailing geological conditions, aiding in the comprehensive understanding and management of ground conditions within the mining environment.

Figure 16-13: Drive face in ore zone

Source: Sierra Metals 2024

Figure 16-14: Drive in limestone breccia

Source: Sierra Metals 2024

Figure 16-15: Drive in altered intrusive.

Source: Sierra Metals 2024

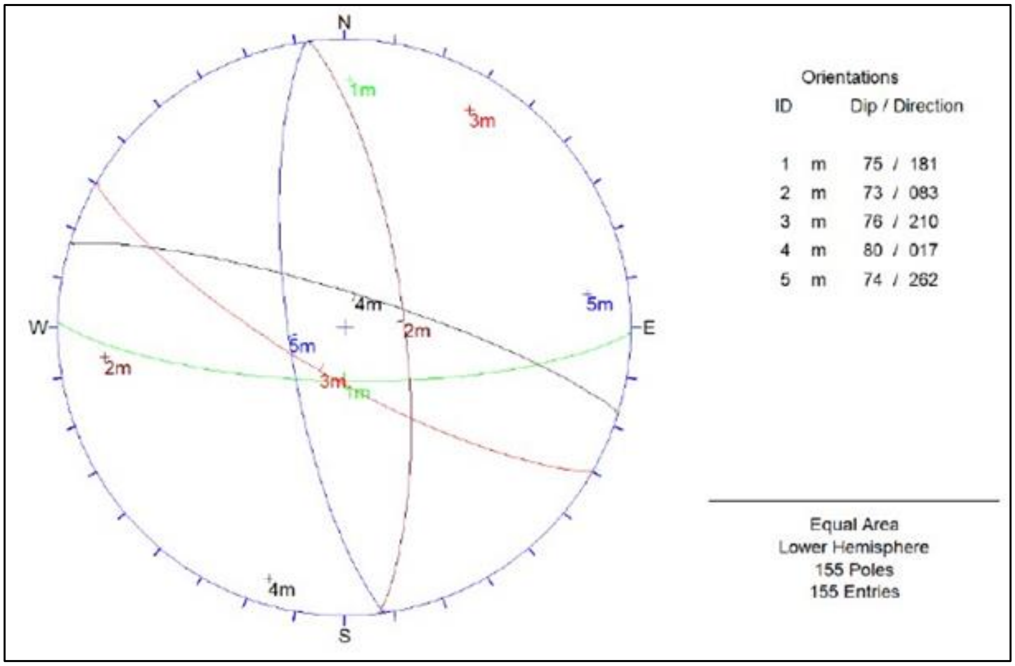
The Mohr-Coulomb strength parameters for disaggregated ore zone material, subjected to increased moisture content (m.c.), were determined through standard soil mechanics strength tests. The cohesion values ranged from 3 kPa (at 2% m.c.) to 0.5 kPa (at 8% m.c.), while the friction angle exhibited a range from 40° (at 2% m.c.) to 2° (at 8% m.c.).

Observations from the core photographs provided in Figures 16-16 and Figure 16-17 suggest that the ore material presents characteristics of very to extremely low strength rock, which can be successfully recovered as intact core using appropriate drilling techniques. However, it is recommended to conduct further strength testing on undisturbed or intact core samples under in-situ moisture conditions.

It is noted that the presence of high fines content in the fault/contact zones occasionally results in mud-rushes, warranting attention to ground control measures.

The structural model typically encompasses two principal sets of joints/discontinuities, oriented in a N-S and E-W direction, both steeply dipping and nearly orthogonal. Additionally, there may be up to three minor sets, all exhibiting steep dips, possibly representing localized variations of the principal sets.

Figure 16-16: Orientation of Principal Structure Sets



Source: Sierra Metals 2024

In-situ stress measurements have been conducted using HI Overcore and Acoustic Emission methods. The outcomes exhibit considerable variability, with certain measurements appearing to be invalid for the depth of testing or influenced by adjacent excavations or structures.

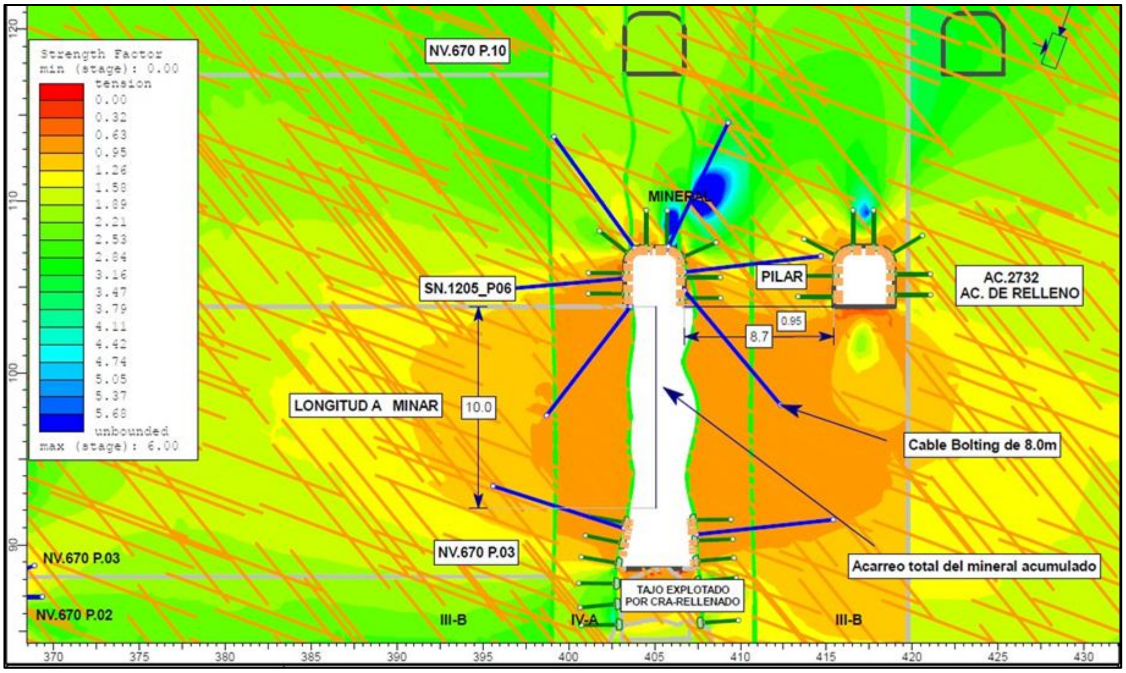
According to the WSM reports, the geological setting of the mine region is characterized by "thrust" tectonic conditions, with the principal stress ($\sigma 1$) oriented approximately ENE-WSW. Some of the stress measurements broadly align with this model, indicating a degree of conformity with the anticipated tectonic framework.

Numerical Modelling

Stope stability assessments are conducted utilizing RS2 numerical modeling, which involves analyzing drive layouts and stoping sequences. Model sections are oriented perpendicular to ore drives or crosscuts. In the analyses, an in-situ stress model with a $\sigma v/\sigma h$ ratio ranging from 0.3 to 0.7 is employed. Below are typical examples of such analyses illustrated.

For the assessment of Fortuna 7, longhole open stope design, it is assumed that a Factor of Safety (FoS) greater than 1.1 is acceptable. However, the results depicted in Figure 16-17 reveal substantial zones of wall with FoS values less than 0.95. This indicates the presence of major failure extending outward to the sub-level drive.

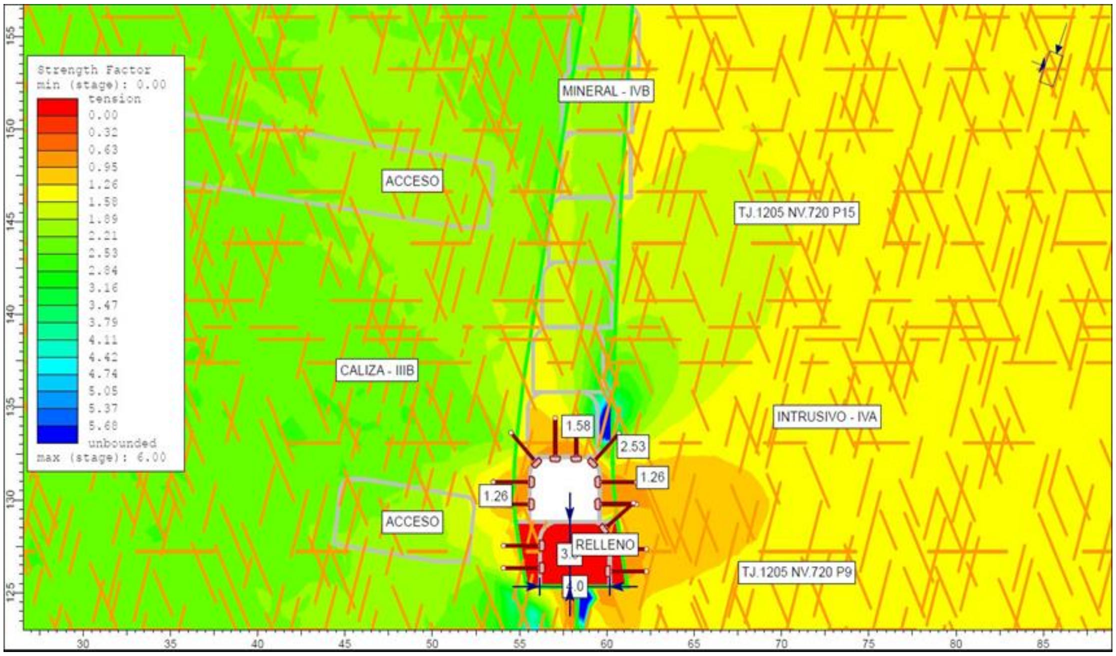
Figure 16-17: RS2 Numerical Model Analysis of Fortuna 7 Longhole Open Stope



Source: Sierra Metals 2024

The design assessment for Fortuna 17 overhand Cut and Fill (C&F) methodology incorporates rock strength data derived from individual triaxial test results. The outcomes, as depicted in Figure 16-18, reveal significant portions of the hangingwall exhibiting Factors of Safety (FoS) below 1.25. This suggests the emergence of an extensive yield zone and the potential development of substantial dilution in subsequent lifts.

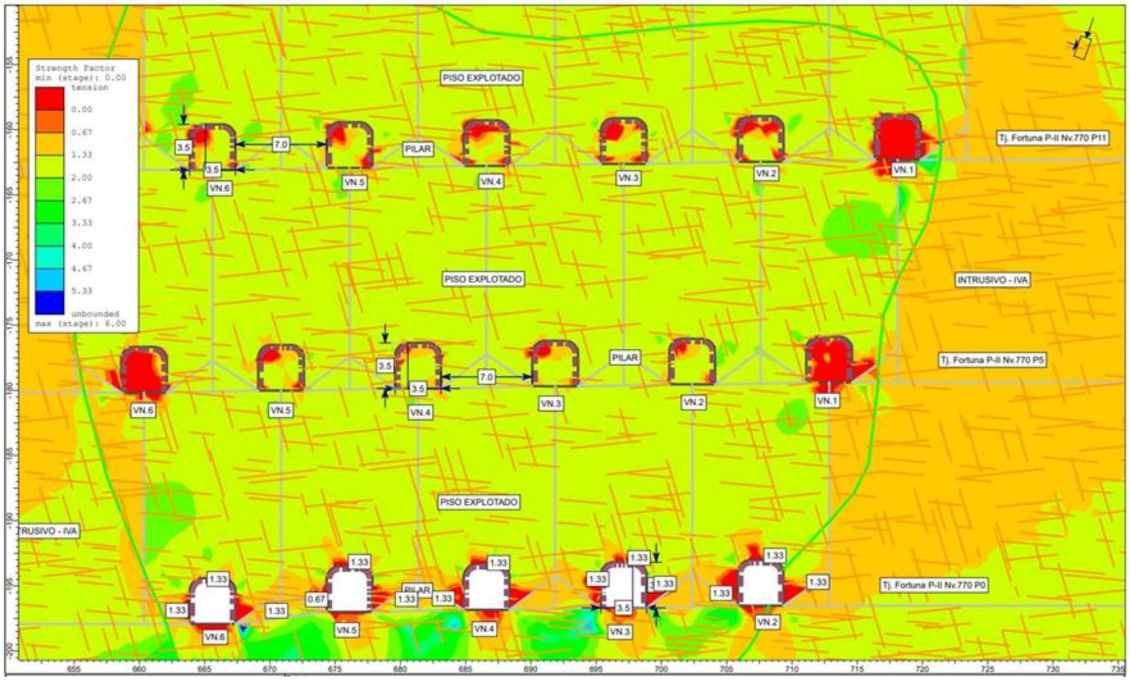
Figure 16-18: RS2 Numerical Model Analysis of Fortuna 17 Cut and Fill Stope



Source: Sierra Metals 2024

The design evaluation for the Fortuna P-II Sub-level Cave employs an analysis section perpendicular to the cross-cut drawpoints, aligned parallel to the ore zone. The outcomes, as depicted in Figure 16-19, reveal that all pillars situated between open crosscuts exhibit Factors of Safety (FoS) below 1.33. This suggests a propensity for substantial deformation and yield within these pillars.

Figure 16-19: RS2 Numerical Model Analysis of Fortuna P-II

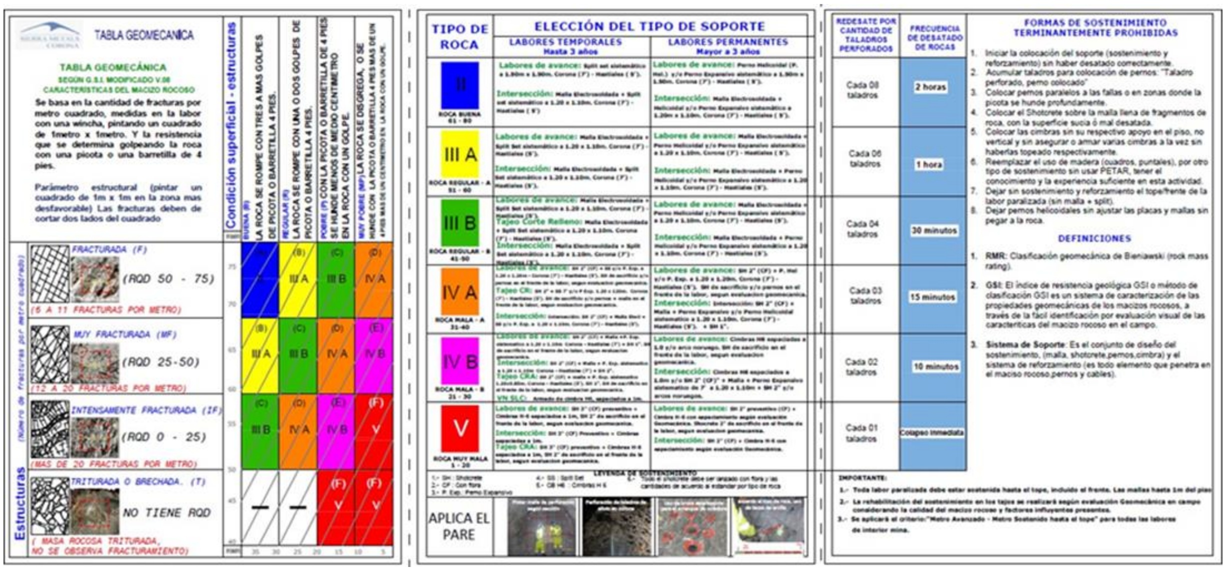


Source: Sierra Metals 2024

Ground Support

Ground support design was conducted utilizing the NGI Q system, employing Excavation Support Ratios (ESR) of 1.6 and 3.0 for permanent and temporary development, respectively. The Support Plans, depicted in Figure 16-20, are generally tailored to suit the prevailing ground conditions. However, it is observed that friction bolts (split-sets) exhibit ineffectiveness in poorer ground conditions classified as Class 4B and 5. Ground control management level plans meticulously outline the conditions and support necessities within the drives.

Figure 16-20: Yauricocha Ground Support Plans



Source: Sierra Metals 2024

The materials specified in the support plans encompass a range of options carefully selected to meet the operational requirements:

- Shotcrete (both dry mix and planned wet mix with fibers): Achieving strengths of 6 MPa at 8 hours, 21 MPa at 7 days, and 28 MPa at 28 days.
- Friction bolts (split-set type) in lengths of 1.5 m and 2.1 m.
- Expansion bolts (Swellex type) with a length of 2.1 m.
- Cable-bolts with lengths up to 8 m, primarily installed in stope walls.
- Weld-mesh (4” x 4” No 8) for reinforcement.
- Steel arches (6” x 6” x 25 lbs/ft H section) spaced at 1 m intervals.
- Timber packs and lining for additional structural support.

Monitoring systems integrated into the support framework include:

- Real-time seismic monitoring system for continuous assessment of ground stability.
- Quality control testing of rock-bolt pull-out capacity and shotcrete thickness and strength to ensure compliance with specifications.
- Time-domain-reflectometry (TDR) cables deployed to monitor stope back failure, providing early detection and mitigation of potential hazards.

Additionally, the QPs were provided with Ground Control Management plans for various mining areas. These plans meticulously outline the configuration of underground access development and mining zones, categorizing them based on rock mass rating criteria. Figure 16-8, reproduced from the original plans, illustrates these delineations by shading the respective areas according to their rock mass rating classifications.

Geotechnical Risks

This section provides succinct commentary on the significant geotechnical risks that hold the potential to influence mine reserves.

- Mudflows have been observed in certain mining zones adjacent to fault contacts, leading to equipment damage. Additionally, these mudflows pose a substantial safety risk to personnel working within the mine.
  - A potential origin of fine silty material within the extracted ore is identified. The fault gouge zone, along with potential argillic alteration of the hangingwall intrusive, may serve as sources for such material.
  - Water inflows into the mining area have been noted. Initial stages of sub-level caving operations have observed minor inflows, typically several litres per second, within the mined drifts.
  - These flows occasionally cease until the buildup of water in the overlying caved material triggers a mudflow event. This delay in triggering indicates water accumulation impeded by the low permeability of the fine silty material.
  - The QP (Alonso Gonzales) posits that the occurrence of mudflows may escalate with increased mining depths, as stresses and groundwater pressures intensify while rock mass strengths remain comparatively weak. An uncontrolled mudflow event could pose a risk to mine reserves by halting operations and isolating production areas.
- Utilizing 2D methods can yield valuable insights when dealing with uniformly shaped cross sections and elongated dimensions. However, when addressing intricate ore bodies like those encountered at Yauricocha, the outcomes derived from 2D numerical modeling may prove less informative and potentially misleading.
  - As mining operations extend deeper, stresses naturally escalate, and the effects of stress may either commence or become more pronounced.
  - Moreover, with the expansion of the mined-out volume, stress redistribution intensifies, potentially resulting in localized regions of heightened stress concentration or relaxation. These phenomena are inherently intricate, dynamic, and three-dimensional in nature, rendering accurate modeling challenging.
  - Nevertheless, adhering to industry standards necessitates the utilization of 3D numerical stress modeling to discern potential areas of concern. This critical information equips mine engineers with the requisite insights to incorporate suitable ground control measures into the mine design.
- Subsidence
  - S.R. Ltda. conducted a study documented in May 2019, with the aim of evaluating the progression of subsidence in correlation with ongoing mine development.
- This comprehensive study encompassed fieldwork, laboratory analyses, and desktop assessments.
- Fieldwork activities included surface crack inspections, evaluation of underground damage and deformation, geomechanical mapping, and review of displacement monitoring data.
- Laboratory analyses comprised point load, unconfined compressive strength (UCS), triaxial, and shear strength tests.

- Desktop work involved data processing and geomechanically and subsidence modeling.
    - QP (Alonso Gonzales) acknowledges the inherent challenges associated with subsidence modeling, emphasizing the necessity for well-calibrated models to ensure reliability.

Comments and Recommendations

QP (Alonso Gonzales) provide the following observations:

The mine has amassed a considerable mapping database, yet the geotechnical logging database warrants ongoing data collection programs, particularly for deeper sections. Detailed definition of geotechnical domains proximal to ore zones is imperative. Notably, immediate hangingwall rocks depicted in Figure 16-2 (97.4 m – 108.4 m) are logged as Geotechnical Class 4B with an average RMR89 of 25, contrary to Class 4A utilized in the analyses.

Block modeling of geotechnical classifications can inadvertently blend data from distinct domains unless constrained meticulously into discrete geotechnical zones. While a reasonable database exists for UCS and Triaxial strength, further testing, especially for zones near or within ore bodies, is recommended. Enhanced assessment of conditions in immediate wall zones, based on logged intervals within zones, is warranted for each ore body's geotechnical models.

Numerical modeling assessments of stoping layouts are currently based on an invalid stress model, necessitating alignment with regional "thrust" tectonic conditions. Relying on individual triaxial tests for local strength parameters may lead to misrepresented conditions. Moreover, long sections for SLC assessment should incorporate stress concentration effects around the cave zone, requiring 2D numerical models normal to ore zone strike and parallel (or full 3D models) to assess stress concentration and extent of yield around ore bodies.

The reliability of numerical modeling work requires complete revision. Current stoping methods (SLC and Overhand C&F) are deemed suitable for geotechnical conditions, though alternative methods may be explored, particularly for Fortuna 7 ground conditions. Ground support plans are generally aligned with reported conditions, yet challenges are anticipated with increasing depth and stress levels, necessitating adjustments in spacing between cross-cut drives and levels to mitigate against pillar yield.

Considering the ineffectiveness of friction bolts (split sets) in high stress/deformation conditions, the Yauricocha Mine should explore employing higher capacity grouted and yieldable types of rock bolts. It is recommended that the mine develop a comprehensive Geotechnical Management Plan, encompassing available logging, mapping, and testing data, planned investigation programs, geotechnical models, design methodologies for mining sections, ground support requisites, and monitoring systems.

16.6.2 Hydrogeology and Hydrology

Water ingress into the underground mine is significant yet controllable, a common occurrence in Sub-Level Caving (SLC) operations. While risks associated with the overall volume of inflow and the potential for mud rushes persist, operational measures effectively manage these risks, facilitating the continuous progression of mining activities. The subsequent sections provide a comprehensive overview of the prevailing water conditions and the concerted mitigation strategies in place.

Water inflows into the underground mine are substantial, but manageable, and not uncommon in SLC mines. Risks exist related to the total inflow quantity and mud rush, but operations are managing these risks sufficiently to allow mining to advance. The following sections summarize the water conditions and mitigation efforts.

Hydrogeological and hydrological data are abundantly available from various sources, encompassing both internal mine records and a multitude of investigations conducted by external consultants. Mine operations have diligently compiled extensive information concerning flow rates and pertinent field water quality parameters such as color, pH, conductivity, and temperature across diverse sections of the mine. Moreover, comprehensive maps summarizing the spatial distribution of these parameters have been meticulously developed.

Externally, numerous hydrogeological and hydrological studies have been commissioned and executed by reputable consultants, including Geologic (2014, 2015), Hydro-Geo Consultores (2010, 2012, 2016), Geoservice Ingenieria (2008, 2014, 2016), and Helium (2018). These studies have entailed a range of methodologies, including underground observations, pump tests, tracer tests, and analysis of surface water features.

This rich repository of data derived from a diverse array of sources serves as a cornerstone for informed decision-making and strategic planning in managing water-related aspects of the mining operation.

- Annual average precipitation of 1010 mm (measured at Yauricocha station);
- Runoff of 268 mm (27% of the total precipitation);
- Depth of infiltration of 265 mm (26% of the total precipitation); and
- The actual depth of the evapotranspiration of 477 mm (47% of the total precipitation).

Current Mine Inflow

The cumulative inflow into the mine amounted to approximately 100 litres per second in 2023. Despite efforts to gather inflow measurements from various locations such as drainage drill holes and discrete inflows at different times, the data exhibits some degree of inconsistency. Water ingress occurs across multiple points, including drainage drill holes situated at different levels within the mine.

The origin of water ingress can be traced to two primary sources:

- Infiltration of water stemming from fluvial precipitation seeping through the subsidence covering the mine.
- Discharge of underground waters moving from east to west, originating from the intrusive and moving towards the cone of subsidence.

Infiltration associated with subsidence encompasses flows into both the depressions formed by subsidence and the tensional features linked to them. While a diversion channel diverts a portion of runoff away from subsidence depressions, unredirected water is anticipated to flow towards drawpoints through the subsidence zone. Moreover, lateral groundwater influx into the subsidence zone also contributes to water ingress.

Surface infiltration into the subsidence zone was previously estimated to be around 11 litres per second with projections suggesting an increase to between 30 and 46 litres per second by 2029, as indicated by Geologic in 2015.

As mining progresses, it is anticipated that mine inflows will increase, primarily due to the expansion of the subsidence cone. Projections suggest:

- Surface inflows could potentially surge by approximately 20 to 35 litres per second by 2029 (Geologic, 2015; Geoservice, 2017).
- Groundwater inflows are estimated to escalate by up to 330 litres per second once mining reaches an elevation of 3,600 metres (Geologic, 2015).

Considering these projections, continued consideration of mitigation measures is imperative to curtail inflow or, at the very least, regulate the manner in which water enters and is managed throughout the mine.

Future Mine Water Management Considerations

Current observations and analyses indicate an anticipated increase in inflow to both the subsidence caving zone and the mine as expansion initiatives progress. Therefore, ongoing mitigation and management endeavors are imperative to comprehensively comprehend the water distribution and to devise strategies for controlling or diminishing inflow. Of particular concern are mud rushes, as delineated in the preceding section.

Previous endeavors have been undertaken to manage and curtail inflows. Despite the wealth of available data that could potentially shed light on the water sources, the information is presently not consolidated in a format conducive to facile analysis.

In summary, historical, and ongoing efforts have enabled the mine to adequately manage water inflows, thus facilitating uninterrupted mining operations. However, with the anticipated expansion, a rise in water inflows should be anticipated. It is imperative that mitigation efforts be continually evaluated and tested. Operational management plans should proactively anticipate heightened inflows and the associated potential for mud rushes until such time that the efficacy of mitigation measures is validated, or alternative water-related risk management strategies are implemented.

Recommendations

QP (Alonso Gonzales) provide the following recommendations:

- Sustain ongoing monitoring of pressure and flow within designated underground hydrogeological boreholes. This practice will afford a refined evaluation of the impacts and efficacy of mitigation measures as they are implemented, fostering adaptive management strategies.
- Establish permanent monitoring stations at strategic locations throughout the mine, maintaining regular monthly records at a minimum. This systematic approach will furnish easily accessible records, enabling thorough assessments of inflow variations over time.
- Consolidate all hydrogeological data, encompassing flows and water quality parameters, into a unified database, and integrate them into a comprehensive 3D model alongside geotechnical and mining data. This integration will enhance the comprehension of flow origins and variations over time, facilitating a nuanced understanding of how the mine's evolution and mitigation strategies have influenced hydrogeological dynamics.

- Perpetuate the collection of flow and water pressure data during drilling operations, meticulously documenting completion details for each drill hole. This concerted effort will contribute to an enriched understanding of the hydrogeological conceptual model, facilitating informed decision-making in water management initiatives.
- Update the mine water balance, incorporating surface runoff and hydrological conditions, to comprehend potential surface inflows into the subsidence cone and assess the potential advantages of existing or prospective diversion structures. This iterative process ensures a comprehensive understanding of the mine's hydrological dynamics, informing proactive measures to optimize water management strategies.

16.7 Stope Optimization

Stoping block configurations were generated for each ore zone and mining method identified, utilizing the MSO routine embedded within Deswik™ software, specifically leveraging its Mineable Stope Optimized (Deswik.SO or MSO) and Enhanced Production Scheduler (Deswik. Sched) functionalities. MSO necessitates the input of various critical parameters and subsequently evaluates the resource block model against a range of simplified mining shapes, thereby delineating a potentially viable Mineral Resource at a specified cut-off value. The essential parameters employed for stope optimization are detailed in Table 16.4.

Table 16-4: Stope Optimization Software Inputs

MSO Input	Sub-level Cave	Cut and Fill
Marginal Cut-off value	US$ 39.71/t	US$ 62.86/t
Economic Cut-off value	US$ 61.33/t	US$ 84.48/t
Level spacing (floor to floor)	16.67m	3m
Stope length	4-1000m	3m
Minimum mining width	5.25m	3-4m
Minimum waste pillar	-	6m

Source: AGP Mining, 2024

The tonnage and grade data for each stope shape underwent further refinement through spreadsheet analysis. This involved the application of factors such as mining recovery and external dilution (at zero grade), culminating in the computation of a Net Smelter Return (NSR) for the material post-dilution and recovery. Subsequently, blocks were categorized as economic, marginal, or waste based on the NSR value of the mining block and the cut-off threshold for the specific area. Blocks meeting the reserve criteria underwent visual inspection, during which isolated blocks were identified and subsequently excluded from the reserves.

The process employed is extensively detailed in Section 15, elucidating the criteria and methodologies utilized. Marginal blocks situated in immediate proximity to economic blocks were also scrutinized, and if deemed feasible with no significant additional development required to exploit the marginal block, they were considered and incorporated into the reserves.

16.8 Mine Production Schedule

A Life of Mine (LoM) production schedule has been meticulously formulated for the Yauricocha reserves, meticulously detailed in Table 16.6. Commencing in January 2024, this schedule aligns with the month immediately following the cut-off date of the mine-out data referenced in this report. Utilizing typical mining rates of 3,780 tonnes per day for ore extraction and 130 - 150 tonnes per hour, the schedule has been calibrated to ensure operational efficiency.

Yauricocha is an operating mine with a signification production history. Operations and production personnel are supported by geology and engineering groups. The geology and engineering groups work in close collaboration and planning is conducted with care and diligence. Historical knowledge of the site is leveraged in the planning process. Production targets at Yauricocha are based on historical performance. The mine has consistently surpassed the threshold of 3,000 tonnes per day (tpd) on multiple occasions, signaling its operational prowess.

Currently, there are strategic plans in place to sustainably target a long-term production rate of 3,780 tpd without necessitating significant capital expenditures. This objective is underpinned by a multifaceted approach that prioritizes enhancements in various operational facets.

