NI 43-101 TECHNICAL REPORT
For the Advanced Project

PORCO MINING OPERATIONS

ANTONIO QUIJARRO PROVINCE, BOLIVIA

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NOTICE

JDS Energy & Mining, Inc. prepared this National Instrument 43-101 Technical Report, in accordance with Form 43-101F1, for Santacruz Silver Mining Ltd. The quality of information, conclusions and estimates contained herein is based on: (i) information available at the time of preparation; (ii) data supplied by outside sources, and (iii) the assumptions, conditions, and qualifications set forth in this report.

Santacruz Silver Mining Ltd. filed this Technical Report with the Canadian Securities Regulatory Authorities pursuant to provincial securities legislation. Except for the purposes legislated under provincial securities law, any other use of this report by any third party is at that party's sole risk.

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1 EXECUTIVE SUMMARY

1.1 Introduction

JDS Energy & Mining Inc. (JDS) was commissioned by Santacruz Silver Mining Ltd. (Santacruz) to prepare a Technical Report in accordance with the Canadian Securities Administrators' National Instrument 43-101 and Form 43-101F1, collectively referred to as National Instrument (NI) 43-101 for the Porco Project (Porco or the Project or the Mine) located in the Porco Municipality of the Antonio Quijarro Province, Bolivia.

The Porco Mine has been active for nearly 500 years and is currently producing Zinc/Silver and Lead/Silver concentrates. The complex consists of an underground mine, concentrator plant, maintenance workshop, tailing storage facility, water treatment plant, supplies warehouse, main office, two hospitals and Yancaviri Camp. Located 50 km southwest of Potosí City in Antonio Quijarro province, the mine is comprised of two underground mining sectors: Central and Hundimiento.

This report is the first declaration of resources and reserves, for the Porco base metals underground mining operation since its acquisition by Santacruz. The mine is fully operational at the time of this report's preparation. The effective date of both the resource and the reserve is January 1, 2023, which is approximately 18 months before the report date. Production data for the calendar year 2023 has been included in Section 24 Other Relevant Data and information to show the depletion and typical replenishment of resources and reserves over a calendar year.

1.2 Ownership

On October 11, 2021, Santacruz entered into the Definitive Agreement with Glencore whereby Santacruz agreed to acquire a portfolio of Bolivian silver assets from Glencore, including the following: (a) a 45% interest in the Bolivar Mine and the Porco Mine, held through an unincorporated joint venture between Glencore's wholly-owned subsidiary Contrato de Asociación Sociedad Minera Illapa S.A. (Illapa) and COMIBOL, a Bolivian state-owned entity; (b) a 100% interest in the Sinchi Wayra S.A. (Sinchi Wayra) business, which includes the producing Caballo Blanco mining complex; (c) the Soracaya exploration project; and (d) the San Lucas ore sourcing and trading business.

On March 18, 2022, Santacruz completed this purchase, including Glencore's interest in the Porco Mine.

Santacruz thus owns 100% of the two Bolivian operating companies Illapa and Sinchi Wayra, which in turn own 45% of the Bolivar Mine, 45% of the Porco Mine, and 100% of the Caballo Blanco mining complex.

Sinchi Wayra is the operating company for all three active mining operations, including the Porco mine.

This report is the first declaration of resources and reserves, for the Porco base metals underground (UG) mining operation since its acquisition by Santacruz.

1.3 Location

Porco Mine is located in Bolivia, Potosi Department, Antonio Quijarro province, 50 km southwest of Potosí City. The mine is 150 km via paved National Highway 5 from a commercial airport at Uyuni and 581 km to the capital, La Paz. A 5 km gravel access road to the mine site goes through the communities of Agua de Castilla and Porco.

1.4 History

Evidence of silver mining at Porco goes back to pre-Columbian times. Porco was a silver source for the Inca, later the Spanish, and others through the late 19th century. As the world silver market began to collapse in the 1880's and early 1890's, a major shift to tin mining began to meet the increased demand of the industrialized world. Wealthy tin barons in Bolivia held much influence in national politics until they were marginalized by the nationalization of the three largest tin mining companies following the 1952 revolution. Bolivian miners played a critical part in the country's organized labor movement from the 1940s to the 1980s and continue to be an important stakeholder.

Porco became a resource of newly formed Bolivian Mining Corporation (COMIBOL), under whose management it operated until leased to private "Iris Mines" through subsidiary Compania Minera del Sur (COMSUR) in 1962. Emergency economic measures by the government in response to the international tin market crash in 1985 included massive layoffs of miners.

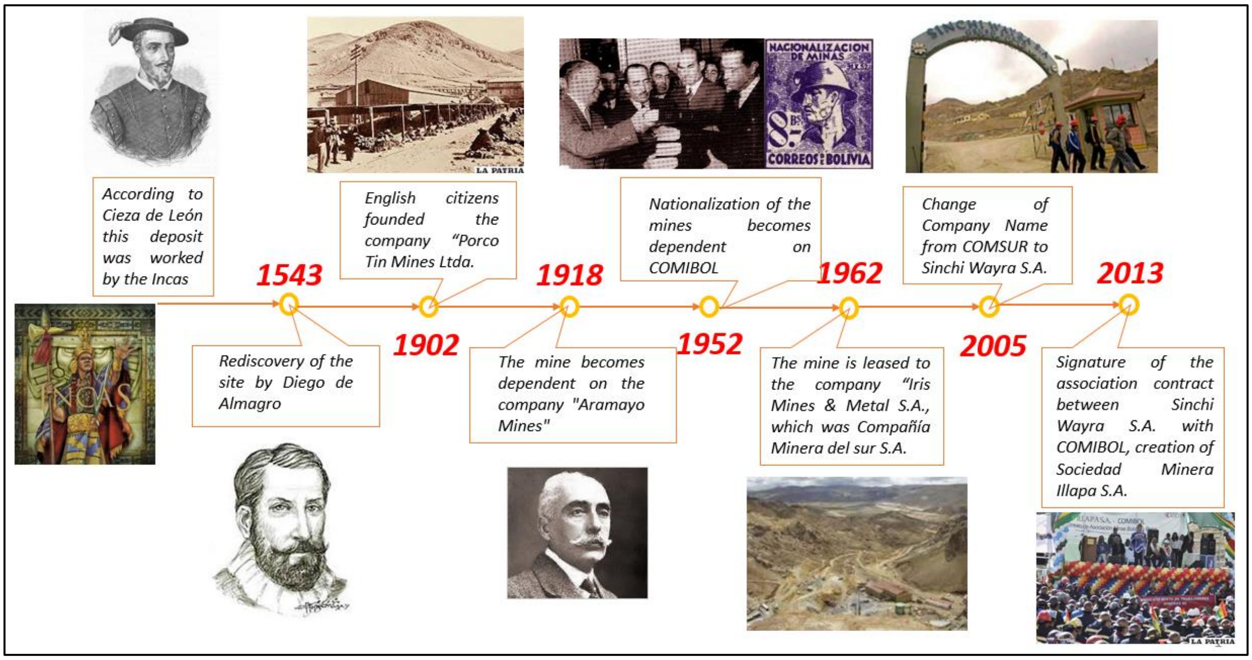
Porco Mine operates under the management of Sinchi Wayra S.A. (formerly COMSUR S.A.), under a joint venture agreement with the Bolivian government (COMIBOL) named Contrato de Asociación Sociedad Minera Illapa S.A. (Illapa) and (COMIBOL) entered this Joint Venture Agreement (the Illapa JV) on December 4, 2014, by virtue of Public Deed N° 1356/2014. The duration of the Illapa JV is 15 years, with the possibility of extending the term for the same duration. Under the Illapa JV, ownership is 55% COMIBOL and 45% Illapa. In the event of any disagreement, the Illapa JV has an arbitration clause with seat in La Paz, Bolivia, under UNCITRAL Rules.

On October 11, 2021, Santacruz entered into the Definitive Agreement with Glencore whereby Santacruz agreed to acquire a portfolio of Bolivian silver assets from Glencore. The Assets include: (a) Glencore's 45% interest in the Bolivar Mine and the Porco Mine, held through an unincorporated joint venture between Glencore's wholly-owned subsidiary Illapa and COMIBOL, a Bolivian state-owned entity; (b) a 100% interest in the Sinchi Wayra business, which includes the producing Caballo Blanco mining complex; (c) the Soracaya exploration project; and (d) the San Lucas ore sourcing and trading business.

On March 18, 2022, Santacruz completed this purchase, including Glencore's interest in the Caballo Blanco mining complex. The Caballo Blanco mining complex has continued to operate since that date under the management of Santacruz.

Sale of concentrates are subject to an Off-Take Agreement with Glencore International AG as buyer, under Contract N°180-13-14212-P, and Contract N°062-13-14190-P, both entered into in 2013, with all their addendums and amendments. These agreements are “evergreen” meaning that they are in effect through the life of mine.

Figure 1-1: Project History



Source: Glencore (2021)

1.5 Geology and Mineralization

The Bolivar, Porco and Caballo Blanco deposits are located in the central part of the Eastern Cordillera, a thick sequence of Paleozoic marine siliciclastic and argillaceous sedimentary rocks deposited on the western margin of Gondwana and deformed in a fold-thrust belt. There were two major tectonic cycles in the Paleozoic: The Lower Paleozoic Famatinian cycle (the Tacsarian and Cordilleran cycles of Bolivia), and the Upper Paleozoic Gondwana cycle (Subandean cycle of Bolivia).

The Porco silver-zinc-tin deposit is located 35 km southwest of the Cerro Rico de Potosí deposit on the southeastern edge of the Los Frailes volcanic field. It was the first silver deposit discovered in Bolivia, with exploitation dating to pre-colonial times. The geology has been described by Sugaki et al. (1983), Cunningham et al. (1993, 1994a, b) and Jiménez et al. (1998).

The deposit is hosted by a north-south-elongated caldera that is 5.0 km x 3.0 km and formed at 12.0 ± 0.4 Ma with the eruption of the crystal-rich dacitic Porco Tuff. Well-defined topographic walls of the caldera cut Ordovician phyllites and Cretaceous sandstones. The 12.1 ± 0.4 Ma Apo

Porco stock (4,886 masl) occurs on the southern margin of the caldera. Mineralization is associated with the younger 8.6 ± 0.3 Ma Huayna Porco stock (4,528 masl) in the center of the caldera. Radial dykes, alteration and metals are zoned around the stock. To the north, the Porco Tuff is overlain by the ignimbrites of the Los Frailes Formation dated at 6 to 9 Ma.

Mineralization occurs in NNE to NE-trending veins that cut the Porco Tuff about 1 km east of the Huayna Porco stock. The deposit is zoned around the stock with cassiterite proximal to the stock and base metals, mainly sphalerite and galena, further away. The upper parts of the veins are silver-rich with pyrargyrite, acanthite and stephanite. The main structure is the San Antonio vein which strikes N10º - 30ºE and dips between 70º and 85º to the east. It is 300 m in vertical extent and 1.2 m to 2.0 m in width. To the south, the vein branches into the Oriente, Misericordia, and Santos veins, whose lengths vary between 500 m to 1,500 m. The main ore minerals are pyrite, sphalerite, galena, argentiferous galena, native silver, chalcopyrite, and arsenopyrite in a gangue of quartz. Other important structures are the Muestra Grande vein on Huayna Porco Hill, where the grade reached 2,300 g/t Ag (Sugaki et al., 1983), and the Rajo Zúñiga vein, which strikes N30ºE and dips 75º-80ºE. The latter vein, with widths between 1.0 m and 1.5 m, was exploited in a 100 m x 20 m open pit. This altered dacite-hosted vein is accompanied by associated veinlets and disseminations in the wall rock and consists of cassiterite, wolframite, galena, silver sulphosalts, and pyrite.

1.6 Metallurgical Testing and Mineral Processing

The processing plant at the Porco Mine has been operating since 1992. The recoveries used in this report are derived from the results of the plant operation over the period of August 2020 to July 2021. Porco mill: a lead concentrate and a zinc concentrate. While both concentrates pay for the metal they are named for and for silver, a lead concentrate does not pay for zinc contained and the zinc concentrate does not pay for lead contained, so these recoveries are not included when summarizing the total recoveries.

The results from this analysis can be found in Table 1-1.

Table 1-1: Recovery and Concentrate Grade Estimates

Parameter	Unit	Concentrates			
		Lead Concentrate		Zinc Concentrate	
		Company Feed	Toll Feed	Company Feed	Toll Feed
Zn Recovery	%	N/A	N/A	93	86
Pb Recovery	%	12.46*(Lead feed grade %) + 68.98	8.28*(Lead feed grade %) + 63.58	N/A	N/A
Ag Recovery	%	0.919 x (Silver Feed Grade) + 37.743	32	-0.0957 x (Silver Feed Grade) + 47.874	50

Parameter	Unit	Concentrates			
		Lead Concentrate		Zinc Concentrate	
		Company Feed	Toll Feed	Company Feed	Toll Feed
Concentrate Grade					
Zn	%	12	12	50	50
Pb	%	51	56	0.39	0.55
Ag	g/t	6,480	2,900	273	310

1.7 Mineral Resource Estimate

The Porco Mine is an “advanced property” and is a well-established, active mining operation. Glencore and subsequently Santacruz Silver has performed exploration and resource expansion drilling of 203 surface and underground drillholes at the Porco project since 2000 totalling 55,804.3 m. The 205 drillholes and 30,348 underground channels in the database were supplied in electronic format by Santacruz. This included collars, downhole surveys, lithology data and assay data (i.e., Ag g/t, Pb%, Zn%, Fe%).

Verification of the Porco drillhole and underground sample assay databases are primarily focused on silver, lead and zinc in addition to iron, arsenic, sulphur and tin. Sample databases were supplied in Excel™ format and in LeapFrog™. Checks against source data and assay certificates showed agreement. Statistical analyses used to investigate and identify errors were performed and resulted in minor issues. These have been corrected and it is recommended that a continued program of random “spot checking” the database against assay certificates be employed.

During the 2023 site visit, an extensive independent sampling verification plan was implemented with a total of 80 samples collected across from the Bolivar, Porco and Caballo Blanco operations. The Don Diego laboratory is an NB/ISO/IEC 17025:2018 accredited laboratory which performs all assay analyses for the mining and processing operations for Sinchi Wayra including Porco. The Don Diego laboratory in owned and operated by the Issuer, Santacruz.

Results of the verification samples indicates that the regression predictions perfectly fit the data meaning that the check sampling program successfully verified and validated the data and although, these results are not a complete audit of the laboratory, they do verify that the assay results are suitable for resource estimation purposes.

The geological and lithological solid domain models were supplied by Santacruz in both Datamine™ and LeapFrog™ which are both industry-leading software systems. The QP imported the multiple vein domains into a similar system called MineSight™ to verify solids volumes and ensure matching of the solids domains against the drillhole and sample database. Results confirmed location and extent of volumes are appropriate to resource estimation purposes.

Resource block models were supplied in Datamine™ format which is an industry recognized software system used for resource estimation. These models were then imported to MineSight™ for verification of the resource estimation. In addition, independent estimations were run using the verified sample data and vein domains employing inverse distance estimations to ensure reasonableness and verify the resources independently. Results illustrated good agreement between the original and verification models. Verification of the SG regression analysis was also performed by comparing measured versus calculated density values.

The mineral resources were estimated in conformity with CIM's "Estimation of Mineral Resources and Mineral Reserves Best Practices Guidelines" (December 2019) and are reported in accordance with NI 43-101 guidelines. The Qualified Person evaluated the resource in order to ensure that it meets the condition of "reasonable prospects of eventual economic extraction" as suggested under NI 43-101. The criteria considered were confidence, continuity and economic cut-off. The resource listed below is considered to have "reasonable prospects of eventual economic extraction".

Table 1-2 shows the Mineral Resource Statement for the Porco deposit. This table illustrates the mineral resources defined within the Hundimiento and Central areas.

Table 1-2: Base-Case Total Mineral Resources at 11.2% ZnEq Cut-off

Total Porco 2023 Mineral Resources					
Mine	**Category**	**Tonnes ('000)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**
Porco	Measured	566	17.17	0.88	202
	Indicated	253	16.38	1.02	166
	Total M+I	819	16.92	0.92	191
	Inferred	1,007	15.16	0.92	117

Notes:

1) The current Resource Estimate was prepared by Garth Kirkham, P.Geo., of Kirkham Geosystems Ltd.
2) All mineral resources have been estimated in accordance with CIM definitions, as required under NI43-101.
3) The Mineral Resource Estimate was prepared using a 11.2% zinc equivalent cut-off grade. Cut-off grades were derived from $25.20/oz silver, $1.38/lb zinc and $1.20/lb lead, and process recoveries of 91% for zinc, 70% for lead, and 89.7% for silver. This cut-off grade was based on current smelter agreements and total OPEX costs of $120.22/t based on 2022 actual costs plus capital costs of $48.68/t, with process recoveries of 91.0% for zinc, 70.0% for lead, and 89.7% for silver. All prices are stated in $USD.
4) An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.
5) Mineral resources are not mineral reserves until they have demonstrated economic viability. Mineral resource estimates do not account for a resource's mineability, selectivity, mining loss, or dilution. All figures are rounded to reflect the relative accuracy of the estimate and therefore numbers may not appear to add precisely.

1.8 Mineral Reserve Estimate

The January 1, 2023 reserve estimate represents the validation of Santacruz's internally-generated mineral reserve estimate by QP Goodwin. All work on the reserve by the Santacruz mine design team and the validation exercises were done in DeswikTM. The following process was used for this work:

- An NSR calculation and cut-off grade (COG) was developed by the QP using data provided by Santacruz;
- The reserve estimation methodology was reviewed, checked, and approved by the QP;
- Mine technical staff prepared a Life of Mine Plan (LOM) for the deposits using the NSR and COG provided by the QP. The LOM plan was prepared specifically for this reserve estimation and does not include inferred resources; and
- All LOM models were downloaded and reviewed by the QP for conformance to the methodology, proper application of the NSR cut-off grade, and correct application of agreed upon dilution and recovery factors.

The QP is satisfied that this exercise resulted in a valid reserve determination.

The Mineral Reserve Estimate for Porco Mine is shown in Table 1-3.