Noteworthy improvements in equipment maintenance, characterized by heightened mechanical availability, have played a pivotal role in bolstering production figures. Additionally, optimization initiatives within the processing plant have contributed to increased throughput rates. Augmented mine planning strategies, coupled with more efficient operations management, have further propelled production escalations.

A key aspect of this operational evolution involves the strategic recruitment of seasoned mining professionals hailing from diverse backgrounds. This infusion of expertise has invigorated the mine's operations management team, infusing it with a wealth of experience and fresh perspectives. Through the amalgamation of these strategies and talent acquisitions, the mine is poised to sustainably achieve and maintain its targeted production rates, solidifying its position as a cornerstone of operational excellence within the industry.

The comprehensive production profile for polymetallic sulphide ore spanning from 2024 to 2029 is presented in Table 16-5 to Table 16-7.

Table 16-5: Yauricocha LoM Production Plan - Polymetallic Sulphide Ore

Item	unit	2024	2025	2026	2027	2028	2029	Total
Tonnes	t	682,588	1,009,012	1,379,669	1,379,573	1,383,674	518,510	6,353,026
Ag	g/t	38.16	42.41	34.70	37.12	31.22	14.65	34.43
Ag	oz/tc	1.23	1.36	1.12	1.19	1.00	0.47	1.11
Pb	%	0.55	0.75	0.46	0.32	0.32	0.13	0.43
Cu	%	0.91	0.85	0.92	1.14	1.11	1.16	1.02
Zn	%	2.15	2.33	2.25	1.93	1.27	0.50	1.83
Au	g/t	0.38	0.36	0.32	0.37	0.36	0.43	0.36
NSR	$/t	93.14	96.96	91.86	97.49	85.75	70.24	90.94
As	%	0.18	0.14	0.13	0.17	0.15	0.09	0.15
Fe	%	20.64	20.35	20.39	21.68	21.86	25.36	21.42

Source: AGP Mining, 2024

Table 16-6: Yauricocha LoM Production Plan by Mining Zone - Polymetallic Sulphide Ore

Item	unit	2024	2025	2026	2027	2028	2029	Total
Zone II	tonnes	282,750	409,108	599,271	495,980	405,140	9,369	2,201,617
Zone IIII	tonnes	35,251	-	-	-	-	-	35,251
Zone V	tonnes	364,587	599,904	780,398	883,592	978,534	509,142	4,116,158
Total	tonnes	682,588	1,009,012	1,379,669	1,379,573	1,383,674	518,510	6,353,026

Source: AGP Mining, 2024

Table 16-7: Yauricocha LoM Production Plan by Mining Method - Polymetallic Sulphide Ore

Item	unit	2024	2025	2026	2027	2028	2029	Total
CRAM	tonnes	110,341	125,843	93,560	20,456	-	-	350,199
SLCM	tonnes	572,247	883,169	1,286,109	1,359,117	1,383,674	518,510	6,002,826
Total	tonnes	682,588	1,009,012	1,379,669	1,379,573	1,383,674	518,510	6,353,026

Source: AGP Mining, 2024

16.9 Mine Development

Level accesses and on-level development were meticulously designed utilizing Deswik software. These designs, alongside infrastructure layouts, were instrumental in calculating the development quantities. These quantities, in conjunction with the current advance rates, formed the basis for generating Yauricocha Life-of-Mine (LoM) development schedule, as presented in Tables 16-8 to Table 16-10.

Table 16-8: Development Plan per Type of Cost.

Item	unit	2024	2025	2026	2027	2028	2029	Total
CAPEX	metres	8,056.2	5,532.1	4,615.4	4,918.5	3,065.8	-	26,188.0
OPEX	metres	12,867.4	11,385.1	9,928.1	7,422.7	4,160.5	48.9	45,812.8
Total	metres	20,923.5	16,917.3	14,543.5	12,341.3	7,226.3	48.9	72,000.7

Source: AGP Mining, 2024

Table 16-9: Development Plan per Mine Zone

Item	unit	2024	2025	2026	2027	2028	2029	Total
Zone II	metres	11,052.1	5,240.5	3,817.7	2,979.5	2,021.0	-	25,110.7
Zone IIII	metres	195.6	-	-	-	-	-	195.6
Zone V	metres	9,675.8	11,676.8	10,725.8	9,361.8	5,205.3	48.9	46,694.4
Total	metres	9,871.5	11,676.8	10,725.8	9,361.8	5,205.3	48.9	46,890.0

Source: AGP Mining, 2024

Table 16-10: Development Plan per Mine Activity Type

Item	unit	2024	2025	2026	2027	2028	2029	Total
Decline	metres	2,114.9	1,726.8	1,145.9	968.9	310.4	-	6,266.9
Infrastructure	metres	2,574.7	1,485.6	1,015.8	1,287.9	1,418.4	-	7,782.5
Access Drive SLC	metres	2,131.2	1,239.8	621.7	495.7	237.2	-	4,725.5
Access Drive OCF	metres	576.4	898.1	200.4	42.3	-	-	1,717.1

Bypass Drive	metres	2,820.0	2,166.1	1,786.3	1,161.8	524.4	-	8,458.6
Crosscut	metres	4,733.9	3,438.6	2,711.3	2,430.8	1,055.5	-	14,370.2
Ore Drive (Waste)	metres	1,980.8	2,179.9	1,916.5	898.6	505.2	-	7,481.0
Ore Drive (Ore)	metres	1,935.9	2,592.8	3,528.4	3,471.5	2,143.1	48.9	13,720.7
Escapeway Drive	metres	356.8	135.7	34.8	17.5	24.0	-	568.8
Exploration Cuddy	metres	112.6	60.0	56.0	34.0	42.0	-	304.6
Poza	metres	141.3	165.5	139.3	67.7	99.3	-	613.2
Raise Boring	metres	533.4	84.8	727.5	899.0	560.6	-	2,805.3
Long hole Raise	metres	911.5	743.5	659.6	565.6	149.0	-	3,029.2
Shaft	metres	-	-	-	-	157.1	-	157.1

Source: AGP Mining, 2024

16.10 Major Mining Equipment

Table 16-11 and Table 16-12 features an inventory of the primary underground mining equipment presently employed at Yauricocha Mine. This equipment roster served as a benchmark for estimating the requisite number of units needed to fulfill the Yauricocha Life of Mine plan.

The performance of this equipment was meticulously assessed and verified utilizing actual operational data provided by Sierra Metals. These performance metrics were instrumental in estimating the requisite quantity of equipment essential for both the production and development phases of Yauricocha Mine. The maximum number of equipment units required to adhere to the production plan is detailed by mining area.

The equipment will be allocated for both development and production tasks. The equipment estimation encompasses an additional scoop, dumper, jumbo, and truck as contingency measures. This surplus equipment can be deployed as needed across any orebody. Additionally, the mine furnished an auxiliary list of mining equipment.

Table 16-11: Current List of Major Underground Mining Equipment by Pegama Contractor

Equipment	Capacity	Brand	Model	Total
Scoop	4.1yd3 Ore	Caterpillar	R1300G	8
	4.1yd3 Waste	Caterpillar	R1300G	
Jumbo	12 / 14 fts	Sandvik	QUASAR DD210	4
Muki	4 fts	Resemin	MUKI LHBP 2R	2
Jumbo Bolter	8 fts		SMALL BOLTER 99	3
Dumper	20 Ton	Komatsu	16TD	4
Haulage Truck		MC	TRANSPORT 14T	1
LV	(435Kg)	Kawasaki	JKAAFCB	3
Mini Lifter		Caterpillar	262D3	1

Source: Sierra Metals, 2024

Table 16-12: Current List of Major Underground Mining Equipment by Corimayo Contractor

Equipment	Capacity	Brand	Model	Total
Scoop	4.1yd3 Ore	Caterpillar	R1300G	7
	4.1yd3 Waste	Caterpillar	R1300G	
Jumbo	12 / 14 fts	Sandvik	QUASAR DD210	3
Muki	4 fts	Resemin	MUKI LHBP 2R	2
Jumbo Bolter	8 fts		SMALL BOLTER 99	3
Dumper	20 Ton	Komatsu	16TD	4
Haulage Truck		MC	TRANSPORT 14T	1
LV	(435Kg)	Kawasaki	JKAAFCB	3
Mini Lifter		Caterpillar	262D3	1

Source: Sierra Metals, 2024

16.11 Mine Ventilation

16.11.1 Overview

The Yauricocha mine is a well-established underground operation encompassing six primary mining zones. Previous ventilation assessments were conducted by SRK Consulting in accordance with NI 43-101 standards during the period spanning 2019 to 2023, covering the mine's operational lifespan. Additionally, a comprehensive ventilation analysis of the existing circuit was undertaken by NOOVA SAC. A ventilation model was meticulously crafted utilizing Ventsim software for thorough evaluation. This section pertains to the timeframe from 2024 to 2028, highlighting ongoing ventilation considerations and enhancements within the mine's operational framework.

The Yauricocha project encompasses six distinct mining areas, namely:

- Mina Central
- Esperanza
- Mascota

- Cuye
- Cachi-Cachi
- Cuerpos Pequeños

A comprehensive ventilation system has been meticulously engineered to supply requisite airflows to all these individual mining zones. This feat is accomplished through an exhaust ventilation mechanism, where primary surface fans create negative pressure below ground, facilitating the influx of fresh air via shafts and audit/decline accesses. Secondary auxiliary fans, in conjunction with ventilation ducting, further distribute airflow to production and development headings outside the primary circuit.

Presently, the mine draws a total of 204.2 m^3/s of fresh air while exhausting 217.2 m^3/s. A detailed breakdown of intake and exhaust airways is provided in Table 16-13 and Table 16-14 below.

Table 16-13: Yauricocha Mine Intake Airway Capacities

Intake Airway	Quantity (m^3/s)	Quantity (cfm)
Tunel Yauricocha	57.5	125,861
Tunel Klepetko	29.6	64,791
Mascota Shaft	53.7	117,543
Central Shaft	36	78,800
BM 300	20.6	45,091
RB Amoeba	6.8	14,884

Source: AGP Mining, 2024

Table 16-14: Yauricocha Mine Exhaust Airway Capacities

Exhaust Airway	Quantity (m3/s)	Quantity (cfm)
Bocamina 410	56.4	123,453
CH CC5	25.6	56,035
RB Yauricocha	57.2	125,204
RB 01	44.3	96,967
AL 47	33.7	73,765

Source: AGP Mining, 2024

The active airways detailed here align precisely with the ventilation model provided. While historical airways are simulated to be inactive, it is probable that some leakage and airflow adjustments are occurring. Discrepancies between exhaust and intake airflows within the model are primarily attributed to density fluctuations.

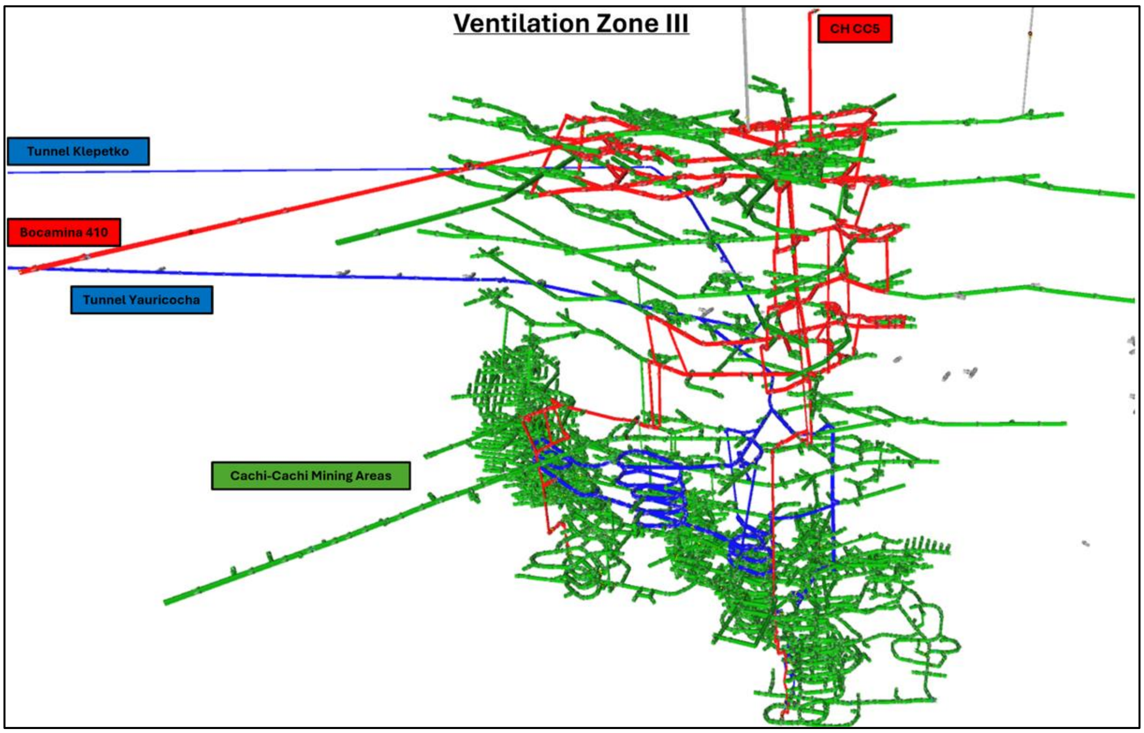
For enhanced management of the Yauricocha ventilation infrastructure, it has been subdivided into three distinct zones:

- Zone II: Encompasses the Esperanza mining area, supplied with fresh air from the Mascota Shaft, Central Shaft, Tunnel Yauricocha, and Tunnel Klepetko. Approximately 26m3/s of fresh air is delivered to this zone, while contaminated air is exhausted via the AL 47 return circuit.
- Zone III: Covers the Cachi-Cachi mining area, receiving fresh air from Tunnel Yauricocha and Tunnel Klepetko. Around 51.2m3/s of fresh air is supplied, with contaminated air expelled through the Bocamina 410, CH CC5, and AL 47 return circuits.

- Zone V: Encompasses the Mina Central, Mascota, Cuye, and Cuerpos Pequeños mining areas. Fresh air is sourced from the Mascota shaft, Central shaft, BM 300, and RB Amoeba, delivering approximately 127 m^3/s. Contaminated air is removed via the RB Yauricocha, RB 01, and AL47 return circuits.

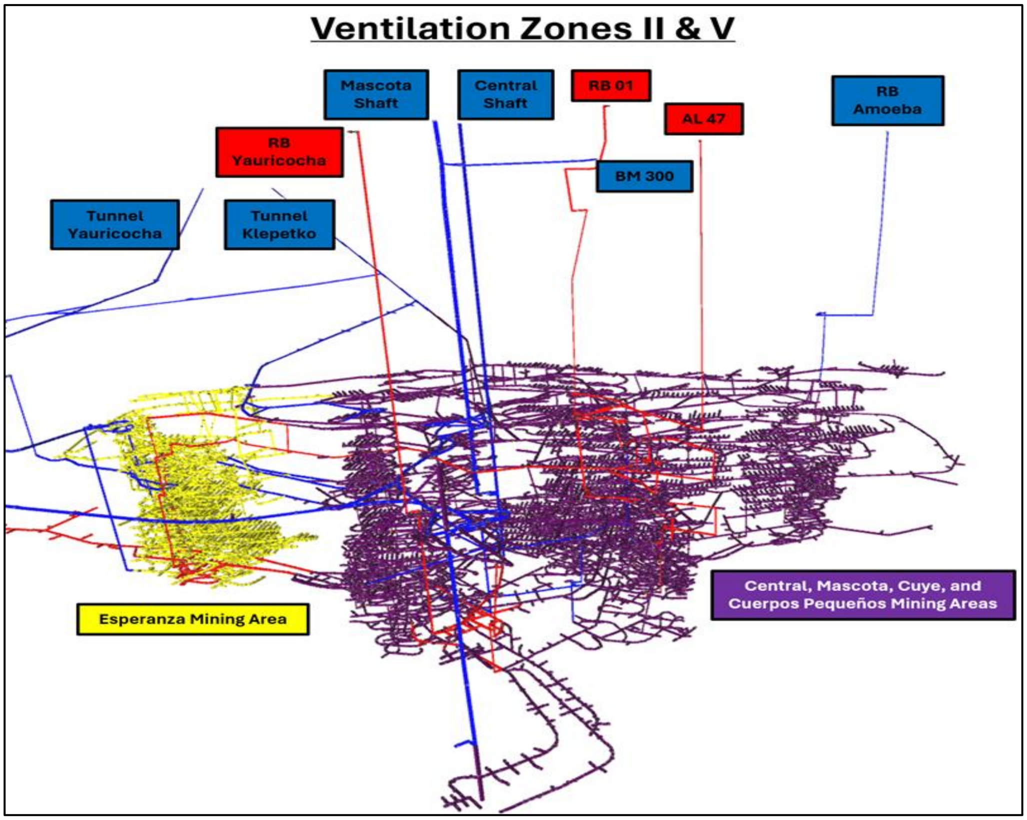
Various regulators, doors, and bulkheads strategically positioned throughout the mine regulate airflow within the main ventilation circuit and zones. Schematic representations of each ventilation zone have been generated using Ventsim and are depicted in Figure 16-21 and Figure 16-22. It is important to note that historical workings have been omitted for simplicity, and the accuracy of the model is contingent upon the provided data.

Figure 16-21: Zone III Ventilation Schematic (Cachi-Cachi Mining Zone)



Source: AGP Mining, 2024

Figure 16-22: Zones II & V Ventilation Schematics (Esperanza, Central, Mascota, Cuye, and Cuerpos Pequeños Mining zones)



Source: AGP Mining, 2024

16.11.2 Ventilation Design Criteria

Surface temperatures and humidities were provided within the Ventsim model. These have been provided within the summer and winter periods, as well as a yearly average. These temperatures should be monitored over the mine's life, if variances occur, these should be applied to the ventilation model to provide more accurate ventilation modelling and planning.

Table 16-15: Surface Temperatures and Humidities

	Temperature (°C)	Humidity (%)
Summer	12.0	75.0
Winter	2.0	25.0
Average	5.1	60.8

Source: AGP Mining, 2024

Average daily environmental settings in the Ventsim model are summarised in Table 16-16.

Table 16-16: Environmental Ventsim Settings

Setting	Value
Surface Datum Dry Bulb Temperature (Average)	5.1°C
Surface Datum Wet Bulb Temperature (Average)	3.1°C
Surface Datum Rock Temperature	4.8°C
Surface Datum Relative Humidity	78.6%
Geothermal Gradient	1.3°C/100m
Surface Datum Barometric Pressure	56.9 kPa
Air Density	0.71 kg/m^3

Source: AGP Mining, 2024

Friction factors used in the Ventsim model are summarised in Table 16-17.

Table 16-17: Friction Factor Settings

Description	Value (kg/m^3)
Ventilation Ducting	0.0037
Timbered Shaft	0.0444
Ventilation Infrastructure	0.0021
Ore Pass	0.013
Standard Drive	0.015
Rough Drive	0.02
Old RB Raise	0.009
RB Raise with Framework	0.00778
RB Raise with Shotcrete	0.005
Ramp	0.014
Ore Drives	0.025
Tunel Klepetko	0.013
Tunel, GL, CX, BP	0.012

Source: AGP Mining, 2024

Leakage factors have only been applied to ventilation ducting. Leakage is only expected where the ducts are joined if ducting is kept in adequate condition and aren't damaged from machinery. Leakage factors should be adjusted accordingly depending on the average condition of ducting during the operations LOM.

Shock losses have been manually inserted within the model as custom values. These have been inserted in drives that suddenly change in size or direction. Assumptions behind these shock factors are unknown.

16.11.3 Time-Weighted Average Exposure Limits

Time-weighted average (TWA's) exposure limits and Short-Term Exposure Limits (STEL) have been determined from those outlined in the regulations established in RSSO DS-024-2016-EM and its amendment in DS-023-2017-EM. A rough outline of TWAs and STELs is illustrated in Table 16-18. For a full breakdown of all regulation TWAs and STELs, refer to DS-023-2017-EM. As stated in the regulations a minimum of 19.5% oxygen (O2) is to be supplied to all working areas.

Table 16-18: Friction Factor Settings

Contaminant	TWA	STEL
CO^2	5,000ppm	30,000ppm
CO	25ppm	N/A
SO^2	25ppm	35ppm
NO	25ppm	N/A
NO^2	3ppm	5ppm
NH^3	25ppm	35ppm
Silica Dust	0.05mg/m^3	N/A
H^2S	10ppm	15ppm
Lead	0.05mg/m^3	N/A
Zinc	2mg/m^3	10mg/m^3

Source: AGP Mining, 2024

16.11.4 Airflow Requirements (equipment)

As per regulations outlined in RSSO DS-024-2016-EM and its amendment in DS-023-2017-EM, “The air requirement for equipment operating with diesel engines should not be less than three (3) m^3/min, based on the effective power capacity (HPs) and in accordance with their mechanical availability and utilization as per the evaluation conducted by the mining activity holder, which also considers altitude, engine heat, and emissions of gases and suspended particles.”

This can also be interpreted that a minimum of 0.05 m^3/s is required per equipment HP in accordance with mechanical availability and utilisation. It is also recommended in the regulations that a factor of 15% is to be applied to the total. Evaluation of the current equipment list is illustrated in the Table 16-19.

Table 16-19: Friction Factor Settings

Equipment Zones II & III (Pengama)									
Equipment	**Make**	**Model**	**Engine**	**HP**	**Utilisation (%)**	**Availability (%)**	**Number**	**Airflow (m3/s)**	**Total (m^3/s)**
Scoop	Caterpillar	R1300G	Diesel	156.9	75%	85%	8	5.0	40.0
Single Boom Jumbo	Sandvik	DD210	Electric	80.5	45%	85%	4	N/A	N/A
Production Drill Rig	Resemin	MUKI LHBR 2R	Electric	73.8	13%	85%	2	N/A	N/A
Bolter	Resemin	Small Bolter 99	Electric	73.8	45%	85%	3	N/A	N/A
Underground Truck	Komatsu	16TD	Diesel	219.9	75%	85%	4	7.0	28.0
Utility Truck	MC	Transport	Diesel	134.1	30%	85%	1	1.7	1.7
Utility Vehicle	Kawasaki	JKAAFCB	Diesel	40.2	30%	85%	3	0.5	1.5
Bobcat	Caterpillar	262D3	Diesel	75.1	30%	85%	1	1.0	1.0
								Total	**72.3**
								Total + 15%	**83.1**
Equipment Zones II & V (Corimayo)									
Equipment	**Make**	**Model**	**Engine**	**HP**	**Utilisation (%)**	**Equipment (%)**	**Number**	**Airflow (m3/s)**	**Total (m3/s)**
Scoop	Caterpillar	R1300G	Diesel	156.9	75%	85%	7	5.0	35.0
Single Boom Jumbo	Sandvik	DD210	Electric	80.5	45%	85%	3	N/A	N/A
Production Drill Rig	Resemin	MUKI LHBR 2R	Electric	73.8	32%	85%	2	N/A	N/A
Bolter	Resemin	Small Bolter 99	Electric	73.8	45%	85%	3	N/A	N/A
Underground Truck	Komatsu	16TD	Diesel	219.9	75%	85%	4	7.0	28.0
Utility Truck	MC	Transport	Diesel	134.1	30%	85%	1	1.7	1.7
Utility Vehicle	Kawasaki	JKAAFCB	Diesel	40.2	30%	85%	3	0.5	1.5
Bobcat	Caterpillar	262D3	Diesel	75.1	30%	85%	1	1.0	1.0
								Total	**67.3**
								Total + 15%	**77.4**

Source: AGP Mining, 2024

As illustrated above, the total required airflow for the mine based on equipment is 160.5 m^3/s. Using this analysis, the current ventilation system exceeds this requirement by 43.7 m^3/s. This additional airflow will be required to ensure that machinery operate efficiently in less dense air, and that other equipment (electrical) that produce heat are provided with sufficient cooling capacity.

The underground mine has a ventilation system that supports the Cachi-Cachi mine and a separate ventilation system that supports the central mine.

Other methods of determining the required airflows for a mining operation are also outlined in the regulations RSSO DS-024-2016-EM and its amendment in DS-023-2017-EM, such as based on miners operating underground and production profiles. The airflow requirements to production areas and development headings depend on the equipment operating and the conditions experienced at that moment in time. These factors will inevitably vary over the mine's life. It is therefore imperative that thermal work limits and TWAs are complied with and are the main guide to the required ventilation to maintain safety to personnel within the operation.

It is also stated in the regulations that "Comprehensive evaluations of the ventilation system in an underground mine must be carried out every semester, and partial evaluations must be conducted whenever connections of workings and changes in air circuits occur. These evaluations must be performed by ventilation specialists. Additionally, continuous ventilation monitoring must be conducted in the exploration, development, preparation, and exploitation workings where personnel are working."

16.11.5 Ventilation LoM

During the 2024-25 period, the Mina Central and Esperanza is to be mined to further depths. To achieve this, the ventilation zones II & V will need to be upgraded to supply the required ventilation conditions. This is to be achieved by the instalment of another fresh air intake system comprising of two (2) additional raises, these being RB 81 and RB 82. The first raise to be installed is the RB 81 with a length of 344.3 m from level 720 to level 1070. The second raise to be installed is the RB 82 which is to be installed from surface to level 720 with a length of 583.7 m. Both raises are to be 3.1 m in diameter. The addition of this system is to supply 70.8 m^3/s to the lower operating levels of zones II & V.

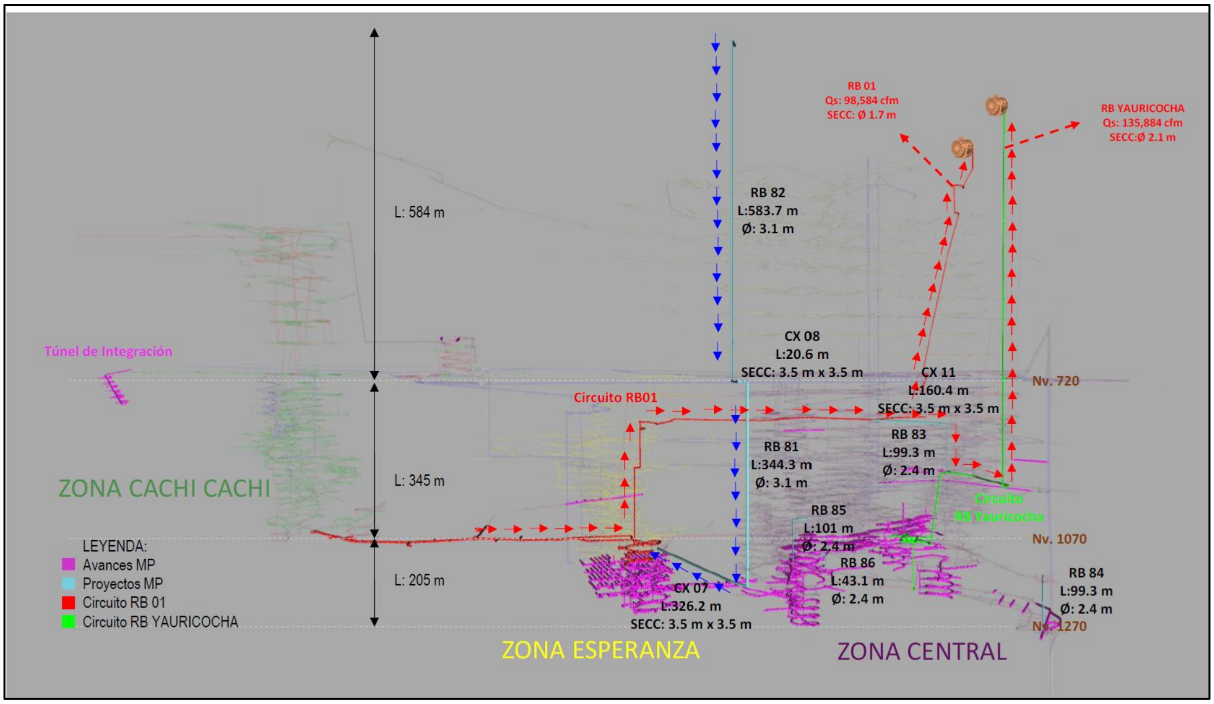
Further improvements to the fresh air systems are to be achieved by the installation of two more 2.4 m diameter raises, RB 84 and 85. Which are to extend the current fresh air systems to supply the lower mining levels.

The RB Yauricocha return circuit is to be upgraded with the addition of the RB 83 with a diameter of 2.4 m. This is to extend from level 820 to level 920 increasing exhaust capacity for the lower mining areas. RB 86 with a diameter of 2.4 m is also to installed to ensure there is adequate exhaust in Mina Central and prevent recirculation of contaminants.

Development of a third decline is to commence in this period, this decline is to allow for the transport of ore to surface from the lower levels in the mine. A total of 1,105 m is to be mined in 2025, ventilation is to be provided to the development heading via two (2) 115 HP auxiliary fans situated at the portals entrance.

Changes to the ventilation system are illustrated in Figure 16-23.