Table 1-3: Mineral Reserve Estimate for Porco Mine (January 1, 2023)

Mine	Category	Tonnes	Zn (%)	Pb (%)	Ag (g/t)
Hundimiento	Proven	95,647	10.35	0.73	208
	Probable	48,381	11.99	0.94	192
	Total	144,028	10.90	0.80	203
Central	Proven	66,202	15.67	0.61	143
	Probable	108,943	13.30	0.69	120
	Total	175,145	14.19	0.66	129
Total Porco	Proven	161,849	12.53	0.68	181
	Probable	157,323	12.90	0.77	142
	Total	319,172	12.71	0.72	162

1.9 Mining

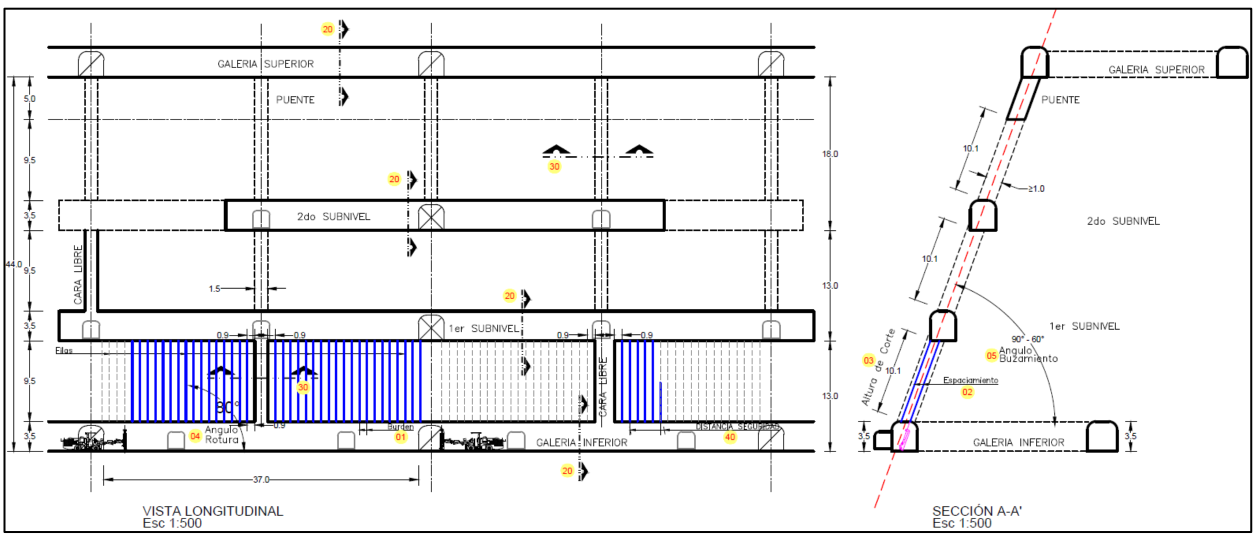
The active production originates from two main areas; Hundimiento and Central zones. Each mineralized zone employs one of two mining methods based on vein and surrounding ground characteristics. The Porco deposit consists of multiple, relatively thin high-grade veins. The mining methods used vary according to the continuity, dip, and width of these veins. Current mining methods employed include sublevel longhole stoping with backfill, shrinkage stoping.

- "Hundimiento" is the more modern section of the mine and is developed mostly with trackless methods using an access ramp to move men and materials between levels. The mineralized zones are predominantly wider and steeper dipping thus, stoping utilizes mechanized sub level stoping with backfill. Some shrinkage stoping is also done in this area where applicable. All waste rock stays in the mine; and
- "Central" utilizes conventional shrinkage mining exclusively. Veins are generally thin and high grade and the wall rock competent. Mineralized material is hauled via rail on each active level to the shaft for hoisting to surface. Levels are spaced at a nominal 45 m and level connections are via manway raises and the main shaft. All waste rock stays in the mine.

Currently each mining area provides roughly 50% of the total mine production.

Then Long hole method of stoping which is used in the Hundimiento zone uses mechanized and trackless equipment to prepare each stoping block (Figure 1-2). It begins with driving two main levels 45 m vertically apart with a section of 3.0 m x 3.5 m with their respective counter galleries and entrances every 40 m (section 3.0 m x 3.0 m).

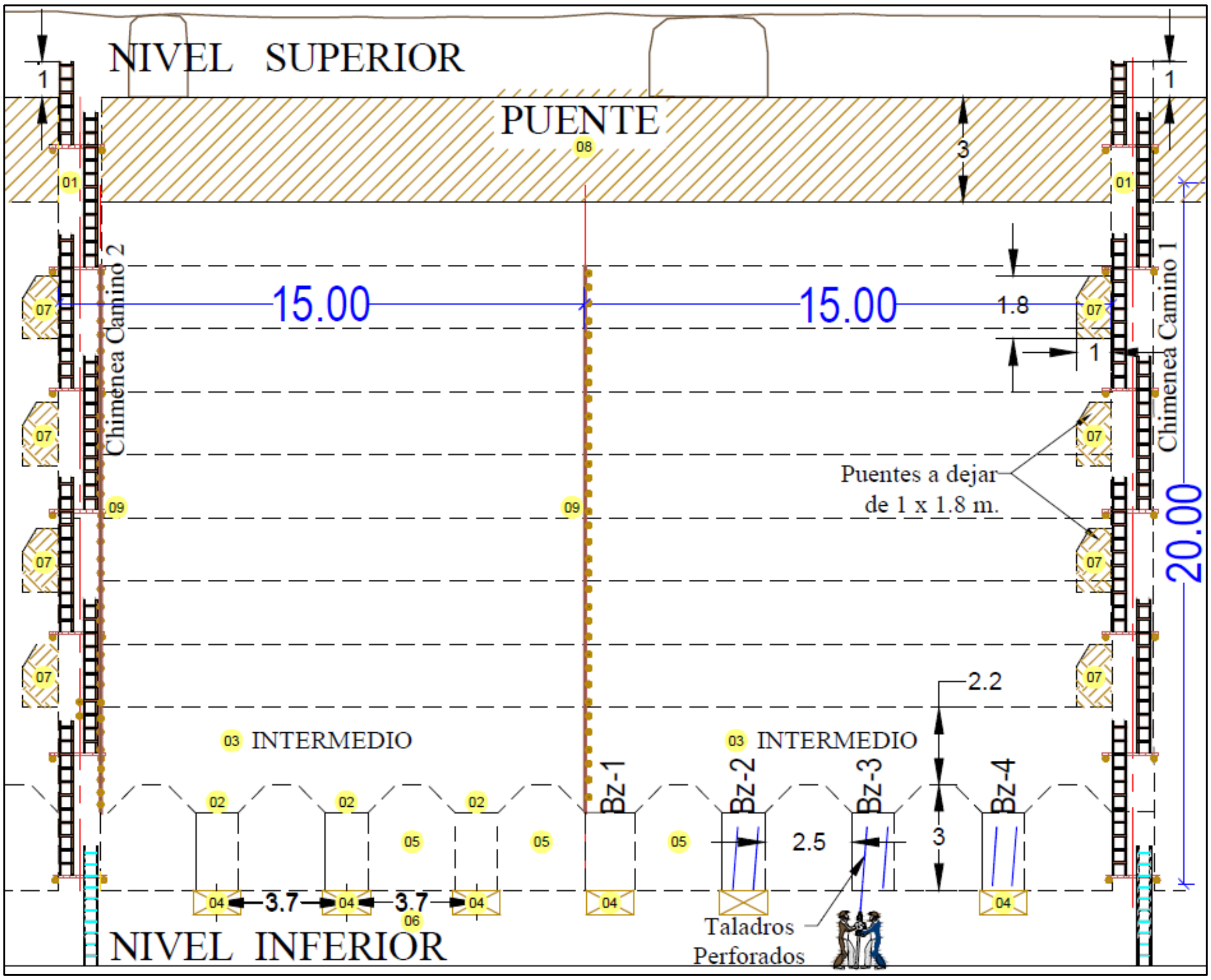
Figure 1-2: Typical Sublevel Stoping Layout



Source: Sinchi Wayra (2022)

Shrinkage is stoping method used in the Central zone with smaller stope dimensions to allow rapid mining of smaller stopes and less mineral inventory stored in the stope (Figure 1-3). Dimensions of each panel are 15 m long and 20 m high.

Figure 1-3: Typical Long Section of Shrinkage Stope



Source: Sinchi Wayra (2022)

Shrinkage is used in veins with dips greater than 45° and with widths less than one meter and geomechanical characteristics of the rock mass of regular quality in relation to the hanging and footwalls of the vein.

The mine employs the following mining equipment:

- Two Resemin Muki FF single boom jumbo rigs with a power of 75 HP that drill between 2.40 and 3.0 m long holes. They are generally used for secondary development (horizontal vein developments) to prepare sublevels whose nominal dimensions are 3.0 m x 3.5 m;
- Two Resemin Small Bolter 77 units to install rockbolts and mesh. These units have a power of 75 HP with a drilling capacity of 3.0 m;

- Two Resemin Raptor Mini DH drills for drilling long holes using the “Sub Level Stoping” method. These have a drill range of 15 m;
- Six scooptrams ranging in size from 1 to 2 yd^3 bucket capacity; and
- Three Dux DT12 8 t trucks and two Trident 6 t trucks.

Total Mine Production in 2022 is shown in Table 1-4.

Table 1-4: Total Mine Production in 2022

	Total
Production (tonnes)	181,153
Waste rock (tonnes)	45,710
Backfill Hauled (tonnes)	
Zinc (%)	7.10
Lead (%)	0.62
Silver (g/t)	118
Primary Devt Horizontal (m)	1,621
Primary Devt Vertical (m)	335
Secondary Devt Horizontal (m)	4,796
Secondary Devt Vertical (m)	1,643

Source: Santacruz (2023)

Total Manpower at the mine site including Mine, Plant, Maintenance, Services, and General and administrative in 2022 totaled 618 people consisting of 358 direct employees and 260 contractors. In the breakout table below, the contractors fill mostly the services roles.

Table 1-5: List of Mine Personnel

Mine	243
Plant	44
Engineering and Maintenance	38
General & Administrative	33
Contractors	260
Total	**618**

Source: Santacruz (2023)

Mining in the upper areas, and adjacent to active mining operations, is carried out by "Cooperativas". These groups are independent miners with which Illapa has informal agreements allowing them to mine certain areas of the deposit. Ore mined under this agreement is processed at the Porco plant on a toll basis. In 2013, it was agreed that Contrato de Asociación Sociedad Minera Illapa S.A. would exploit the levels lower than elevations 4,213 and 4,225, in the central zone. However, members of the Cooperatives regularly violate the agreement and access active mining areas below these agreed boundaries, which is both a safety and production issue. As well, environmental licenses and controls are not in place for Cooperatives and little or nothing is done to regulate the environment in their work areas.

The production from cooperative mined areas is separate from that planned and exploited by Illapa. The Cooperative system is one method to reduce illegal activity and have some positive influence on operating standards and control over areas being mined, however the impacts of blocked mine access, unauthorized entry, and activities in active mining areas remain significant.

1.10 Recovery Methods

The Porco Mill, which has two sources of feed (company feed and toll feed), has been in production since 1992. The mill processes the company and toll feeds separately.

The mill uses a crushing, grinding, and flotation flowsheet to recover a lead concentrate and a zinc concentrate. Both concentrates are sold to Glencore by overseas shipment through Antafagasta Chile. The zinc concentrate is shipped as a bulk product. The lead concentrate, due to local laws, is bagged prior to shipping.

The mill generally separates company and toll feed into different days, but there are a few days where the feed is processed on the same day, with a shutdown in between to separate them.

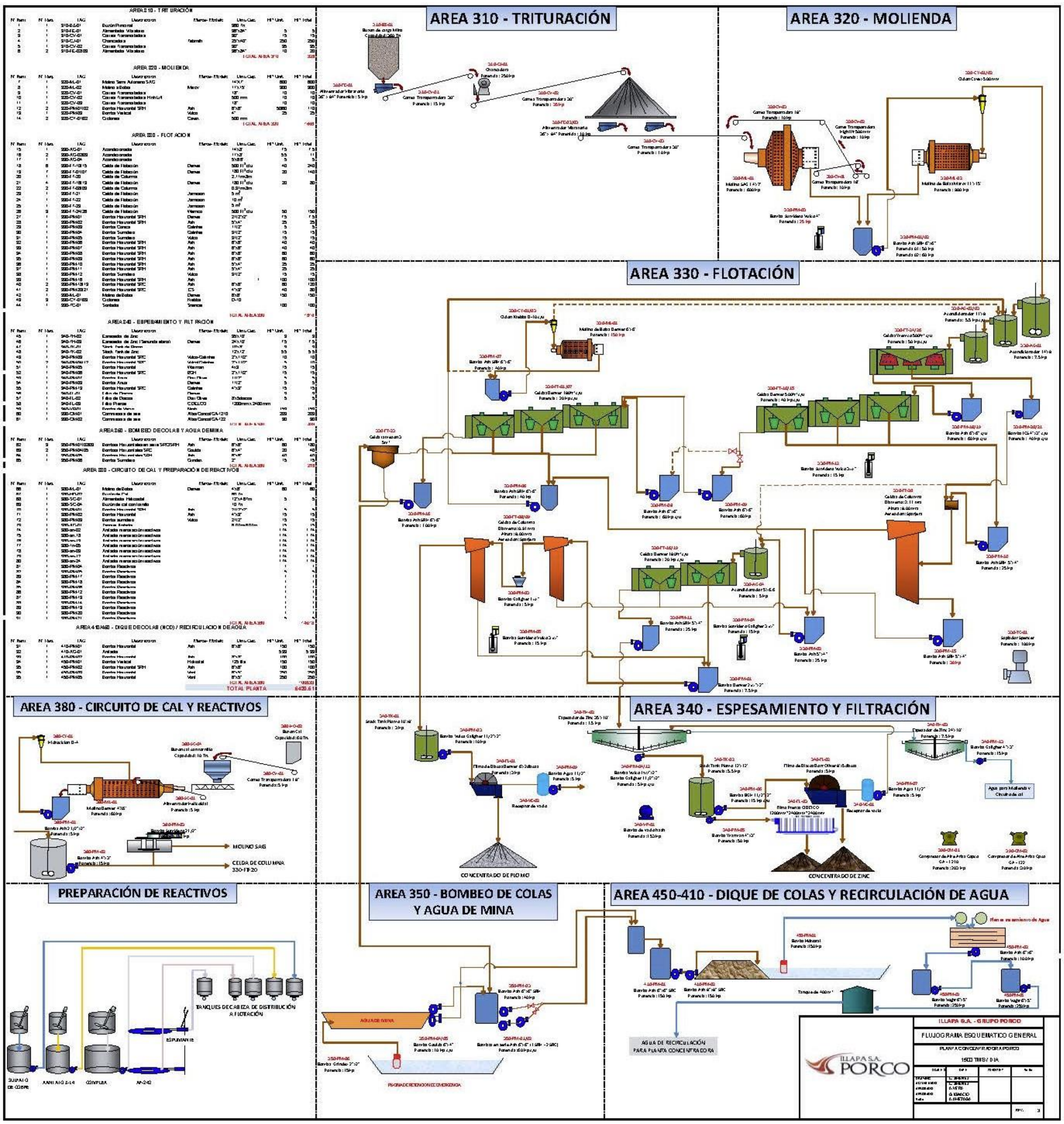
The feed grades for the company feed are measured as is typical for a processing plant, by taking samples from the process at the cyclone overflow and performing a reconciliation each month based on concentrate produced and tailings samples. The toll ore has extra sampling as part of the contract with the local minors. The ore is received by San Lucas, often in 1-2 t lots, where it is weighed and sampled. The ore is combined on a toll feed stockpile to be fed to the mill. The toll feed follows the same sampling and reconciliation procedure as the company ore.

The plant flowsheet for the Porco mill, which can be seen in Figure 1-4, is a typical differential flotation circuit to produce lead and zinc concentrates.

The ore is crushed in preparation for feed to the grinding circuit. The grinding circuit utilizes a SAG/Ball mill combination to grind the feed to a P_{80} of 100 µm.

The flotation circuit recovers both lead and zinc to a bulk concentrate. The bulk concentrate then undergoes cleaner flotation to remove a lead concentrate. The tailings from the lead cleaning circuit becomes the zinc concentrate. Both of the concentrates are filtered for shipping to the smelter. The lead concentrate is bagged for shipping, while the zinc concentrate is shipped bulk in trucks.

Figure 1-4: Porco Mill Flowsheet



Source: Glencore (2021)

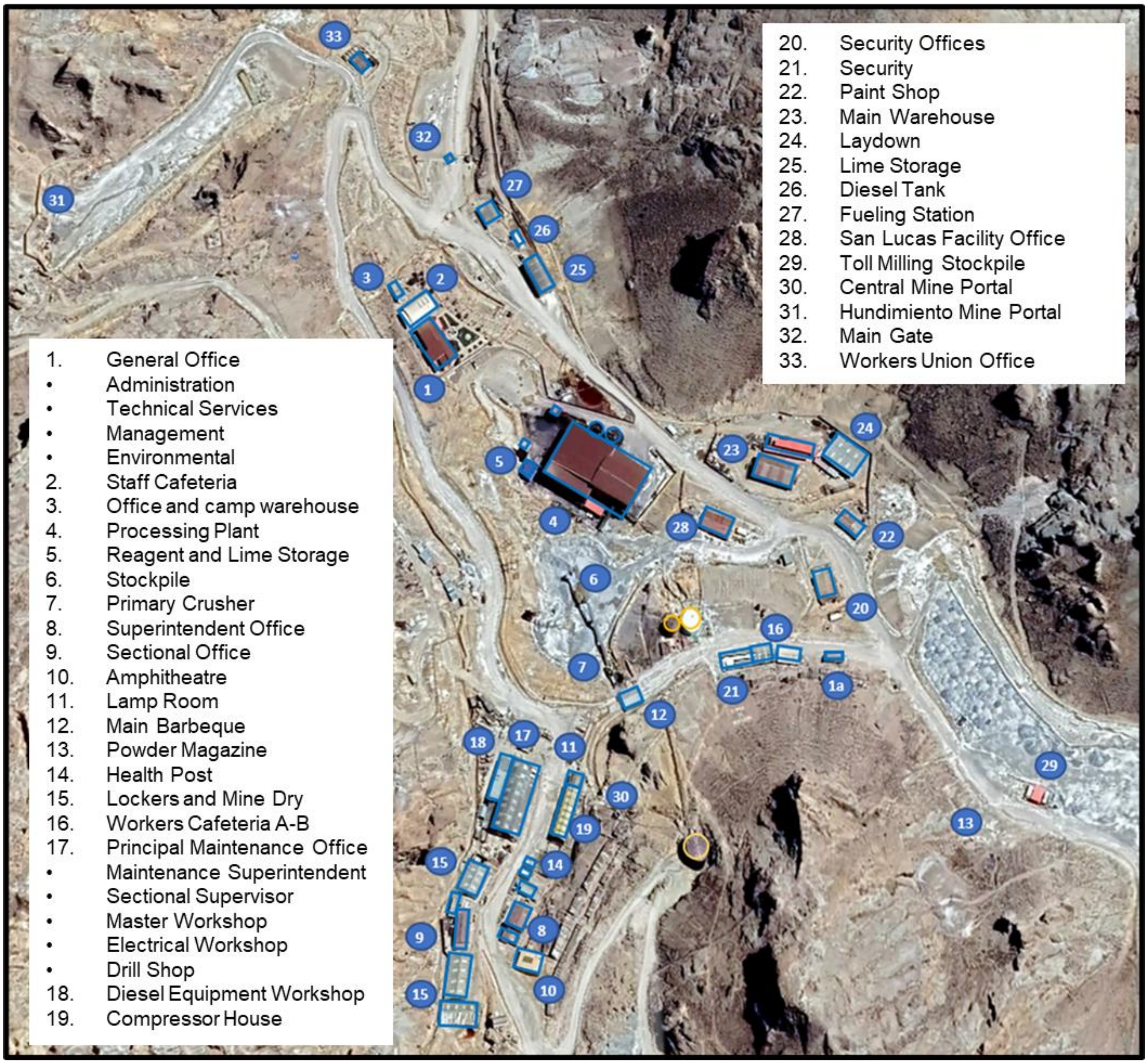
1.11 Infrastructure

The industrial complex for the Porco operation comprises both mine portals, the processing plant, and all services to support mining and processing, as detailed on Figure 1-5. This includes:

- Various technical, administrative offices, and mine operations office;
- Maintenance facilities for all surface and underground equipment;
- Surface stockpiles;
- Warehousing facilities for mine and processing supplies, including reagents;
- A dining hall for technical and administrative staff;
- A first aid station;
- Fuel storage and a refilling station;
- A one million liter water storage tank;
- An explosives magazine;
- Water treatment; and
- Mine services, such as a mine dry, power, water supply, and compressed air.

The industrial site is gated and has a security force.

Figure 1-5: Industrial Complex of the Porco Mining Operation



Source: Santacruz (2023)

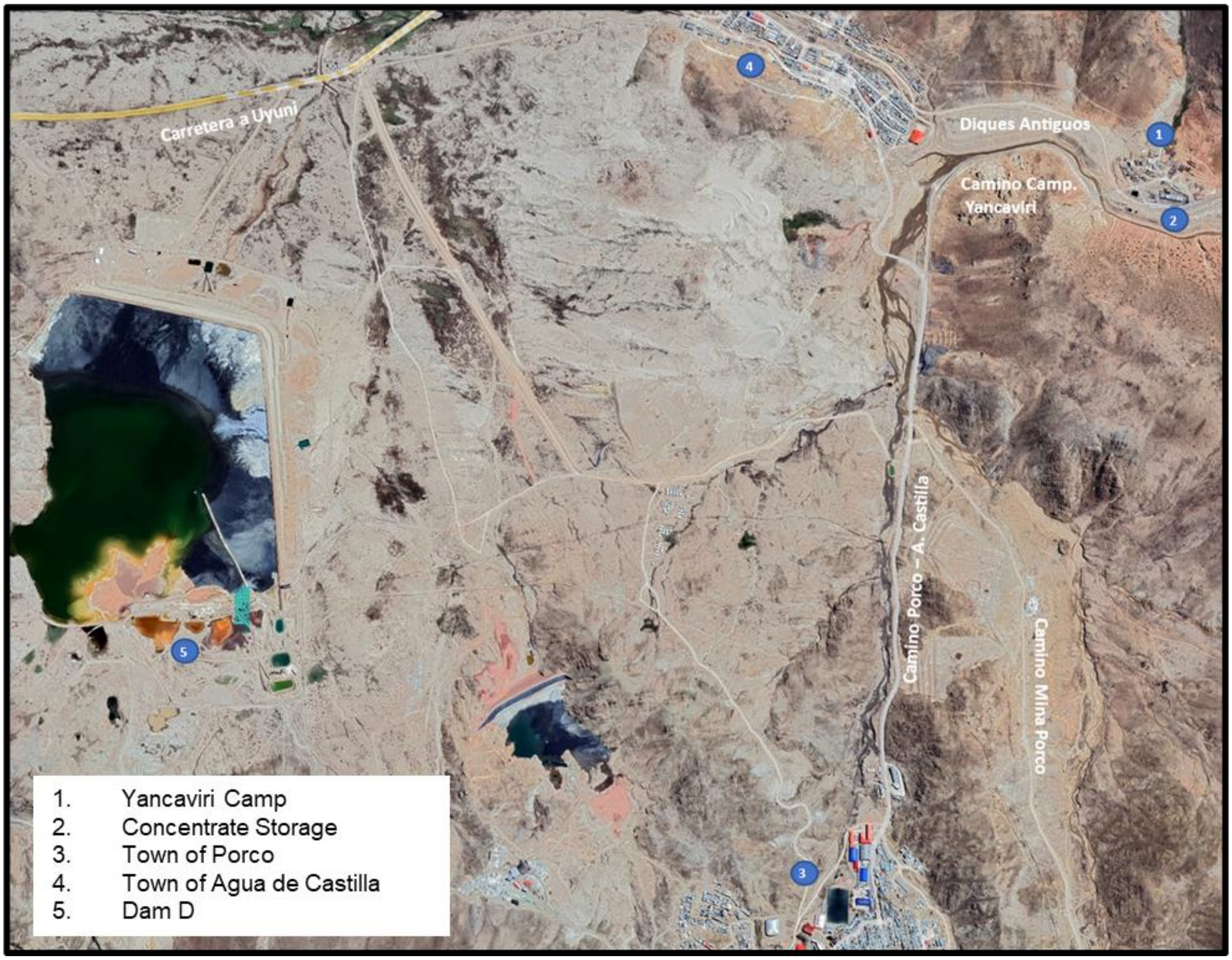
The Yancaviri camp area is located approximately 5 km from the industrial area of the Porco Mine operation and approximately 2 km from the town of Agua de Castilla (Figure 1-6).

The camp provides housing for technical staff of the operation and visitors. It is equipped with a cookhouse and dining hall, gymnasium and basketball court (Figure 1-7).

The camp site also houses the concentrate storage facility and the railway loadout for concentrate shipment.

The Yancaviri is also gated with a security force.

Figure 1-6: Yancaviri Camp Site, Porco, and Agua de Castilla Townsites.



Source: Santacruz (2023)

Figure 1-7: Details of Yancaviri Camp Facilities

Source: Santacruz (2023)

1.12 Environment and Permitting

1.12.1 Environmental Considerations

Responsible environmental management is a critical part of Santacruz's license to operate and our responsible, compliant operation of Bolivian assets has continued for the last 30 years. Environmental Compliance with national laws and regulations is the basis of Santacruz's environmental management system and is governed by a framework of oversight by the relevant Environmental Authority. Its environmental commitments are reported to the authorities annually in an Environmental Monitoring Report, which summarizes environmental management of its operations under applicable laws and regulations.

1.12.2 Waste and Water Management

Waste management is an important part of Santacruz's Comprehensive Environmental Management, which includes a waste management plan to classify, handle, and store waste separately for proper disposal or treatment. Waste management complies with Environmental Law No. 1333, its Regulations on Solid Waste Management, and its supplementary regulations, focusing primarily on the sectoral requirements of the Environmental Regulation for Mining Activities for waste rock and tailings.

1.12.2.1 Solid Waste

There are a total of 9 tailings dams at the Porco mine. Eight of the tailings dams have been decommissioned. All of the tailings facilities are inspected regularly and maintained to the standards set out by the Canadian Dam Association guidelines. Dams are under the supervision of engineers from AMEC (now Wood Engineering) and regular external audits are conducted by a third-party engineering firm.

The active Tailings Storage Facility (dam "D") began operations on March 3, 1998. Initially designed by AGRA Earth & Environmental Ltda. For the first two phases., and AMEC for the current active expansion. The facility meets current international standards. The impoundment is of downstream construction and the dam lined with 60 mil HDPE. A system of well and piezometers are in place to monitor the facility's performance. Construction of Phase VI begun in 2018 was completed in 2019 and included recommended work to reinforce areas of the foundation. Another expansion was completed in 2021, and construction of the next expansion is planned for Q3 2024.

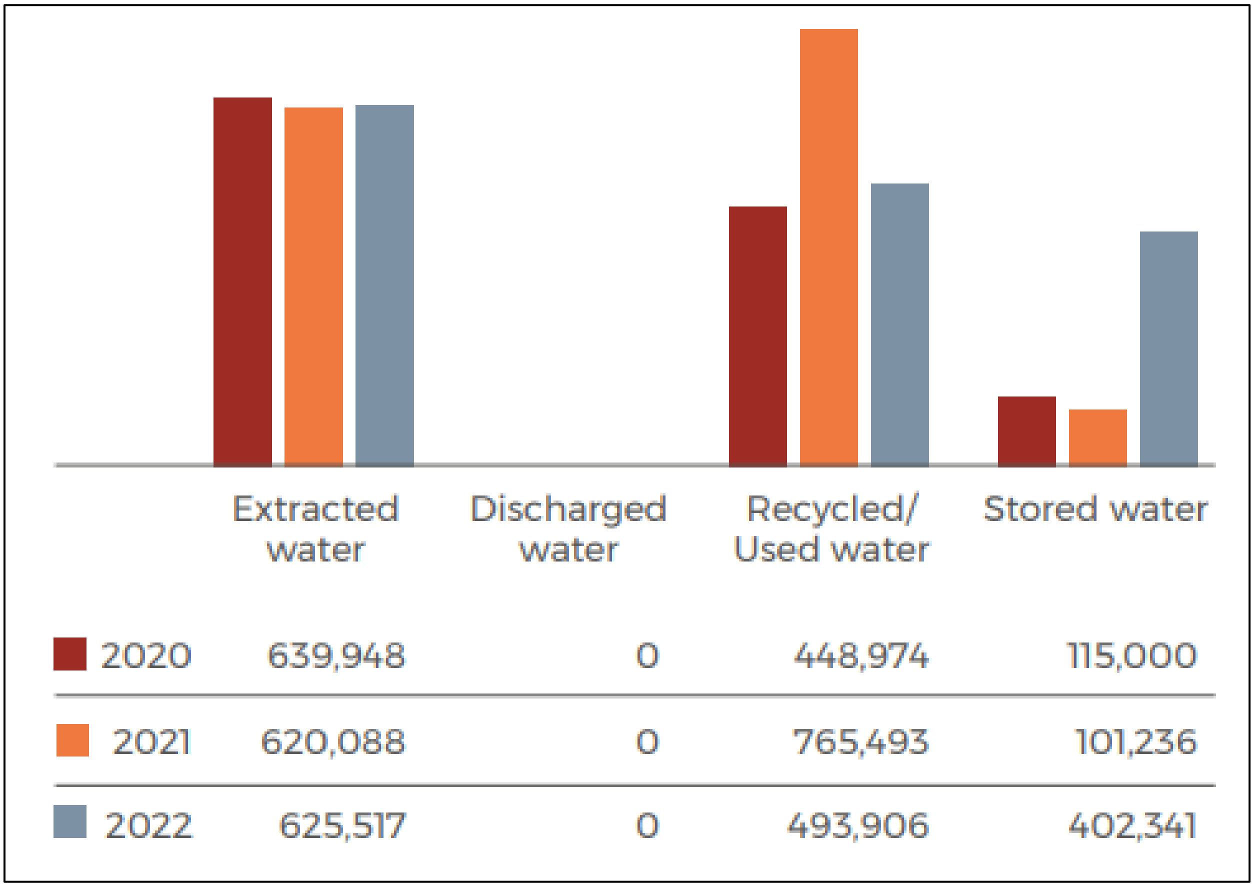
Tailings are discharged along the inside face of the dam at 25-29% solids, forming a tailings beach for additional support, and keeping the water away from the dam. The water reclaim system consists of a barge mounted pump system to form a closed loop with the process plant. The site is zero discharge. There exists capacity to contain all tailings to be generated by processing the stated reserves.

1.12.2.2 Water Management

Water management has been identified as the most critical environmental area. Water is a shared resource of high social, environmental, and economic value, which is also a critical component of Santacruz's mining and metallurgical activities. Mining operations are located in the Bolivian Highlands, in areas with low precipitation, high evapotranspiration, and threats of drought.

Porco Mine is a zero-discharge operation. The mine produces about 35 liters/s excess water, which combined with that precipitation captured in the Tailings Storage Facility makes up 85% of the fresh water supply and is the major source for Industrial make-up water. Treated discharge is reused for drilling and dust suppression water underground and the process plant uses mine water combined with reclaim from the Tailings Storage Facility. Porco Mine has permits in place for maximum water needed, however limits the use of fresh makeup water from the Jalsuri spring to potable needs at campsite and offices, and to prepare certain reagents.

Figure 1-8: Porco Mine Water Balance



Source: Sustainability Report, Sinchi Wayra (2022)

1.12.3 Permitting

Santacruz Silver operates the Porco mine as a joint venture with the Bolivian Government (COMIBOL) The structure of the contract with COMIBOL is a "Partnership Contract governing Bolivar and Porco Mines (CA-MBP), and its purpose is to develop and implement a mining operation for the treatment of the existing mineralogical reserves and resources in the Bolívar and Porco Mines, by the exploitation, preparation, beneficiation and sale of mineral concentrates. Contrato de Asociación Sociedad Minera Illapa S.A. is authorized as operator and responsible of executing on behalf of COMIBOL, all the operations and activities of the association contract. The shares of CA-MBP are 55% for COMIBOL and 45% for Contrato de Asociación Sociedad Minera Illapa S.A." This renewable agreement expires in 2028.

Mining Contracts that grant the right to the subsoil mining resource are granted by the Mining Administrative Jurisdictional Authority (AJAM) over the ATE mining areas, and a contract is granted for each area or contiguous group of areas. Recent changes to the laws and government personnel have pushed Santacruz contract updates into a transitionary period waiting for final signatures and approvals. Santacruz holds Special Transitory Authorizations for each contract area which are officially designated “Mining Administrative Contracts for Adaptation”. As of the effective date, approximately half of the applications have been transitioned, and the remainder fall under Article 187 of Law No. 535 on Mining and Metallurgy, which states:

> *ARTICLE 187. (CONTINUITY OF MINING ACTIVITIES). Holders of Special Transitory Authorizations to be adapted or in the process of adaptation will continue their mining activities, with all the effects of their acquired or pre-constituted rights until the conclusion of the adaptation procedure.*

Santacruz has fully complied with this administrative procedure and is waiting for the Mining Administrative Authority to issue the relevant documents. It should be noted that this public entity has a considerable delay in the issuance of these documents.

Environmental Licenses have been formally granted to allow operation for all mining activity, by the Ministry of Environment and Water. The following table shows the licenses held by Santacruz:

Table 1-6: Environmental Licenses Held by Santacruz

Operation	License
Bolívar	040603-02-da-0324/14
Porco	051203-02-da-0031/14
Caballo Blanco – Colquechaquita Mine	050101-02-da-131/11
Caballo Blanco – Mina Reserva and Tres Amigos	050101-02-da-561/11
Caballo Blanco – Don Diego Concentrator Plant	050302-02-da-003/2024
Caballo Blanco – San Lorenzo Mine	050101-02-da-005/06
Comco	050101-02-da-006/09
Soracaya	050801-02-CD-C3-002/2017
Aroifilla Thermoelectric Plant	050101-04-da-007/2023
Yocalla Hydroelectric Plant	050103-05-da-006/2023

1.12.4 Community Relations

Santacruz mining projects are mostly well-established operations with a long history and a developed infrastructure, which provide direct benefits to employees and supporting businesses. However, the mines are located in rural to semirural areas in which the surrounding mostly agricultural communities can benefit from each operation only indirectly or through company outreach. Santacruz supports these communities by addressing services that are lacking, and helping to create value with economic development programs, and other forms of support.

A key player connected with all Bolivian Mines and surrounding areas are the mining cooperatives which are organized independent mining entities, some quite capable and organized with their own equipment. Recognized by the government as a valid economic activity for local development, they conduct their activities in abandoned mines or expropriating active mines, which can pose risks to business. The relationship is not completely one-sided as the Cooperatives sell mineralized material to process their product, thus mechanisms are in place to face possible subjugations, protect mine employees and the communities.

The Porco operation has dealt and continues to deal with both mining cooperatives and illegal miners, particularly those working in and around the Santacruz operation. Some of these cooperatives are legitimate entities under agreement with Santacruz to exploit the near surface areas of the Porco deposit. Therefor cooperatives share mine access with Santacruz workers. From 2013, it was agreed that Contrato de Asociación Sociedad Minera Illapa S.A. would exploit the levels lower than levels 4,213 and 4,225, in the central area and Hundimiento zone, respectively. However, members of the cooperatives regularly violate the agreement and access active Santacruz areas, which at times can endanger the safety of Santacruz personnel and infrastructure.

Much effort has been spent to successfully control this risk, with agreements put in place with large cooperatives to purchase their mineral. However, the influx of illegal miners who are less likely to negotiate is a constant risk to safe and productive operations.

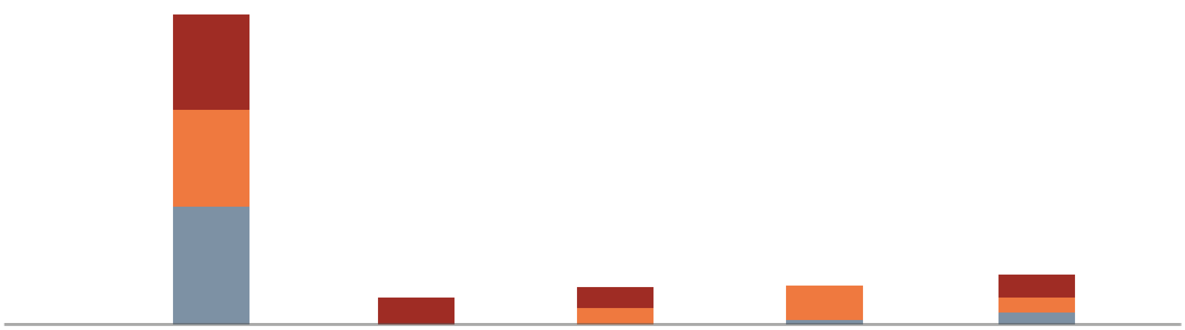
1.12.4.1 Porco

Porco is a completely self-contained industrial center which supports the two main processes of mineral exploitation and concentration. There also exist on site, management, maintenance, transportation and sales support. Porco has been a mining area since colonial times, and mining is its main source of income. It is inhabited by civilians with outside sources of income, cooperative miners, and Santacruz workers with their families. The company works closely with the local populations, the most important being Porco and Agua de Castilla, as well as other smaller, satellite communities. Two cooperatives also work at, and adjacent to, Santacruz operations.

Figure 1-9: Porco Surrounding Communities

Source: Sustainability Report, Sinchi Wayra (2022)

Figure 1-10: Porco Community Investment



	Education	Community/ Economic Development	Environment	Health and Sports	Local Needs
2022	282,452	74,211	60,053	0	71,087
2021	291,206	0	52,718	105,747	43,407
2020	342,732	0	0	5,812	33,474

Source: Sustainability Report, Sinchi Wayra (2022)

1.12.5 Mine Closure

Closure Planning for Operations has social, economic, workforce, and environmental impacts, so conceptual closure plans are shared with communities. Santacruz's goal is to recover areas by establishing a healthy ecosystem capable of sustaining productive land use, ensuring the best possible environmental conditions, including physical, chemical, biological, and ecosystem aspects, at closure. Environmental superintendents are responsible for monitoring the environmental closure planning, and periodic reviews of these plans are conducted, including surveys of areas and activities to adjust financial provisions for closure.

Land Use and Rehabilitation - environmental challenges related to biodiversity protection, soil restoration, and land use, are addressed through dialogue with stakeholders, including local communities and relevant authorities. Our comprehensive environmental management focuses on minimizing disturbed areas. In 2022, Santacruz managed a total of 6,600 hectares of land covered by Temporary Special Authorizations (ATEs) granted by the Mining Administrative Jurisdiction Authority (AJAM), under leasing contracts with the Government through COMIBOL. However, Santacruz's processing activities, services, and related infrastructure (industrial area) currently occupy only 400.5 hectares of land, including areas of previous mining operations and other areas with environmental closure located within the properties Santacruz manage.

In 2022, Santacruz continued with the reforestation plan in the Queaqueani Dam area, in accordance with an agreement with the community of the same name, and significant progress was made in the progressive closure of the old tailings facilities at the Don Diego Concentrator Plant.