Figure 16-23: Ventilation Overview 2024-2025



Source: Noova, 2023

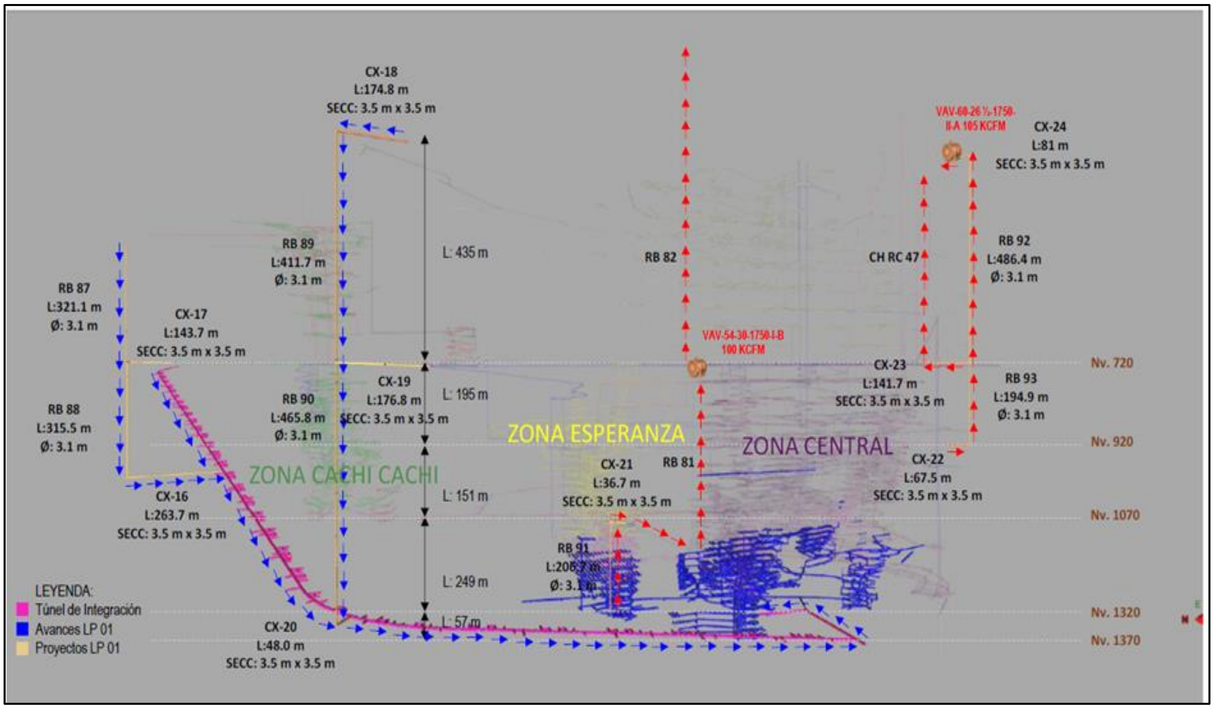
During the 2026-28 period, development of the third decline is finished. The establishment of a third decline allows for the expansion of the Esperanza and Central Mine production levels of the sub-level cave to increase from a depth of level 1270 to level 1320.

To establish the third decline, four 3.1 m diameter raises are required to supply adequate ventilation during the decline's development. Approximately 2,500 m of decline is to be advanced before the first set of raises (RB 87 and RB 88) connect a ventilation circuit from surface to the decline. The two (2) 115 HP auxiliary fans are then to be repositioned to allow development of the decline to advance (c.1200 m) to the next raise connection (RB 89 and 90). The establishment of both raise systems will allow for sufficient fresh air to be supplied during the decline development. Once established, decline and raises will supply approximately 100 m^3/s fresh air to the lower production levels.

To provide adequate return capacity to the lower production levels, the RB 82 and RB 81 fresh air system is to be converted into exhaust system. This will be achieved by the addition of a 3.1 m diameter raise (RB 91) that will connect level 1320 to level 1070, and a 100Kcfm exhaust fan on 720 level. This system will provide approximately 53m3/s exhaust.

Changes to the ventilation system during this period is illustrated in Figure 16-24.

Figure 16-24: Ventilation Overview 2026-2028



Source: Noova, 2023

17 RECOVERY METHODS

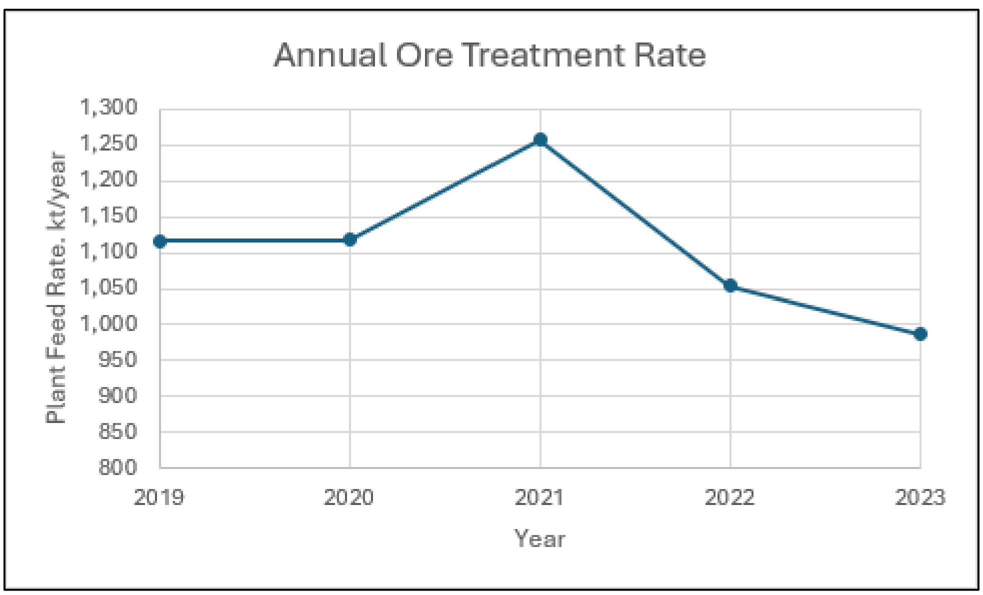
17.1 Overview

The Yauricocha process plant currently treats polymetallic sulphide ore via conventional comminution and flotation circuits. The plant can nominally treat 3,600 tonnes per day (tpd). The plant historically had a capacity of 3,100 tpd to process sulphides and 500 tpd to process oxides. Since 2018, no oxide material has been treated at Yauricocha. The process plant has been progressively upgraded. The annual daily average for 2023 was 2,700 tpd due to the slow process in obtaining government authorizations to exploit ore below the 1120 level, this authorization will be obtained in mid-2024, however the plant is at full capacity to process 3,600 tpd.

The process plant consists of a conventional two stage crushing and rod-ball mill comminution circuit followed by a rougher-cleaner flotation circuit to produce separate copper, lead and zinc concentrates. The individual concentrates are each dewatered via a conventional thickener and plate-and-frame pressure filter to produce copper, lead and zinc concentrates for sale. Flotation tailings are stored in a conventional TSF. An overall flowsheet of the process plant is shown in Figure 17-2.

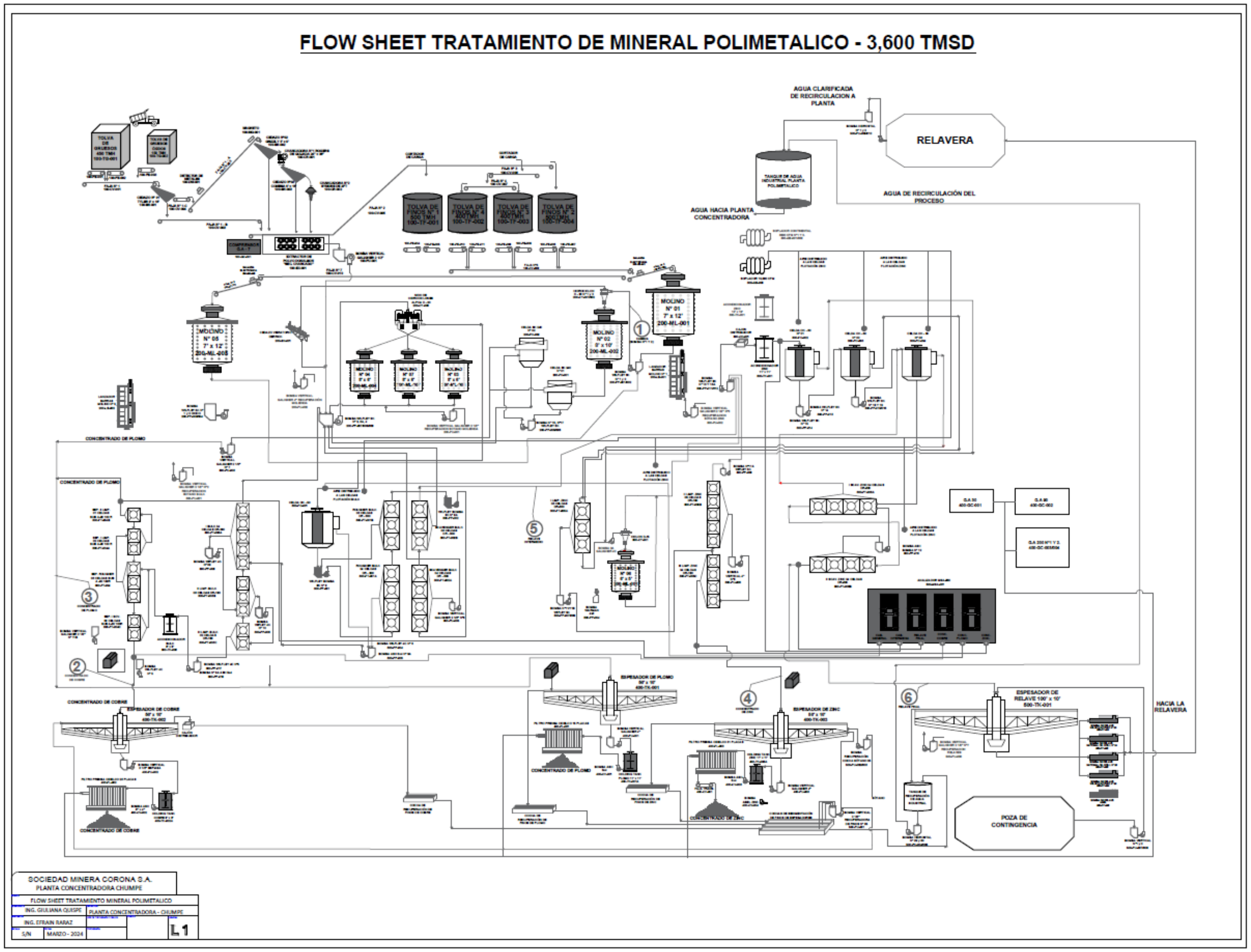
Process plant performance from 2019 to 2023 is provided in Figure 17-1. The process plant has recently (2023 averages) been treating ore feed grades of approximately 0.87% Cu, 0.76% Pb and 2.42% Zn and achieving approximately 75% copper, 79% lead and 83% zinc recoveries.

Figure 17-1: Historical Ore Treatment Rate



Data Source: Sierra Metals (2024)

Figure 17-2: Overall Process Plant Flowsheet



Source: Sierra Metals (2024)

Major equipment list is provided in Table 17.1.

Table 17-1: Process Plant Major Equipment List

Equipment	Quantity	Equipment Size/Type
Jaw Crusher	1	24” x 36”
Cone Crusher	1	4’
Rod Mill	2	7’ x 12’
Ball Mill	1	8’ x 10’
Ball Mill	3	8’ x 6’
Flash Lead Flotation Cells	2	SK-240
Bulk Rougher Flotation Cell	1	OK50
Bulk Rougher Flotation Cells	7	DR300
Bulk Scavenger Flotation Cells	7	DR300
Bulk Cleaner Flotation Cells	10	DR180
Separation Flotation Cells (Pb/Cu)	8	DR180
Zinc Rougher Flotation Cells	3	OK30
Zinc Scavenger Flotation Cells	8	DR300
Zinc 1st Cleaner Flotation Cells	3	DR300
Zinc 2nd Cleaner Flotation Cells	5	DR180
Zinc 3rd Cleaner Flotation Cells	4	DR180
Copper Concentrate Thickener	1	50’ diameter
Lead Concentrate Thickener	1	50’ diameter
Zinc Concentrate Thickener	1	50’ diameter
Tailings Thickener	1	100’ diameter
Copper Concentrate Filter Press	1	1.2m x 1.2m
Zinc Concentrate Filter Press	1	1.5m x 1.5m
Lead Concentrate Filter Press	1	1.2m x 1.2m

Source: Sierra Metals (2024)

The following major plant improvements have been made at the process plant to improve circuit availability and process reliability:

- upgraded the existing crushing plant primary screen
- upgraded the existing grinding circuit cyclones
- upgraded the motor and installed a variable speed drive on mill #2
- replaced the existing zinc thickener rake mechanism with a new high-rate mechanism
- installed additional flotation blower capacity and improved air control for flotation

17.2 Process Description

Since 2018, no oxide material has been treated at Yauricocha and only the process description for treating sulphide polymetallic ore is described below.

17.2.1 Crushing Plant and Crushed Ore Storage

Run-of-mine (ROM) ore is hauled from the mine site and either dumped directly into crusher feed bin or stockpiled near the primary jaw crusher area.

ROM is fed directly via apron feeders to the jaw crusher which operates in open circuit. Crushed ore is then conveyed to a double deck primary vibrating screen. Oversize material from the screen feeds a secondary cone crusher. The crushed ore from the cone crusher is conveyed back to the double deck screen.

Crushed ore from the screen undersize is conveyed to one of the four crushed ore silos. Crushed ore is reclaimed from the silos using belt feeders and conveyed to the grinding circuit.

17.2.2 Grinding Circuit

The grinding circuit consists of two lines of grinding and operate in a primary, secondary and tertiary grinding configuration. The grinding circuit produces an average product size of 80% passing 104 µm. Steel balls are manually added to the ball mills on a batch basis as grinding media. Rods are replaced as required in the rod mill. Dilution water is added to the grinding circuit as required.

17.2.3 Flotation Circuit

The flotation circuit consists of a bulk lead-copper rougher-cleaner circuit, zinc rougher-scavenger and cleaner circuit and lead cleaner circuit.

Final copper, zinc and lead concentrates are dewatered separately via individual conventional thickeners and plate and frame pressure filter to produce copper, zinc, and lead concentrates for export.

Final flotation tails are pumped to the TSF. Process water is reclaimed from the tailings water pond and reused in the process plant.

17.3 Plant Consumption

17.3.1 Reagents

The following reagents are used in the process plant:

- $ZnSO_4$
- NaCN
- Z-14
- Z-11
- MIBC
- Frother-70
- Lime
- $CuSO_4$
- SMBS
- ZnO

17.3.2 Power

Power for the process plant is provided from the local grid.

17.3.3 Air

Low pressure air blowers supply the process air needed for all the flotation tank cells. Compressed air for plant distribution is provided by the plant air compressor via the plant air receiver.

17.3.4 Water

The bulk of the water requirements for the process plant is provided by process water and consists of thickener overflows and reclaim water from the TSF.

Fresh water is primarily used as gland seal water and for reagent dilution.

Potable water is provided to the process plant from a potable water treatment plant.

18 PROJECT INFRASTRUCTURE

18.1 Overview

The mining site operates as an established and efficient entity, boasting fully operational infrastructure. It benefits from convenient highway access, with two routes catering to the project's logistical needs. The nearby regional capital of Huancayo, home to a population of 619,000, lies within 100 km. Personnel commute to the site via buses and reside in one of four accommodation camps. Presently, there are approximately 1,700 individuals on-site, comprising 600 employees and 1,100 contractors.

On-site amenities encompass the processing plant, surface and underground mine facilities, tailings storage facility (TSF), and ancillary support facilities. The processing facility integrates unit processes such as crushing, grinding, flotation, dewatering, concentrate separation, storage, thickening, and tailings discharge lines to the TSF. Surface and underground mine facilities feature headframes, hoist houses, shafts, ventilation structures, access tunnels, waste storage, explosives storage, shops, and fuel/lubrication storage. Supporting amenities include accommodation camps, a laboratory, change houses, cafeterias, medical facilities, engineering and administrative buildings, and equipment/electrical shops.

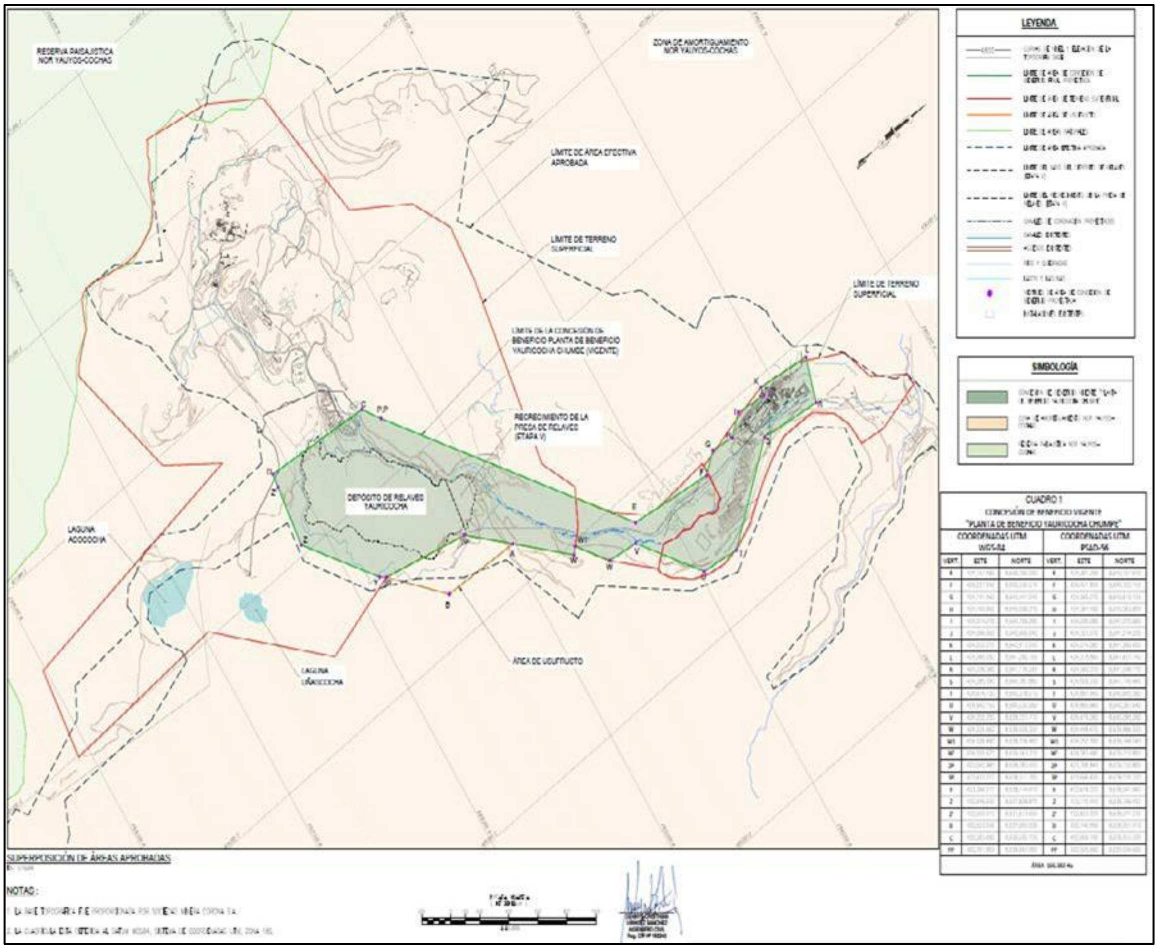
Water requirements are managed through existing systems, using water flows from the Klepetko and Yauricocha Tunnels underground mine and recycled water from the mine water treatment plant (PTAM) which is used for concentrator plant operations. Similarly, water recirculation from the tailings storage facility (TSF) pond is also used for concentrator plant. Energy sources comprise electric power, compressed air, and diesel. Electric power is procured via a 69 kV line to the site substation, distributed underground and at the processing facility. A compressed air system operates underground, complemented by a new 149 KW compressor system, while diesel powers mobile equipment and a backup generator.

Waste management systems include the TSF, waste rock storage, and industrial landfill, ensuring proper disposal. TSF expansion will extend capacity by 5 years, totaling six years of additional capacity with two additional lift stages. Waste oil, scrap metal, plastic, and paper are collected and recycled off-site.

Communications infrastructure features a fiber optic backbone supporting internet, telephone, and paging systems. On-site security is enforced through checkpoints at main access roads, the processing plant, and camp entrances.

Logistics rely on truck transport, with concentrate products shipped by 30 t trucks to customer locations in Peru. Materials and supplies are sourced from Lima and delivered by truck. A location map depicting the facilities is provided in Figure 18-1.

Figure 18-1: Project Infrastructure Location - Yauricocha Mine



Source: Sierra Metals, 2024

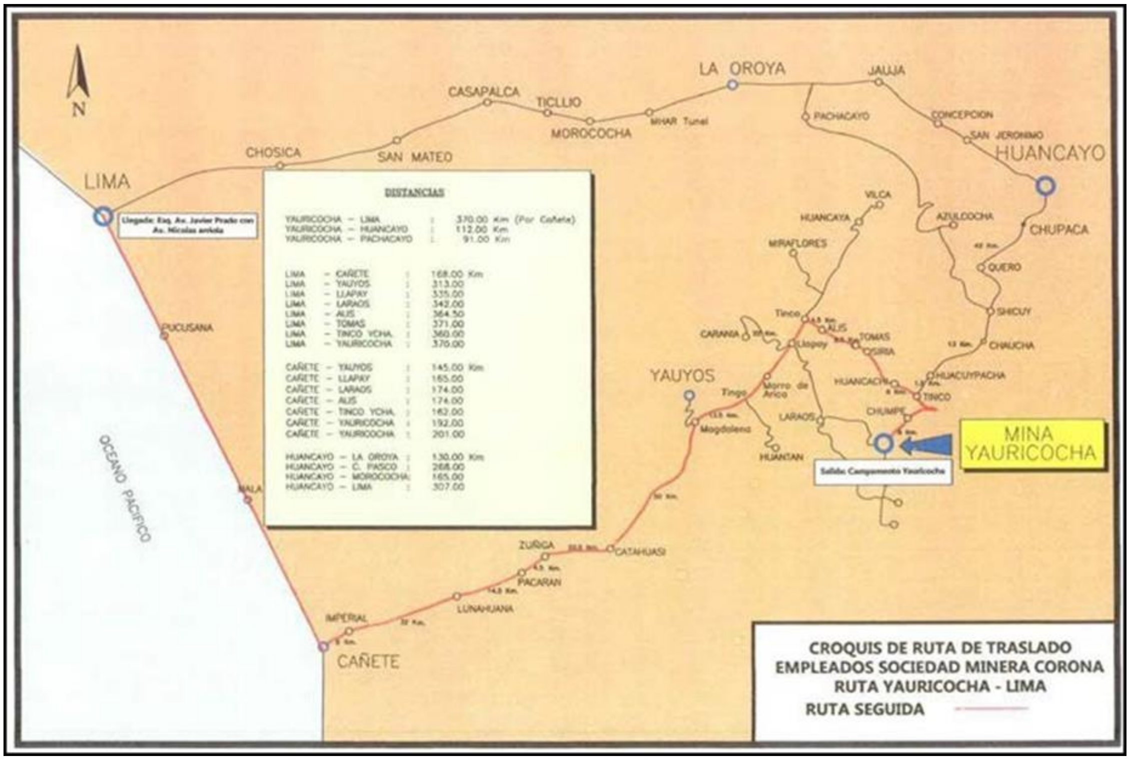
18.2 Access, Roads, and Local Communities

The project site is situated in a remote region amidst the picturesque mountains of Peru, accessible via two primary routes originating from Lima. The first route spans approximately 260 km, tracing the Lima-Huancayo-Yauricocha Highway, with the final stretch comprising unpaved terrain. Alternatively, the second route encompasses a journey of roughly 344 km, commencing with the well-paved Pan-American Highway from Lima, followed by the old Pan-American Highway and the Cañete-Yauyos highway leading to Yauricocha.

To facilitate efficient movement within the site, several gravel secondary roads have been established, strategically connecting key areas such as the mine zone (westward), milling facilities (eastward), and central locations housing the tailings areas, along with other pertinent sections of the project. The routes are presented in Figure 18-2 for clarity and reference.

The Pachacayo railway station stands at an approximate distance of 100 km northward from the project site. The principal urban center nearest to the mine is Huancayo, situated approximately 100 km to the east-northeast of the mine. This city, and its surrounding communities, has a population of around 619,000. Huancayo serves as the administrative capital of the Junin Region within Peru.

Figure 18-2: Routes from Lima to the Yauricocha Mine



Source: Sierra Metals, 2024

18.3 Process Support Facilities

A comprehensive processing facility, along with necessary ancillary support structures, is operational on-site and extensively elucidated in Section 17 of the documentation. The plant infrastructure encompasses a spectrum of functions essential for efficient operations, encompassing crushing, grinding, flotation, dewatering, concentrate separation, concentrate storage, as well as thickening and tailings discharge lines leading to the Tailings Storage Facility (TSF). Moreover, the processing facility encompasses auxiliary amenities such as workshops, a sample laboratory, change house with shower facilities, and dedicated engineering and administrative spaces.

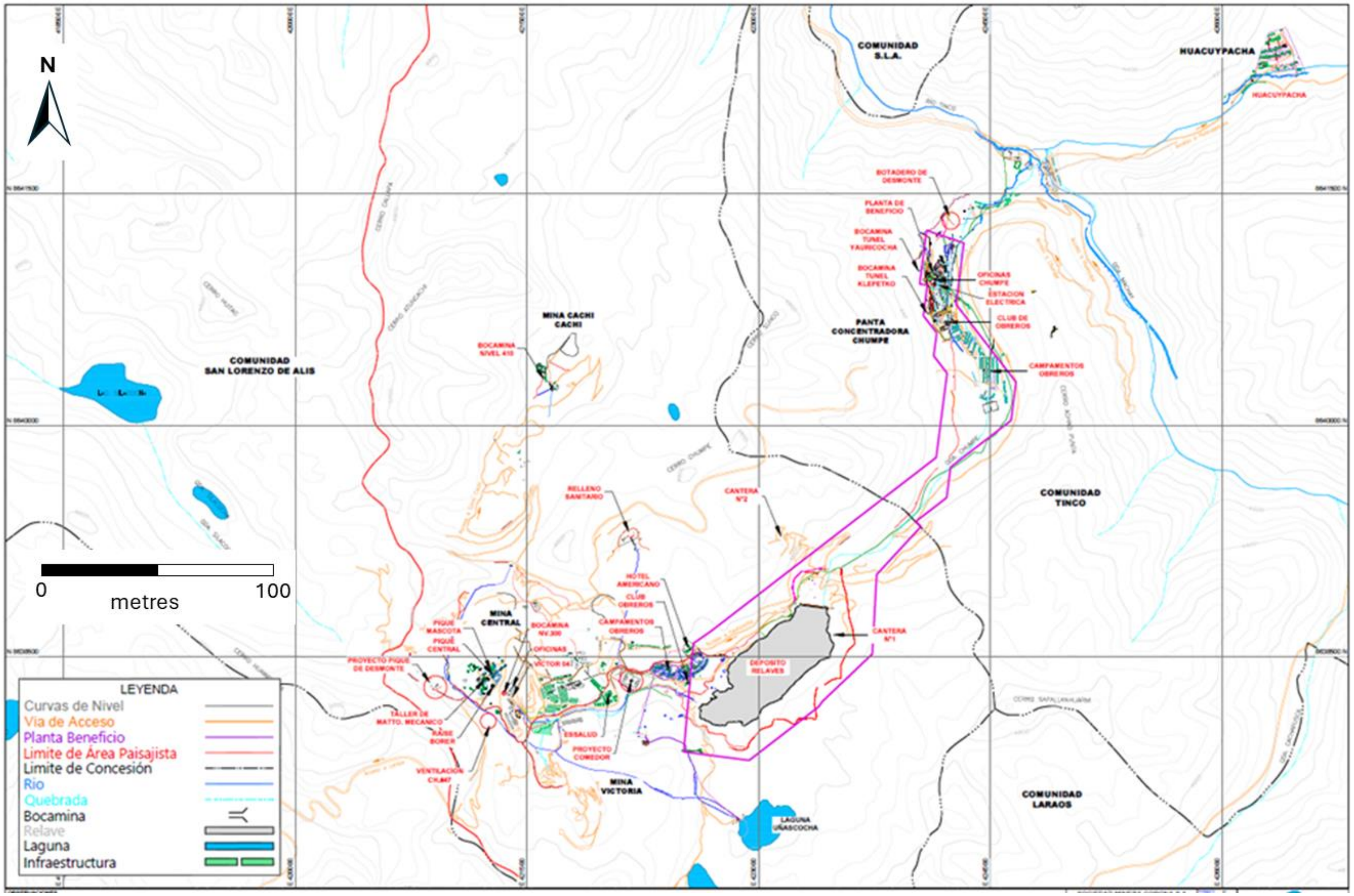
18.4 Mine Infrastructure – Surface and Underground

The surface facilities of the mine encompass various critical components:

- Hoists and headframes are installed to facilitate the operation of the on-site shafts.
- Amenities such as the change house, dry facilities, workshops, engineering spaces, and administrative facilities are meticulously arranged to support operational requirements.

A visual representation of the mine area layout is presented in Figure 18-3 for reference and clarity.

Figure 18-3: Mining Area Infrastructure



Source: Sierra Metals, 2024

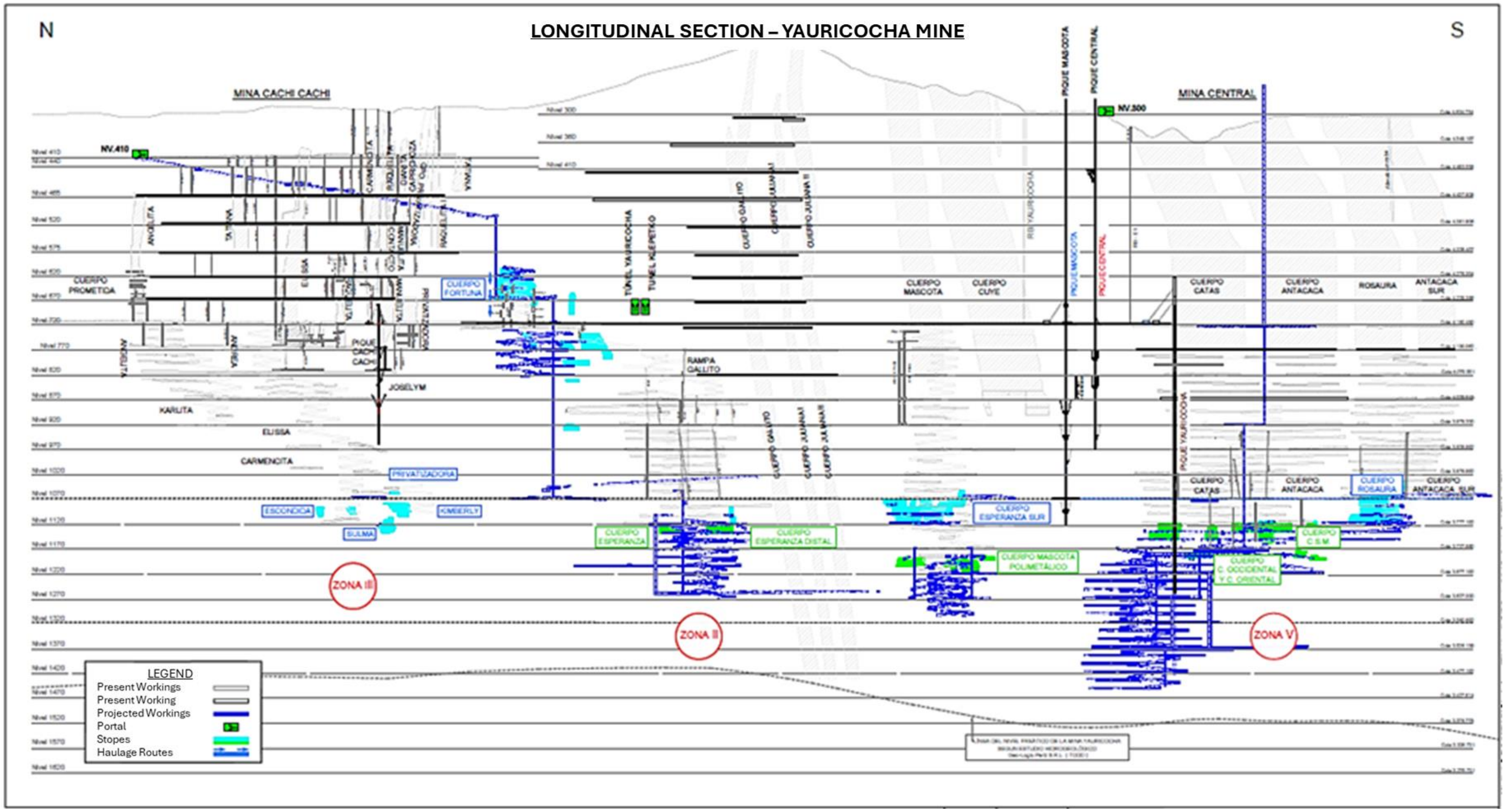
18.4.1 Underground Access and Haulage

Access to the underground mine is facilitated through a network of pre-existing shafts and tunnels. Presently, the site boasts three operational shafts: The Central shaft, Mascota shaft, and the Cachi-Cachi shaft. Additionally, construction is underway for a new shaft, the Yauricocha shaft.

Primarily utilized for the transportation of personnel and materials, these shafts possess the capability to convey ore and waste to the surface when required. Moreover, they serve as conduits for the movement of ore and waste from deeper levels to the 720-haulage level. Subsequently, the material is transported through tunnels by rail, facilitating its transit from the underground to the surface. It is worth noting that all ore and waste transportation to the surface currently occurs exclusively through the tunnels.

Figure 18-4 presents the mine haulage system for Yauricocha.

Figure 18-4: Mining Haulage System – Yauricocha Mine



Source: Sierra Metals, 2024

At the Cachi Cachi Mine, the ore and waste extraction are transported via dump trucks along the Hidden Ramp to the pocket of the Cachi Cachi Shaft at Level 920. Subsequently, it is hoisted to Level 720 and conveyed by locomotive through the Yauricocha tunnel to the portal near the Concentrator Plant – CHUMPE.

Similarly, at the Central Mine, ore and waste extraction are transported by dump trucks along Level 1070 to the pocket of the Mascota Shaft. From there, it is hoisted to Level 720 and transported by locomotive through the Yauricocha tunnel to the portal near the Concentrator Plant – CHUMPE.

The fragmented ore from the mechanized sub-level caving (SLCM) and ascending cut-and-fill (OCF) exploitation fronts is directed into accumulation chambers before being loaded onto 4.1 cubic yard Scoops and transported to the 110 ft^3 and 160 ft^3 mine cars (at different levels). These mine cars are hauled by locomotives weighing 6, 8, and 12 tons respectively. The locomotives transport the ore approximately 650 m, as seen in the case of the Rosaura – Antacaca area, to the shaft pockets for subsequent hoisting.

The generated waste rock from the advances is accumulated in loading chambers and loaded onto the mine cars by the 4.1 cubic yard Scoops. Subsequently, these mine cars, pulled by locomotives, are transported to the waste rock pockets of the shaft for subsequent hoisting.

The locomotives operate on continuous 250 Volt trolley power. The convoy travels along the 60 lb/Yd Cauville line, supported by 6”x9”x5’ sleepers.

Low-profile trucks MT-2000 / 2010 (20 tons) and JOY 16TD (16 tons) are used respectively for each zone of the Central Mine and Cachi Cachi. These trucks are loaded using the 4.1 cubic yard Diesel Scoops, and the haulage distance is approximately 2,000 m to the Level 1070 pocket where the trucks unload directly.

Once the ore is fed into the shaft pockets at different levels, the skips (02) are balanced:

- From the loading level (01)
- With Level 680 (01), where unloading takes place via the tipping plate.

This load accumulates in the Level 720 pocket, from where it is transported to the concentrator plant. The capacity of the Mascota shaft skips is 6.0 metric tons per skip, with an average performance between ore and waste rock of 145 metric tonnes per hour.

The ore and waste rock extracted and reaching the Level 720 pockets (hoisted by the shafts) are loaded onto the 160 ft3 mine cars through hoppers located according to the design. The convoy, consisting of 13 cars, is then transported by locomotives to trolleys (Continuous 250 Volt power) to the concentrator plant discharge points through Yauricocha Tunnel NV. 720, which has an approximate length of 4,000 m.

Upon reaching the surface, there are discharge points for ore and waste rock where they are unloaded using a lateral tipping system (Giba). The Cauville line gauge is 30 inches, with rails weighing 75 lb/Yd and supported by 6”x9”x5’ sleepers. The average capacity of the mine cars is 8.6 metric tonnes per car. The average extraction system performance is 45 metric tonnes per hour.

18.4.2 Yauricocha Shaft

The Yauricocha Shaft project is located southwest of the Mascota/Central shaft, with a total projected height of 750 m, the first stage of the project corresponds to the construction of 600 m from level 640 to level 1270, the section is 4.8m x 4.8m, with 4 compartments: 2 for the skips, 1 for the personnel cage and 1 for the road, with a designed production capacity of 7,200 tpd, it is engineered to handle both ore and waste materials effectively. The total budget allocated for the shaft construction amounts to US$ 36.2 million.

Construction of the Yauricocha shaft is presently underway, with anticipated completion and commissioning scheduled to finish of 2024 and operationally in 2025 to replace the Mascota and Central shafts.

Shaft sinking activities commenced in October 2017, significant progress has been achieved such is the shaft excavation, the hoist service installation and operation, the equipment column with steel guides and timber sets, the loading and spill pocket, the stations, pumping station, production hoist is also installed and the pull chamber.

The pending works are excavations in the load and upload area, shaft access, skips and rope installation, the commissioning.

18.4.3 Central Shaft and Central Incline Shaft

The Central shaft, reaching a depth of 810 metres, caters to levels 970 through 690, boasting a capacity of 74 tons per hour for ore and 67 tons per hour for waste. Adjacent to it, the Central incline shaft spans between the 920 level and extends services down to the 1070 level. Functioning as a production shaft, the Central incline shaft is equipped with a 200 HP winch responsible for hauling three 1.5-ton railcars between these levels.

As part of ongoing maintenance and optimization efforts, attention is being directed towards the upper segment of the Central shaft, specifically from levels 410 to 520, levels 920 to 970 and Surface to level 410. Rehabilitation works were executed between 2021 to 2023.

18.4.4 Mascota Shaft

The Mascota shaft exhibits a remarkable capability to transport 135 tons per hour of ore and 110 tons per hour for waste materials. Spanning 920 metres in depth, the Mascota shaft provides services to levels 1100 through 680. This crucial infrastructure is equipped with a state-of-the-art Hepburn hoist, enabling the efficient movement of approximately 105,000 tons per month to the 1430 level. Notably, the system facilitates the transportation of both ore and waste materials, optimizing operational efficiency.

The commissioning of the Mascota shaft was successfully completed in December 2016, marking a significant milestone in operational readiness. In a proactive approach to maintenance and enhancement, the timber sets of the Mascota shaft underwent refurbishment in 2018. This refurbishment initiative involved the meticulous cleaning of ore from the timber sets, reinforcement of existing timber sets, and replacement of any missing wall liners. Additionally, in 2018, the development drift at the 1120 level was excavated as part of the shaft bottom cleanup effort, further ensuring operational integrity and safety.

Also, maintenance works were executed between 2022 to 2023, specifically from levels 680 to 1100.

18.4.5 Cachi-Cachi Shaft

The Cachi-Cachi shaft serves as a vital conduit, offering access to the shaft bottom at the 870 level from the 910 level. It exclusively manages the transportation of waste and ore originating from the Cachi-Cachi orebody. This shaft plays a pivotal role in the efficient handling and transportation of materials essential to operational processes within the mine site.

18.4.6 Subsidence in Central and Mascota Zones

The subsidence inherent to the sub-level caving mining method has commenced exerting slight effects on the upper levels of both the Mascota and Central shafts. To diligently oversee this development, the Project has instituted a robust monitoring regimen employing advanced surveying techniques, inclusive of ground stations strategically installed on the surface. As a proactive measure in response to these observations, the Mascota and Central shafts will be replaced with the Yauricocha shaft in 2025. This strategic decision aligns with the Project's commitment to ensuring the long-term viability and sustainability of its mining operations.

18.4.7 Tunnel Haulage

The current primary haulage route utilizes the 4.7-kilometre Yauricocha Tunnel, measuring 3.5 m in height and 3.5 metres in width, situated at level 720. Haulage operations are facilitated by 20-ton electric trolley locomotives, accompanied by cars ranging in size from 3.1 m^3 to 4.5 m^3.

In April 2017, the excavation of the new Yauricocha tunnel was successfully completed from the surface at Chumpe. This tunnel provides access to the mine at the 720 level. Its construction was motivated by the imperative to enhance haulage flexibility and alleviate bottlenecks previously experienced in the Klepetko tunnel. Additionally, the new Yauricocha tunnel serves as a vital conduit for ventilation purposes.

The installation of tunnel infrastructure was meticulously carried out, with commissioning and finalization completed in December 2018. The Project incurred costs totaling US$4.85 million for this significant infrastructure enhancement, underscoring the commitment to operational efficiency and safety.

18.4.8 Ventilation

The underground mine operates with a sophisticated ventilation infrastructure, meticulously tailored to support both the Cachi-Cachi and central mine areas independently.

At Cachi-Cachi, a dedicated intake ventilation system facilitates the influx of fresh air through the Yauricocha Tunnel and Klepetko Tunnel. The fresh air is then channeled into the mine through the main decline, subsequently reaching lower levels where production activities are underway. The ventilation circuit ensures optimal airflow by expelling air through CH CC5 and the 410 level. Positioned in the 410 level, a SIVA 150HP primary fan adeptly draws in approximately 100,000 cubic feet per minute (cfm) of air. The exhausted air is efficiently removed through vent raises and shafts, ultimately reaching to the 410 level and CH CC5. Throughout the mine, strategic ventilation doors and booster fans are meticulously deployed to ensure consistent air quality.

The ventilation setup at the central mine strategically draws in air from multiple sources, including the central mine main decline, the Mascota and Central shafts, BM 300, RB Amoeba, Yauricocha Tunnel and Klepetko Tunnel. This intake system ensures a robust inflow of approximately 330,000 cfm of air. The extracted air is then expelled through Raisebore #1, Raisebore Yauricocha and Raise Climber#47, where primary fans are strategically positioned. A Joy 200 HP fan operates at Raisebore #1, A Joy 250HP fan operates at Raisebore Yauricocha, while Raiseclimber #47 is equipped with a Joy 250 HP fan. Throughout the mine workings, the airflow is meticulously regulated using ventilation doors and booster fans to maintain optimal air quality standards.

18.5 Additional Support Facilities

18.5.1 Mine Site Camps

The project encompasses a comprehensive on-site living infrastructure, comprising four accommodation camps along with a hotel, collectively providing housing for approximately 2,000 individuals. These camps cater to various needs and functions, including the supervisory camp, the mill camp, and the mining camp, which accommodates both project employees and mining contractors. Presently, the site hosts around 1,700 individuals, including 600 employees and 1,100 contractors. Each camp is equipped with essential amenities such as dining facilities, exercise facilities, and comfortable housing options.

Furthermore, the project boasts additional essential facilities such as dedicated engineering and geology offices, safety, and environmental buildings, all contributing to the smooth operation and management of the site. Additionally, the presence of a health clinic staffed by a qualified National Health Service doctor ensures the well-being and medical needs of all individuals on-site are adequately addressed.

18.5.2 UG Infrastructure Facilities

The mine infrastructure comprises a compressed air system situated at the primary portal to the Yauricocha Mine. This system features compressors and receiving tanks that bolster underground operations. Additionally, there are two subterranean workshops dedicated to equipment maintenance, facilitating minor repairs and servicing. Refer to Figure 18-5 for a visual representation of the underground workshop.

Figure 18-5: Yauricocha UG Workshop II

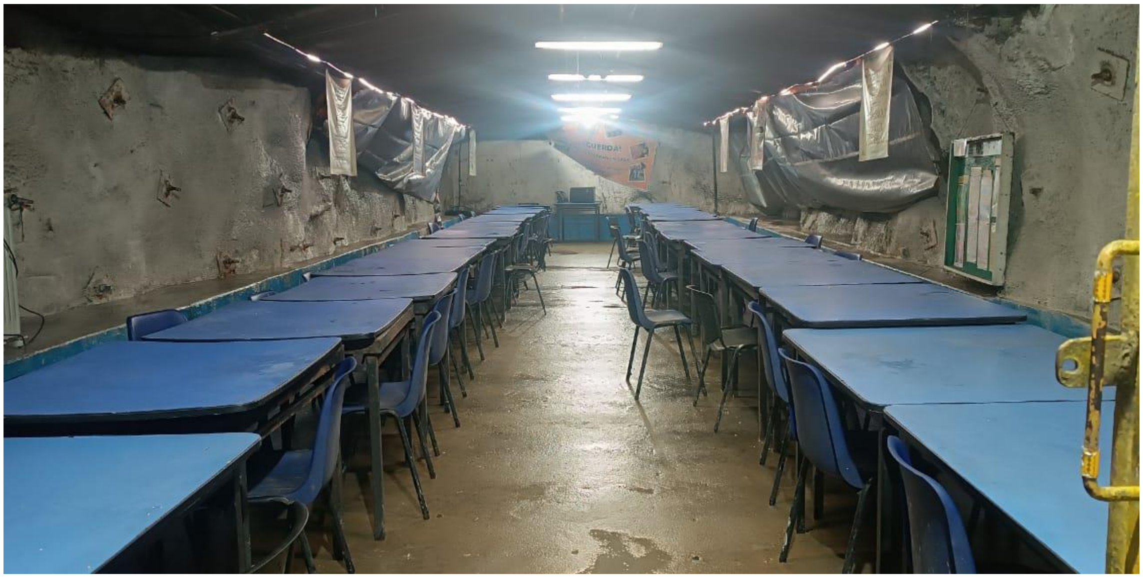
Source: Sierra Metals, 2024

The Yauricocha Mine is equipped with several underground (UG) refuge chambers strategically positioned throughout the underground mine to address emergency events or entrapment situations. Figure 18-6 illustrates the current placement of one such refuge chamber at the Esperanza Sur. Additionally, the underground mine features NV 1070 crib room where personnel can take meal breaks, as shown in Figure 18-7. The cafeteria was constructed in 2019 with an estimated cost of US$3.0 million. There are additional underground shops, powder and detonator magazines, and fuel and oil storage facilities.

Figure 18-6: Yauricocha Esperanza Sur Refuge Chamber

Source: Sierra Metals, 2024

Figure 18-7: Yauricocha NV 1070 Crib Room



Source: Sierra Metals, 2024

18.6 UG Pumping System

18.6.1 Cachi Cachi Mine

The wastewater originating from Level 410 is efficiently drained at the same elevation via ditches and then conveyed through a 4" diameter pipeline to the wastewater reservoir located at Level 440. From there, it undergoes further transport via 4" diameter pipelines to reach the primary reservoir situated at Level 720.

Similarly, wastewater from Level 520 is skillfully directed through ditches at its respective elevation and subsequently transported through a 4" diameter pipeline to join the reservoir at Level 720.

At Level 670, wastewater management follows a similar protocol, where drainage via ditches at the same elevation is facilitated, followed by transportation through a 4"Ø pipeline leading to the pumping pool at Level 720.

Operations at Levels 770 and 820 necessitate a more comprehensive approach. Wastewater is meticulously collected and conveyed through 4" pipes to the Pumping Pool at Level 820, boasting a capacity of 110 m^3. From there, it is efficiently pumped by two HIDROSTAL pumps, equipped with a maximum head of 120 m and a flow rate of 25 L/S, to the principal reservoir at Level 720, utilizing 8" diameter pipes.

Similarly, wastewater management at Levels 870 and 920 involves initial drainage via ditches, followed by conveyance through 4" pipes to the Pumping Pool at Level 920, with a capacity of 60 m^3. Subsequently, pumping is carried out by a HIDROSTAL pump, featuring a maximum head of 100 m and a flow rate of 20 L/S, to the primary reservoir at Level 870, with the provision of a standby pump of equivalent specifications.

Wastewater originating from filtration activities, intended for the deepening of the Cachi Cachi Shaft at Level 950, undergoes a specialized pumping process. Utilizing the GRINDEX MASTER MS pump, rated at HP=10, Hmax=50 m, and Q=35 L/S, it is initially directed to the pumping pool at Level 870 before being further pumped to the primary reservoir at Level 720 through 8" diameter pipes.

A similar approach is adopted for wastewater derived from filtration activities aimed at the deepening of Ramp 8773 NW at Level 970. Employing the GRINDEX MASTER MS pump, rated at HP=13, Hmax=80 m, and Q=20 L/S, the wastewater is first directed to the pumping pool at Level 870 before being subsequently pumped to the main reservoir at Level 720 via 8" diameter pipes.

Ultimately, all wastewater, whether conveyed by gravity or through pumping mechanisms to the primary reservoir at Level 720, is efficiently transported to the surface via 8"Ø pipes through the Klepetko tunnel, facilitating its treatment at the designated water treatment plant.

Water supply for operations at Levels 820, 870, and 920 is secured through a reservoir located at Level 720 Andrea, boasting a capacity of 150 m^3. Equipped with a 2" diameter pipe outlet, this reservoir is fed by water intakes from higher elevations as well as from the Klepetko tunnel, ensuring a reliable and sustainable water supply for operational needs.

18.6.2 Central Mine

At Level 1120, during the ramp expansion of the Mascota area, our operations are supported by two stationary pumps manufactured by Hidrostal, model 40200. These pumps boast a power output of 40 hp, enabling them to achieve a maximum head of 110 m and a flow rate of 10 L/S.

Moving to Level 1070, where the Mascota shaft is being deepened, the level relies on two GRINDEX MASTER SMH-21,23 pumps. With a maximum head of 75 m and a flow rate of 15 L/S, these pumps efficiently handle the wastewater pumping requirements at this level.

In the same Level 1070, there is a GRINDEX Maxi H pump with 50HP, delivering a head of 60 m and a flow rate of 35 L/s. This pump is instrumental in transferring water towards Level 1020 through 4" polyethylene pipes, utilizing water sourced from drilling activities.

Transitioning to Level 1020, a GRINDEX Major H pump with 30HP is operated, offering a head of 60 m and a flow rate of 35 L/s. This pump facilitates the movement of water towards Level 970 through 4" polyethylene pipes, also utilizing water derived from drilling operations.

At Level 970, the wastewater management includes a GRINDEX Major N pump with 30 HP. With a head of 50 m and a flow rate of 35 L/s, this pump efficiently pumps water towards Level 920 through 4" polyethylene pipes.

Progressing to Level 1090, where the Yauricocha shaft is being deepened, two GRINDEX MASTER SMH-14,12 pumps are employed, each boasting 25 hp. These pumps exhibit a maximum head of 75 m and a flow rate of 15 L/S, operating in parallel to facilitate pumping towards Level 920.

Now, at Level 920, two pumps: one Maxi H pump with 40HP and one Master M pump with 35HP are implemented. These pumps, situated in the sedimentation pool, deliver efficient pumping towards Level 870 through two 4" polyethylene pipes, culminating in a 134 m^3 sedimentation pool.

Meanwhile, at Level 870, the wastewater management involves one GRINDEX Maxi H pump with 40HP and one GRINDEX Bravo 400 pump, each with a head of 60 m and 52 m respectively, and a flow rate of 40 L/s and 39 L/s respectively. These pumps operate in conjunction with 4" polyethylene pipes, ensuring seamless pumping towards Level 820. Additionally, an 85 m^3 water reservoir is maintained to support operations at Levels 920 through 2" polyethylene pipes.

At Level 820, a consistent wastewater pumping system utilizing one GRINDEX Maxi H pump with 40HP and one GRINDEX Bravo 400 pump is utilized. These pumps, each with a head of 60 m and 52 m respectively, and a flow rate of 40 L/s and 39 L/s respectively, facilitate pumping towards Level 770 through 4" polyethylene pipes.

Proceeding to Level 770, the wastewater management with one Master M pump and one GRINDEX Bravo 400 pump, each with a head of 55 m and 52 m respectively, and a flow rate of 40 L/s and 39 L/s respectively. These pumps operate in tandem with 4" polyethylene pipes, effectively pumping towards Level 720. Moreover, an 85 m^3 water reservoir to support operations at Level 920 through 2" polyethylene pipes is maintained.

At Level 720, the water flow ranging from 80 to 100 L/s is overseen. Equipped with a sedimentation pool, this level ensures the appropriate settling of sediments before water gravitates towards the surface through the Klepetko tunnel towards Chumpe.

The water flow trajectory through the Klepetko, Yauricocha, and Cachi Cachi tunnels reaches the mine water treatment plant via channels and pipelines, where conventional treatment is carried out, comprising the following stages: neutralization, coagulation, flocculation, and sedimentation, totaling 264 L/s.

18.6.3 LoM Pumping System

The Central Mine Pumping System project encompasses two pumping stations situated at Level 920, with a pumping capacity of 50 L/S, and at Level 1070, with a capacity of 160 L/S, as shown in Figure 18-8.

At the Level 920 pumping station, water will be drawn from other reservoirs, augmenting the volume to be pumped at this level.

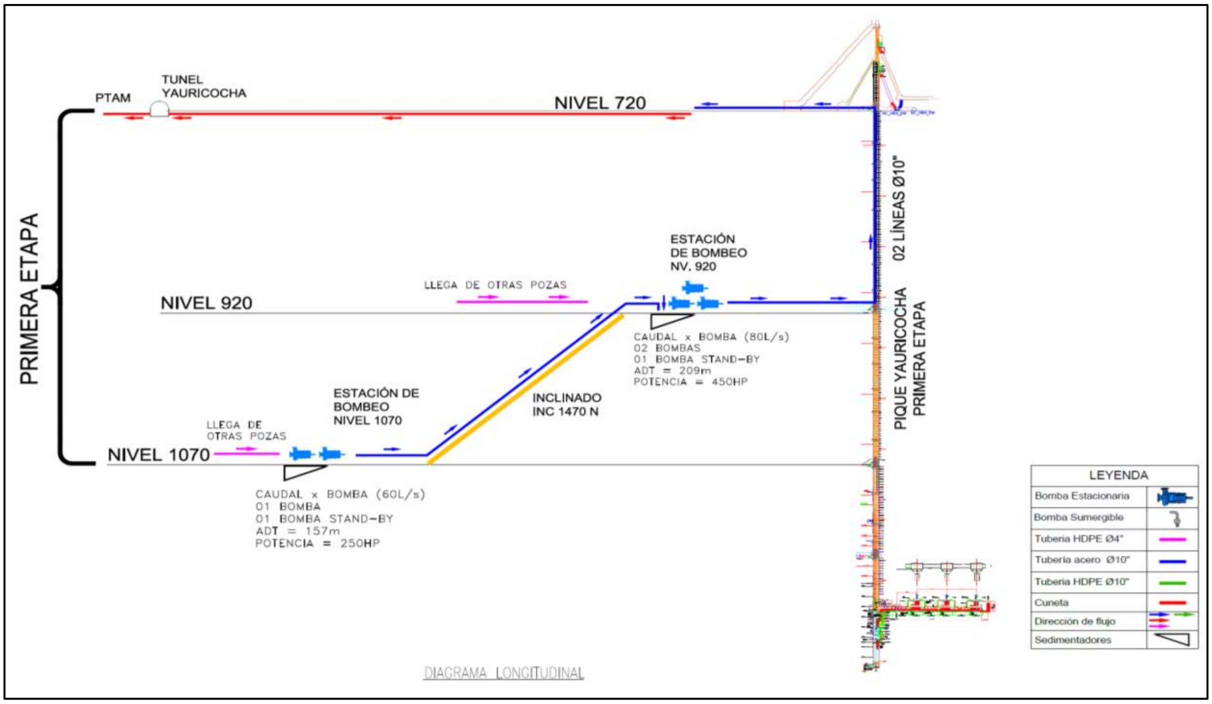
Each pumping station will be equipped with essential infrastructure, including sedimentation tanks, water reservoirs, pump chambers, drying chambers, flocculant chambers, and dedicated electrical substations.

In the Level 1070 pumping station, high-powered 250 hp pumps will be deployed to facilitate a flow rate of 50 L/S through an 8" diameter steel pipeline. This pipeline will traverse a horizontal stretch of 40 m before reaching the incline (which spans a length of 300 m), followed by a 60-metre horizontal journey to Sedimentation Tank No.1).

Subsequently, excess water will cascade into the water reservoir at Level 920, where two 450 HP pumps will further propel 120 L/S of water through twin 10" diameter steel pipelines across a horizontal distance of 350 m.

Upon reaching the Yauricocha shaft (with a length of 150 m along its course), the water will then navigate another horizontal stretch of 245 m, ultimately discharging into the concrete channel of the Yauricocha tunnel. This water will subsequently travel a distance of 5 km before reaching the treatment plant located in Chumpe, at the surface.

Figure 18-8: Yauricocha LoM Pumping System



Source: Sierra Metals, 2024

18.7 Water Systems

18.7.1 Water Supply

Water is obtained from various sources, including the Mishquipuquio Spring, the Klepetko Tunnel, the Huacuypacha Spring, and recycled/overflow water from the Tailings Storage Facility (TSF), depending on its intended application. A comprehensive overview of water quality and its diversified usage is encapsulated in Table 18-1.

Table 18-1: Water Source and Use

Source	Quantity (L/sec)	Uses
Huacuypacha Spring	10	Huacuypacha Camp: 1.5 L/sec
Mishquipuquio Spring	2	Chumpe Camp: 1.5 L/sec
Klepetko Tunnel	40	Esperanza and Vista Alegre Camps: 2.8 L/sec

Source: Sierra Metals, 2024

18.7.2 Potable Water

The intake located at the Klepetko Tunnel (Aldrich) serves as the main source of water for potable use. Treatment occurs at the optimized plant (PTAP ESPERANZA), located in the upper part of the Esperanza camp. The treatment involves filtration methods, disinfection, and reverse osmosis. This system operates at a flow rate of 2.8 L/s.

In Chumpe, a conventionally operated multimedia filter plant is used, featuring filtration mechanisms ranging from 40 µm gravel to sand, followed by finer 5 µm filters. Additionally, water disinfection is achieved by adding a sodium hypochlorite solution. This system operates at a flow rate of 1.5 L/s.

Meanwhile, in the Huacuypacha camps, a multimedia filtration system followed by disinfection with a sodium hypochlorite solution is used. This system operates at a flow rate of 1 L/s.

The disinfection process involves pre- and post-chlorination in all treatment systems.

18.7.3 Service Water

Service water is a crucial resource within the operations of the Chumpe Mill, with complementary use for dust control in surface mining activities. It is predominantly obtained from the Cachi-Cachi underground mine and transported through the Klepetko and Yauricocha tunnels. Additionally, service water is drawn from the infrastructure of the Tailings Storage Facility (TSF).

Effluent management is carried out through the Klepetko wastewater treatment facility, with a capacity of 1,000 litres per second (L/s). Treated effluent is reused in the internal processes of the mill, with any surplus discharged into the Chumpe River. Residues from the treatment process are deposited within the TSF for containment. Simultaneously, domestic wastewater from camp facilities is treated in one of the two dedicated wastewater treatment plants, with a combined processing capacity of 1.7 L/s.

18.8 Energy Supply and Distribution

18.8.1 Power Supply and Distribution

Sociedad Minera Corona S.A. has diligently explored two distinct energy sources to secure an uninterrupted electrical power supply to critical equipment within our operations, encompassing vital systems such as ventilation, water drainage, and personnel hoisting winches. In the event of unforeseen disruptions to the power supply from the National Interconnected Electrical System (SEIN), our contingency plan relies on generator sets boasting a robust capacity of 3500 kW.