1.13 Capital and Operating Cost Estimates

1.13.1 Capital Costs

The Porco Mine has been in continuous operation for many years. There will be, as the reserve is expanded and developed, the need for step changes in mine access, production or haulage methods, that may require large capital outlays. These will be financially justified as needed. However, the capital needs for continued operation to exploit the remaining reserves is limited to Primary mine development, Capital equipment rebuilds and replacements, and Tailing Storage Facility expansions. Average annual capital has been and is projected to be in the 4 to 5 million USD range. The historic total capital requirement for all the Bolivian operations is shown in Table 1-7. Porco's projected capital requirements for 2023 to 2027 is shown on Table 1-8.

Table 1-7: Actual Combined Capital Requirement for All Bolivian Operations, 2017 to 2022 ($M)

	2017	2018	2019	2020	2021	2022
Bolivar	8.8	13.7	13.7	6.3	11.3	10.2
Porco	**3.0**	**8.8**	**8.4**	**3.6**	**5.3**	**3.1**
Reserva	1.3	2.4	2.1	2.0	4.3	3.5

	2017	2018	2019	2020	2021	2022
Tres Amigos	2.1	2.6	1.5	1.8	2.2	3.0
Don Diego	0.9	6.9	1.4	0.9	1.1	1.2
Colquechaquita	1.2	2.0	1.4	1.0	3.0	2.5
La Paz	3.3	0.6	0.3	0.4	0.2	0.7
Soracaya	0.5	2.1	0.2	0.1		
San Lucas	0.8	0.0	0.0	0.1	0.4	
Total	**21.8**	**39.0**	**28.5**	**16.3**	**27.8**	**24.3**

Table 1-8: Projected Capital Requirement for Porco Operations, 2023 to 2027 ($M)

	2023	2024	2025	2026	2027
Engineering/Admin			0.1	0.0	
Safety/Environmental			0.2	2.0	
Mobile Equipment/Maintenance			0.9	1.8	1.2
Plant	0.3	0.5	0.3	0.3	0.2
Exploration		0.0	0.4	0.2	0.2
Primary Development			1.4	1.7	2.4
Total		**2.9**	**6.4**	**4.1**	**2.5**

Recurring exploration and primary development costs have been included in the COG calculations to better anticipate and account for total costs and make the COG more meaningful for reserve estimation and mine planning.

1.13.2 Operating Costs

Costs used for Cut-off grade analysis were taken from actual costs for 2022. The actual cost of corporate G&A was allocated to each of the businesses.

Table 1-9: Unit Operating Costs ($/t)

Mine	94.68
Mine Operations	16.06
Mine Maintenance	58.85
Indirect	19.78
Plant	15.04
Warehouse	1.94
G&A	13.36
Total	**125.02**

Source: Santacruz (2023)

Mine operations include direct costs of mining, including labor, energy, materials, and services.

Mine Equipment Maintenance Costs includes maintenance to all equipment related to direct development, exploitation and haulage, as well as service equipment such as pumping, ventilation, winches, etc.

Indirect costs would include Site Management, Technical services, Site Administration, Environmental and Social, Safety and Security.

Plant costs include direct Beneficiation costs as well as plant maintenance, and indirect costs.

Warehouse costs refer to Concentrate handling and storage.

General and Administration includes allocated Bolivian corporate costs.

1.14 Economic Analysis

1.14.1 Result

The Reserve Estimate was generated using actual costs experienced during a stable production period following the change in management after the purchase of the mine by Santacruz Silver (2022 and beginning of 2023). Actual costs were used for mine operating, concentrate overland transport, port costs, and shipping as well as smelting fees, payment terms, and penalty charges. A simplified Cash flow model was built to model the costs and conditions used to generate the Reserve estimates stated in this report.

The Porco Mine is part of a multi-operation business. However, the Economic model treats it as a separate financial entity with Bolivian corporate costs allocated for the analysis. As well, the operation is subject to a partnership with the Bolivian Government (COMIBOL), but the financial modelling examines the value of the operation on a 100% basis to support the Reserve statement.

The Porco Mine has been in continuous operation for over 500 years and the deposit is a network of relatively narrow veins. These two aspects drive the normal exploitation process of the mine, where inferred resources are converted and exploited in the same budget year. Resources are generally proven-up by drifting and sampling instead of drilling. Therefor normal budgeting and mine planning includes resources outside of the Reserve estimate.

For the current exercise in this report, only Proven and Probable reserves are included in financial evaluation, so the production schedule represents the depletion of these reserves at average grade and current production rates. The context of the production schedule exploits the Proven and Probable reserves as part of a continuous operation and as such does not include the closure activities.

Table 1-10: Production Forecast – Mining and Processing

	Unit	2023	2024
Mine Production			
Tonnes Mined	(DMT)	197,400	121,772
Tonnes Processed	(DMT)	197,400	121,772
Head Grades			
Zinc	(%)	12.71	12.71
Lead	(%)	0.72	0.72
Silver	gr/t	162	162

Metallurgical recoveries and concentrate qualities are actual for the times and head grades that were actually mined. These parameters will necessarily be conservative considering the higher grades in the production schedule.

Table 1-11: Production Forecast - Concentrate

	Unit	2023	2024
Concentrates			
Zinc	(DMT)	46,279	28,548
Zn Conc. Grade	(%)	51	51
Ag (in Zinc)	gr/t	266	266
Zn Recovery	(%)	94	94
Ag (in Zinc)	(%)	38	38
Lead	(DMT)	1,984	2,444
Pb Conc. Grade	(%)	54	27
Ag (in lead)	gr/t	8,069	4,049

	Unit	2023	2024
Pb Recovery	(%)	76	76
Ag (in Lead)	(%)	50	50
Metal Recovery			
Zinc	(FMT)	24,000	15,000
Silver (in Zinc)	(FOT)	395,000	244,000
Lead	(FMT)	1,000	1,000
Silver (in Lead)	(FOT)	515,000	318,000
Silver (Total)	(FOT)	910,000	562,000

Notes:
FMT = Fine Metric Tonnes; DMT = Dry Metric Tonnes; FOT = Fine Ounces Troy

That same logic follows to the net revenue generation (Table 1-12) which includes smelter charges and penalty fees.

Table 1-12: Revenue and Cost Projection ($M)

	Unit	2023	2024
Payable Metal Revenue			
Zinc		60	37
Metallurgical Deduction		9	6
Gross Payable Zinc		50	31
Lead		2	1
Metallurgical Deduction		0	0
Gross Payable Lead		2	1
Silver		19	12
Metallurgical Deduction in Zinc		5	4
Metallurgical Deduction in Lead		1	0
Gross Payable Silver		14	8
Gross Revenue (Total)		67	40
Smelter Charges and Penalties			
Treatment charges Zn	(USD/t)	230	277
Treatment charges Zn		11	8
Treatment charges Pb	(USD/t)	130	133
Treatment charges Pb		0	0
Penalties in Zn	(USD/t)	3	7
Penalties in Zn		0	0

	Unit	2023	2024
Penalties in Lead	(USD/t)	0	13
Penalties in Lead		0	0
Refining Charges in Pb	(USD/FOZ)	1	1
Refining Charges in Pb		1	0
Smelter Fees and Penalties		12	9
Net Revenue		55	31
Operating Costs			
Production Costs		22	14
Cost of Sales			
Rail Freight Zn			3
Rail Freight Pb			0
Port Expenses Zn		2	1
Port Expenses Pb			0
Rollback Fee Zn		4	2
Rollback Fee Pb		0	0
Concentrate Freight and Port Costs		7	7
Mine Royalty		4	3
Communities and Unions		1	2
Total Cost of Sales		**34**	**25**

Depreciation is a product of previous operation and annual capital expenditure incurred for the exploitation of the reserve tonnage. Capital is limited to that required to support mining, processing, and tailing storage for the reserve. Corporate G&A is that part of the in-country costs allocated to the Porco mine.

Table 1-13: Cashflow Projection ($M)

	2023	2024
Income Statement		
Net Revenue	55	31
Production Costs	(22)	(14)
Selling Costs	(12)	(12)
Depreciation	(2)	(3)
Gross Profit	20	3
Corporate G&A	(2)	(1)
Corporate Administrative Expenses	(2)	(1)

	2023	2024
Operating Profit	18	2
EBIT	18	2
Income Tax Expense (CIT)	(6.6)	(0.7)
Net Gain/(Loss) for the Year	11	1
Cashflow Statement		
Cash from Operations Activities		
Net Income	11	1
Depreciation	2	3
Subtotal	13	4
Cash from Investing Activities		
Sustaining Capital Expenditure	(2)	-
Subtotal	(2)	-
Cash Balance		
Beginning	-	10
Change in Cash	10	4
Ending	**10**	**14**

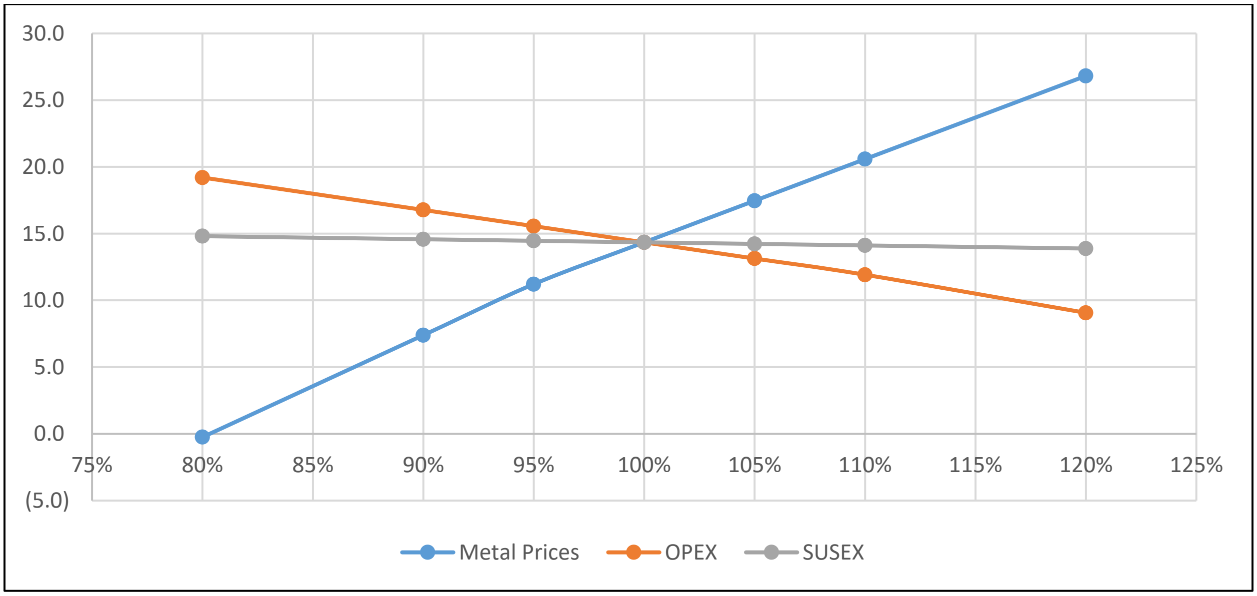
Income Tax is 37.5% of the EBIT. As seen, the operations generate a positive cash flow after tax upon exploitation of the stated reserve at the metal prices used to generate the reserve.

1.14.2 Sensitivities

A univariate sensitivity analysis was performed to examine which factors most affect the Project economics when acting independently of all other cost and revenue factors. Each variable evaluated was tested using the same percentage range of variation, from -20% to +20%, although some variables may experience significantly larger or smaller percentage fluctuations over the LOM. For instance, the metal prices were evaluated at a ±20% range to the base case, while the capex and all other variables remained constant. This may not be truly representative of market scenarios, as metal prices may not fluctuate in a similar trend. The variables examined in this analysis are those commonly considered in similar studies – their selection for examination does not reflect any particular uncertainty.

Notwithstanding the above noted limitations to the sensitivity analysis, which are common to studies of this sort, the analysis revealed that the Project is most sensitive to metal pricing. The Project showed the least sensitivity to capital costs. Figure 1-11 shows the results of the sensitivity analysis.

Figure 1-11: Univariate Sensitivities



1.15 Observations, Risks, Opportunities and Recommendations

1.15.1 Observations

The Porco Mine Project consists of two separate mining zones that essentially function as separate mines, the Hundimiento and Central, that feed ore to a single processing plant on site to produce zinc and lead concentrates. Sinchi Wayra S.A. owns and operates all facets of the Porco business, which is in turn owned by Santacruz.

The QPs found that Porco is a well-managed operation that should be capable of sustaining profitable operations for many years to come in the same fashion as it has operated for the past several years.

The reserves were found to be estimated correctly using industry-standard techniques and procedures and industry-standard software by diligent and competent professionals.

The mine has an ample provision of skilled workers. Typical and reasonable ore control systems were in place, but it is possible that the results could be improved with a closer attention to appropriate mining widths, minimizing them wherever possible to minimize dilution.

The single greatest challenge to the operation is the incessant trespassing of illegal miners into the active mining operations. This results in damage of mine equipment (often disrupting the ventilation system), disruption to scheduling, loss of revenue, and poses a real threat to the safety of the workers. How this situation can be ameliorated or prevented is beyond the scope of this document and the cultural awareness of the authors. However, it should be noted that this situation is ongoing and, as such, all production and economic results contained in this report are inclusive of this threat and impediment.

This threat also forces the mine to minimize its resources and reserves. Both require development for expansion, and while a typical mine provides adequate development ahead of production. A typical mine provides adequate development ahead of production for ore definition and proper scheduling. However, the Porco Mine minimizes open development to provide less opportunity for the illegal miners to access and illegally extract its ore. As a result, the operation runs very "hand to mouth" with respect to both access development and resources / reserves. This is demonstrated by the forward planning; 37% of the 2023 schedule was based on inferred resources.

It is difficult to estimate the ability of the mining fleet to execute the mine plan, as industry-standard availability and utilization factors are not tracked by unit or even unit type.

The processing facility at the Porco Mine appears to be well run and in good condition.

1.15.2 Risks

The following Risks were identified for the Project:

- Geological interpretations may be subjective and may result in the location and extent of some of the mineralized structure although as the Porco mine is comprised of well constrained veins, this risk is minimal;
- As vein thicknesses are narrow, resources may be sensitive to dilution although the relative high grades that exist at the Porco mine are successful mitigating such risks to date;
- Varying resource classification methods and criteria may vary as more data is considered;
- There is no guarantee that further drilling will result in additional resources or increased classification;
- Lower commodity prices will change size and grade of the potential targets;
- Further work may disprove previous models and therefore result in condemnation of targets and potential negative economic outcomes;
- The single greatest risk to the Project is the activity that is prevalent throughout the region related to Cooperativas and artisanal miners may cause issues for access and for reasonable prospects of eventual economic extraction and may condemn or reduce resources and reserves in those areas and can drastically impact mine planning and scheduling;
- The current political and socio-economic climate in Bolivia poses risks and uncertainties that could delay or even stop development as reported within the Fraser Institute Annual Report 2022 where Bolivia ranks very low in many non-technical metrics. Bolivia has been ranked consistently low for the past five years and ranks in the lower quartile on all metrics that gauge risk and uncertainty. It is difficult to gauge or qualify the level or extents of the risks

however, all companies working in Bolivia must continue to be aware of the potential risks and develop mitigation strategies. A significant risk related to the Santacruz Bolivian mineral assets and in particular the mineral resources and mineral reserves is the significant artisanal activity that continues to exist. This activity is not only a socio-economic risk but also affects access to resources and reserves along with potential sterilization of mineral resources;

- Lower commodity pricing will change the size and grade of potential targets;
- Ability to replace mined reserves on an annual basis; and
- Maintenance of permitting.

As the mines continues to expand to depth, the following aspects of mine operations will be challenged:

- Worker travel time (reduced time at the face);
- Dewatering inflow quantities, infrastructure and costs; and
- Ventilation system needs and costs.

As the ore is conveyed by shaft for both mines, and most of the remaining reserve at depth, this could be very impactful on future operations. The shaft will ultimately require extension to depth or trackless equipment will be required to haul the ore to the shaft bottom.

1.15.3 Opportunities

Project opportunities include:

- A systematic exploration program could provide an excellent opportunity for successfully uncovering new discoveries;
- An increased understanding and derivation of alternative theories may result in further discovery and expansion for the Project;
- A hydrogeological study could help the operation to better characterize and understand water inflows, aiding design work and planning to reduce the impact of major seasonal inflows;
- Higher commodity prices will change size and grade of the potential targets; and
- Potential for expansion and classification upgrade of resources as mining activities progress.

The primary opportunity to the mine is to somehow contain or eliminate the illegal miner situation. This would allow for more predictable scheduling and operations, the ability to expand the resources and reserves, reduce operating costs, and improve the safety of all personnel.

The grade to the mill could be improved the grade to the mill by incorporating a mine dilution control program. As is typical with all narrow width mining, dilution is very sensitive to the mined widths of veins, which must be kept at minimum to accommodate equipment widths. Often, however, veins are over-mined to ensure complete recovery of the ore. This practice significantly increases dilution due to overbreak of the hangingwall and footwall.

1.15.4 Recommendations

To advance the Porco Mine and further evaluate the potential additional veins and increase resources thereby displacing depletion due to ongoing mining activities, the following is recommended:

- Regional exploration for identification of new veins;
- Incorporate structural interpretations to assist regional understanding;
- Analysis of thickness and grade-thickness profiles for resource targeting and predictive dilution study;
- Investigate geo-metallurgical characteristics; and
- Hydrogeological study and modelling should be done to better understand water inflows and minimize their impact on production.

Some surface or near surface targets along with underground drilling for resource delineation and extension. As is typical with all narrow width mining, dilution is very sensitive to the mined widths of veins. Often veins are over-mined to ensure complete recovery, but this practice comes with significantly increased dilution due to overbreak of the hangingwall and footwall. The operation should conduct a thorough test stoping experiment to ensure the most economic balance between incomplete recovery and excessive dilution.

Availability and utilization factors should be tracked, calculated, and reported for all mining equipment. This information should be used as a management tool to determine which units should be rebuilt or replaced and to avoid or minimize usage of the units with the highest operating costs.

The activities of both Cooperativas and illegal miners must continue to be monitored and action taken to understand and, to whatever extent is possible, control their activities to mitigate safety concerns for the workers reduction to the resources and/or reserves, to avoid disruption of the mine plan.

These recommendations have not been costed, as they represent changes to current practices that can be funded by existing operating budgets.

2 INTRODUCTION

2.1 Terms of Reference

JDS Energy & Mining Inc. (JDS) was commissioned by Santacruz Silver Mining Ltd. (Santacruz) to prepare a Technical Report in accordance with the Canadian Securities Administrators' National Instrument 43-101 and Form 43-101F1, collectively referred to as National Instrument (NI) 43-101 for the Porco Project (Porco or the Project) located is located in the Porco Municipality of the Antonio Quijarro Province, Bolivia.

Santacruz is based in Vancouver, British Columbia and is engaged in the operation, acquisition, exploration and development of mineral properties in Latin America, with a primary focus on silver and zinc. Santacruz was incorporated on January 24, 2011 under the laws of British Columbia and is listed on the TSX Venture Exchange under the trading symbol "SCZ".

On October 11, 2021, Santacruz entered into the Definitive Agreement with Glencore whereby Santacruz agreed to acquire a portfolio of Bolivian silver assets from Glencore, including the following: (a) a 45% interest in the Bolivar Mine and the Porco Mine, held through an unincorporated joint venture between Glencore's wholly-owned subsidiary Contrato de Asociación Sociedad Minera Illapa S.A. (Illapa) and COMIBOL, a Bolivian state-owned entity; (b) a 100% interest in the Sinchi Wayra S.A. (Sinchi Wayra) business, which includes the producing Caballo Blanco mining complex; (c) the Soracaya exploration project; and (d) the San Lucas ore sourcing and trading business.

On March 18, 2022, Santacruz completed this purchase, including Glencore's interest in the Porco Mine.

Santacruz thus owns 100% of the two Bolivian operating companies Illapa and Sinchi Wayra, which in turn own 45% of the Bolivar Mine, 45% of the Proco Mine, and 100% of the Caballo Blanco mining complex.

Sinchi Wayra is the operating company for all three active mining operations, including the Porco mine.

This report is the first declaration of resources and reserves, for the Porco base metals underground mining operation since its acquisition by Santacruz. The mine is fully operational at the time of this report's preparation. The effective date of both the resource and the reserve is January 1, 2023, which is approximately 18 months before the report date. Production data for the calendar year 2023 has been included in Section 24 Other Relevant Data and information to show the depletion and typical replenishment of resources and reserves over a calendar year.

2.2 Qualified Persons

The Qualified Persons (QPs) preparing this report are specialists in the fields of geology, exploration, mineral resource estimation, metallurgy and mining.

None of the QPs or any associates employed in the preparation of this report has any beneficial interest in Santacruz and neither are any insiders, associates, or affiliates. The results of this report are not dependent upon any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings between Santacruz and the QPs. The QPs are being paid a fee for their work in accordance with normal professional consulting practice.

The following individuals, by virtue of their education, experience and professional association, are considered QPs as defined in the NI 43-101, and are members in good standing of appropriate professional institutions / associations. The QPs are responsible for the specific report sections as listed in Table 2-1.

Table 2-1: QP Responsibilities

Qualified Person	Company	QP Responsibility / Role	Report Section(s)
Richard Goodwin, P.Eng.	JDS	Author, Mining, Project Manager	1.1 to 1.2, 1.8 to 1.9, 1.11 to 1.15, 2 to 6.1, 12.1, 12.3, 12.5, 15, 16, 18 to 26, 28
Garth Kirkham, P.Geo.	Kirkham Geosystems Inc.	Geology, QA/QC, Data Verification, Drilling, Resource Estimate	1.3 to 1.5, 1.7, 6.2, 7 to 11, 12.2, 9, 10, 11, 12.1, 12.2, 14, 27
Tad Crowie, P.Eng.	JDS	Metallurgy	1.6, 1.10, 12.4, 13, 17

2.3 Site Visit

In accordance with National Instrument 43-101 guidelines, site visits are summarized in Table 2-2. Sinchi Wayra staff and management were cooperative and helpful during the course of each visit. Access to all requested information and physical sites was provided voluntarily.

Table 2-2: QP Site Visits

Qualified Person	Company	Date	Description of Inspection
Richard Goodwin, P.Eng.	JDS	January 28 to 30, 2023	Mr. Goodwin met with technical and operating staff and toured the Central Zone and processing plant.
Garth Kirkham, P.Geo.	Kirkham Geosystems Inc.	August 10-13, 2021 March 15-30, 2023	Porco Mine and Project site; including select working areas and faces underground, Potosi professional offices, Don Diego Mill Complex, sample storage facilities, La Paz company offices, discussions with site and company personnel.

Qualified Person	Company	Date	Description of Inspection
Tad Crowie, P. Eng.	JDS	August 10-13, 2021	Porco Mine and Project site; including select working areas and faces underground, Potosi professional offices, Don Diego Mill Complex, sample storage facilities, La Paz company offices, discussions with site and company personnel.

2.4 List Of Previous Relevant Technical Reports

There has been one technical report published which was the subject of the Porco Project entitled "NI43-101 Technical Report, Porco Project, Potosi, Bolivia" dated December 21, 2021. This report was produced by JDS on behalf of Santacruz and authored by Kirkham and Crowie who are also QP's for this Technical Report.

2.5 Units, Currency and Rounding

The units of measure used in this report are as per the International System of Units (SI) or metric, except for Imperial units that are commonly used in industry (e.g., ounces (oz.) and pounds (lb.) for the mass of precious and base metals).

All dollar figures quoted in this report refer to United States dollars (US$ or $) unless otherwise noted.

Frequently used abbreviations and acronyms can be found in Section 28. This report includes technical information that required subsequent calculations to derive subtotals, totals and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, the QPs do not consider them to be material.

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

3 RELIANCE ON OTHER EXPERTS

The QP's have relied on information provided by the Issuer on claims, ownership, property agreements, royalties, environmental liabilities, and permits as described in Section 4. The information appears reasonable but has not independently verified beyond the information that is publicly available.

The QPs have relied upon a legal opinion provided by Enrique Barrios of the firm Dentons Guevara & Gutierrez S.C., located in La Paz, Bolivia, in the documents "Local Counsel Legal Opinion on the Porco Mine", "Local Counsel Legal Opinion on the Caballo Blanco Project", "Local Counsel Legal Opinion on Empresa Minera San Lucas S.A.", "Local Counsel Legal Opinion on Sociedad Minero Metalúrgica Reserva Ltda.", "Local Counsel Legal Opinion on Sociedad Minera Illapa S.A.", "Local Counsel Legal Opinion on Sinchi Wayra S.A.", and "Local Counsel Legal Opinion on the Illapa Joint Venture", all dated March 18, 2022 with regards to the Property's location, title, and environmental licenses described in Section 4 of this report.

The QPs have relied on information provided by Arturo Prestamo of Santacruz for the information contained in Section 20 and for the smelter agreements used for the determination of the resources, reserves, and economic model.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The Porco Mine and Plant is located in the Porco Municipality of the Antonio Quijarro Province, in the Potosí Department, Bolivia. UTM W-84 Coordinates: 7806780E; 188096N at an elevation of 4,174 masl. Figure 4-1).

Figure 4-1: Project Location Map

4.2 Property Description and Tenure

The Porco Mine is owned by the Bolivian Government (COMIBOL) with exclusive mining rights held pursuant to an unincorporated joint venture (the “**Illapa JV**”) between private owner operator Contrato de Asociación Sociedad Minera Illapa S.A. (Illapa). Pursuant to the Illapa JV, Illapa holds a 45% interest in the Porco Project, and the Bolivian Government (COMIBOL) which holds a 55% interest in the Porco Project.

Illapa itself owns no mineral tenements in this district (Table 4-1 and Figure 4-2).

The Porco Mine produces Zinc/Silver and Lead/Silver concentrates. The complex consists of an underground mine, concentrator plant, maintenance workshop, tailing storage facility, water treatment plant, supplies warehouse, main office, two hospitals and Yancaviri Camp as shown in Figure 4-3.

Off-take Agreements with Glencore International are in place for the Porco Mine production: Contract No. 180-03-10309-P and Contract No. 062-03-10276-P, including all its addendums and amendments. These Off-Take Agreements are in effect through the life of the mine.

On March 18, 2022 Santacruz acquired 100% of the shares of Illapa, as more particularly described in Section 2. There was a 1.5% NSR royalty to Glencore, provided as part of the purchase price that Santacruz paid pursuant to the Definitive Agreement, however on March 28, 2024, Santacruz and Glencore entered into a binding term sheet (the Term Sheet) which, among other terms, extinguished the 1.5% NSR royalty to Glencore. The only known existing agreements that will bind Santacruz is that of the Illapa JV. Environmental liabilities observed consist mostly of historic tailing storage facilities and mine workings. Recent audits verify environmental legal compliance and associated closure plan costing.

Table 4-1: Mineral Tenements (Sinchi Wayra contribution)

Area	Ates
Porco Mining Project (Ca – Mbp) First Group (Purple) Hectáreas: 344	La Esperanza, Socorro Del Pobre, Minerva, Santa Elena, Carmen, Iruputungo, Caccha, Hundimiento, Wally, La Rica, Soledad, San José, Esperanza Candelaria y Veneros Jalantaña
Porco Mining Project (Ca – Mbp) Second Group (Red) Hectáreas: 149	Electra, Paracaidas, Demasias Papicito, Sucesivas Primera Mamacita, Papicito, Mamicita Sucesivas Segunda Papicito y Sucesivas Primera Papicito
Individual Contract (Green) Hectáreas: 40	Precaución

Source: Glencore (2021)

Figure 4-2: Mineral Tenement Locations

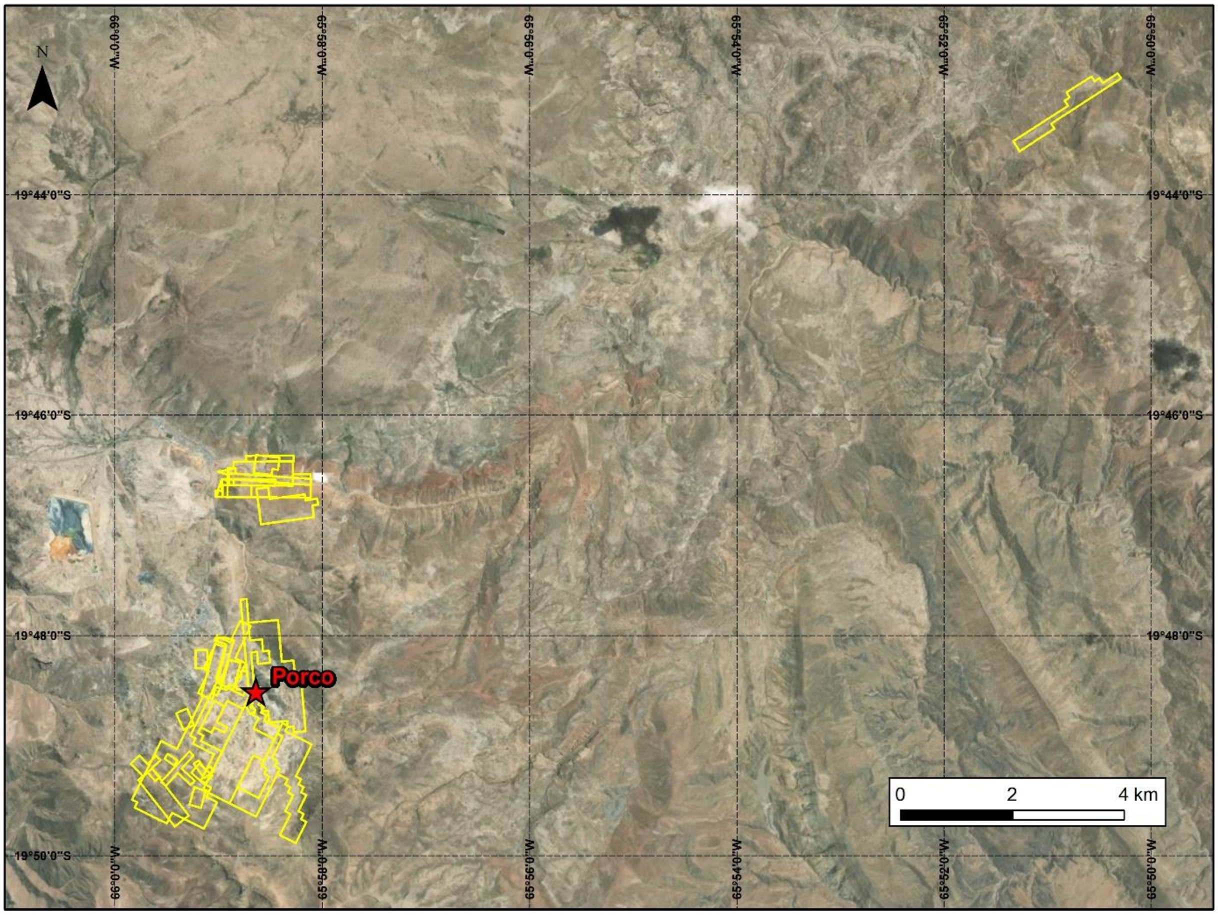
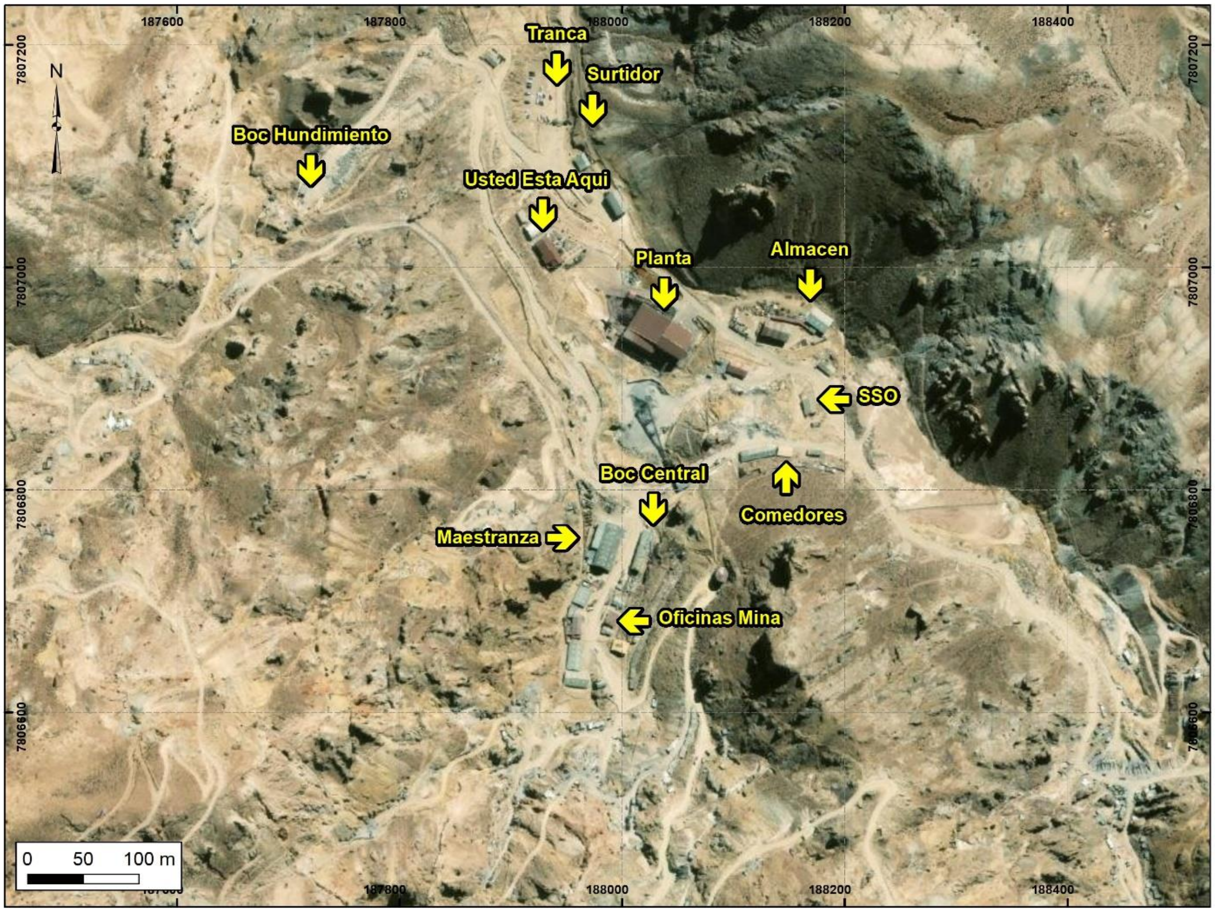


Figure 4-3: Porco Mine Site



4.3 Environmental, Permitting and Social Relations

Santacruz Silver continues to manage its operations using a sophisticated management approach to sustainability consistent international standards. From the 2022 Sustainability Report:

We are: "A leading Business Group in the mining industry in Bolivia, sustainable, committed to the safety, health, and well-being of our Human Capital, and the preservation of the environment, with an entrepreneurial spirit, openness to change and innovation, and we strive to generate value and positive impact for society as a whole."

This integrative approach is evident in the Porco operation. Areas addressed and monitored include:

- Employees;
- Occupational Health & Safety;
- Governance and Compliance;
- Stakeholder Engagement;
- Contributing to Community;
- Environment; and
- Product Stewardship & Material Handling.

4.3.1 Regulatory Framework

Bolivia's central statute governing environment protection is Law 1333, of 27 April 1992; specific regulations for which are set out in Regulation of Environmental Prevention and Control, December 8, 1995. Special Decree No. 24782 of 31 July 1997 sets out specific environmental requirements related to mining. Breaching environmental obligations can result in criminal liability under the Bolivian Constitution, in addition to other administrative penalties (such as a loss of mining rights).

An Environmental Impact Assessment (EIA) would be required for a project the scale of a mining and processing operation. As well, public consultation with any potentially affected indigenous communities and local populations may also be necessary. Granting of the operating permit allows the proponent to obtain the appropriate operating licenses, which must be updated with any relevant changes during the life of the operation.

Specialized environmental authorities control compliance. As required under the license, any impact on the environment must be reported to these authorities. Remediation measures and rehabilitation projects are compulsory, and financial reserve funds are maintained annually to cover closure costs. A final closing study on the effect on the environment will also be required, and restitution met.

On February 25, 2014, a Declaration of Environmental Adequacy Certificate was issued by the Ministry of Environment and Water addressing the proper license updating procedure carried out by Sinchi Wayra S.A. during the transfer of the Porco Mine to Contrato de Asociación Sociedad Minera Illapa S.A. In the same manner, the updating of the Porco Mine License, was addressed and approved by the Ministry of Environment and Water, on February 21, 2014, in the transfer procedure from Sinchi Wayra to Illapa.

Illapa was granted the Mining Identification Number 02-0697-04, by the SENARECOM (National Service of Control and Registration of Minerals and Metals Commercialization, for its acronym in Spanish), which expires on September 25, 2022:

a. Porco: Sinchi Wayra transferred the Porco Mine and plant, which was recognized in the Declaration of Environmental Adequacy (DAA) N.° 051203-02-DAA-0031/10 dated February 21, 2014. The DAA has the character of an environmental license. Last updated April 4, 2017; and

b. The General Direction of War Logistics and Material issued a Registration Certificate under number 0668/2019, for the use of explosives and accessories in mining activities. Expiring date: August 26, 2023.

Contrato de Asociación Sociedad Minera Illapa SA, in compliance with the internal policy of caring for the health and wellbeing of its employees and mine resources, is implementing an Integrated Management System based on the ISO 14001 standard and the ISO 45001 Risk Prevention standard with the precepts of mitigating risks and improving business performance through a safer work environment and a healthier workforce.

In compliance with D.L. 16998 of Hygiene, Occupational Safety and Well-being, directives of the Industrial Safety and Occupational Health regulations are met with programs such as: unplanned and planned workplace Inspections, keeping company standards current, Occupational Health Monitoring (dust, noise, gases, heat stress, vibrations), meetings of the Joint Safety Committee, five-minute talks before the start of daily work, personal protective equipment, breathalyzer control, induction and training of personnel with safety issues, and Investigation of accidents.