1) The primary energy source:
    a) Drawing power from the Sistema Electrico Interconectado Nacional (SEIN), our primary energy supply originates from the bars of the Nueva Oroya substation, facilitated by an overhead line operating at 69 kV. This power is then seamlessly transmitted to the Chumpe Substation (main), where it undergoes distribution to both Mine and Plant operations.
    b) Notably, this distribution is facilitated by dedicated transformers, with capacities of 9 and 6 MVA respectively, ensuring optimal power delivery efficiency.
2) The secondary energy source:
    c) The Project concluded the implementation of a 12.6 kV overhead ring line, enabling the utilization of the mine's backup generator for emergency loads within both the processing plant and the Cachi-Cachi Zone.
    d) Our secondary energy source is meticulously safeguarded by "Generator Sets", strategically positioned adjacent to the Victor 1 Guardhouse (Chumpe). These generator

sets boast a commendable capacity, capable of generating up to 3500 kVA at 460 V.

e) Leveraging a sophisticated transformation process involving a 4.0 MVA transformer, this electrical output is elevated to 12.6 kV before seamlessly integrating into the electrical network. This meticulously designed setup stands ready to promptly address any unforeseen contingencies, thereby ensuring the resilience and reliability of our operations.

Notably, Statkraft retains ownership, Enel the operational responsibility and maintenance oversight of the Chumpe substation, and the line distribution network extending from the Chumpe substation to both the mine and processing plant substations. Additionally, the availability of 895 kW backup generation capacity is ensured through a CAT model 3512B backup generator.

The main substation in Chumpe has 2 Power transformers:

- A 6 MVA three-phase transformer, transformation ratio 69/2.4 kV, for the supply of electrical power to the Concentrator Plant.
- A 9 MVA three-phase transformer, transformation ratio 69/12.6 kV, from which 2 circuits are derived to supply power to the Mine operations, through 2 overhead power transmission lines at a voltage level of 12.6 kV. These lines reach substation No. 1, located in Yauricocha, from where feeder circuits are derived at 4.16 kV for underground mine operations and main surface fans.

From electrical substation No. 01, electricity is distributed to various surface equipment, including the main fans RB Yauricocha, RB 47 and RB 01, compressors, CIR winch, and offices, as well as to support the operations of Central Mine.

- Power supply for Central Mine - Substation No. 1
  - Substation No. 1 is equipped to distribute power effectively to Central Mine and its surface operations. The electrical infrastructure includes:
  - A 2.5 MVA transformer with a 12.6/2.4 kV rating, dedicated to powering the compressors of the compressed air system and offices at Victor 4 and Palomar.
  - An 800 kVA transformer with a 12.6/0.46 kV rating, designated to supply power to the 1000 cfm compressors and the main fan JY-02 of Raise Borer No. 1.
  - A 3/3.5 MVA transformer rated at 12.6/4.16 kV, serving to provide electrical power to the interior of the Mine. The power distribution to Central Mine is facilitated through four circuits operating at 4.16 kV.
  - Additionally, a capacitor bank with a capacity of 400 kVAR is installed on the 4.16 kV busbars, enhancing power quality and stability.
- Power supply for Cachi Cachi Mine - Substation No. 11
  - Substation No. 11 is equipped with a bank of single-phase transformers, each rated at 500 kVA (1.5 MVA) with a transformation ratio of 12.6/4.16 kV.
  - These transformers supply power to the interior of Cachi Cachi Mine via two sets descending through mine shafts, ensuring reliable power distribution within the mine's operational areas.

Production winch power supply encompasses the following:

- Through a Medium Voltage circuit at 12.6 kV, utilizing N2XSEOH type power cable with 3x70 mm2 + 35 mm2, electrical power is supplied from Substation No. 1 (surface) to Substation No. 50 (Level 720) of the Mascota Production Winch and Yauricocha Services.
- Using a 2.0 MVA transformer, the voltage is reduced from 12.6 kV to 4.16 kV.
- Through a 4.16 kV medium voltage circuit, utilizing N2XSEY type power cable with 3x50 mm2, power is supplied from Substation No. 50 to Substations No. 51 and 52, corresponding to the Electrical Substation of the Mascota Winch and Yauricocha Services.
- Two transformers, one of 600 kVA and another of 500 kVA, reduce the voltage from 4.16 kV to 450 V and supply power to the Mascota and Yauricocha Services winches.

Provision of power to Yauricocha tunnel and Fortune Orebody

- Electrical power is supplied through voltage-reducing substations at 12.6/4.16-0.46 kV for rectifiers with a power rating of 350 kVA, designated as numbers 08, 71, 72, 73, and 74.
- Electrical power is supplied through voltage-reducing substations at 4.16/0.46-0.23 kV with a power rating of 500 kVA, designated as numbers 21 and 22.

18.8.2 Compressed Air

Compressed air serves as a vital energy source within the mine, powering a range of equipment including air chutes, drilling machinery, small pumps, and various tools essential for operations. The system comprises compressors and storage tanks located on the surface, with an extensive network of piping facilitating the distribution of compressed air throughout the mine's infrastructure. Notably, a 149-kW compressor was integrated into the system in 2018, representing a strategic enhancement aimed at optimizing the efficiency and reliability of the compressed air infrastructure.

Similarly, the mill operates a smaller-scale compressed air system primarily designated for control air and various miscellaneous tools required for operational purposes.

18.8.3 Fuel

The project features on-site diesel storage tanks designated for fueling surface mining equipment, with the flexibility for transfer to underground fuel storage facilities as needed. These tanks, having served the project for a considerable duration, are comprised of two sets with a combined capacity of approximately 104,000 litres. Visual representation of the underground fuel tank and sorter configuration is provided in Figure 18-9.

Figure 18-9: Yauricocha UG Fuel Station

Source: Sierra Metals, 2024

The initial cluster of tanks is situated at the Chumpe Processing Plant, boasting a cumulative capacity exceeding 68,000 litres. These tanks are pivotal in furnishing a supply of fuel lasting approximately 30 days, based on an average daily consumption rate of 2,100 litres. Conversely, the secondary array, comprising four tanks positioned near the Yauricocha Mine, boasts a combined capacity of roughly 36,000 litres. With an average daily consumption of approximately 5,700 litres, these mine-side tanks provide a storage duration of approximately six days.

Fuel procurement is facilitated through vendors based in Huancayo, with transportation to the site orchestrated via trucking services. As of 2023, the cost per liter of fuel stands at approximately US$4.32. Detailed breakdowns of the storage capacities for both fuel storage areas are presented in Table 18-2 and Table 18-3.

Table 18-2: Chumpe Diesel Storage Capacity (Gallons and Litres)

Chumpe Location	Gallons	Litres
Tank 01	3,384	12,810
Tank 02	1,127	4,266
Tank 03	2,230	8,441
Tank 04	2,230	8,441
Tank 05	3,064	11,598
Tank 06	6,000	22,712
Total Chumpe Capacity	**18,035**	**68,270**

Source: Sierra Metals, 2024

Table 18-3: Yauricocha Location Diesel Storage Capacity (Gallons and Litres)

Yauricocha Location	Gallons	Litres
Tank 07	4,354	16,482
Tank 08	1,643	6,219
Tank 09	1,457	5,515
Tank 10	2,042	7,730
Total Yauricocha Capacity	**9,496**	**35,946**

Source: Sierra Metals, 2024

18.9 Tailings Management Area

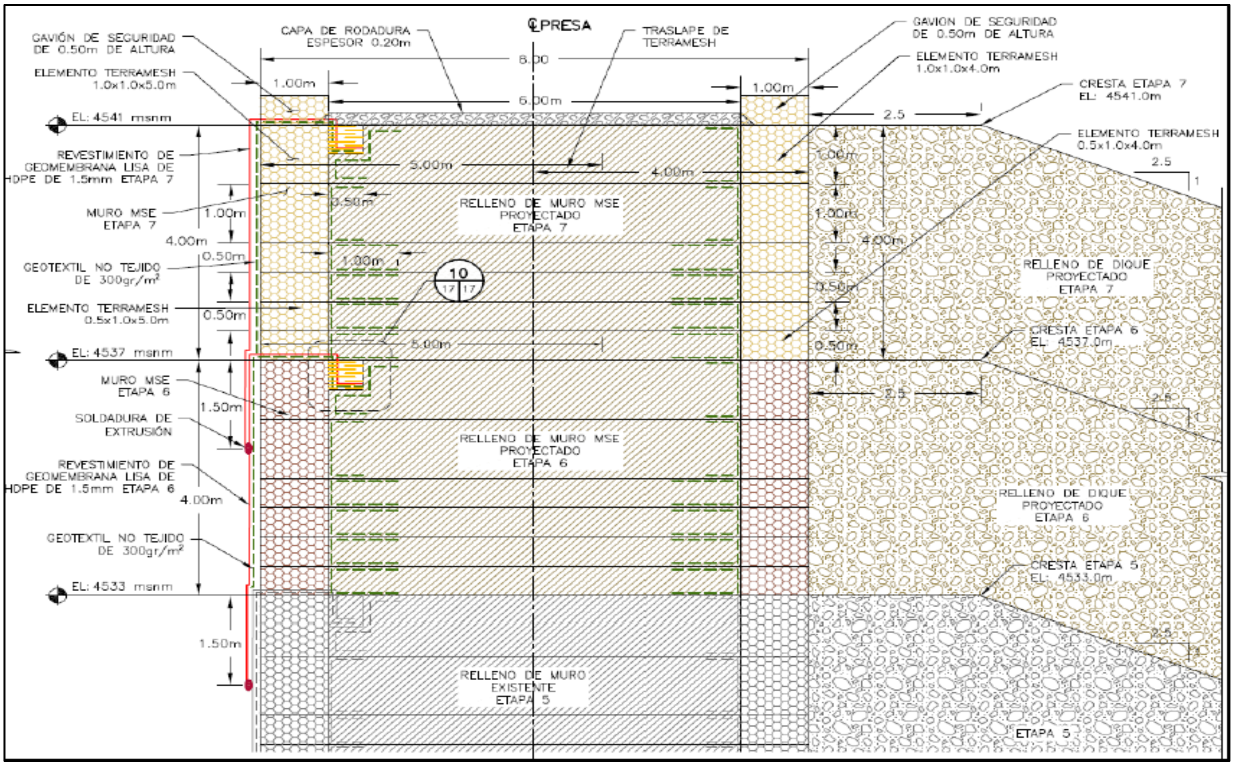
Tailings from the Chumpe mill are stored in on-site tailings facilities. The tailings undergo flocculation and sedimentation and are then processed through a thickener and channeled to the existing permitted TSF. The dam up to Stage 7 has a capacity of 3,650 km^3. Currently, Stage 6 was constructed in 2023 for a capacity of 0.920 km^3, the construction of Stage 7 will occur in 2025. Table 18-4 shows some of the parameters of the expansion of Stage 6. A representative cross-section of stage 6 and stage 7 is provided in Figure 18-10.

Table 18-4: Tailings Storage Facilities – Stage 6

Yauricocha Location	Gallons
Berm level – Stage 6	4533.00 masl
Maximum tailings level – prior to Stage 5	4531.40 masl
Projected level of final berm Stage 6	4537.00 masl
Maximum Storage level	4535.00 masl
Freeboard	2.00 m
Berm Width	10.50 m
Upstream slope	Vertical
Downstream slope	2.5H:1V
Horizontal projection area of the TSF	233,118 m^2
Volume of stored tailings material	920,000 m^3
Volume of dam fill material	175,511 m^3

Source: Sierra Metals, 2024

Figure 18-10: Yauricocha UG Fuel Station



Source: Sierra Metals, 2024

18.9.1 Expansion of TSF (Stage 6 to 8)

Sierra Metals engaged Tierra Group International (TGI) updated the design the TSF expansion for Stages 5 to 7 considering an extreme risk level classification for the dam.

Sierra Metals voluntarily accepted the CDA international rules to improve your standard in Tailing Management.

The project consists of increase the capacity of the tailings deposit by raising the crest of the dam in 4 m of elevation until reaching the final elevation of 4,541 masl. The expansion of the dam will follow the central axis construction method used in previous stages. The crest of the dam is formed by terramesh elements, consisting of gabions and geogrids, and a compacted fill on its downstream face constructed of mine waste material.

The external slope of the stage 7 will have a reinforcing buttress also made of mine waste material with a crest width sufficient to improve the stability conditions of the structure. TGI reviewed the site hydrology, geology, hydrogeology, seismic risk and designed the TSF facilities raises.

In 2023 to extend the useful life of the mine, Sierra Metals engaged Anddes to develop the expansion of the Tailings Storage Facility, this study defined four raises, from stage 8 to stage 11.

The TSF key design elements are summarized in Table 18-5.

Table 18-5: Tailings Storage Facilities – Stage 6

Description	Units	Stage 6	Stage 7	Buttress – Stage 7	Stage 8
Altitude of crets, previous stage	masl	4,533	4,537		4,541
Maximum altitude of tailings, previous stage	masl	4,531.4	4,533.9		4,540
Height of extra elevation, this stage	m	4	4		4
Altitude of crest, this stage	masl	4,537	4,541	4,514/4,500	4,545
Maximum level of storage	masl	4,535	4,538.7		4,543
Freeboard	m	2	2		1
Width of crest	m	10.5	10.5	50/45	13
Length of Dam	m	344	422		498.4
Inclination of Upstream	grade	Vertical (strengthened ground)	Vertical (strengthened ground)		1.5H:1V
Inclination of Downstream	grade	2.5H:1V	2.5H:1V	2.5H:1V	2.5H:1V
Volume of stored tailings material	m3	920,000	1,910,000		2,876,000
Volume of dam fill material	m3	175,511	218,194	797,906	955,400
Useful life	years-(months)	1.03 – (13)	2.13 – (26)		3.21 – (39)

Source: Sierra Metals, 2024

The designs of Stages 6 and 8 yield a total storage of approximately 5.7 mm^3 or 7.9 Mt of tailings, which yields approximately 6.3 years of storage at the projected annual tailing deposition rate of 897,029 m^3 and an average tailing density of 1.4 t/m^3.

Tabe 18-6 summarizes the results of the study.

Table 18-6: Yauricocha Key Desing Elements for TSF Expansion Stages 6 to 8

Stage	Volume (m3)	Capacity (t)	Years
6	920,000	1,288,000	1.03
7	1,910,000	2,674,000	2.13
8	2,876,000	4,026,400	3.21
Total	**5,706,000**	**7,988,400**	**6.36**

Source: Sierra Metals, 2024

18.10 Waste Rock Storage

The project implements a comprehensive waste management strategy whereby waste rock generated is repurposed as backfill underground, while any surplus is transported to the surface, predominantly via the Yauricocha Tunnel. Notably, there exists a substantial 1.2 million cubic metre storage area on the surface, encompassing both historic open pits and designated sites proximate to the shaft area, slated for reclamation in compliance with regulatory mandates.

Additionally, certain development materials are elevated through the shafts to facilitate the backfilling process of the pits. Concurrently, waste transportation from the plant site to the open pit continues as an ongoing operation. Moreover, the site incorporates a designated borrow area to fulfill general construction needs and support tailings construction endeavors.

18.11 Other Waste Handling

The project employs two on-site landfills for the disposal of industrial and sanitary waste. Waste management procedures include the collection of waste oil, scrap metal, plastic, and paper, which are subsequently recycled at licensed off-site facilities, ensuring adherence to environmental regulations, and promoting sustainable practices.

18.12 Logistics

Materials and supplies essential for the project's operations are sourced from Lima and transported via truck. Labor is transported to the site via buses utilizing the existing highway infrastructure from Lima or Huancayo. The concentrates yielded by the project are conveyed overland utilizing 30-ton trucks to the refinery. Expenses covering transportation, insurance, and associated charges are encompassed within the treatment costs for concentrates. These concentrates undergo processing at a Peruvian smelter, with treatment and refining charges prearranged under annual contracts.

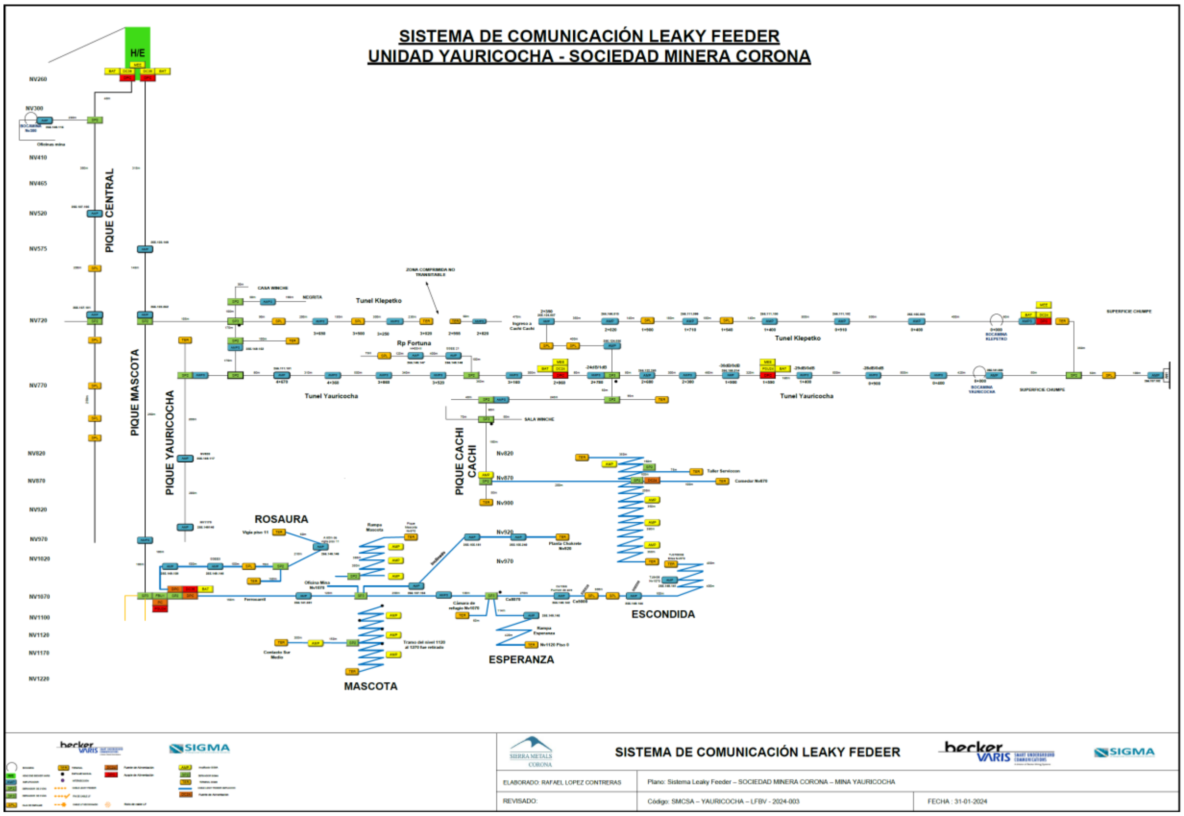
18.13 Off-Site Infrastructure and Logistics Requirements

The project currently lacks substantial off-site infrastructure, necessitating the transportation of its three concentrate products to customer destinations within Peru. These products encompass lead concentrate, copper concentrate and zinc concentrate.

18.14 Communications and Security

The site boasts an established and robust communications infrastructure comprising local internet connectivity, a fiber optic backbone, a comprehensive telephone network, and an underground telecommunication system. Figure 18-11 displays Yauricocha communication system onsite.

Figure 18-11: Yauricocha Communication System



Source: Sierra Metals, 2024

Furthermore, a paging system is in place at both the plant and mine facilities. Security measures are diligently maintained, with checkpoints strategically positioned at key junctures, including the main access road, the mill site, and the camp entrance, ensuring comprehensive safeguarding of the premises.

19 MARKET STUDIES AND CONTRACTS

Yauricocha operates as a polymetallic mining facility, strategically extracting and processing lead, zinc, and copper ores to yield high-quality concentrates. These concentrates, meticulously tailored to meet the specific requirements of various smelting operations, are subsequently sold to a range of smelters across the market. Sierra Metals currently holds a contractual agreement for the sale of its concentrate, with the terms of the contract meticulously reviewed by QP (Alonso Gonzales). Upon evaluation, these terms are deemed reasonable and congruent with industry standards observed in analogous operations familiar to the QP (Alonso Gonzales).

The metals derived from the Yauricocha concentrate are actively traded on various metals exchanges. The payable metals produced from the Yauricocha concentrates are zinc, copper, silver, lead, and gold. Notably, metal prices have been meticulously sourced from Sierra Metals and are derived from the November 2023 CIBC Global Mining Group Analyst Consensus Commodity Price Forecast. In the expert opinion of QP (Alonso Gonzales), the selected metal prices are deemed rational and appropriate for the accurate representation of mineral resources and ore reserves. Detailed metal price assumptions are presented in Table 19-1 for comprehensive transparency and reference.

Table 19-1: Metal Prices for Mineral Reserves for the Yauricocha Mine

Metal	Price	Unit
Copper	8,302.27	$/tm
Gold	1,711.21	$/oz
Silver	22.55	$/oz
Zinc	2,588.55	$/tm
Lead	2,064.04	$/tm

Source: Sierra Metals (2024)

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

20.1 Required Permits and Status

20.1.1 Required Permits

Sierra has all relevant permits required for the current mining and metallurgical operations to support a processing rate of 3,600 tpd. The current regulation allows the operation to have a 5% additional as an average through the year, which allows the operation to process a maximum average of 3,780 tpd. These permits include operating licenses for the plant as well as for the waste disposal facility (tailings dam), mining and process concessions, exploration permits, water use license, discharge permits, sanitary treatment plants permit, and environmental management instruments, among others.

Sierra Metals also has an Environmental Management Plan and a Community Relations Plan, both approved in the current 2019 Environmental Impact Assessment (EIA). Among the relevant permits, the following are highlighted:

- Land ownership titles.
- Public registrations (SUNARP) of:
  - process concession
  - mining concession
  - Constitution of "Acumulación Yauricocha"
  - land ownership and Records owned property (land surface) and lease
- Water use licenses from the Huacuypacha spring (1994), Klepetco tunnel (2004), and Misquipuquio spring (2005)
- Environmental Permits
  - The Environmental Adaption and Management Plan (PAMA, Plan de Adecuación y Manejo Ambiental) (1997)
  - EIA (2019)
  - EIA´s Technical Reports (ITS N °1, ITS N °2, ITS N°3, ITS N°4 and ITS N°5); these studies permit for the expansion of the processing capacity to 3600 tpd and expansion of the mine until 2027 (2024)
  - Fifth Technical Report of Support to the EIA (Fifth Supporting Technical Report - ITS to the EIA), for the: Redistribution of auxiliary facilities (offices, workshops, others); development of underground works between level 1120 and 1320 and implementation of exploration platforms (approved by Directorial Resolution No. 00031-2024-SENACE-PE/DEAR, 20/02/2024
  - Third Update of the Closure Plan of the Yauricocha Unit (2023)
- Mining Permits
  - Mining Technical Report (ITM), for the construction and operation of the plant at a capacity of 3,600 tpd (2021)
  - authorization to operate the Yauricocha tailings facility up to 4,537 m in altitude (Phase 6) (2024)

20.1.2 State of Approved Permits

Table 20-1 to Table 20-4 lists Sierra's permits and licenses which has been prepared based on reports of the Ministry of Energy and Mines (MINEM), National Environmental Certification Service (SENACE), National Water Authority (ANA), Public Registry of Mining (current INGEMMET), National Water Authority (ANA), National Public Registry Authority (SUNARP), General Directorate of Environmental Health (DIGESA), notary and information provided by Sierra Metals.

The following permits were not available for review:

- 2024 Closure Plan financial guarantee accreditation
- 2023 mining concessions proof of payment
- 2023 processing concession proof of payment

Table 20-1 to Table 20-3 list the approved operation and closure permits for: Environmental Management and Mine Closure Plan and Mineral Process Concession, respectively. Table 20-4 list land ownership permits/agreements and water use permits.

Table 20-1: Approved Operation and Closure Permits; Environmental Management Instruments

Date	Expiry date	Status	Issued By	Permits/Licensees	Document
Environmental Management Instruments					
Plan de Adecuación y Manejo Ambiental (PAMA), Informe Técnico Sustentatorio (ITS) and Environmental Impact Assessment (EIA)					
1/13/1997		Valid	MINEM	Approval of the PAMA (*Plan de Adecuación y Manejo Ambiental*), Environmental Adjustment and Management Program of the Yauricocha Production Unit of CENTROMIN located in the district of Alis, province of Yauyos and department of Lima	Directorate Resolution N° 015-97-EM/DGM
5/23/2002		Valid	MINEM	Approval of the modification of the implementation of the PAMA of the Yauricocha Production Unit by CENTROMIN	Directorate Resolution N° 159-2002-EM-DGAA
2/8/2007		Valid	MINEM	Approval of the implementation of the PAMA “Yauricocha" Administrative Economic Unit by Sierra Metals.	Directorate Resolution N° 031-2007-MINEM- DGM Report N° 963-2006-MINEM-DGM-FMI-MA
6/9/2015		Valid	MINEM	Conformity of the Supporting Technical Report (ITS, *Informe Técnico Sustentatorio*) to the PAMA for "Expanding the capacity of the Processing Plant Chumpe of the Accumulated Yauricocha Unit from 2500 to 3000 TMD", presented by Sierra Metals.	Directorate Resolution N° 242-2015-MINEM- DGAAM Report N° 503-2015-MINEM.DGAAM-DNAM- DGAM-D
11/12/2015		Valid	MINEM	Conformity of the second Supporting Technical Report (ITS) to the PAMA for "Technological improvement of the domestic wastewater treatment system " PAMA Accumulation Unit Yauricocha presented by Sierra Metals.	Directorate Resolution N° 486-2015-MINEM- DGAAM Report N° 936-2015-MINEM-DGAAM-DNAM- DGAM-D
7/3/2017		Valid	MINEM	Approval of the third amendment of the ITS to the PAMA for “Addition of new equipment and infrastructure in the Chumpe concentrator plant process” of the Yauricocha Mining Unit, presented by Sierra Metals.	Directorate Resolution N° 176-2017-MINEM- DGAAM Report N° 288-2017-MINEM-DGAAM-DNAM- DGAM-D
4/5/2019		Valid	MINEM	ITS 4 from PAMA presented by Sociedad Minera Corona S.A.	Directorate Resolution N° 051-2019/MEM-DGAAM Report N° 174-2019/MEM-DGAAM-DEAM-DGAM

Date	Expiry date	Status	Issued By	Permits/Licensees	Document
Environmental Management Instruments					
Plan de Adecuación y Manejo Ambiental (PAMA), Informe Técnico Sustentatorio (ITS) and Environmental Impact Assessment (EIA)					
2/11/2019		Valid	SENACE	EIA for update of mining components, presented by Sociedad Minera Corona S.A.	Directorate Resolution N° 028-2019-SENACE- PE/DEAR Report N° 126-2019/SENACE-PE-DEAR
7/7/2020		Valid	SENACE	Conformity of the Supporting Technical Report (ITS, *Informe Técnico Sustentatorio*) to the EIA for disposal of waste in the mine.	Directorate Resolution N° 078-2020/SENACE- PE/DEAR Report N° 399-2020/SENACE-PE/DEAR
12/03/2021		Valid	SENACE	Conformity of the Second Technical Report to expand the capacity of the Processing Plant from 3000 to 3600 tpd	Directorial resolution N°041-2021-SENACE- PE/DEAR
13/09/2021		Valid	SENACE	Conformity of the Third Technical Reports to expand the mine util 2024	Directorial resolution N°00121-2021-SENACE- PE/DEAR Report Nº 00616-2021-SENACE-PE/DEAR,
17/11/2022		Valid	Senace	Conformity of the Fouth Technical Reports to: Relocation, implementation and improvement of auxiliary facilities. Improvement of safety factors of the Yauricocha tailings deposit (Stage VII). And implementation of exploration platforms	Directorial resolution N° 00163-2022-SENACE-PE/DEAR
20/02/2024		Valid	Senace	Conformity of the Fouth Technical Reports to expand the mine until 2027: Redistribution of auxiliary facilities (offices, workshops, others). Development of underground works between level 1120 and 1320. And implementation of 13 exploration platforms	Directorial resolution N" 00031-2024-SENACE-PE/DEAR

Source: Sierra Metals, 2024

Table 20-2: Approved Operation and Closure Permits; Mine Closure Plan

Date	Expiry date	Status	Issued By	Permits/Licensees	Document
Environmental Management Instruments					
Mine Closure Plan					
8/24/2009		Valid	MINEM	Approval of the Mine Closure Plan (PCM) at feasibility level of the Yauricocha Mining Unit, presented by Sierra	Directorate Resolution N° 258-2009-MINEM- AAM Report N° 999-2009-MINEM-AAM-CAH-MES-ABR
12/17/2013		Valid	MINEM	Approval of the Yauricocha Mining Unit Mine Closure Plan Update, presented by Sierra	Directorate Resolution N° 495-2013-MINEM- AAM Report N° 1683-2013-MINEM-AAM-MPC-RPP- ADB-LRM
1/8/2016		Valid	MINEM	Approval of the amendment of the Closure Plan of the Yauricocha Mining Unit, presented by Sierra	Directorate Resolution N° 002-2016-MINEM- DGAAM Report N° 021-2016-MINEM-DGAAM-DNAM- DGAM-PC
1/15/2016	1/17/2017	Expired	Sierra	Proof of payment for Mine Closure Plan guarantee. Amount 14'346,816.00 USD-Period 2016	Report N° 2570612
2/28/2017		Valid	MINEM	Approval of the second amendment of the Closure Plan of the Yauricocha Mining Unit, presented by Sierra	Directorate Resolution N° 063-2017-MINEM- DGAAM Report N° 112-2017-MINEM-DGAAM-DNAM- DGAM-PC
12/29/2016	1/17/2018	Valid	Sierra	Proof of payment for Mine Closure Plan guarantee. Amount $14,458,801.00 USD (2017)	Report N° 2669957
9/1/2020		Valid	MINEM	Approval of the Second Update of the Mine Closure Plan of the Yauricocha Mining Unit, presented by Sierra	Directorate Resolution N° 111-2020-MINEM- DGAAM Report N° 339-2020-MINEM-DGAAM-DEAM- DGAM
6/11/2023		Valid	MINEM	Approval of the Third Modification of the Mine Closure Plan of the Yauricocha Mining Unit, presented by Sierra	Directorate Resolution N° 0293-2023/MINEM-DGAAM