New employees are trained on topics including workplace safety procedures, safe work environment, relations with communities, safety standards, and the use of the integrated management system for Occupational Health and Safety of Contrato de Asociación Sociedad Minera Illapa SA.

4.3.2 Health, Safety and Economic Development

As per the Santacruz Sustainability program:

- Employees - Establishing relationships based on trust and promoting a culture of prevention and safe environments. Quality employment opportunities are offered with non-discriminatory hiring. In 2022, Bolívar employed total of 370 employees and 314 contractors, 7% of whom were women. Given the labor benefits offered, Bolívar has a low turnover rate. 71% of employees at Bolívar are unionized. Santacruz guarantees freedom of association and the right to collective bargaining;

- Occupational Health & Safety - Realizing the inherent personal risks of mining, and the incremental increase in incident rates over the last three years, emphasis continued in 2022 in program development and training in proper work practices at Bolívar;

- Health - Medical care is provided to employees through third party health insurers at Santa Rita Hospital. Regular Occupational Health examinations are given to all workers and treatment provided when prescribed. In 2022, occupational health factors at Bolívar, continue to be monitored after baseline date indicated most parameters fell within acceptable limits;

- Community - The neighboring communities house workers, contractors, and their families. Most of them reside in Antequera, which lies adjacent to the mine. In 2022, USD 660,000 was invested in the development of neighboring communities, benefitting approximately 1,900 families;

- Education - One of the schools in Antequera continues to be financed by Santacruz and serves 500 students. The program includes funding of teachers', directors' and supporting personnel's wages, supplies and equipment, payment of services and school infrastructure. 29 scholarships were awarded for study abroad in the capital cities. These programs not only help the local communities, but they provide Porco with trained professionals. Public education is also supported through extracurricular sports and cultural activities;

- Economic Development - Bolívar offers a professional training workshop for women who live in the mining camp and that make up the Housewives' Committee. Fire extinguisher training was provided for 100 people this year and five houses were renovated as well as other help to nearly 100 families in two communities;

- Environment - Reforestation continued throughout the Queaqueani tailings dam area, and a water diversion project in Antequera focused on improving farming performance that benefited 200 people; and

- Local needs - Cultural activities were sponsored including a safety management contest, sponsorship of trips for the Sebastián Pagador graduates, cooking courses for housewives, support for the elderly in purchasing groceries, and the anniversary celebration of Antequera.

4.3.3 Environment

4.3.3.1 Water Management

At Porco, the process plant and underground mine work on a closed circuit with zero discharge. Although Illapa has the necessary discharge permit, water recycling is maximized in order to minimize the use of surface fresh water, from the Jalsuri spring. The use of fresh water is reserved for potable use by the campsite and offices, and for preparation of certain reagents at the process plant.

4.3.3.2 Tailings Management

The active Tailings Storage Facility (dam "D") began operations on March 3, 1998. Initially designed by AGRA Earth & Environmental Ltda. For the first two phases., and AMEC for the current active expansion. The facility meets current international standards. The impoundment is of downstream construction and the dam lined with 60 mil HDPE. A system of well and piezometers are in place to monitor the facility's performance. Construction of Phase VI begun in 2018 was completed in 2019 and included recommended work to reinforce areas of the foundation.

4.3.3.3 Waste Management

Porco currently disposes of all waste rock underground; thus, surface management is not required. Process tailing and sludge from the water treatment plant are both stored in the Tailing Storage Facility (dam “D”). Domestic waste is collected by the Porco cleaning company, who is supported by Illapa with equipment and a front-end loader, to move the waste in Porco’s sanitary landfill. Hospitals in Agua de Castilla and Porco generate a considerable amount of biological hospital waste, which is classified and carefully stored for subsequent incineration.

4.3.4 Community Interaction

The town of Porco has been a mining area since colonial times, and mining is its main source of income. It is inhabited by civilians with various activities, mine workers, their families, and cooperative miners. Illapa works closely with the closest towns, i.e., Porco and Agua de Castilla, as well as the smaller, satellite communities totalling approximately 16,000 people. As well, Illapa engages with two Cooperatives that work at, and adjacent to, the Porco operation.

The Covid Pandemic dominated Community needs and was answered with support from Illapa. However underlying long term aid programs remained intact. COVID-19 prevention supplies were provided such as alcohol gel, liquid alcohol, bleach, masks, and gloves. Informative posters for prevention awareness were also posted. Provisions kits were also supplied, in view of the economic crisis caused by the pandemic.

Support to education was affected by the early conclusion of the school year; however, financial support for teachers’ wages and administrative personnel was provided, as well as the adoption of biosecurity measures for the return of in-person classes. This project benefits 1000 students and will continue in 2021.

4.3.4.1 Mining Cooperatives

A large part of how the mine operation interacts with nearby communities is related to the Cooperativa system. This system is based on establishing informal agreements with local miners who independently mine in designated areas, and toll mill at the Porco plant. Resources in the upper central zone are made available to the Cooperativas who mine the material and deliver it to the process plant. They are paid based on weight and sample grades. After the material is processed, some reconciliation mechanism is used to adjust the payment based on actual recoveries. This system helps to direct the energies of the informal miners into an opportunity for legitimate production and steady income while also helping to minimize the activity of illegal mining.

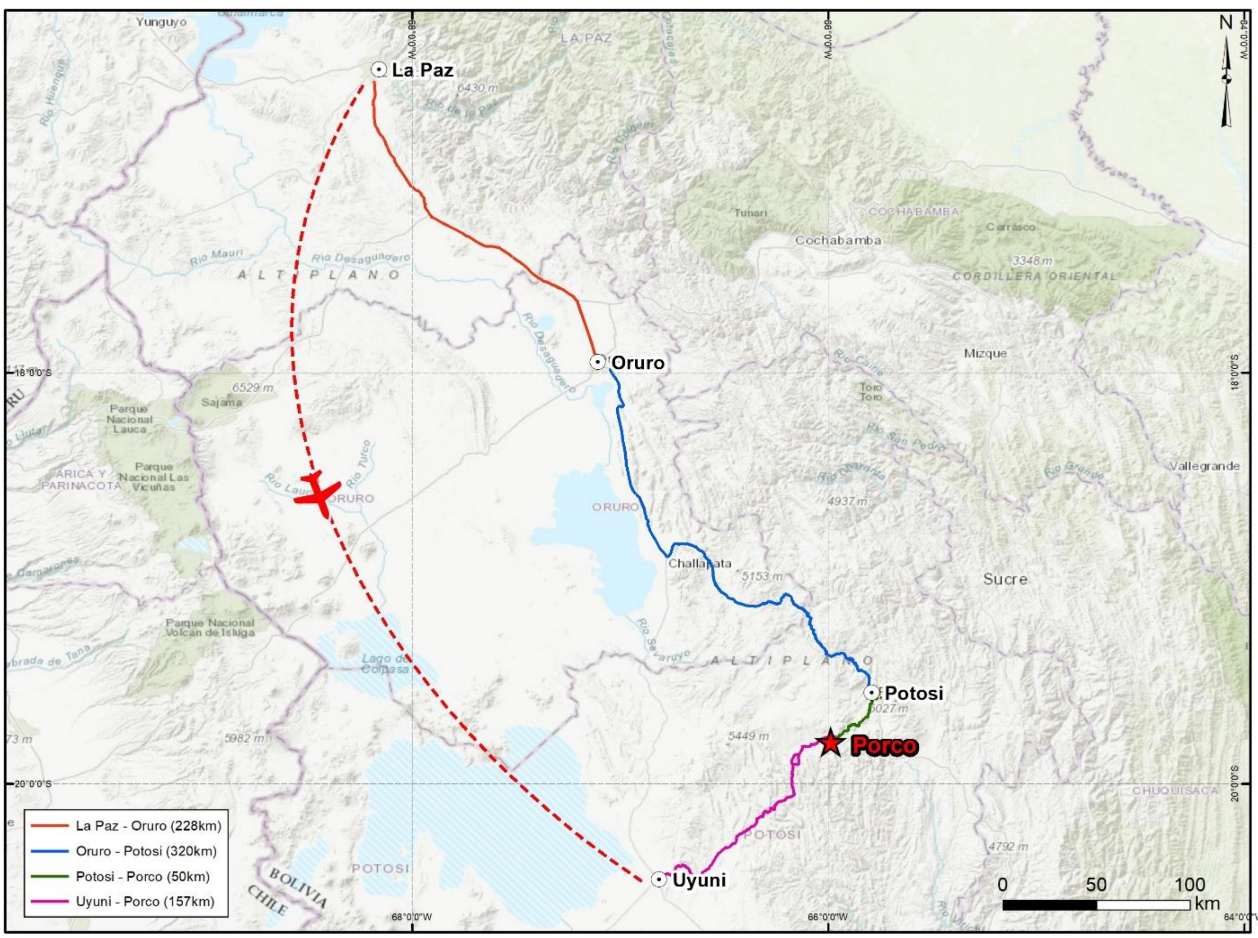
However, illegal mining is still being carried out at Porco Mine and was observed on our site visit. Forced access to mining areas through destruction of ventilation brattices and gates causes direct losses, while mining in unauthorized areas causes instability and reduced productivity as well as creating a safety hazard to both the perpetrators and the mine workforce.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Accessibility

Porco Mine is located in Bolivia, Potosi Department, Antonio Quijarro province, 50 km southwest of Potosí City. The mine is 150 km via paved National Highway 5 from a commercial airport at Uyuni and 581 km to the capital, La Paz. A 5 km gravel access road to the mine site goes through the communities of Agua de Castilla and Porco (Figure 5-1).

Figure 5-1: Project Location Map (showing region)



Concentrates are transported 5 km by truck from Porco Concentrator to the Yancaviri Warehouse and rail Station in Agua de Castilla. From there rail takes the concentrate directly to the Pacific port of Antofagosta, Chile.

5.2 Climate and Physiography

The climate at site in a semi-arid ecological zone known as the high mountain prairie of Puno; This eco-region occupies the central-east and south slope of the Royal Range in Potosí and Chuquisaca. The deposit's outstanding features are the geological massifs Apo-Porco and Huayna Porco, and the ravines that pass through Jalantaña, Porco and Agua Castilla. Geologically, it is located at the southern end of the Los Frailes Range, within the polymetallic strip of the Eastern Andes.

According to the land use classification system of the USDA Soil Conservation Service (US Department of Agriculture), it has been determined that soil class IV predominates which are, soils with reduced arable layers and little use for agriculture.

Geographically Porco is part of the Cordillera de Azanaques, which in turn is part of the Cordillera Central or Meridional, located on the slopes of Cerro El Salvador (4560 masl). The project is at altitude 4147 masl.

The climate is arid to semi-arid and included in the "Puna" eco-region which extends south of the 18th parallel, from which aridity increases. Precipitation averages 450 mm per year with temperatures ranging from a maximum of 24°C to a minimum of -13°C. The topography of the area is moderately rugged, with mountain ranges cut by the Antequera canyon, through which the Chapana River runs.

The project lies within the Altiplano, an extensive volcanic plateau where regional flora includes dry plants such as queña, or quenua, which is a dwarf tree found at higher elevations. In addition, abundant yareta is present which is a species of moss that grows on the ubiquitous rocky surfaces.

Faura such as llamas and alpaca are the most distinctive animal populations in the area and are mostly domesticated with wild populations being fairly rare. Another similar animal, the vicuna, exists in the region however it is thought to be on the verge of extinction. In the air, condors inhabit the remote caves of the high peaks, flying over the plateaus.

5.3 Infrastructure

The underground mine and process plant are supported by the site infrastructure built up over five centuries of mining activity Figure 5-2.

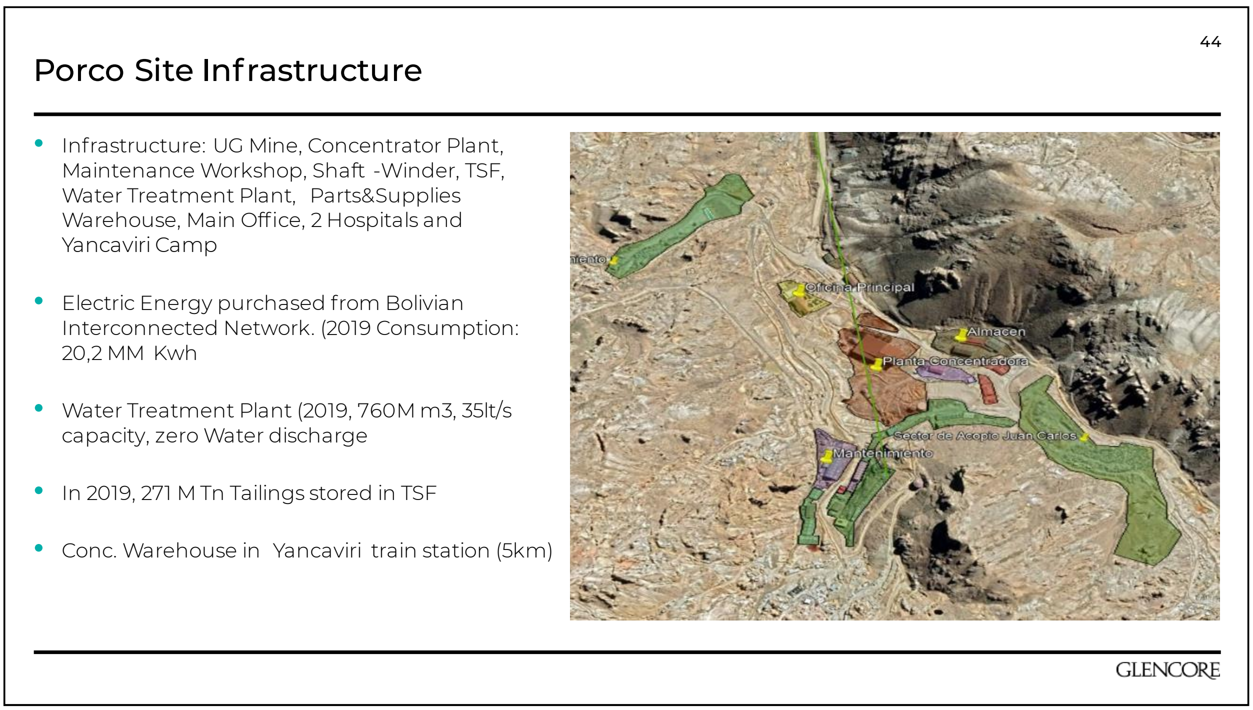
Electrical power is supplied from the national grid via 69 kV transmission lines from the Landara substation to El Tambo II substation, where voltage is transformed from 69 to 24.9 kV for distribution to the mine site. The site has two separate electrical substations: Mine and Plant, where the voltage is transformed from 24.9 kV to 3.3 kV, 440 V and 220 V.

Water is sourced mostly from the mine discharge of 35 l/s which is treated for use in the process plant as part of a zero-discharge system. Potable water for the mine and surrounding communities are sourced at the Jalsuri well.

Most of the workers live in the towns of Agua de Castilla and Porco, while the technical personnel live in the Yancaviri camp, there are a total of 35 units built complete with recreation areas, and in both communities, there are health services at Hospitals in both Porco, and Agua de Castilla, as well as supply and grocery markets.

The mine utilizes one modern Tailings Storage Facility and hosts 8 inactive facilities on site as well. All facilities are monitored and audited regularly by a third-party engineering firm Figure 5-2.

Figure 5-2: Porco Site Infrastructure



Source: Glencore (2021)

The active Tailings Storage Facility (dam "D") began operations on March 3, 1998. Initially designed by AGRA Earth & Environmental Ltda. For the first two phases., and AMEC for the current active expansion. The facility meets current international standards. The impoundment is of downstream construction and the dam lined with 60 mil HDPE. A system of wells and piezometers are in place to monitor the facility's performance. Construction of Phase VI began in 2018 and included recommended work to reinforce areas of the foundation.

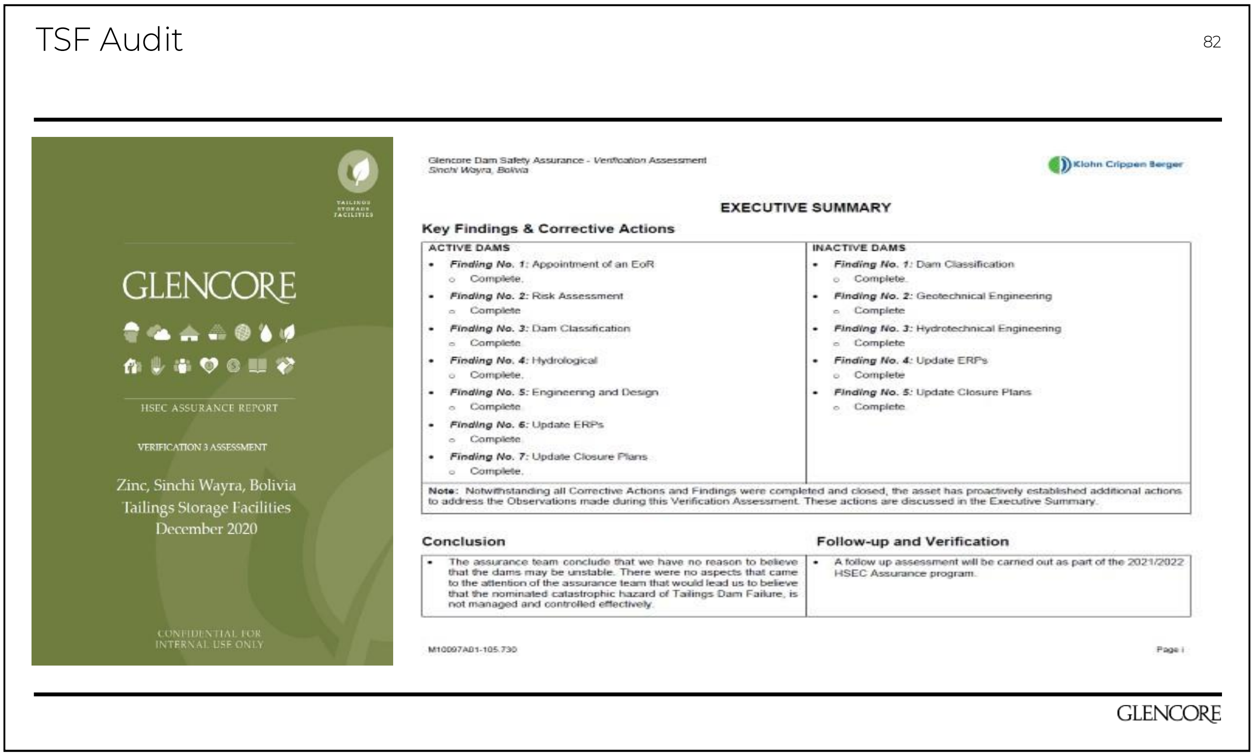
Tailings are discharged along the inside face of the dam at 25-29% solids, forming a tailings beach for additional support, and keeping the water away from the dam. The water reclaim system consists of a barge mounted pump system to form a closed loop with the process plant. The site is zero discharge.