Source: Sierra Metals, 2024

Table 20-3: Approved Operation and Closure Permits; Mineral Process Concession

Date	Expiry Date	Status	Issued By	Permits/Licensees	Document
Mineral Process Concession					
4/18/1996		Expired	MINEM	Definite authorization to operate the "Yauricocha Chumpe Processing Plant" at an installed capacity of 1350 TMD, CENTROMIN	Report N°164-96-EM-DGM-DPDM
9/4/2008		Valid	MINEM	Authorization to operate the "Yauricocha Chumpe Processing Plant", including an additional lead circuit and expanding its capacity to 2010 TMD, Sierra	Resolution N° 549-2008-MINEM-DGM-V Report N° 178-2008-MINEM-DGM-DTM-PB
9/16/2009		Valid	MINEM	Authorization to raise the Yauricocha tailings deposit dam crest by an additional 20 m in 4 stages, Sierra	Resolution N° 714-2009-MINEM-DGM-V Report 242-2009-MINEM-DGM-DTM-PB
7/14/2010		Valid	MINEM	Authorization to operate the Mill No. 4 (8' x 10') and the amendment of the "Yauricocha Chumpe" Benefit Concession to the expanded capacity of 2500 TMD, Sierra	Resolution N°279-2010-MINEM-DGM-V Report N° 207-2010-MINEM-DGM-DTM-PB
3/4/2011		Valid	MINEM	Operating license for the Ball Mill (5' x 6') for regrinding, installed in "Yauricocha Chumpe Processing Plant, Sierra	Resolution N°088-2011-MINEM-DGM-V Report N° 075-2011-MINEM-DGM-DTM-PB
4/3/2012		Valid	MINEM	Authorization to operate the "Yauricocha" tailings deposit up to 4519 m in altitude (second stage) with a free board of 2 m, Sierra	Resolution N° 112-2012-MINEM-DGM-V Report N° 112-2012-MINEM-DGM-DTM-PB
4/29/2014		Valid	MINEM	Authorization to operate the raised "Yauricocha- Chumpe" tailings deposit up to 4522 m in altitude, Sierra	Resolution N° 0159-2014-MINEM-DGM-V Report N° 128-2014-MINEM-DGM-DTM-PB
8/3/2015		Valid	MINEM	Authorization to operate the raised "Yauricocha- Chumpe" tailings deposit up to 4524 m in altitude (third stage)	Resolution N° 0344-2015-MINEM-DGM-V Report N° 240-2015-MINEM-DGM-DTM-PB
10/14/2015		Valid	MINEM	Authorization to build, implement equipment and operate the Chumpe Process Plant Extension Project 2500 to 3000 TMD of the "Yauricocha Chumpe" benefit concession, Sierra	Resolution N° 0460-2015-MINEM-DGM-MV Report N° 326-2015-MINEM-DGM-DTM-PB
8/29/2017		Valid	INEM	Approval of the extension of the "Yauricocha Chumpe" benefit concession area. It was increased by 17,887 Ha. Also, authorization to build and operate civil and electromechanical works	Resolution N° 0366-2017-MEM-DGM Report N° 229-2017-MEM-DGM-DTM-PB

				of the new equipment and auxiliary facilities of the "Yauricocha Chumpe" benefit concession	
03/09/2019		Valid	MINEM	Request for extension of benefit concession	Directorial Authorization. N° 437-2019-MINEM-DGM/DTM
04/11/2019		Valid	MINEM	Authorization to construction the Yauricocha tailings facility up to 4533 m in altitude (Phase 5- Stage 2).	Directorial Resolution N° 0535-2019-MEM-DGM/V (Exp. 2910746)
20/11/2020		Valid	MINEM	Authorization to operate the Yauricocha tailings facility up to 4531 m in altitude (Phase 5- Stage 1).	Directorial Resolution N°326-2020-MINEM-DGM/V,
14/06/2021		Valid	MINEM	Mining Technical Report, Construction and Operation Authorization of additional facilities in the process plant for a capacity of 3600 tpd.	Directorial Resolution N°0241-2021-MINEM-DGM/V.
5/02/2024		Valid	MINEM	Authorization to operate the Yauricocha tailings facility up to 4535 m in altitude (Phase 6).	Resolution Nº 0044-2024-MINEM-DGM/V Report N° 0337-2022-MINEM-DGM-DTM/PB

Source: Sierra Metals, 2024

Table 20-4: Approved Operation and Closure Permits; Land Ownership and Water

Date	Expiry Date	Status	Issued By	Permits/Licensees	Document
Land Ownership					
12/21/2021		Valid	Sierra	Vílchez Yucra family (way of passage and installations)	
3/7/2022		Valid	Sierra	Varillas Vílchez family (56 ha for mining use)	
7/31/2037		Valid	Sierra	San Lorenzo de Altis Community (696,6630 ha for mining use)	
	Indefinite	Valid	Sierra	Mineral processing concession: Yauricocha Chumpe processing plant (148.5 ha for mining use and an authorized capacity for 3600 TMD)	
--	Indefinite	Valid	Sierra	Mining concession: “Acumulación Yauricocha” (18,777.9238 ha for mining use)	--
Water: Use, Discharge and Sanitation Facilities					
2004		Valid		Water use license for population purposes in the Yauricocha Production Unit, whose collection point is the Laguna Acococha – Uñascocha	Administrative resolution N°249-2004-GR-LP-DRA- MOC
1994		Valid		Water use license for population purposes in the Yauricocha Production Unit whose collection point is the Huacuypacha spring	Administrative resolution N° 013-1994-AG/DRA-LC/ATDR-MOC
2004		Valid		Water use license for industrial purposes in the Yauricocha Production Unit, whose collection point is the Klepetko Tunnel.	Administrative resolution N° 042-2004-AG/DRA-LC/ATDR-MOC
2005		Valid		Water use license for population purposes in the Yauricocha Production Unit whose collection point is the Misaspuquio spring	Administrative resolution Nº 225-2005-GR.L-DRA/ATDR-MOC
2017	1/31/2021	Valid		Authorization for the discharge of mine water from the Yauricocha Production Unit.	Administrative resolution N° 217-2017-ANA/DGCRH
2021	14/02/2026	Valid		Authorization for the discharge of mine water from the Yauricocha Production Unit.	Administrative resolution Nº 0017-2021-ANA-DCERH

Source: Sierra Metals, 2024

The Environmental Adequation and Management Program (PAMA), as established by the Supreme Decree Nº 016-93-EM, was the first environmental management tool that was created for mines and metallurgical operations existing before 1994 to adopt technological advances and / or alternative measures to comply with maximum permissible limits for effluent discharge and emissions of mining and metallurgical activities. Since then, many environmental regulations have been enacted updating and/or replacing older regulations.

In 2013, Sierra Metals began the preparation of an EIA for the deepening of the mine and the expansion of the tailings deposit. This study was developed under the normative framework of the environmental regulation approved by Supreme Decree No. 016-1993-EM. In this study the environmental and social baseline was updated, the environmental monitoring program was adjusted and updated, and the environmental management plan and community relations plan of the mining unit were approved. This report also includes an archaeological survey report for the certificate of nonexistence of archaeological remains (CIRA, certificado de inexistencia de restos arqueológicos). The EIA was finally approved in February 2019, however during the preparation and approval of the EIA, new regulations were approved such as the new environmental protection regulation for mining activities (DS N ° 040-2014-EM) and SENACE was designated as the competent environmental authority in the case of mining projects (December 2015).

Although the EIA has covered a large part of the requirements of the new environmental regulation for mining activities (S.D. N ° 040-2014-EM), there is a gap that must be covered related to the evaluation and management of environmental and social impacts. In that sense, the Peruvian environmental legislation contemplates that mine owners perform several studies to adjust to these new regulations, such as:

- Environmental Quality Standards Compliance for Soils (Estudio de Calidad Ambiental-ECA de Suelos). Sierra Metals submitted this study to MINEM in compliance with the Supreme Decree N° 002- 2014-MINAM, with register N° 2488477 (04/10/2015).
- Integral Plan for the Adaptation and Implementation of its activities to the Permissible Limits for the discharge of liquid effluents (Plan Integral para la Adecuación e Implementación de sus actividades a los Límites Permisibles para la descarga de efluentes líquidos). Sierra Metals submitted this study to MINEM in compliance with the Supreme Decree N° 015-2015-MINAM, with register N° 2706233 (19/05/2017).
- Deposition to the Department of Environmental Mining l Affairs (DGAAM), and Environmental Enforcement Agency (OEFA) of the activities and/or processes and/or extensions and/or existing components to regularize (Declaración Jurada de los componentes por Regularizar).
- In compliance with the Supreme Decree Nº 040-2015-EM all those activities, extensions, and/or components that have not been included in any Environmental Management Instrument had to be declared. Sierra Metals did not declare any component. The submittal of this type of study is not available at present.

Between 2019 and 2021, Sierra Metals has three Supporting Technical Reports which authorize the construction of the technological improvement of the domestic wastewater treatment system, the addition of new equipment and infrastructure in the concentrator plant process to increase capacity to 3,600 tpd, and to expand underground mining until 2024. This last Supporting Technical Report (ITS) was approved in 2021 by Directorate Resolution N°00121-2021-SENACE-PE/DEAR.

It is important to mention that in the case of operations that have a PAMA, it has the category of an environmental certification similar to an environmental impact assessment. In the case of Yauricocha, there is a PAMA approved in 1997 and an EIA approved in 2019, so that currently both constitute the main environmental certifications for the Yauricocha operation, while the ITS only modify specific aspects of the operation contemplated within the environmental certifications. It should be noted that in accordance with the provisions of Supreme Decree No. 040-2014-EM, operations must integrate and update the environmental impact assessment of their operations with the objective that each operating unit has a single environmental management tool updated.

In this sense, and for the extent of the useful life of the mine, that includes the expansion of the Tailings Storage Facility, mine expansion to level 1620, and a waste dump implementation; Sierra Metals is developing a modification of its EIA (EIA Modification). Currently, the preparation of the study has been formally started with the authority and the initial citizen participation process with the communities of the area of influence has been completed.

Additionally, it has completed the collection of information on the environmental baseline of the dry season (July to September) and the development of wet season field works is planned between December 2021 and January 2022. Sierra Metals expects to present the EIA modification to the authority in the fourth quarter of 2024 for evaluation. The authority in charge of evaluating the EIA Modification is SENACE with the participation of other authorities such as ANA, MINAGRI, MINEM and others.

In March 2021, Senace approved of the Second Technical Report to expand the capacity of the Processing Plant from 3000 to 3600 tpd. The Second ITS was approved by Directorial resolution N°041-2021-SENACE- PE/DEAR

In September 2021, Senace approved of the Third Technical Reports to expand the mine util 2024. The Third ITS was approved by Directorial Resolution N°00121-2021-SENACE- PE/DEAR.

In November 2021, Senace approved of the Fouth Technical Reports to: Relocation, implementation and improvement of auxiliary facilities. Improvement of safety factors of the Yauricocha tailings deposit (Stage VII). And implementation of exploration platforms. The Fourth ITS was approved by Directorial Resolution N° 00163-2022-SENACE-PE/DEAR.

Lastly, in February 2024, Senace approved of the Fifth Technical Reports to expand the mine util 2027: Redistribution of auxiliary facilities (offices, workshops, others). Development of underground works between level 1120 and 1320. And implementation of 13 exploration platforms. The Fifth ITS was approved by Directorial resolution N" 00031-2024-SENACE- PE/DEAR.

20.2 Environmental Study Results

Sierra Metals has updated its environmental base line and environmental monitoring program according to current regulation through different environmental permits and documents. These documents are mainly ITS to the initial PAMA, followed by the approval of an EIA (2019) and five ITS approved in July 2020, March and September 2021, November 2022 and February 2024. The site has also submitted other documents such as the Water Standards Adequation Plan, the Soils Contaminated sites, and approved other significant documents such as the Third Modification of the Mine Closure Plan (November 2023).

The current monitoring plan is the one included in the EIA approved in February 2019, which is implemented by the site. The EIA includes different information encompassing multiple disciplines in the Baseline. From those, the following are noted:

- Land use capacity - Soils are suitable for cold climate grassland and protection.
- Actual land use - Is limited to urban (private or government), natural pastures and unproductive land.
- Wetlands: In the area there are some extensions of wetlands and according to the approved EIA there is a potential impact due to the expansion of the tailing's storage facility. For this, there are some specific environmental management measures.
- Soil quality - 32 samples from disturbed areas were analyzed and the results compared to the environmental quality standards for soil (Supreme Decree N° 002-2013-MINAM): arsenic, cadmium, lead, and total petroleum hydrocarbons (TPH) exceed the environmental standards, as well as to a lesser extent also: benzene, xylene, naphthalene, toluene and ethylbenzene; this indicates that the area where the site operates is a mineralized area with high levels of metals identified since the baseline.
- Geology - There is predominantly sedimentary rock such as sand-, silt- and claystone, conglomerates, limestones, and dolomites.
- Biology - Terrestrial biology has been assessed in a dry and a wet season:
    - Flora – twelve species were identified listed as protected by Supreme Decree N° 043-2006- AG, among which categorized as Critical Endangered (CR): Ephedra rupestris, and as Endangered (EN): Nototriche tovari, as well as three species belonging to the CITES category II
    - Birds - four species were identified listed as protected by Supreme Decree N° 004-2014- MINAGRI, among which categorized as Endangered (EN): Vultur gryphus (Condor), seven species in the IUCN Red List and four species belonging to the CITES category I and II
    - Mammals - two species were identified listed as protected by Supreme Decree N° 004- 2014-MINAGRI, among which categorized as Endangered (EN): Puma concolor (Puma)
    - Vicugna (Vicuña) and two species belonging to the CITES
    - Reptiles and amphibians - three endemic species were identified (gender: Lioalemus), but none is listed as protected
- Hydrobiology - Indicates that in both wet and dry season for most monitoring stations the diatom pollution tolerance index IDG results in moderated polluted water (eutrophication), while the EPT and BMWP indicate in wet season bad water quality with presence of organic matter and in the dry season good water quality with presence of trout (Onchorynchus mykiss). In some, trout elevated concentrations of mercury and cadmium were found while in others retention of P, Na, Mg, K and Ca. Successive regular monitoring should be performed in the same five surface water quality monitoring stations for phytoplankton, zooplankton, benthos, periphyton and nekton.

- Hydrology - The Yauricocha project is in eight micro-watersheds belonging to the Alis and Laraos rivers sub-watersheds which include mountain tops with elevations as high as 4,800 and 5,300 metres above sea level.
- Springs - The water of the Laraopuquio and Quilcasa springs are slightly acidic while the water from the Chumpe 1 spring exceeds the environmental quality standards for copper, lead and manganese according to the Supreme Decree N° 002-2008-MINAM, category 3 (irrigation of tall and short stem crops and animal's beverage).
- Surface water quality monitoring – The Monitoring is performed at seven monitoring stations: M-2, M-4 (707), PM-11, PM-12, PM13, PMZ-01 and PMZ-02. In the case of stations M-2 and M-4 (707), the sampling and analysis is carried out monthly, while in the rest of the stations it is quarterly. Reports to the authority are made on a quarterly basis. The water quality results are compared with the national environmental quality standards for Category 4: Conservation of the aquatic environment, subcategory E-2 rivers (Supreme Decree N° 004-2017-MINAM). In the reports presented to the competent authority, the field parameters (temperature, conductivity, and dissolved oxygen) presented values within the ranges established in the ECA. However, in stations M- 02 and M-04 (707) the pH slightly exceeded the ECA value, which is due to the geological characteristics of the soil (presence of limestone). Regarding the physicochemical parameters, all were found below the ECA. Total metals registered concentrations below the ECA except for the following: Lead registers values above the ECA at stations M-2 and M-4 in July and September. Station M-4 presented a manganese concentration above the ECA in August. At the PM-11 station, copper reported a value above ECA category N ° 4. However, all values are below or in accordance with the EIA baseline concentrations.
- Underground water quality monitoring - Groundwater quality monitoring is performed monthly for water levels and quarterly for quality. There are eleven approved stations, three of them under implementation (approved in the ITS). The quality results are referentially compared with the Category 3 ECA (irrigation and animal drinking) for surface water since there are no approved standards for groundwater. In the reports presented to the competent authority, the field parameters (pH, temperature, and conductivity) registered values within the ranges of the reference ECA, except the pH in the DR-03-13 station, which registered a value slightly above. The dissolved oxygen of all the stations registered values outside the range of the reference ECA, which is usual in groundwater. All the physicochemical and microbiological parameters reported concentrations below the reference ECA values. Regarding total metals, they reported concentrations below the reference ECA values, except for arsenic in station DR-03-13, manganese in stations PB- 02-13, PB-03-13 and DR-03- 13; and lead in all seasons.
- Effluent water quality - Monitoring is performed monthly, in one monitoring station: V-1 (705) and its quality is compared to Supreme Decree N° 010-2010-MINAM. Current Environmental Monitoring Report show that the effluent water quality complies with the maximum permissible limits for effluent discharge of metallurgical mining activities.
- Air quality - The monitoring is performed in five stations: CA-01 (704) CA-02, CA-03, CA-06 y CA-06b. The monitoring is performed in accordance with Supreme Decree N° 003-2008- MINAM.

According to the EIA, the frequency of monitoring and delivery of reports to the MEM is every six months. All monitoring results are within the environmental air quality standards

- Noise: The monitoring is performed in five monitoring stations: R-1, R-2, R-3, R-4 and R-6 in accordance with Supreme Decree N° 085-2003-PCM. According to the EIA, the frequency of monitoring and delivery of reports to the MEM is every six months. All monitoring results are within the environmental air quality standards
- Soil quality monitoring - Monitoring is performed in four (04) stations: “MI-01-UY, MI-03-UY, MI-06-UY and PMS-01”. The results are compared with the National Environmental Quality Standards for soil (S.D. No. 002-2013-MINAM), ECA Soil. The frequency of monitoring and reporting to MINEM is quarterly. In the third quarter of 2021, all the physicochemical parameters and total metals complied with the Soil ECA, except for Arsenic in the MI-06-UY station.

20.3 Environmental Aspects

Data and information for this section is based on the successive environmental permits submitted and approved by the authority, as explained in the previous sections. The most recent and main environmental permit is the Fifth Technical Reports to expand the mine until 2027. This section describes the main activities at the site related to environmental management for the extraction and processing of mineralized material.

The Yauricocha Mine is an underground mine operated by the method of OCF stoping to extract its polymetallic mineralized material (sulphides) of lead, silver, copper, zinc and iron and lead silver oxide mineralized material.

- Mineralized material transport - The mineralized material is transported from the Klepetko tunnel to the hopper of the Chumpe mineral processing plant.
- Waste rock: The waste rock is disposed inside the mine; as fill material in construction activities, such as the implementation of the tailings dam; and in some closure activities. The mining unit has around 17 additional facilities for waste rock disposal that do not have additional capacity, at the moment, and are in the process of being closed. The current Closure Plan and the following updates consider two types of covers for the closure of waste dumps. The covers are designed for non-generating material for acid rock drainage (NAG) and for generating material for acidic rock drainage (PAG). There is currently no full study on ARD potential available to review whether different waste rock deposits are NPAG or PAG.
- Additionally, to prevent rain runoff from coming into contact with the waste rock, the site has built diversion and water management channels and plans to implement additional channels as indicated in the latest closure plan. Mineralized material processing - The mineralized material is processed in the Chumpe processing plant. The process is conventional with stages of crushing, grinding, regrinding, selective flotation, and filtration, dispatch of concentrates and transport, and tailings storage. Currently the plant has authorized a processing of 3,600 tpd, however the current regulation allows the operation to have a 5% additional as an average through the year, which allows the operation to process a maximum average of 3,780 tpd.
- Tailings - The tailings deposit is located at an elevation of 360 m and 2.6 km upstream of the existing processing plant and several camps and installations, in the location that was the

Yauricocha Lake, however the waterbody was occupied in the early stages of the operation, several decades ago. The current tailings dam was built with compacted granular material of intrusive and metamorphic origin. Sierra Metals has the environmental permit for the construction of the tailings dam up to stage VII. Currently, this is in Stage 6. For 2024 and 2025, the programmed construction of Stage VII is planned.

- Sierra Metals has obtained the authorization to operate the sixth stage of the tailings deposit, at a projected crown level of 4,537 masl. The initial PAMA and early versions of the closure plan update indicate that the tailings are considered PAG, as tailings deposited from 1979 to 1988 contains 31.4% of pyrite and tailings deposited from 1989 to 1996 contains 17.6% pyrite. Currently, some studies are being carried out to expand the knowledge regarding the mineralogical composition and the quality of the drainage in the short, medium, and long term of the tailings. With the results of these studies, it is expected to have a better understanding of the geochemical characteristics of these materials as well as their environmental implications. However, it is estimated that some complementary studies will be necessary to confirm the assumptions and design the proper final closure of the facility.
- Regarding water management:
  - Water in the tailings pond is mainly composed of water from the tailings pulp, direct and rainfall; the clarified water from the tailings pond is pumped to tanks and returned to the processing plant by gravity, closing the circuit.
  - Filtrations are captured by a system of underdrains and sent towards the underdrain sump and pool for recirculation,
  - Channels on the right and left of the tailings deposit capture the rainfall runoff preventing them to enter in contact with the tailings. Further expansions of the tailing's facility will follow the same design.
- Regarding its management and control: Sierra Metals monitors the design parameters, the physical stability by piezometers installed in the tailings dam, and the cleaning of the rainfall runoff channels.
- Domestic and industrial solid waste - Sierra Metals operates a landfill for domestic wastes and has warehouses for temporary storage of recyclable waste. Recyclable non-hazardous solid waste and hazardous solid waste are delivered to an authorized company, complying with the Regulations of the General Law of Solid Waste.
- Effluent, surface and groundwater management and control:
  - Mine water - The mine water from the Klepetko tunnel is collected in a channel and directed to the water treatment plant at Chumpe where it is physically treated by adding lime and flocculants.
  - Sewage control - Sierra Metals operates three domestic sewage treatment plants called PTARD (the Spanish acronym) for residual domestic wastewater treatment plant.
    - one with a capacity of 17 m^3/day
    - one with a capacity of 50 m^3/day, installed in the Chumpe area, operated by activated sludge and multiple aeration
    - one with a capacity of 100 m^3/day, installed in the Chumpe area, that operates by means of sequential biological reactors. The treated water is incorporated in the

mineral processing plant (zero effluent)

  - Surface water quality control - Monthly monitoring of water for quarterly reporting to the MINEM and ANA includes verification of the compliance with Maximum Permissible Limits (Supreme Decree N°010- 2010-MINAM) and Environmental Quality Standards for Water (Supreme Decree N° 0004-2017-MINAM).
  - Groundwater quality control - Quarterly is monitored by eleven piezometers, three of them under implementation (approved in the ITS N°1 and ITS N°2).
- Emissions and dust control:
  - Bi-annual monitoring of five monitoring stations. Dust prevention by wetting the road surfaces (dirt roads) during the dry season (vehicle traffic).

The following tables (Table 20-5, Table 20-6, and Table 20-7) describe the current Environmental Monitoring program, as described in the current approved EIA.

Table 20-5: Air Quality Monitoring (EIA extract)

Station	Description	Location UTM, WGS 84, Zona 18		Regulation
		Este	Norte	
CA-01(704)	Sotavento de la planta concentradora Chumpe	424264	8641159	Supreme decree N° 003-2017-MINAM
CA-02	Barlovento del campamento Chumpe	424469	8640080	
CA-03	Barlovento Relleno Sanitario	422046	8639278	
CA-06	Barlovento Deposito de Relaves	422776	8637816	
CA-06-b	Centro Poblado Tinco	424848	8641704	

Source: Sierra Metals, EIA 2019

Table 20-6: Environmental Noise Monitoring (EIA extract)

Station	Description	Location UTM, WGS 84, Zona 18		Regulation
		Este	Norte	
R-1	Pie de la catarata de la Quebrada Chumpe	424464	8641381	Supreme decree Nº 085-2003-PCM
R-2	Ex estadio Chumpe, a 100 del campamento Chumpe	424469	8640080	
R-3	Parte alta del patio Winche, sobre el tajo Cculle	421377	8638782	
R-4	Al lado sur del depósito de relaves Yauricocha	422776	8637816	
R-6-b	Centro Poblado Tinco	424848	8641704	

Source: Sierra Metals, EIA 2019

Table 20-7: Water Quality Monitoring (EIA extract)

Station	Description	Location UTM, WGS 84, Zona 18		Regulation
		Este	Norte	
M-2	Rio Tinco, 100m aguas arriba del vertimiento V-1 (705)	4244581	8641772	Decreto Supremo Nº 004-2017- MINAM
M-4 (707)	Río Tinco, 150m aguas abajo del vertimiento V-1 (705)	424487	8641837	
PM-11	Quebrada Chumpe aguas arriba de la planta de beneficio	424373	8640006	
PM-12	Quebrada Chumpe (200m antes de desembocar al Río Tinco)	424673	8641583	
PM-13	Rio Tinco (70m aguas arriba de la desembocadura de la quebrada Chumpe)	424920	8641735	Decreto Supremo Nº 004-2017- MINAM
PM-14	Poza de captación Chumpe (casa de bombas)	424153	8640718	Decreto Supremo Nº 004-2017-MINAM
PMZI-01*	50 m aguas arriba de la descarga del efluente EF-ZI (Río Rodiana)	427196	8 63 0610	Decreto Supremo Nº 004-2017-MINAM
PMZI-02*	100 m aguas abajo de la descarga del efluente EF-ZI (Río Rodiana)	427081	8 63 0638	

Source: Sierra Metals, EIA 2019

20.4 Operating and Post Closure Requirements and Plans

Sierra Metals has a closure plan with three approved amendments:

- Yauricocha Mine Unit Closure Plan, approved by Directorate Resolution N°258-2009-MEM/AAM (08/24/2009) and Report N°999-2009-MEM-AAM/CAH/ MES/ABR.
- Yauricocha Mine Unit Closure Plan Update, approved by Directorate Resolution N°495-2013-MEM-AAM (12/13/2013) and Report N°1683-2013-MEM-AAM/ MPC/ RPP/ADB/LRM.
- Yauricocha Mine Unit Closure Plan Modification, approved by Directorate Resolution N°002-2016-MEM-DGAAM (01/08/2016) and Report N°021-2016-MEM-DGAAM/DNAM/DGAM/ PC.
- Yauricocha Mine Unit Second Amendment of the Closure Plan, approved by Directorate Resolution N°063-2017-MEM-DGAAM (02/09/2017) and Report N° 112-2017-MEM-DGAAM/DNAM/DGAM/ PC.
- Second update of the Closure Plan of the Yauricocha Mining Unit approved by Management Resolution No. 111-2020-MINEM-DGAAM (09/01/2020) and Report No. 339-2020-MINEM-DGAAM / DEAM / DGAM.
- Third modification to the Mine Closure Plan in the Mining Unit Yauricocha (approved by Directorial Resolution No. 293-2023-MINEM-DGAAM, 06/11/2023).

In 2007, a first feasibility-level Closure Plan for the Yauricocha Mining Unit was developed by CESEL S.A. following the requirements of the Peruvian legislation for mine closure, “Ley de Cierre de Minas”, Law N° 28090 and its Regulation, Supreme Decree N° 033-2005-EM and its amendments Supreme Decree N° 035-2006-EM and Supreme Decree N° 045-2006-EM. and based on the content recommended by the DGAAM in the Guideline for Preparation of Mine Closure Plans approved by Resolution R.D. N° 130-2006-AAM, dated April 2006.

This Closure Plan considers eight areas as follows: Central, Cachi-Cachi, Éxito, El Paso, Ipillo, Chumpe, Yauricocha and Florida.

In 2012, pursuant to Peruvian regulations, the Mine Closure Plan was updated by Geoservice Ingeniería S.A.C. and approved in 2013.

In 2015 and in 2017, the time schedule of the Closure Plan has been modified in accordance with the mine's life by its Closure Plan modification and second amendment, respectively.

Last version of an update was approved in September 2020, including the modifications approved in the EIA 2019. Currently, there is the Third modification to the Mine Closure Plan in the Yauricocha Mining Unit (approved by Directorial Resolution No. 293-2023-MINEM-DGAAM, 06/11/2023).

20.5 Post-Performance Reclamation Bonds

In November 2023, the bank's guarantee will be renewed for compliance with the Third Update of the Closure Plan of the Yauricocha Mining Unit (approved by Management Resolution No. 293- 2023-MINEM-DGAAM) for US $ 15,652,253.

The current update of the Closure Plan designates that the mining operator must register the guarantee for variable annuities the first days of each year, in a manner that the total amount required for the final and subsequent closing is recorded in January 2028 as shown in Table 20-8.

Table 20-8: Closure Plan – Annual Calendar for Guarantee Payment

Year	Annual	Accumulated	Situation
2020		13,418,970	Constituted
2021	-392,599	13,811,569	to constitute
2022	-450,262	14,261,831	to constitute
2023	-520,938	14,782,769	to constitute
2024	-611,174	15,393,943	to constitute
2025	-734,063	16,128,006	to constitute
2026	-922,342	17,050,348	to constitute
2027	1,306,957	18,357,305	to constitute

Note: The amount includes tax (VAT, 18%)

Source: Sierra Metals, 2024, Report Nº 033-2020-MINEM-DGM/DTM/PCM

20.6 Social and Community

Sierra Metals maintains a good relationship with the communities within the area of influence, which are San Lorenzo de Alis, Huancachi, Santo Domingo de Laraos, Tomas and Tinco, signing agreements with these communities. The company collaborates with several sustainable projects based on three pillars: health, education, and business development in the area. Currently, the company has a Community Relations Plan approved in the last EIA (February 2019). The main activities are shown in Table 20-9.

Table 20-9: Community Engagement Activities

Plan	Program	Subprogram /Activity
Community Relations Plan	Communications and Consultation Plan	Implementation of Permanent Information offices, located in Alis and Tinco
		Workshops and Information Meetings
	Economic and Productive Development Program	Local capacities development subprogram
		Local acquisition subprogram
		Acquisition of products and services
	Social Development Program	Education subprogram
		Health support subprogram
		Agriculture, cattle, local tourism, infrastructure and innovations program
		Local employment subprogram
	Preservation and Support of Local Culture	Tourism subprogram
		Local cultural heritage conservation subprogram
		Technical support to local authorities on efficient use of mining canon
		Effective communications
		Environmental participative monitoring

Source: Sierra Metals, 2024

20.7 Mine Closure

This section has been prepared based on the Yauricocha Mine Unit Closure Plan Update´s Report N°1683-2013-MEM-AAM/MPC/RPP/ADB/LRM, the Second Amendment of the Closure Plan, approved by Directorate Resolution N°063-2017-MEM-DGAAM (02/08/2017) and Report N° 112- 2017-MEM-DGAAM/DNAM/DGAM/ PC, and the second update of the closure Plan approved under DR N° 339-2020/MINEM-DGAAM-DEAM-DGAM in September 2020.

Currently, there is the Third modification to the Mine Closure Plan in the Yauricocha Mining Unit (approved by Directorial Resolution No. 293-2023-MINEM-DGAAM, 06/11/2023).

Sierra Metals is committed to perform progressive closure activities starting in 2019 and finishing in 2027, final closure in a span of two years and post-closure in five years (this latter is the minimum period required to achieve physical, geochemical, and hydrological stability of the area occupied by the mining unit as per Peruvian legislation).

The mine closure objective is to recover conditions like pre-mining conditions and/or uses compatible with the surrounding environmental conditions.

Specific objectives are:

- Human health and safety - Ensure public health and safety implementing measures to eliminate risks such as pollution caused by acid rock drainage or waste, that could be transported to populated areas by water or wind.
- Physical stability - Implement environmental and technical measures to maintain physical stability of the mining components in the short, medium, and long term (including mine entrances, chimneys, waste rock dumps, tailings deposits, etc.) that must withstand seismic and hydrological extraordinary events.
- Geochemical stability - Implement measures to maintain chemical stability of the mining components in the short, medium, and long term (including mine entrances, chimneys, waste rock dumps, tailings deposits, etc.) that must withstand ordinary and hydrological extraordinary hydrological events.
- Land use - Implement measures to enhance post-mining beneficial land use, restoring gradually soil fertility for agriculture, livestock, landscape and / or recreational use, considering the topographical conformation and integration into the landscape.
- Water use - Implement measures in the Production Unit Acumulación Yauricocha to prevent contamination of superficial and underground water, and focusing on restoring those water bodies, which have been potentially affected, by means of a strategic recovery for post-mining use.

It should be noted that Sierra Metals obtained approval for the third modification of the closure plan to include the components approved in ITS No. 1, No. 2 and No. 3 and update the progressive and definitive closure measures of the mining unit. This study was approved in November 2023.

20.8 Reclamation Measures During Operations and Project Closure

20.8.1 Reclamation Measures During Operations and Project Closure

The third modification of the closure plan (2023) considers:

- Incorporate the modifications into the closure plan approved in the Supporting Technical Reports (Second and Third ITS of the EIA) and Prior Communications.
- Update the closure activities of the Cachi Cachi Pit and waste rock deposit Chumpe.
- Include the Carmencita waste rock deposit in the closure plan.
- Modify and/or update the progressive closure and final closure schedule of different components.
- Modify the general closing budget.

20.8.2 Temporary Closure

In case of a temporary closure (for a period less than three years), ordered or not by the competent authority, Sierra Metals will develop a detailed care and maintenance plan considering future operations and evaluating the social impacts associated with it.

The temporary closure considers:

- Remove and save mobile equipment.

- Demolition, salvage, and disposal - not applicable during temporary closure.
- Physical stability - maintain mine entrances, chimneys, tailing deposit, waste rock dumps, and infrastructure.
- Geochemical stability - maintain tailings deposit and waste rock dumps sedimentation ponds to capture any drainage.
- Hydrological stability - maintain canals and ditches in an operative state.
- Landform - profiling the outer slope of the tailing deposit; and
- Social programs - mitigate impacts on local employment and local development implementing the following programs:
    - communication, culture, and participation program
    - environmental education and training program
    - health and responsible environmental management program
    - citizenship: leadership, institutional strengthening, and project transfers program

The following preventive measures will be adopted:

- Communicate to DGAAM any temporary closure program (indicating the causes).
- Final closure must be made if the closure needs to be prolonged over three years.
- Designate responsibilities for the safety and cleanliness of the facilities.
- Instruct the surrounding population on risk related to temporary closed facilities.
- Seal all areas that are potentially dangerous to the environment and the population, placing signs and symbols that indicate their danger for containing materials that could affect the environment.
- Perform facility inspections and establish a periodic schedule to perform the necessary maintenances (including wind erosion and sediment transport control, channels, ditches, and sediment ponds), safety and environmental inspections, water quality monitoring and progressive reclamation monitoring.
- Perform safety inspections to prevent risks associated to the physical stability of underground workings and surfaces exposed to weathering, such as tailings deposits slopes; and
- Implement measurements to prevent accidents (environmental or public) by:
    - implementing security berms.
    - blocking accesses to mine entrances; and
    - profiling slopes if needed.

20.8.3 Progressive Closure

Progressive closure is performed simultaneously during operation and considers the following:

- Dismantling - All materials in disuse will be dismantled.
- Demolition, salvage, and disposal - Not applicable during progressive closure.
- Physical stability:
    - Open pits in disuse - the Mascota, Juliana, Pawac, Cachi Cachi and Poderosa pits will be partially filled with surrounding waste rock and pit slopes will be stabilized by

benching and the Central, Amoeba and Maritza pits will be closed.
  - Mine entrances - four mine entrances will be closed by a masonry wall without drainage, and in one land forming using waste rock and a proper cover will be applied (Type 2, see geochemical stability).
  - Waste rock dumps:
    - Waste rock from the Mascota, Juliana and Triada dumps will be removed to the Central pit.
    - Waste rock from the Mariela dump will be removed to the Central pit and Mariela mine entrance.
    - Waste rock from the Pawac dump will be removed to the Pawac pit.
    - Waste rock from the Poderosa dump will be removed to the Poderosa pit; and
    - The passive Triada waste rock dump and the Cachi-Cachi waste rock dump will be stabilized and covered.
- Geochemical stability - implementing covers considering the material to be covered (i.e. its mineralogy, net neutralization potential, presence of acid drainage, granulometry, topography and slopes) considering two types:
  - Type 1, to cover non-acid generating materials: 0.20 m of organic material, revegetated
  - Type 2 to cover acid generating materials: 0.20 m of organic material, overlaying a layer of 0.20 m draining material, overlaying a layer of 0.20 m clay material, overlaying a 0.20 m thick layer of limestone; and revegetated
- Hydrological stability - implementing collector channels considering two types:
  - Type 1 - trapezoidal masonry channel with base and height of 0.50 m and 0.50 m and slope of 1H: 2V (flow 0.45 m3/sec)
  - Type 2 - trapezoidal masonry channel with base and height of 0.60 m and 0.65 m and slope of 1H: 2V (flow 0.90 m3/sec)
- Landform - consist of leveling, re-contouring and organic soil coverage.
- Revegetation - planting native grasses such as Stipa ichu and Calamagrostis sp; and
- Social programs - programs are designed year by year considering the following topics:
  - education
  - healthcare
  - local sustainable development
  - basic infrastructure
  - Institutional and capabilities empowerment; and
  - Culture promotions.

Table 20-10 lists components that have been closed as of October 2013 (as per report N°1683- 2013-MEM-AAM/MPC/RPP/ADB/LRM), and February 2017 (as per report N°112-2017-MEM-AAM/MPC/RPP/ADB/LRM).

Table 20-10: Closed Components

Type	Component	Description
Mine		
Open pit	Central mine	24 de Junio Open pit (1)
		Cuye Open pit (1)
		Poderosa Open pit (1)
	Éxito mine	Éxito Open pit (1)
	Cachi Cachi	Cachi Cachi pit (3)
Mine entrance	Central mine	Level 260 Mine entrance 6565-NW (Mascota)
		Level 300 Mine entrance 247-49-NW (2) (Tajo Central)
		Level 360 Mine entrance 4554-NW (2) (Tajo Central)
		Level 360 Mine entrance 1523-SW (2) (Tajo Central)
		Level 360 Mine entrance 1287-S (2) (Tajo Central)
		Level 260 Mine entrance 5460-S (Juliana)
		Level 230 Mine entrance 2575-N (Mariela)
		Level 230 Mine entrance 8047-NW (Mascota)
		Level 210 Mine entrance 6050-NE (Carmencita)
	Éxito mine	Level 300 Mine entrance Rampa 7052-N
	El Paso mine	Level 250 Mine entrance 3522-NW
		Level 210 Mine entrance 4010-NW
Chimneys	Central mine	Chimneys 782-0 - surface
	Éxito mine	Chimneys 215-5 – surface (1)
		Chimneys 801-6 – surface (1)
Waste handling facilities		
Waste Rock Dumps	Central mine	Waste deposit Mascota (1)
		Waste deposit Carmencita
		Waste deposit Juliana (1)
		Waste deposit Mariela
		Waste deposit Pawac
		Waste deposit Poderosa (1)
		Waste deposit Triada (1)
	Cachi Cachi mine	Waste deposit level 410
	Éxito mine	Waste deposit Éxito
	El Paso mine	Waste deposit Level 250(1)
	Chumpe	Waste deposit Chumpe (3)
Water handling facilities		
Water Treatment System	Éxito mine	Effluent treatment plant (2)
	Chumpe	Domestic wastewater treatment plant PTAR 17m3/día
	Yauricocha	Domestic wastewater treatment plant PTAR 40m3/día

Other project facilities		
Facilities	Central mine	Industrial fill (2)

(1) Components declared in the Yauricocha Mine Unit Closure Plan Update´s report N°1683-2013-MEM-AAM/MPC/ RPP/ADB/LRM
(2) Components declared in the report N° 112-2017-MEM-DGAAM/DNAM/DGAM/ PC
(3) Components declared in the report N° 0602-2023/MINEM-DGAAM-DEAM-DGAM
Source: Yauricocha Mine Unit Closure Plan Update´s report N°1683-2013-MEM-AAM/MPC/ RPP/ADB/LRM and report N° 112-2017-MEM-DGAAM/DNAM/DGAM/ PC

20.8.4 Final Closure

For Final Closure, a final Updated Closure Plan must be presented detailing the closure specifications and process of public consultation. Table 20-11 shows which components must be closed according to the last approved closure plan and its amendment.

Table 20-11: Components for Future Closure

Component	Zone	Description
Mine		
Shaft	Central mine	Pique Central
		Pique Mascota
Mine Entrance	Central mine	Level 300 – Mine entrance 0280-NW
	Cachi Cachi mine	Level 410 – Mine entrance - 1724-S
	Ipillo mine	Level 280 – Mine entrance 2015-SW
		Level 430 – Mine entrance 9249- S
		Central mine
	Central mine	Level 35 – Victoria
Tunnel	Chumpe	Level 720 – Klepetko tunnel
		Yauricocha tunnel – 2815-SW
Chimneys	Central mine	Chimney 473-6 – Surface
		Chimney 427-14 – Surface
		Chimney 568-8 – Surface
		Chimney 789-5 – Surface
		Chimney Yauricocha (raise bore)
		Chimney Amoeba - Surface
		Chimney 906-7
	Cachi Cachi mine	Chimney 316-6 - Surface
		Chimney 350-9 - Surface
		Chimney 211-1 - Surface
		Chimney 928-2 - Surface
		Chimney 825-0 - Surface
		Chimney Fortuna
	Ipillo mine	Chimney 578-3 - Surface

Processing Facilities		
Plant	Chumpe	Processing Plant
		Inclusion of new equipment in the Plant Profit
Waste Rock Dumps	Central mine	Yauricocha tailings deposit
		Regrowth of the Yauricocha deposit
	Ipillo mine	Waste rock dumps - Level 280
		Waste rock dumps – Level 430
		Waste rock dumps – Level 480
	Carmencita	Waste Rock dumps Carmencita (3)
	Chumpe	Waste rock dumps – Chumpe (3)
Water Treatment System	Chumpe	Effluent treatment plant
	Chumpe	Effluent treatment plant
	Chumpe	Domestic wastewater treatment plant – Chumpe (100m3)
	Chumpe	Water pumping system for Esperanza
	Chumpe	Domestic wastewater treatment plant – Chumpe (50m3)
	Chumpe	Pumping system – Aldrich / Chumpe – Yauricocha (Pool N°2)
Borrow Material		
Quarries	Yauricocha	Yauricocha High
		Yauricocha C. L.
	Chumpe	Chumpe
		Chumpe
Other Infrastructure for The Project		
Other Facilities	Yauricocha	Mine facilities: (warehouse, compressors, shaft, winch, maintenance workshop, carpentry, offices, chemical laboratory)
	Chumpe	Adjoining facilities processing plant (central warehouse, warehouse of fuel, junkyard)
	Central mine	Landfill
		Expansion of the sanitary landfill
		Composting area
	Central mine	Hazardous waste warehouse
	Ipillo mine	Concrete slab Nº 1
		Concrete slab Nº 2
		Trench
Housing and Services for Workers		
Camp	Central Mine	Yauricocha camps (Miraflores, Florida, Vista Alegre, Esperanza, Hotel Americano, casa de obreros y otros)
	Chumpe	Chumpe camps (Chumpe y Huacuypacha – workers houses, employees houses, stadium, school, market)

Dining rooms	Central mine	Dining rooms - Esperanza
	Chumpe	Dining rooms - Chumpe

Source: Yauricocha Mine Unit Closure Plan Update´s report N°1683-2013-MEM-AAM/MPC/ RPP/ADB/LRM and report N° 112-2017-MEM-DGAAM/DNAM/DGAM/ PC

(3) Components declared in the report N° 0602-2023/MINEM-DGAAM-DEAM-DGAM

20.9 Closure Monitoring

Operational monitoring continues until final closure is achieved.

20.10 Post-Closure Monitoring

According to the Yauricocha Mine Unit Closure Plan Update under Report N° 339-2020/MINEM-DGAAM-DEAM-DGAM and modification Closure Plan by RD N° 0293-2023/MINEM-DGAAM, all post closure monitoring activities shall be performed as follows:

- Physical stability monitoring - Monitoring of possible displacements and settlements, cracks, slip surfaces control in mine entrances, open pits, tailings deposit, waste rock dumps, camps, and auxiliary related installations by topographic landmarks control (fixed concrete bases and stainless plates). The established monitoring frequency for the first two years is bi-annual, and for the following three years annually.
- Geochemical monitoring - Monitoring of tailings deposit, waste rock dumps, and open pits inspecting the cover´s surface for cracks and slip surfaces. The established monitoring frequency is bi-annual for the first two years and annually for the following three years.
- Hydrological monitoring - Inspection of the hydraulic components of the tailings deposit, waste rock dumps, and open pits for (structural) fissures, settlements, collapsing and flow obstructions. The established monitoring frequency for the first two years is bi-annual, and for the following three years annually.
- Water quality monitoring - In three monitoring stations (MA-1, MA-2, MA-3, see footnote 1) for: pH, electrical conductivity, total suspended solids, total dissolved solids, nitrates, alkalinity, acidity, hardness, total cyanide, cyanide wad, ammonium, sulfates, total metals (Al, As, Cd, Ca, Cu, Fe, Pb, Hg, Mo, Ni, Se, and Zn), DBO5, DQO, dissolved oxygen. The established monitoring frequency for the first two years is quaternary, and for the following three years bi- annual. No groundwater quality monitoring has been contemplated.
- Sediment monitoring - Data from three monitoring stations (MA-1, MA-2, MA-3, see footnote 1) is analyzed for: total metals (Al, As, Cd, Ca, Cu, Fe, Pb, Hg, Mo, Ni, Se and Zn), total cyanide. The data collected shall be compared with reference values for the National Oceanic and Atmospheric Administration of the USA. The established monitoring frequency for the first two years is bi-annual, and annual for the following three years.
- Hydrobiological monitoring - In three monitoring stations (MA-1, MA-2, MA-3, see footnote 1) for: phytoplankton, zooplankton, bentos, macrophytas. The established monitoring frequency for the first two years is bi-annual, and annual for the following three years.
- Biological monitoring - Vegetation control to verify the effectiveness of the plant cover systems evaluating the extent of engraftment of the species, the success of the revegetation systems

and the need for complementary planting, seeding, fertilization and vegetation control. The established monitoring frequency for the first two years is bi-annual, and annual for the following three years.

- Social monitoring - Monitoring to ensure the quality and accuracy of the information collected in the field, ensure the compliance with the goals and achievements of the objectives of the social activities and programs, and achieve its sustainability. The closure social program monitoring is summarized in this section.

Social monitoring - Consists of the development of a set of actions that will allow Sierra Metals to verify the efficiency of social programs related to closure stages, in accordance with each specific objective established for each activity described in the plan, and with the aim to correct if deemed necessary. This program is implemented in the surrounding communities in the social influence area. The main objectives of this program are to provide organization, measurement, and information capabilities to the communities which will enable them to participate with the impact monitoring activities. The KPIs mostly used are related to:

Environmental perception surveys in the education centers:

- dissemination of the operation's public information in the most representatives' buildings as well as internet
- closure schedule and progress per month
- roles and responsibilities
- resource requirements: Local transport
- quality control procedures
- reports presentation

Sierra Metals will hire a specialist group of professionals with experience in social and communities' relations. This team will be onsite twice a year to the area and will submit a report, scheduling all the potential activities to develop.

20.11 Reclamation and Closure Cost Estimate

Table 20-12 shows the estimated mine closure costs.

Table 20-12: Closure Plan – Summary of Investment per Periods (US$)

Description	US$ without tax	US$ with taxes	Periods (years)
Progressive closure	15,335,588.85	18,095,994.84	2022 – 2027
Final Closing	10,164,167.19	11,993,717.28	2028 – 2029
Post-Closing	1,072,472.43	1,265,517.47	2030 – 2034
Total Closing	26,572,228.47	31,355,229.59	
Total amount of the guarantee		13,259,234.75	
Cost reference date 2023			

Note: The amount includes tax (VAT, 18%)
Source: Sierra Metals, 2024, Report N° 169 -2023-MINEM-DGM-DTM/CM

21 CAPITAL AND OPERATING COSTS

This section provides a detailed overview of the capital and operating costs taken into account in the valuation process. All costs outlined herein are denominated in US dollars for the year of 2024, unless explicitly specified otherwise.

It is noteworthy that the audited Yauricocha project is presently operational, with reserves in place to sustain ongoing operations up to the year 2029, based on the anticipated throughput and operating cost projections.

21.1 Capital Costs

The Project's technical team has meticulously compiled an estimate of the capital required to sustain the mining and processing operations, encompassing various essential components. The equipment sustaining cost encompasses the financial resources required for the upkeep and renewal of mining and plant machinery. This includes sustaining capital allocations for essential components such as the concentrator plant, water pumping systems, expansion of the tailings dam, mine camp facilities, underground mine ventilation systems, and environmental considerations.

Moreover, the expansionary capital estimate encompasses additional investments, such as the installation to complete the extension of the Yauricocha shaft for accessing deeper mineral reserves and the finalization of the Yauricocha Tunnel to enhance underground operational efficiencies. This capital estimation is itemized into distinct categories, including but not limited to:

- Mine Development: Encompassing all expenditures associated with underground mine development activities eligible for capitalization. The cost projection is based on site-specific data derived from Yauricocha.
- Ventilation: This pertains to the anticipated costs related to establishing ventilation raises essential for maintaining optimal production levels in the underground mining zones. The estimation is founded upon the ventilation requirements outlined in Section 16.
- Equipment: Covering the capital outlay necessary for the maintenance and replacement of mine equipment, ensuring operational continuity.
- Infill Drilling and Exploration: Allocated for conducting infill drilling and exploration endeavors aimed at identifying and assessing potential mining opportunities within the company's mining and exploration concessions.
- Plant and Tailings Storage Facility (TSF): Incorporating capital expenditures aimed at enhancing and expanding the processing plant and the TSF infrastructure.
- Closure: Reserved for funding future closure activities in adherence to environmental regulations and operational sustainability principles.
- Project or Expansionary Capital:
  - Yauricocha Shaft

Given the operational status of the Project, QP (Alonso Gonzales) has taken into account the pre-existing working capital reserves deemed sufficient for ongoing operations. Consequently, no additional provisions for working capital fluctuations were factored into the economic modelling.

A comprehensive breakdown of the capital expenditure by area is succinctly summarized in Table 21-1 for reference and clarity.+

Table 21-1: Capital Cost Summary 2024-2027 (US$)

Description	Budget 2024 (US$,000)	Life of Mine (US$,000)
Sustaining Capital Development	$8,153	$24,910
Sustaining Capital Ventilation	$1,807	$7.804
Sustaining Capital Equipment	$835	$3,495
Sustaining Capital Infill Drilling - Exploration	$811	$1,734
Sustaining Capital Concentrator	$500	$1,500
Growth Capital Tailings Dam	-	$13,082
Sustaining Capital Draining System	$1,483	$4,618
Sustaining Capital Pumping System	$900	$3,225
Growth Capital Yauricocha Shaft	$2,181	$3,938
Growth Capital Waste Dump	-	$1,267
Growth Capital Integration Access to Yau Shaft	$780	-
Growth Capital Mine Closure	-	$10,100
TOTAL CAPITAL	**$17,451**	**$76,483**

Source: Sierra Metals (2024)

21.2 Operating Costs

The estimation of operating costs is meticulously grounded in site-specific data, ensuring a comprehensive and accurate assessment. The QP (Alonso Gonzales) has been provided with historical cost data for comparative analysis, aiding in contextualizing the current projections. These costs have been meticulously categorized into three primary areas, as delineated below:

- Mining: Encompassing all expenses directly associated with the extraction and transportation of ore from the mining site. This category includes costs related to labor, fuel, equipment maintenance, and other operational expenditures essential for sustaining mining activities.
- Processing: This category pertains to the operational costs associated with the processing plant, encompassing expenses related to ore milling, flotation, leaching, and other processing activities aimed at extracting valuable minerals from the ore.
- G&A (General and Administrative): Covering the administrative and overhead expenses incurred in managing and overseeing the day-to-day operations of the project, including salaries, office supplies, utilities, insurance, and other administrative costs.

For enhanced clarity and transparency, a comprehensive summary of the estimated operating costs, juxtaposed with the historical cost data provided by the project owner, is meticulously presented in Table 21-2 and Table 21-3, respectively. These tables serve as valuable reference points for evaluating cost trends and patterns over time, facilitating informed decision-making and strategic planning.

Table 21-2: Modeled Operating Cost Summary

Description	Budget 2024 (US$,000)	Life of Mine (US$/t ore)
Underground Mining	358,330	60.05
Process	81,468	13.78
G&A	29.813	5.42
Total Operating	**439,798**	**79.25**

Source: Sierra Metals (2024)

Table 21-3: Yauricocha 2024 Operating Costs

Period (January to December 2024)	Cost (US$/t)
Mine	70.95
Plant	16.18
G&A	9.66
Total	**96.79**

Source: Sierra Metals (2024)

22 ECONOMIC ANALYSIS

Under the provisions of NI 43-101, producing issuers have the option to omit the requisite Economic Analysis information concerning properties currently in production, provided that the technical report does not entail a significant expansion of ongoing production activities. Sierra Metals, as a producing issuer, operates the Yauricocha Mine, which is presently engaged in production. Furthermore, there are no imminent plans for any substantial expansion of the current production operations.

The enhancements in production have been facilitated by various operational improvements, including enhanced equipment maintenance resulting in greater mechanical availability, optimized utilization of the processing plant, refined mine planning strategies, and more efficient operations management.

Sierra Metals has conducted a thorough economic analysis of the Yauricocha Mine's comprehensive life-of-mine plan, utilizing the estimates delineated in this report. The analysis affirms a positive cash flow outlook that robustly supports the assertion of Mineral Reserves.

23 ADJACENT PROPERTIES

The Authors are not aware of any adjacent properties to the Yauricocha Project area that would materially affect the understanding of the Project and the results of the Report.

24 OTHER RELEVANT DATA AND INFORMATION

The Authors are not aware of any other relevant information or explanation necessary to make the Technical Report understandable and not misleading.

25 INTERPRETATION AND CONCLUSIONS

25.1 Summary

The underground Yauricocha Polymetallic Mine, owned by Sierra Metals Inc. and operated by Sociedad Minera Corona S.A., is located about 140 km by road west of Lima, Peru and about 64 km southwest from Jauja. The mineral rights to the Property comprise a single mining concession (Concession Minera) and the mineral rights are in good standing, held by Sociedad Minera Corona S.A., a subsidiary of Sierra Metals.

The purpose of the Report is to present the results of the Mineral Resources for the Yauricocha Mine to include all available drilling information and data and to account for the depletion of resources in 2023.

Mr. Simon Mortimer visited the Property between 6 November and 8 November 2023, to fulfill the requirement of a QP personal inspection (site visit) of the Project. The Effective Date of the Report is 31 December 2023.

The Property is situated in a temperate highland tropical climate climatic zone which is characterized by dry cool winters and warm wet summer seasons; mining and exploration activities can continue all year-round.

The silver of Yauricocha was initially documented by Alexander von Humboldt in the early 1800s. The Valladares family mined high grade silver mineralized material for 22 years and in 1927, Cerro de Pasco Corporation acquired the Yauricocha claims. In 1948, Cerro de Pasco commenced mining operations at Yauricocha until the Peruvian Military Government nationalized Cerro de Pasco Corporation and Yauricocha became a production unit of State-owned Centromin Peru S.A. for 30 years. In 2002, the Yauricocha unit was privatized and purchased by Minera Corona. Sierra Metals retains a 100% controlling ownership status in the Yauricocha Mine, through their subsidiary Sociedad Minera Corona S.A.

25.2 Geology

The Western Andean Cordillera is recognized for its world class base- and precious-metal deposits, many of which have been intermittently mined since Incan time. Most of the metal deposits in Peru are spatially and genetically associated with metal-rich hydrothermal fluids generated along magmatic belts that were emplaced along convergent plate tectonic lineaments. Furthermore, many of these primary base-metal deposits have undergone significant supergene enrichment due to uplift and weathering over the last 30 Ma.

Like many of the ore deposits in the Yauricocha District of central Peru, the Yauricocha Deposit is spatially and genetically related to the Yauricocha Stock, a composite intrusive body of granodioritic to quartz monzonitic composition. The approximately 7.5 Ma (Giletti and Day, 1968) stock intruded tightly folded beds of the Cretaceous Goyllarisquizga, Jumasha, and Celendin formations, and Cretaceous-Tertiary Casapalca Red Beds.

25.2.1 Mineralization

Mineralization in the Yauricocha Deposit features several mineralized zones which have been emplaced along structural trends, with the mineralization itself related to replacement of limestones by hydrothermal fluids related to nearby intrusions.

Mineralization varies widely in morphology from large, relatively wide, tabular manto-style deposits, to narrow, sub-vertical chimneys (shoots or pipes). The majority of the mineralization is related to the regional high-angle northwest-trending Yauricocha Fault, or the northeast trending and less well-defined Cachi-Cachi structural trend. The mineralization generally presents as polymetallic sulphides but is locally oxidized to significant depths or related to more Cu-rich mineralization.

All parts of the Property with historical exploration or current production activity are in the current area of operations. This area is nearly centered within the concession boundary and there is both space and potential to expand the resources and the operation both directions along the strike of the Yauricocha Fault.

25.3 Deposit Types

The sedimentary-hosted Yauricocha polymetallic (copper, lead, zinc, silver, gold) deposit closely resembles that typified by polymetallic Ag-Au deposits, which comprise quartz-sulphide-carbonate fissure vein equivalents of quartz-sulphide and carbonate- base metal deposits.

Mineralized bodies are dominantly high-temperature polymetallic sulphide bodies that replaced limestone. Metal-bearing solutions of the Yauricocha magmatic-hydrothermal system were highly reactive and intensely attacked the carbonate wall rock of the Jumasha and Celendín Formations, producing the channels in which sulphides were deposited. Base and precious metals were largely precipitated within several hundred metres of the stock (Lacy, 1949; Thompson, 1960). Skarn is developed adjacent to the stock but does not host appreciable amounts of economic mineralization (Alverez and Noble, 1988). Mineralization typically exhibits both vertical and radial zoning and there is a pronounced district zoning, with an inner core of enargite (the principal copper mineral) giving way outward to an enargite-chalcopyrite-bornite zone, which in turn is succeeded to the west by zones characterized by sphalerite, galena and silver (Lacy, 1949; Thompson, 1960).

Mineralized zones at Yauricocha are partially to completely oxidized and extend from the surface to below level 1220. Supergene enrichment is closely related to oxidation distribution. Supergene covellite, chalcocite and digenite are found where the sulphide minerals are in contact with oxidized areas.

25.4 Drilling

As of the Effective Date, 31 December 2023, Sierra Metals has completed approximately 663,013 m of diamond drilling in 4,502 holes. Drill holes are categorized as exploration and development, drilling by contractor, and drilling by the Company. Since the effective date of the previous technical report (SRK, 2022), Sierra Metals has completed 73,913 m of drilling in 568 diamond drill holes (Table 10-2). Drilling is ongoing on the Project.

25.5 Sample Preparation and QA/QC

Since 2018 a rigorous program for quality assurance and quality control has been in place to monitor the results of analyses reported from samples of drill core processed by ALS Minerals for the Company. The QA/QC process included the insertion of various materials into the normal sample stream. This included: i) eleven different custom CRMs (certified reference materials); samples of inert blank material; fine (pulp) and coarse (reject) duplicates; and field (quartered core) duplicates.

The results conclude that the database is supported by adequate QA/QC to have reasonable confidence to estimate Mineral Resources. The QP recommends that QA/QC failures be addressed as soon as possible a through a continuous review of the QA/QC results and their performance limits.

25.6 Mineral Resources

QPs (Simon Mortimer and Oscar Retto) have undertaken detailed review of the database, domain interpretation, estimation parameters and validation of the block models of Yauricocha Mine for all stages of the mineral resource estimate.