Table 5-1: Tailings Facility "D" Statistics

Parameters	Unit	Porco
Crest Elevation	masl	4.036,77
Spillway Elevation	masl	4035,77
Tailings Elevation	masl	4036
Water Elevation	masl	4034,65
Life Dam	months	6-7
Design Freeboard	m (by construction)	1
Current Freeboard	m	1,35
Design Tailings beach length	m	100
Current Tailings beach length	m prom.	150
Design Water Volume	m^3	200.000
Current Water Volume	m^3	138.000
Operations Maintenance and Surveillance Manual		M.O.
Engineer of Record (EoR)		AMEC/WOOD

Source: Glencore (2021)

Figure 5-3: TSF Audit Summary



TSF Audit 82

GLENCORE

HSEC ASSURANCE REPORT

VERIFICATION 3 ASSESSMENT

Zinc, Sinchi Wayra, Bolivia
Tailings Storage Facilities
December 2020

CONFIDENTIAL FOR INTERNAL USE ONLY

Glencore Dam Safety Assurance - *Verification Assessment*
Sinchi Wayra, Bolivia

Klohn Crippen Berger

EXECUTIVE SUMMARY

Key Findings & Corrective Actions

ACTIVE DAMS	INACTIVE DAMS
• *Finding No. 1:* Appointment of an EoR ○ Complete. • *Finding No. 2:* Risk Assessment ○ Complete • *Finding No. 3:* Dam Classification ○ Complete • *Finding No. 4:* Hydrological ○ Complete. • *Finding No. 5:* Engineering and Design ○ Complete • *Finding No. 6:* Update ERPs ○ Complete. • *Finding No. 7:* Update Closure Plans ○ Complete.	• *Finding No. 1:* Dam Classification ○ Complete. • *Finding No. 2:* Geotechnical Engineering ○ Complete • *Finding No. 3:* Hydrotechnical Engineering ○ Complete • *Finding No. 4:* Update ERPs ○ Complete • *Finding No. 5:* Update Closure Plans ○ Complete

Note: Notwithstanding all Corrective Actions and Findings were completed and closed, the asset has proactively established additional actions to address the Observations made during this Verification Assessment. These actions are discussed in the Executive Summary.

Conclusion	Follow-up and Verification
• The assurance team conclude that we have no reason to believe that the dams may be unstable. There were no aspects that came to the attention of the assurance team that would lead us to believe that the nominated catastrophic hazard of Tailings Dam Failure, is not managed and controlled effectively.	• A follow up assessment will be carried out as part of the 2021/2022 HSEC Assurance program.

M10097A01-105.730 Page i

GLENCORE

Source: Glencore (2021)

6 HISTORY

6.1 Management and Ownership

Evidence of silver mining at Porco goes back to pre-Columbian times. Porco was a silver source for the Inca, later the Spanish, and others through the late 19th century. As the world silver market began to collapse in the 1880's and early 1890's, a major shift to tin mining began to meet the increased demand of the industrialized world. Wealthy tin barons in Bolivia held much influence in national politics until they were marginalized by the nationalization of the three largest tin mining companies following the 1952 revolution. Bolivian miners played a critical part in the country's organized labor movement from the 1940s to the 1980s and continue to be an important stakeholder.

Porco became a resource of newly formed Bolivian Mining Corporation (COMIBOL), under whose management it operated until leased to private "Iris Mines" through subsidiary Compania Minera del Sur (COMSUR) in 1962. Emergency economic measures by the government in response to the international tin market crash in 1985 included massive layoffs of miners.

Porco Mine operates under the management of Sinchi Wayra S.A. (formerly COMSUR S.A.), under a joint venture agreement with the Bolivian government (COMIBOL) named Illapa S.A. Sinchi Wayra S.A. and (COMIBOL) entered this Joint Venture Agreement (the Illapa JV) on December 4, 2014, by virtue of Public Deed N° 1356/2014. The duration of the Illapa JV is 15 years, with the possibility of extending the term for the same duration. Under the Illapa JV, ownership is 55% COMIBOL and 45% Illapa. In the event of any disagreement, the Illapa JV has an arbitration clause with seat in La Paz, Bolivia, under UNCITRAL Rules.

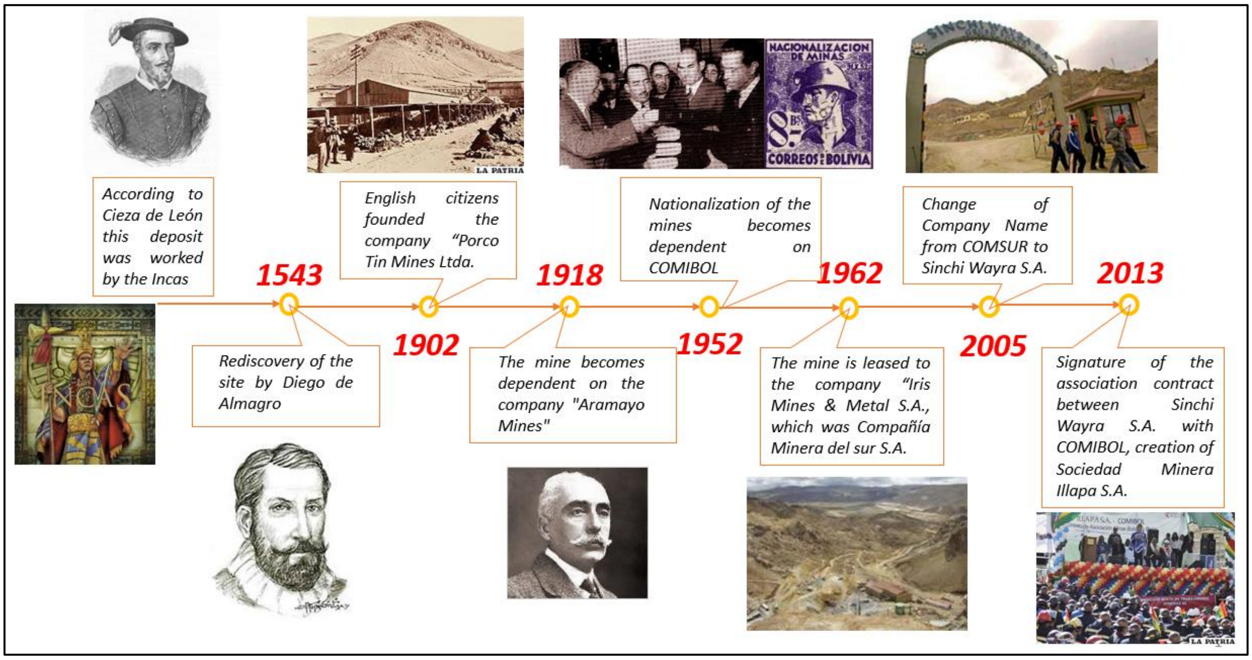
On October 11, 2021, Santacruz entered into the Definitive Agreement with Glencore whereby Santacruz agreed to acquire a portfolio of Bolivian silver assets from Glencore. The Assets include: (a) Glencore's 45% interest in the Bolivar Mine and the Porco Mine, held through an unincorporated joint venture between Glencore's wholly-owned subsidiary Contrato de Asociación Sociedad Minera Illapa S.A. (Illapa) and COMIBOL, a Bolivian state-owned entity; (b) a 100% interest in the Sinchi Wayra business, which includes the producing Caballo Blanco mining complex; (c) the Soracaya exploration project; and (d) the San Lucas ore sourcing and trading business (the Assets).

On March 18, 2022, Santacruz completed this purchase, including Glencore's interest in the Caballo Blanco mining complex. The Caballo Blanco mining complex has continued to operate since that date under the management of Santacruz.

On May 10, 2023, Santacruz and Glencore entered into a framework agreement to amend certain terms of the transaction documents pertaining to the acquisition of the Assets. On March 28, 2024, Santacruz and Glencore entered into the binding Term Sheet which amends the terms of certain deferred consideration and ancillary documents pertaining to the acquisition of the Assets.

Sale of concentrates are subject to an Off-Take Agreement with Glencore International AG as buyer, under Contract N°180-13-14212-P, and Contract N°062-13-14190-P, both entered into in 2013, with all their addendums and amendments. These agreements are "evergreen" meaning that they are in effect through the life of mine.

Figure 6-1: Project History



Source: Glencore (2021)

6.2 Historical Resource Estimates

Glencore's Resources & Reserves report as of December 31, 2020 disclosed Porco, Bolivar and Caballo Blanco historic mineral resource statements as well as historic mineral reserve estimates as of December 31, 2020. Given the source of the estimates, Santacruz considers them reliable and relevant for the further development of the Project; and accordingly, they should be relied upon only as a historical resource and reserve estimate of Glencore, which pre-dates Santacruz's agreement to acquire the Assets however, the Company is not treating the historical estimates as current Mineral Resources or Mineral Reserves.

A "Qualified Person" as per NI 43-101 has not done sufficient work to classify the historical estimate as current Mineral Resources or Mineral Reserves and Santacruz is not treating the historical estimate as current Mineral Resources or Mineral Reserves. Further drilling and resource modelling would be required to upgrade or verify these historical estimates as current mineral resources or reserves for the respective assets.

The resources have been reported for Porco as of December 31, 2020 at a Zinc Equivalent (ZnEq) cut-off grade 2% as follows in Table 6-1.

Table 6-1: Historic Mineral Resource Estimate

Category	Tonnes (Mt)	Zinc (%)	Lead (%)	Silver (g/t)
Measured Mineral Resources	0.7	10.68	0.63	83
Indicated Mineral Resources	0.4	10.86	0.77	114
Measured + Indicated Mineral Resources	1.1	10.74	0.68	93
Inferred Mineral Resources	2.2	11.78	0.84	98

Notes:

1) The Mineral Resources have been calculated in accordance with definitions in accordance with the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code), the 2016 edition of the South African Code for Reporting of Mineral Resources and Mineral Reserves (SAMREC) and the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Standards on Mineral Resources and Reserves (2014).
2) The ZnEq = (Zn% + (Pb% * 0.73) + (Ag g/t * 0.019290448)).
3) The Mineral Resources have been calculated in accordance with definitions adopted by the Canadian Institute of Mining, Metallurgy and Petroleum. Employees of Glencore have prepared these calculations.
4) Mineral resources are not mineral reserves until they have demonstrated economic viability. Mineral resource estimates do not account for a resource's mineability, selectivity, mining loss, or dilution.
5) An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.
6) All figures are rounded to reflect the relative accuracy of the estimate and therefore numbers may not appear to add precisely.
7) Reported in-situ Mineral Resources do not consider mineral availability by underground mining methods.
8) Historical Mineral Reserves and Resources are inclusive of Mineral Reserves shown at 100% ownership.

Source: Glencore (2020)

For comparison, Table 6-2 shows the Measured and Indicated Resources for 2018 and 2019, respectively which reflects mining depletion and changes in classification due to additional drilling and sampling during operations. The historic Indicated and Inferred Resources are reported at a 2% ZnEq cut-off grade.

Table 6-2: Historic Mineral Resource Estimate for 2018 and 2019

	Measured		Indicated		Measured + Indicated		Inferred	
	2019	2018	2019	2018	2019	2018	2019	2018
Ore (Mt)	0.8	1.2	0.3	0.7	1.2	1.9	1.8	2.2
Zinc (%)	10.7	11.3	9.7	10.4	10.4	10.8	10	11
Lead (%)	0.6	0.7	0.6	0.7	0.6	0.9	1	1
Silver (g/t)	76	106	87	102	79	108	87	102

Source: Glencore (2020)

Glencore reported resources and reserves in accordance with the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code), the 2016 edition of the South African Code for Reporting of Mineral Resources and Mineral Reserves (SAMREC) and the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Standards on Mineral Resources and Reserves (2014 edition). The term 'Ore Reserves', as defined in Clause 28 of the JORC Code, has the same meaning as 'Mineral Reserves' as defined in the CIM Definition Standards for Mineral Resources and Mineral Reserves. All tonnage information has been rounded to reflect the relative uncertainty in the estimates; there may therefore be small differences in the totals. The Measured and Indicated resources are reported inclusive of those resources modified to produce reserves, unless otherwise noted. Commodity prices and exchange rates used to establish the economic viability of reserves are based on long-term forecasts applied at the time the reserve was estimated.

6.3 Production 2018 to 2022

The production generated from the Porco Mine from the period 2018 to 2022 is shown in Table 6-3.

Table 6-3: Production at the Porco Mine, 2018 to 2022

Year	Tonnes	Zn%	Pb%	Ag g/t
2018	233,159	6.95	0.58	84
2019	219,561	7.08	0.64	66
2020	82,798	7.73	0.68	72
2021	100,346	7.93	0.77	165
2022	188,602	7.12	0.61	117

7 GEOLOGICAL SETTING AND MINERALIZATION

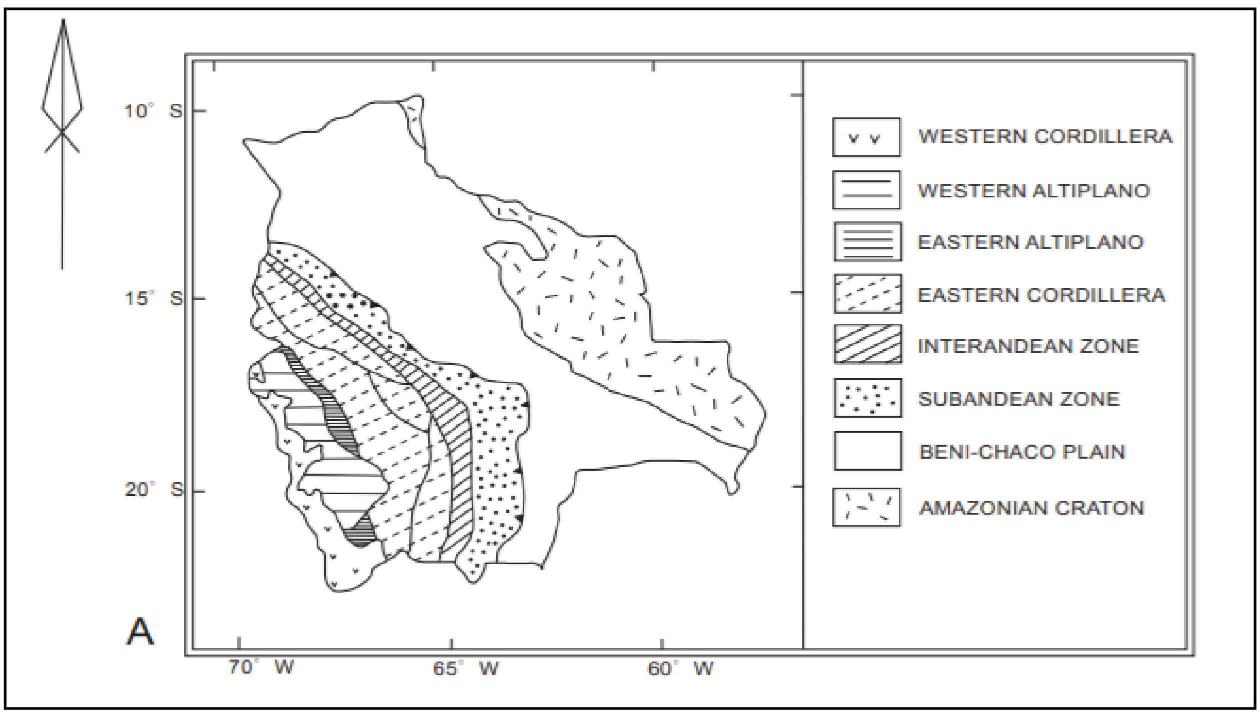
7.1 Introduction

The geological setting and framework detailed herein, is primarily referenced from the definitive publications for Bolivian geology such as Redwood (2021) and Arce-Burgoa (2009).

7.2 Geological Tectonic Framework and Regional Geology

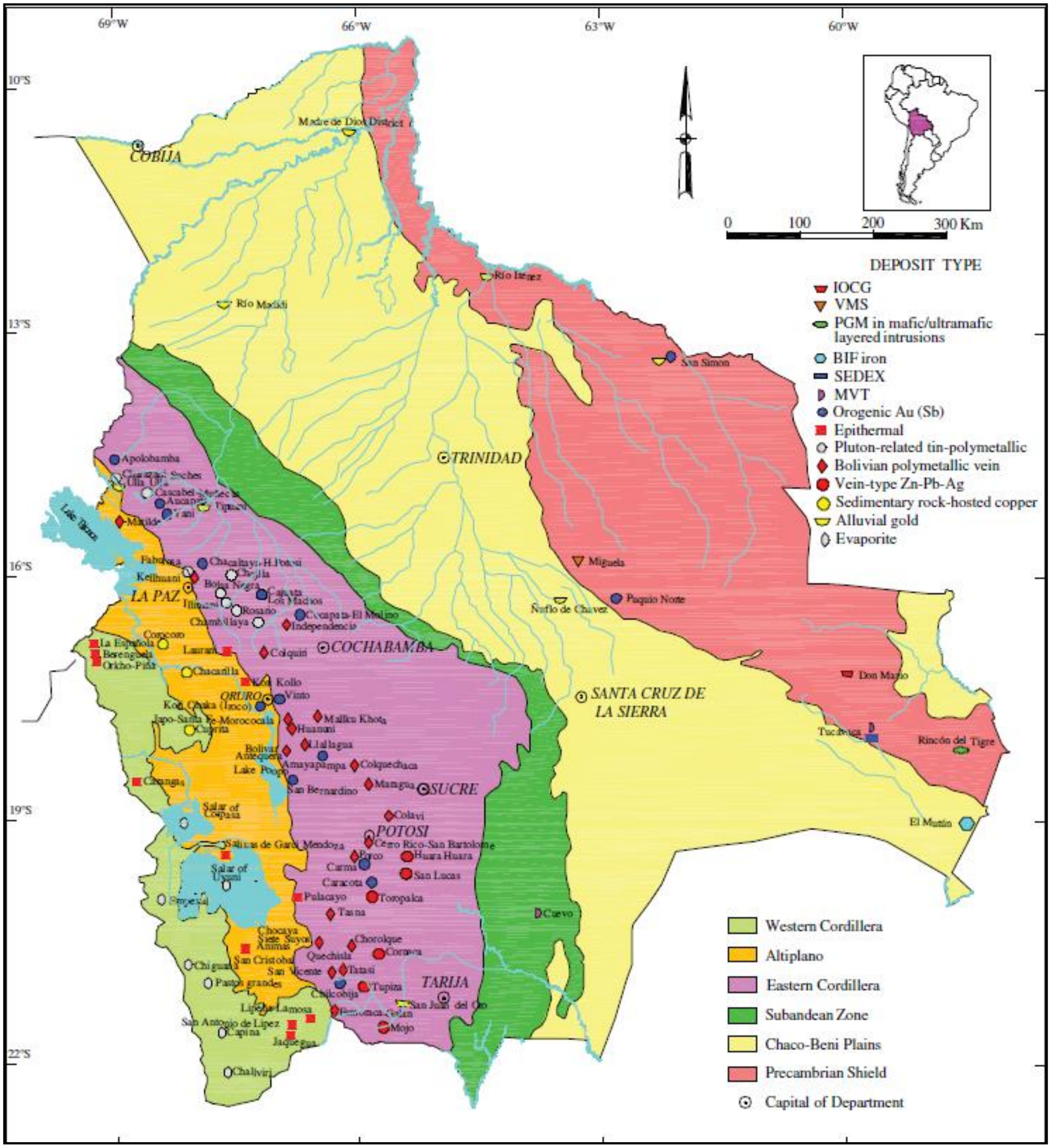
The geologic-tectonic framework of Bolivia can be divided into six physiographic provinces. From east to west (Figure 7-1), these are the Precambrian Shield, the Chaco-Beni Plains, the Sub Andean zone, the Eastern Cordillera (or Cordillera Oriental), the Altiplano, and the Western Cordillera (or Cordillera Occidental). The latter four provinces are elements of the Mesozoic-Cenozoic Andean orogen in Bolivia (Arce-Burgoa, 2002, 2007), which hosts an abundance of mineral deposits (Figure 7-2). The landward Precambrian Shield, exposed far to the east of the Andes, represents an area of great mineral potential, but has had limited exploration.