Drill holes and channel samples were statistically compared to identify potential bias that could affect the estimate. The analysis revealed important variations at local scale that could affect the quality of the estimate. These variations can be attributed to the sampling methodology and support size differences. The QP (Oscar Retto) recommended using only drill hole information for the current mineral resource estimate.

The block models were flagged with mine area, mine depletion and populated with estimated blocks for Cu, Zn, Ag, Pb, As and Fe grades, and bulk density under industry-standard estimation methodologies.

Mineral Resources are categorized in a manner consistent with industry best practice and are reported on underground mining within mineable stope shapes above reasonable unit value cut-offs, based on actual operational costs using NSR values in the block model, calculated on the projected long-term metal prices, commercial terms, and actual metallurgical recoveries experienced in the plant.

The Mineral Resources for the Yauricocha Mine are: Measured Resource of 1.9 Mt at 1.37% Cu, 2.12% Zn, 40.35 g/t Ag, 0.48% Pb, and 0.56 g/t Au; Indicated Resource of 8.4 Mt at 1.29% Cu, 2.21% Zn, 42.73 g/t Ag , 0.56% Pb, and 0.47 g/t Au; and an Inferred Resource of 13.2 Mt at 1.30% Cu, 1.59% Zn, 34.42 g/t Ag, 0.49% Pb, and 0.43 g/t Au.

Mineral Resources are reported at an NSR and are variable by mining method, the cut-off US$39.71/t for sub level caving (SLC) and US$62.86/t for cut and fill (OCF) method. The QP responsible for the Mineral Resources Estimate for the Yauricocha Mine is Oscar Retto, MAIG. The effective date of the Mineral Resources is 31 December 2023.

The QPs (Simon Mortimer and Oscar Retto) are of the opinion that the Mineral Resources have been estimated using standard industry practices and are suitable for public reporting in compliance with NI 43-101.

25.7 Mineral Reserve Estimate

QP (Alonso Gonzales) affirms that the Mineral Reserve Estimate has been conducted in accordance with established industry standards, and the available data and information adequately support the classification of reserves as Probable and Proven.

As an active operational site, the Yauricocha Mine relies on recent production data as a primary source for validating or, where necessary, deriving relevant modifying factors for the conversion of Mineral Resources into Mineral Reserves.

Every mining area underwent assessment utilizing appropriate mining block configurations tailored to the respective mining method employed within the zone. The evaluation drew upon a comprehensive dataset and information encompassing mining recovery, dilution, metallurgical recovery rates, operational expenditures, and smelter agreements. These metrics were derived from historical data, including mine-to-mill reconciliation processes.

The production schedule associated with these reserve estimates extends mining operations until Q4 2029, maintaining an average daily production rate of approximately 3,780 tonnes of ore. The Life-of-Mine (LoM) production plan encompasses material sourced from 22 primary mining zones that compose the Ore Reserves for Yauricocha Mine, utilizing SLC and Overhand Cut & Fill mining techniques.

QP (Alonso Gonzales) is of the opinion that the reserve estimations are suitable for public reporting and are a fair representation of the mill feed tonnes, grade, and metal for the Yauricocha deposit. However, recommends the development of flow modelling techniques for the SLC mining areas and calibration of the geotechnical numerical modelling.

25.8 Mining Methods

25.8.1 Mining

The Yauricocha Mine operates as a productive entity with an extensive history of production. Mechanized sub-level caving constitutes the primary mining method, with overhand cut and fill accounting for a smaller proportion. The mine relies on established and validated mining techniques, ensuring operational continuity. It is projected that the mine will maintain a production rate of 3,780 tonnes per day (1.38 million tonnes per year) during 2024, a level deemed achievable and sustainable throughout the Life of Mine (LoM) plan.

25.8.2 Geotechnical

Geotechnical logging database is adequate for initial assessments and needs ongoing data collection programmes for deeper sections. QP (Alonso Gonzales) recommends that the mine continues updating and maintaining the geotechnical model. Geotechnical domains need more detailed definition close to the ore zones. Block modelling geotech classifications can lead to “smearing” of data from different geotechnical domains unless it is constrained into distinct geotechnical domains.

The numerical modeling assessments of stoping and SLC layouts are conducted using an inadequate stress model. According to regional "thrust" tectonic conditions, the horizontal to vertical stress ratio should exceed 1.5. Additionally, relying solely on individual triaxial tests for determining local strength parameters instead of utilizing averages for domains is prone to misinterpretation of conditions. The long sections for SLC assessment do not take into account of the stress concentration effects around the cave zone. SLC areas require 2D numerical models normal to ore zone strike as well as parallel (or full 3D models), to assess stress concentration and extent of yield around orebodies. Therefore, the QP (Alonso Gonzales) has provided recommendations in Section 26 that, if implemented and followed, should enable the Geotechnical Numerical Modelling to be compliant.

Current stoping methods (SLC and Overhand Cut & Fill) are appropriate to the geotechnical conditions. If cemented rock or paste fill is available, the mine could reduce C&F support requirements in poorer ground by undercutting beneath filled ore drives.

The ground control management level plans assessed exhibit a rock mass quality regime consistent with the conceptual geotechnical rock mass model and the domain/sub-domain descriptions outlined in the Geomechanical Assessment Mining Plan 2024. These plans, accompanied by development profiles and installation procedures, are well-developed and suitable for operational implementation. Although ground support designs were not extensively scrutinized in this study, it was noted that the absence of surface support in good ground contradicts industry standards. Unless a comprehensive and systematic check-scaling procedure is ensured, it is customary to incorporate surface mesh and/or shotcrete even in favorable ground conditions.

The QP (Alonso Gonzales) acknowledge the adequacy of the current understanding of subsidence and its impacts. While the comprehension of in-situ and induced stress within the existing mining areas is deemed satisfactory, deeper planned mining areas necessitate site-specific stress measurements and modeling. Moreover, while the current grasp of the factors contributing to mudflow and the implemented mitigation measures is reasonable, the perpetual risk of mud rush events, especially during the initiation of new mining areas, underscores the importance of vigilant dewatering practices, continuous monitoring of existing drawpoints, and thorough investigation of new development areas prior to commencement.

25.8.3 Hydrology

Current observations and analyses suggest that inflow to both the subsidence (caving) zone and the mine will increase as the mine expands. Mitigation and management efforts should continue to understand the distribution of water and value in efforts to control or reduce inflow. One risk are mud rushes, as described in Section 16.

Past efforts have been made to control or reduce inflows. A large amount of data is available that could be used to understand the source of water, but it is currently not compiled in a manner to allow this to be easily done.

In conclusion, the mine has in the past, or currently, been able to manage water sufficiently to allow mining to proceed. As the mine expands, water inflows should be expected to increase. Mitigation efforts should continue to be assessed and tested, but operational management plans should continue to assume that inflows and mud rush potential will increase until such a time that the effectiveness of mitigation efforts can be proven, or decisions are made to address water-related risks through other management plans.

25.9 Infrastructure

The existing infrastructure demonstrates a high level of development and is operating in line with expectations for a mature operation. The ongoing evolution of the tailings facility necessitates continuous monitoring to ensure timely construction of subsequent lifts to sustain operational needs. It is advisable to maintain ongoing vigilance regarding the stability of the embankment and operational protocols to align with industry standards and best practices.

25.10 Capital and Operating Costs

Based on average mining/processing rate of 3,780 tpd, the Yauricocha reserves should support the project until the end of 2029. The Project’s operating costs were estimated using historical cost data and current site-specific.

25.11 Economic Analysis

Under the provisions of NI 43-101, producing issuers have the option to omit the requisite Economic Analysis information concerning properties currently in production, provided that the technical report does not entail a significant expansion of ongoing production activities. Sierra Metals, as a producing issuer, operates the Yauricocha Mine, which is presently engaged in production. Furthermore, there are no imminent plans for any substantial expansion of the current production operations.

Enhancements in production have been facilitated by various operational improvements, including enhanced equipment maintenance resulting in greater mechanical availability, optimized utilization of the processing plant, refined mine planning strategies, and more efficient operations management.

Sierra Metals has conducted a thorough economic analysis of the Yauricocha Mine's comprehensive life-of-mine plan, utilizing the estimates delineated in this report. The analysis affirms a positive cash flow outlook that robustly supports the assertion of Mineral Reserves.

25.12 Foreseeable Impacts of Risks

No further pertinent information or elucidation is deemed requisite to ensure the comprehensive understanding of the technical report, thereby mitigating any potential for misinformation or ambiguity.

26 RECOMMENDATIONS

It is the opinion of the Authors that the geological setting and character of the polymetallic mineralization on the Yauricocha Mine and Project and mine delineated and exploited to date is of sufficient merit to justify additional work on the Property with the aim of expanding mineral resources. A recommended work program, arising through the preparation of the Report and consultation with the Company, is provided below.

The Yauricocha Mine has a long history of production and current work on the project – mainly diamond drilling – has expanded mineral resources and shown the potential for the property host additional mineralization.

26.1 Geology

QPs (Simon Mortimer and Oscar Retto) has made the following recommendations for the development of the Mineral Resources at Yauricocha:

- Integrate geology data in a single database for the entire Yauricocha mine, which can be easily verified and audited.
- The number of bulk density measurements be increased in mineralized structures that lack sufficient values.
- Integration of structures (fault model) and mineralized zones as shown in Mina Central into a global model is essential in developing a comprehensive exploration and mining model. This will improve the representation of mineral continuity and prevent inconsistencies in defining domains.
- Evaluate the inclusion of channel samples for block estimation with alternative geostatistical methods as conditional simulation.
- Conduct geostatistical studies to investigate if the current block dimensions used in the model are the optimum size for resource estimation and mining method.
- Lithology and structural models be extended to cover all the zones of the mine and that the individual mineralised zone wireframes be remodelled with respect to the new 3D lithostratigraphic interpretation.
- Completion of an integrated structural-lithostratigraphic and mineralisation model would facilitate the mine planning process with regards to the ability to apply a waste density for dilution purposes and serve for brownfields exploration.

26.2 Mining

The QP (Alonso Gonzales) have the following recommendations for the Mineral Reserve estimation practices and mining methods at Yauricocha:

- Efforts should be directed towards streamlining and automating the mineral reserve estimation process to facilitate future estimates, reviews, and audits.

- The mine planning group should thoroughly review the latest version of the MRMR Best Practice Guidelines published by CIM on November 29th, 2019, and strive to implement the best practices pertaining to the mineral reserve estimation process.
- It is imperative to establish a robust mineral reserve to mine-to-mill reconciliation process to provide solid support for the dilution and mining recovery assumptions.
- The redesign and update of the SLC mine design layouts and sequencing based on the Geotechnical recommendations:
  - lead/lag rules
  - cave front retreat direction
  - pillar analysis (Interlevel and on level design)
- Reassessment of the production drilling equipment fleet utilised on site to meet redesign requirements.
- The development of an SLC flow model for grade and tonnage forecasting
  - step-outs
  - cave draw strategy
  - HoV optimisation
  - SLC flow model calibration and reconciliation
- Integration of flow model with Deswik mine design and scheduling process.
- The development of a cave and operational management plan
  - enhancing operational practices and reduces hazards on the SLC
  - improvement on the risk and safety protocols
  - optimising the SLC mining recovery and reduction in dilution
- Incorporating a risk assessment as a standard component of the reserve estimation process is considered a best practice.
- An appropriate data collection system must be implemented to gather the necessary data for establishing the reconciliation process in a usable format. While this is relative straightforward for cut and fill areas, it presents greater challenges for sub-level caving areas.
- Close monitoring of the Yauricocha Shaft project is essential to ensure timely access.
- Completion of a consolidated 3D Life-of-Mine (LoM) design is recommended to enhance communication of the LoM plan, infill drilling requirements, and overall mine planning and execution.
- Update on the Base Case LoM plan should be maintained and utilized by Yauricocha to furnish medium and short-term mine production forecasts.
- The mine planning group should prepare one or more LoM plans that are more optimistic than the Base Case for strategic planning purposes.
  - typically, the optimistic LoM plan incorporates inferred mineral resources designed to a conceptual level of detail and is updated as resources transition to Indicated or Measured categories.

26.3 Geotechnical

The QP (Alonso Gonzales) geotechnical recommendations are:

- Develop a comprehensive Geotechnical Management Plan
  - available logging, mapping, and testing data,
  - maintain a centralized geotechnical database for efficient data management.
  - planned investigation programmes,
  - develop and uphold geotechnical models, encompassing structures and rock mass wireframes, to enhance geological understanding.
  - design methods to be applied for mining sections,
  - ground support requirements,
  - monitoring systems.
- Continue the acquisition of geotechnical characterization data from mined drifts and exploration drillholes.
- Undertake further numerical modelling analyses to assess ore drive stability and potential dilution in deeper mining sections; analyses should include prominent structural features.
- Conduct an in-situ stress measurements in the deeper planned mining areas.
- Friction bolts (split sets) are not effective in high stress/deformation conditions.
  - consider using higher capacity grouted and yieldable types of rock bolts.
- Conditions will become more difficult with increasing depth and stress. Increased deformation/yield is likely to develop.
  - increased spacing between cross-cut drives and levels to limit pillar yield.
- If cemented rock or paste fill is available, the mine could reduce C&F support requirements in poorer ground by undercutting beneath filled ore drives.
- Longhole open stoping does not appear to be a practical method for Fortuna 7 ground conditions; it is likely to result in extensive wall failure/dilution.
- Sustain short-term to long-term dewatering programs, employing drainage systems to manage groundwater levels effectively.
- Review the current mine sequence and simulate an optimal mine sequence to mitigate safety risks and the potential for inadvertent ore reserve sterilization due to unforeseen ground conditions.
  - cave front retreat relative to principal stress
  - SLC step-outs
  - lead lag rules (inter-level and within production level)

26.4 Infrastructure

Continued monitoring of the stability of the tailings storage facility embankment and operational practices is advised to align with industry-leading standards.

Continued monitoring of the cave propagation and subsidence zone on the surface to align with industry-leading standards and avoid infrastructure damage or development of hazards in the operation.

26.5 Economic Analysis and Costs

As outlined in Section 22, no economic evaluation was conducted given the operational status of the Yauricocha Mine.

Anticipated ongoing development of new resources and subsequent requirements for additional development in subsequent years are expected to lead to an escalation in mining costs, contrary to the decrease projected in the assessment. It is advised to incorporate these higher mining costs into the evaluation of this asset.

26.6 Estimated Budget

The following is the summary of the estimated costs for the proposed work programs for the continued development of the Yauricocha Mine and expansion of mineral resources. The estimated budget for these proposed work programs is approximately US$2.6 million. Table 26-1 presents the estimated costs for the proposed work.

Table 26-1: Summary of Costs for Proposed Work Programs

Description	Unit Cost (US$)	Estimated Cost (US$)
Geology		
2024 drilling program (approx. 15,000 m)	$ 90/m	$ 1,350,000
Geostatistical study for channel sample inclusion in the model		$ 40,000
Block size optimization study		$ 25,000
Annual density determinations and laboratory analysis		$ 100,000
Mining		
Implementation of Reconciliation Data Collection		$ 70,000
Update SLC Mine design layout (Geotech rules)		$ 100,000
SLC Flow Modelling		$ 150,000
Deswik Caving Integration		$ 30,000
Cave & Operational Management Plan		$ 50,000
Training and Coaching (SLC Mining)		$ 15,000
Implementation of Reconciliation Data Collection		$ 70,000
Geotechnical		
Annual data and analysis review and data collection		$ 100,000
Geotechnical Management Plan		$ 50,000
Numerical Modelling		$ 100,000
Ground Support Study (Deeper Mining)		$ 70,000
In-situ Stress measurements		$ 50,000
Subtotal:		**$ 2,370,000**
Contingency (10%)		$ 237,000
TOTAL (US$):		**$ 2,607,000**

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28 CERTIFICATE OF AUTHORS

28.1 Simon Mortimer, FAIG

CERTIFICATE OF QUALIFIED PERSON

I, Simon James Atticus Mortimer, FAIG, do hereby certify that:

1. I am a Professional Geologist with Atticus Geoscience Consulting S.A.C. with an address at Av. Jose Larco 724, Miraflores, Lima, Peru.
2. I graduated from the University of St. Andrews, Scotland, with a B. Sc. in Geoscience in 1995 and from the Camborne School of Mines with a MSc. in Mining Geology in 1998.
3. I am a registered Professional Geoscientist, practicing as a member of the Australasian Institute of Mining and Metallurgy (#300947) and the Australian Institute of Geoscientists (FAIG #7795).
4. I have worked as a geoscientist in the minerals industry for over 20 years and I have been directly involved in the mining, exploration, and evaluation of mineral properties mainly in Peru, Chile, Argentina, Brazil, and Colombia for precious and base metals.
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
6. I am responsible for Sections 1.11, 2.3.1, 2.4 – 2.7, 3, 10, 12, 14.1-14.4, 25, and 26 (co-author of Sections 1.11, 3, 10, 12, 25, and 26) in the technical report titled, "National Instrument 43-101 Technical Report and Mineral Resource Estimates on the Yauricocha Mine, Peru"" (the "Technical Report"), issued 14 June 2024 and with a Mineral Resource Estimate and Report Effective Date of 31 December 2023.
7. I have not visited the Yauricocha Mine Property, the subject of the Report.
8. I am independent of Sierra Metals Inc., applying all of the tests in Section 1.5 of NI 43-101 and Companion Policy 43-101CP.
9. I have not had any past involvement with the Property that is the subject of the current Technical Report.
10. I have read NI 43-101, Form 43-101F1 and confirm the Technical Report has been prepared in compliance with that instrument and form.
11. As of the Effective Date of the Technical Report, to the best of my knowledge, information and belief, the Sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed at Lima, Peru this 14th day of June 2024.

"signed electronically"

____

Simon Mortimer, FAIG

28.2 Dr. Scott Jobin-Bevans, Ph.D., P.Geo.

CERTIFICATE OF QUALIFIED PERSON

To accompany the technical report entitled: "Technical Report on the Yauricocha Mine, Yauyos, Peru" dated 14 June 2024, with an effective date of 31 December 2023 (the "Technical Report").

I, Scott Jobin-Bevans, P.Geo., do hereby certify that:

- I am an independent consultant and Principal Geoscientist with Caracle Creek International Consulting Inc. and Managing Director for Caracle Creek Chile SpA, with an address at Benjamin 2935, Office 302, Las Condes, Santiago, Chile.
- I graduated from the University of Manitoba (Winnipeg, Manitoba), BSc. Geosciences (Hons) in 1995 and from the University of Western Ontario (London, Ontario), PhD. (Geology) in 2004.
- I am a registered member, in good standing, of the Professional Geoscientists of Ontario (PGO), License Number 0183 (since June 2002).
- I have practiced my profession continuously for more than 29 years, having worked mainly in mineral exploration but also having experience in mine site geology, mineral resource and reserve estimations, preliminary economic assessments, pre-feasibility studies, due diligence, valuation and evaluation reporting. I have authored, co-authored or contributed to numerous NI 43-101 and JORC Code reports on a multitude of commodities including nickel-copper-platinum group elements, base metals, gold, silver, vanadium, and lithium projects in Canada, the United States, China, Central and South America, Europe, Africa, and Australia.
- I have read the definition of "Qualified Person" set out in National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
- I am responsible for Sections 1.1 to 1.8, 1.10, 1.20, 2.1, 2.2, 3 to 10, 12, 23, 25, and 27 (co-author of Sections 3, 10, 12, and 25)of the Technical Report and accept professional responsibility for this section of the Technical Report
- I have not visited the Yauricocha Mine Property, the subject of the Report.
- I am independent of Sierra Metals Inc., applying all of the tests in Section 1.5 of NI 43-101 and Companion Policy 43-101CP.
- I have not had any past involvement with the Property that is the subject of the current Technical Report.
- I have read NI 43-101, Form 43-101F1 and confirm the Technical Report has been prepared in compliance with that instrument and form.
- As of the Effective Date of the Technical Report, to the best of my knowledge, information and belief, the Sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed at Santiago, Chile this 14th day of June 2024.

"signed electronically"

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Scott Jobin-Bevans (P.Geo., PhD, PMP)

28.3 John Siriunas, P.Eng.

CERTIFICATE OF QUALIFIED PERSON

To accompany the technical report entitled: "Technical Report on the Yauricocha Mine, Yauyos, Peru" dated 14 June 2024, with an effective date of 31 December 2023 (the "Technical Report").

I, John M. Siriunas, P.Eng., do hereby certify that:

- I am an associate independent consultant of Caracle Creek International Consulting Inc. (Caracle) and have an address at 25 3rd Side Road, Milton, Ontario, Canada, L9T 2W5.
- I graduated from the University of Toronto (Toronto, Ontario) with a B.A.Sc. (Geological Engineering) in 1976 and from the University of Toronto (Toronto, Ontario) with an M.A.Sc. (Applied Geology and Geochemistry) in 1979.
- I have been a member, in good standing, of the Association of Professional Engineers of Ontario since June 1980 (Licence Number 42706010) and possess a Certificate of Authorization to practice my profession.
- I have practiced my profession continuously for 44 years and have been involved in mineral exploration, mine site geology, mineral resource and reserve estimations, preliminary economic assessments, pre-feasibility studies, due diligence, valuation and evaluation reporting, and have authored or co-authored numerous reports on a multitude of commodities including nickel-copper-platinum group element, base metals, precious metals, lithium, iron ore and coal projects in the Americas.
- I have read the definition of "Qualified Person" set out in National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
- I am responsible for the preparation of Sections 1.9, 1.10, 11, 12, and 25 (co-author of Sections 12, and 25) of the Technical Report and accept professional responsibility for this section of the Technical Report
- I have not personally visited the Yauricocha Mine Property, the subject of the Report.
- I am independent of Sierra Metals Inc. applying all of the tests in Section 1.5 of NI 43-101 and Companion Policy 43-101CP.
- I have had no prior involvement with the Property that is the subject of the Technical Report.
- I have read NI 43-101, Form 43-101F1 and confirm the Technical Report has been prepared in compliance with that instrument and form.
- As of the Effective Date of the Technical Report, to the best of my knowledge, information and belief, the Sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed at Milton, Ontario this 14th day of June 2024.

"signed electronically"

John M. SIriunas (M.A.Sc., P.Eng.)

28.4 Oscar Retto, MAIG

CERTIFICATE OF QUALIFIED PERSON

To accompany the technical report entitled: "Technical Report on the Yauricocha Mine, Yauyos, Peru" dated 14 June 2024, with an effective date of 31 December 2023 (the "Technical Report").

I, Oscar Retto Magallanes, MAIG. of Lima, Peru, do hereby certify that:

- I am a Principal Mineral Resource Associate with AGP Mining Consultants Inc., with a business address at #246-132K Commerce Park Dr., Barrie, Ontario L4N 0Z7, Canada.
- I am a graduate of the Universidad Nacional Mayor de San Marcos of Lima, Peru with a degree in Mining Engineering in 1994 and a graduate of Ecole des Mines de Paris, Fontainebleau, France with a diploma in Geostatistics (CFSG) in 1995.
- I am a member in good standing of the Australian Institute of Geoscientists, membership #5295.
- I have practiced my profession in the mining industry since graduation.
- My relevant experience includes over 28 years and has covered various operational, technical and consultancy functions on early stages projects through to production mines in Peru, Canada, and Australia. I have worked as Senior Deposit Modeler Engineer in Minera Yanacocha and Mineral Resource Chief in Cerro Corona mine and as an Independent Mineral Resource Consultant. I have completed resource estimates for a variety of deposit types such as porphyry copper and molybdenum deposits, porphyry gold and copper deposits, gold, and copper epithermal high sulfidation deposits, and polymetallic veins.
- I have read the definition of "qualified person" set out in National Instrument 43-101 3531 ("NI 43-101") and certify that by virtue of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
- I am independent of the issuer, Sierra Metals, as defined in Section 1.5 of NI 43-101.
- I am responsible for Section 1.11, 12, 14.5 to 14.11, 25, and 26 (co-author of Sections 1.11, 12, 25, and 26) of the Technical Report and accept professional responsibility for this section of the Technical Report.
- As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the portions of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the portions of the Technical Report for which I am responsible not misleading.
- I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in accordance with NI 43-101 and Form 43-101F1.

Dated this 14th day of June 2024, in Lima, Peru.

"signed electronically"

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Oscar Retto Magallanes, MAIG.

28.5 Alonso Gonzales, MAusIMM

CERTIFICATE OF QUALIFIED PERSON

To accompany the technical report entitled: "Technical Report on the Yauricocha Mine, Peru" dated 14 June 2024, with an effective date of 31 December 2023 (the "Technical Report").

I, Alonso Gonzales, MAusIMM, do hereby certify that:

- I am a Principal Mine Engineer with AGP Mining Consultants Inc., with a business address at #246-132K Commerce Park Dr., Barrie, Ontario L4N 0Z7, Canada.
- I am a graduate of the University of Queensland with a degree in Mining and Geotechnical Engineering in 2016.
- I am a member in a good standing professional association of the AusIMM with a license membership number of 317880.
- I have practiced my profession in the mining industry continuously since graduation. My relevant experience includes over 8 years in a wide variety of mining operations, mineral reserve estimation, preliminary economic assessments, pre-feasibility studies, due diligence, valuation and evaluation reporting, and feasibility studies projects within multiple commodities and countries worldwide. With my most recent experience in copper and gold deposits include: the Capricorn Copper Project, Australia, Arizona Sonoran Copper Project, USA, Carrapateena Copper Project, Australia and the ATK Gold Project, Kazakhstan.
- I have read the definition of "qualified person" set out in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by virtue of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
- I am independent of the issuer, Sierra Metals Ltd., as defined in Section 1.5 of NI 43-101.
- I am responsible for all Sections of this report, except for Sections 1.12, 1.13, 1.15, 1.16, 1.18, to 1.20, 2.3.2, 15, 16, 18, 19, 21, 22, 24, 25, and 26 (co-author of Sections 25, and 26) and accept professional responsibility for those sections of the Technical Report.
- I have had no previous involvement with the Property that is the subject of the current Technical Report.
- My most recent site visit to the Project was from February 12 and February 16, 2024, for three days.
- As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the portions of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the portions of the Technical Report for which I am responsible not misleading.
- I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in accordance with NI 43-101 and Form 43-101F1.

Dated this 14th day of June 2024, in Gold Coast, Queensland, Australia.

"signed electronically"

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Alonso Gonzales, MAusIMM

28.6 Neil Lincoln, P.Eng.

CERTIFICATE OF QUALIFIED PERSON

To accompany the technical report entitled: "Technical Report on the Yauricocha Mine, Yauyos, Peru" dated 14 June 2024, with an effective date of 31 December 2023 (the "Technical Report").

I, Neil Lincoln, P.Eng., do hereby certify that:

- I am a Principal Process Engineer with AGP Mining Consultants, with a business address at #246-132K Commerce Park Drive, Barrie, Ontario L4N 0Z7 Canada.
- I graduated from the University of the Witwatersrand, South Africa, in 1994 with a Bachelor of Science in Metallurgy and Materials Engineering (Minerals Process Engineering) degree.
- I am a professional engineer in good standing with the Professional Engineers of Ontario (PEO) in Canada (no. 100039153).
- I have practiced my profession in the mining industry continuously since graduation. My relevant experience includes 30 years as a metallurgist having worked on numerous projects ranging from scoping studies, prefeasibility and feasibility studies to project implementation related to processing plants. My mineral processing commodity and unit operations experience includes precious metals, base metals and industrial minerals covering metallurgical test work to process plant design. As a result of my experience and qualifications, I am a Qualified Person as defined in NI 43–101. Select base metal projects include La Plata Project for Atico Mining, Back Forty Project for Aquila Resources, and Copperwood Project for Highland Copper.
- I have read the definition of "qualified person" set out in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by virtue of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
- I am independent of Sierra Metals Ltd. as described by Section 1.5 of the instrument.
- I am responsible for Section 1.14, 13, and 17 of the Technical Report and accept professional responsibility for these sections of the Technical Report.
- I have not had previous involvement with the Property.
- I have not visited the site.
- As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the portions of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the portions of the Technical Report for which I am responsible not misleading.
- I have read NI 43–101 and the sections of the Technical Report for which I am responsible have been prepared in compliance with that Instrument.

Dated this 14th day of June 2024, in Gold Coast, Queensland, Australia.

"signed electronically"

Neil Lincoln, P. Eng

28.7 Sandro Guarniz Anticona, MAusIMM

CERTIFICATE OF QUALIFIED PERSON

To accompany the technical report entitled: "Technical Report on the Yauricocha Mine, Yauyos, Peru" dated 14 June 2024, with an effective date of 31 December 2023 (the "Technical Report").

I, Sandro Guarniz Anticona, MAusIMM, of Lima, Peru, do hereby certify that:

- I am a Mining Engineer with Sierra Metals Inc., with a business address at: Avenida Ricardo Palma, No. 341, Oficina 1301, Edificio Platino, Distrito de Miraflores, Lima, Peru.
- I am a graduate of the Universidad Nacional de Ingenieria of Lima, Peru with a degree in Mining Engineering in 1994.
- I am a member in good standing of the Australian Institute of Mining and Metallurgy (No. 1007109).
- I have practiced my profession in the mining industry since graduation.
- My relevant experience includes over 29 years and has covered various operational, mining planning, project management and consultancy on early stages projects through to production mines in Peru and Mexico, also academic activities in Peru.
- I have read the definition of "qualified person" set out in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by virtue of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
- I am not independent of the issuer, Sierra Metals Inc., as defined in Section 1.5 of NI 43-101.
- I am responsible for Sections 1.17 and 20 of the Technical Report and accept professional responsibility for this section of the Technical Report.
- I have had previous 11 months/2 years of involvement on the Yauricocha Mine.
- I have made regular site visits to the Yauricocha Mine as a function of my responsibilities with Sierra Metals.
- As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the portions of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the portions of the Technical Report for which I am responsible not misleading.
- I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in accordance with NI 43-101 and Form 43-101F1.

Dated this 14th day of June 2024, in Lima, Peru.

"signed electronically"

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Sandro Guarniz Anticona, MAusIMM.