Figure 7-1: Regional Geology Setting



Source: Arce-Burgoa (2009)

Figure 7-2: Regional Geology Setting with Deposit Types



Source: Arce-Burgoa (2009)

Rocks of the Precambrian Shield in easternmost Bolivia have commonly been hypothesized to represent the southwestern part of the Amazon craton, covering an area of approximately 200,000 square kilometer (km^2), or 18% of Bolivia. The lithological units are mainly Mesoproterozoic medium and high-grade metasedimentary and meta-igneous rocks, which have been covered by Tertiary laterites and Quaternary alluvial basin deposits. Earlier studies have referred to this as the Guaporé craton, but Santos et al. (2008) proposed that are not basement rocks belonging to the craton proper but rather, that they represent the 1.45–1.10 Ga Sunsas orogen, formed along the craton margin. Major tectonic events in the orogen are dated 1465–1420, 1370–1320, and 1180–1110 Ma. The subsequent Brazilian tectonism (ca. 600–500 Ma) only had minor effects on the orogen (Litherland et al., 1986, 1989).

The Chaco-Beni plains, located in the central part of the country, cover 40% of Bolivia. The topography is dominated by the southwestern Amazon basin wetlands. Lying below 250 m elevation the wetlands offer little relief or outcrop. These extensive plains are part of the foreland basin of the Central Andes and include a 1 to 3 km thick sequence of Cenozoic foreland alluvial sediment in the west and much thinner accumulations atop a broad forebulge to the east (Horton and DeCelles, 1997). This sequence overlies Tertiary red-bed sediments that are >6 km thick which in turn rest unconformably on the Precambrian crystalline basement to the east and Paleozoic and Mesozoic sedimentary rocks to the west. The alluvial accumulations are products of several Neogene to Holocene episodes of post-kinematic and epeirogenetic isostatic adjustment in the Eastern Andes and its piedmont.

Rocks of the Bolivian Andean orogen include the Subandean zone, Eastern Cordillera, Altiplano, and the Western Cordillera, represent approximately 42% of Bolivia. These physiographic provinces form a series of mountain chains, isolated mountain ranges, and plains, with a north-to-south trend (Ahlfeld and Schneider-Scherbina, 1964). This part of the orogen has a length of 1,100 km, with a maximum width of 700 km, and an average crustal thickness of 70 km. The orogen displays a distinct oroclinal bend in the main fabric orientation at the Arica Elbow (18°–19°S).

The Subandean zone is the thin inland margin of an orogen-parallel fold-and-thrust belt, which is partly obscured by sediments of the western side of the active foreland basin. It is characterized by north- south- trending, narrow mountain ranges with elevations between 500 and 2,000 m. The dominant lithologies include Paleozoic siliciclastic marine and Mesozoic and Tertiary continental sedimentary rocks.

The Eastern Cordillera, the uplifted interior of the Andean thrust belt, includes polydeformed sequences of shale, siltstone, limestone, sandstone, slate, and quartzite deposited since the Ordovician. The largely Paleozoic clastic flysch basin sediments and metamorphic rocks extend over an area of approximately 280,000 km^2 were deposited along the ancient Gondwana margin and first deformed in the middle to late Paleozoic. After Permian to Jurassic rifting, they were uplifted, folded and displaced on thrust faults during the Andean compression, which may have been as early as Late Cretaceous (McQuarrie et al., 2005).

The Altiplano is comprised of a series of intermontane, continental basins with a combined length of approximately 850 km, an average width of 130 km, and an area of approximately 110,000 km^2. The basins have been uplifted to form a high plateau at elevations between 3,600 and 4,100 m. Geomorphologically, the province consists of an extensive flat plain that is interrupted by isolated mountain ranges. Crustal shortening, rapid subsidence, and, with concurrent sedimentation accumulated a sequence thickness of as much as 15 km during the Andean orogeny (Richter et al., in USGS and GEOBOL, 1992). Basin fill was dominated by erosion of the

Western Cordillera during Late Eocene-Oligocene, but Neogene shortening in the Eastern Cordillera and Subandean zone led to a subsequent dominance of younger sediments derived from the east (Horton et al., 2002).

The Western Cordillera consists of a volcanic mountain chain that is 750 km in length and 40 km in average width, with an area of about 30,000 km^2. Late Jurassic and Early Cretaceous flows and pyroclastic rocks and marine sandstone and siltstone sequences dominate the Cordillera in Peru and Chile. Lesser Late Cretaceous continental sediment was deposited above the marine rocks and, simultaneously, large granitoid plutons, many of which are associated with large porphyry orebodies, were emplaced along the coasts of adjacent Peru and Chile. In Bolivia, the province is dominated by high andesitic to dacitic strata volcanoes, erupted since ca. 28 Ma, which define the narrow, main Central Andes magmatic arc.

7.2.1 Eastern Cordillera

The Bolivar, Porco and Caballo Blanco deposits are located in the central part of the Eastern Cordillera, a thick sequence of Paleozoic marine siliciclastic and argillaceous sedimentary rocks deposited on the western margin of Gondwana and deformed in a fold-thrust belt. There were two major tectonic cycles in the Paleozoic: The Lower Paleozoic Famatinian cycle (the Tacsarian and Cordilleran cycles of Bolivia), and the Upper Paleozoic Gondwana cycle (Subandean cycle of Bolivia).

The late Precambrian supercontinent broke up with the opening of the southern Iapetus Ocean and the spreading of Laurentia away from Gondwana in the latest Precambrian or early Cambrian (Figure 7-3 through Figure 7-5). Ocean closure and collision of Laurentia and the South American segment of Gondwana during the Ordovician formed the Famatinian orogenic belt of NW Argentina (Dalla Salda et al., 1992a) which has been correlated with its probable Laurentian equivalent, the Taconic event of the Appalachian orogen (Dalla Salda et al., 1992b). The Famatinian belt records extension in the latest Precambrian with establishment of subduction during the Cambrian and closure of the ocean basin and continent-continent collision in the Ordovician (480-460 Ma) (Figure 7-6). The Pre-Cordillera Terrane carbonate platform of western Argentina, which has faunal similarities with eastern North America, may be a sliver of eastern Laurentia detached in the late Ordovician when Laurentia separated from Gondwana again (Dalla Salda et al., 1992a; b) (Figure 7-7 and Figure 7-8).

Figure 7-3: Plate Tectonic Reconstructions of the Neoproterozoic Subcontinent and the Late Precambrian Supercontinent after the Opening of the Southern Iapetus Ocean

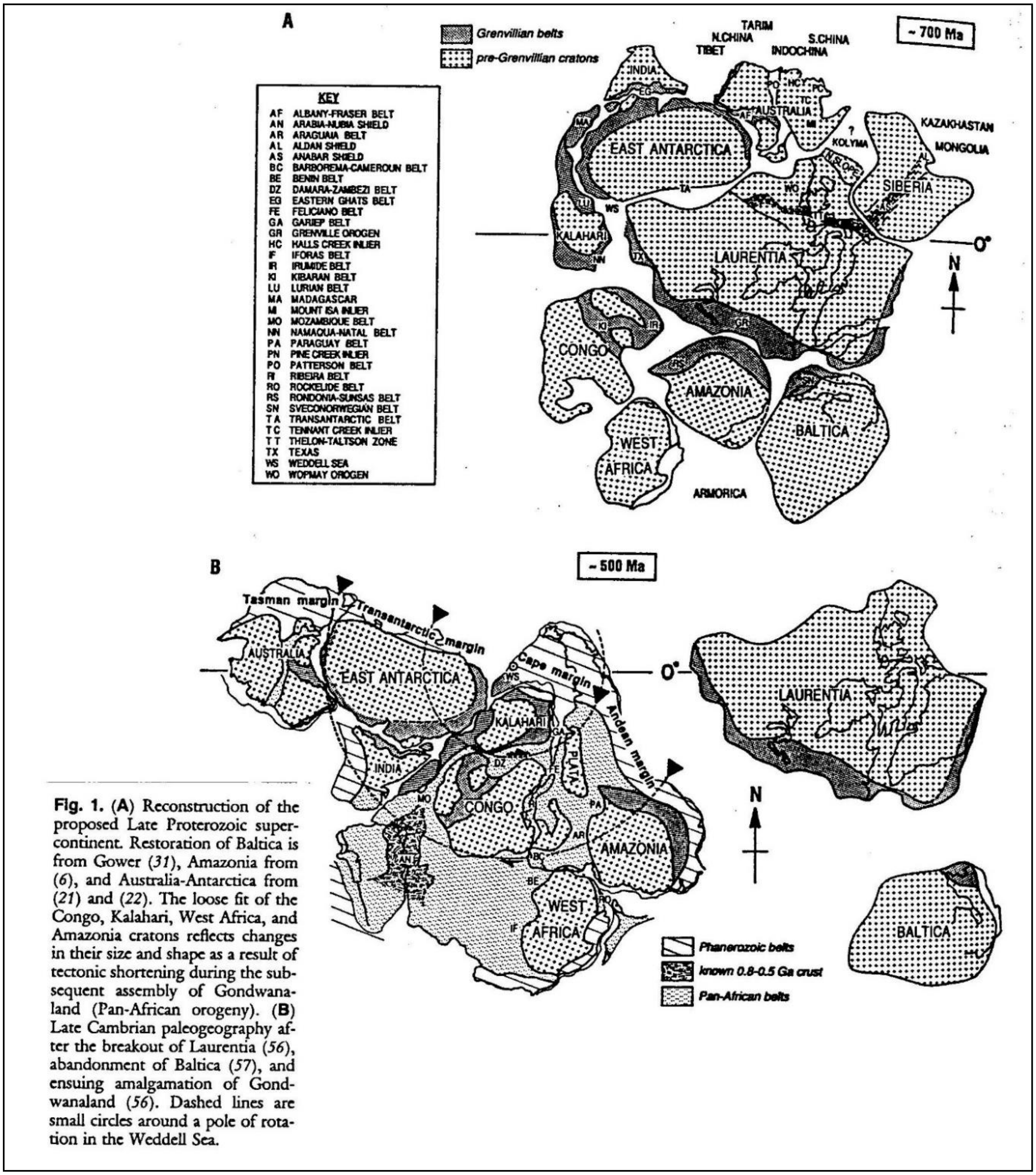


Fig. 1. (**A**) Reconstruction of the proposed Late Proterozoic supercontinent. Restoration of Baltica is from Gower (*31*), Amazonia from (*6*), and Australia-Antarctica from (*21*) and (*22*). The loose fit of the Congo, Kalahari, West Africa, and Amazonia cratons reflects changes in their size and shape as a result of tectonic shortening during the subsequent assembly of Gondwanaland (Pan-African orogeny). (**B**) Late Cambrian paleogeography after the breakout of Laurentia (*56*), abandonment of Baltica (*57*), and ensuing amalgamation of Gondwanaland (*56*). Dashed lines are small circles around a pole of rotation in the Weddell Sea.

Source: Hoffman (1991)

Figure 7-4: Plate Tectonic Reconstructions of the Neoproterozoic and Late Precambrian Subcontinents

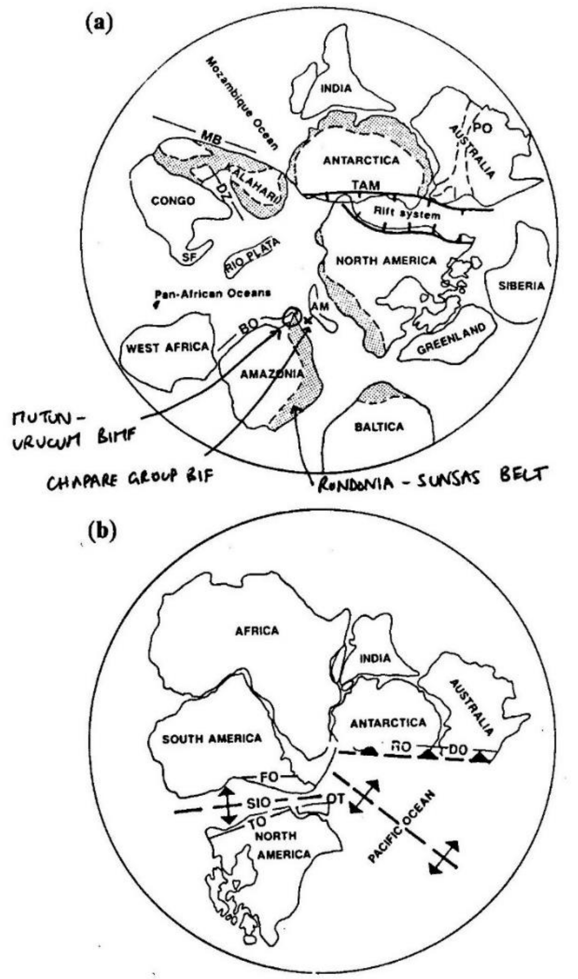


Fig. 3. (**a**) A Neoproterozoic reconstruction (*c*.750 Ma) based on the ideas of Moores (1991), Dalziel (1991, 1992*a*, *b*) and Hoffman (1991). It illustrates a single Neoproterozoic supercontinent just prior to rifting and a loose collage of African and South American cratonic blocks separated by oceanic crust. Variations in the position of the cratonic blocks can be seen in Hoffman (1991) and Dalziel (1992*a*, *b*). The supercontinent incorporates the SWEAT hypothesis of Moores (1991) linking the Transantarctic Mountains margin of East Antarctica to the western Cordilleran margin of Laurentia. The Grenville belt is shown as a stipple. AM, Arequipa Massif: BO, Brasiliano orogen; DZ, Damara -Zambezi belt; MB, Mozambique belt; PO, Patterson orogen; SF, São Francisco craton; TAM, Transantarctic Mountains. (**b**) Reconstruction of a late Precambrian to early Cambrian supercontinent following opening of the Pacific Ocean and amalgamation of Gondwana during Pan-African collisional events (Dalziel 1992), and at the time of opening of the southern Iapetus ocean (SIO) between North and South America. DO, Delamerian orogen; FO, Famatinian orogen; OT, Occidentalia terrane; RO, Ross orogen; TO, Taconic orogen.

Source: Story (1993)

Figure 7-5: Paleogeography of SW Gondwana Margin in the Early Ordovician

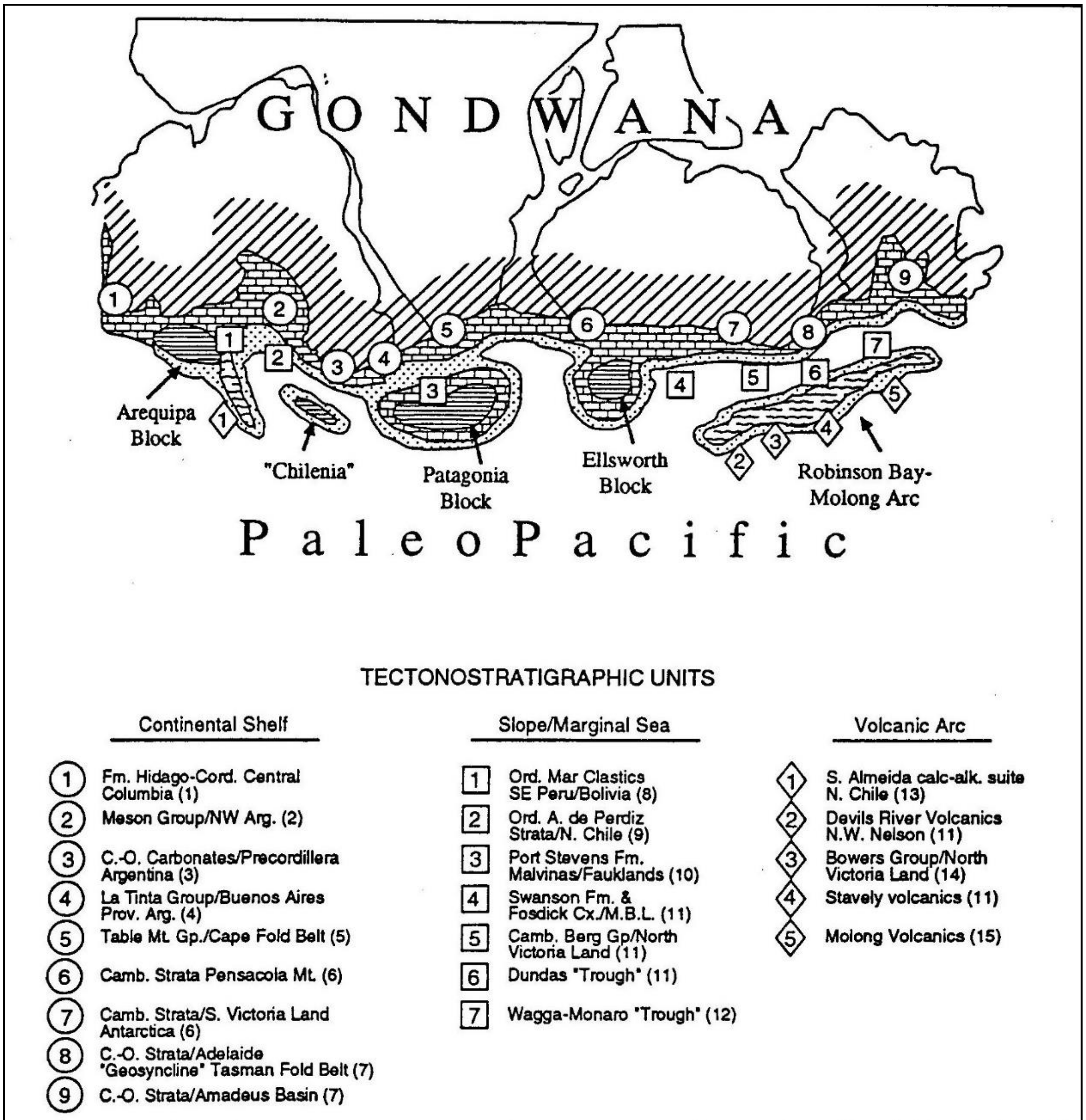


Fig. 12. Paleogeographic model for the SW margin in Gondwana in the Early Ordovician. Brick pattern outlines the marginal shelves and the stable Proterozoic platforms of Gondwana, in stipple are slope and outer basin floor clastic deposits, in horizontal ruling, possible platform and/or microplate regions of discontinous lower Paleozoic deposition, and in v symbols, theallocthonous volcanic arc components. References are: (1) Mojica et al. [1988], (2) Turner [1970, 1972], (3) Borrello [1969], Baldis and Bordonaro [1985], (4) Baldis et al. [1985], (5) Rust [1973], Tankard and Hobday [1979], (6) Laird and Bradshaw [1982], (7) Veevers et al. [1982], (8) Martinez [1980], Acenolaza [1976], Dalmayrac et al. [1980], (9) Garcia [1976], (10) Borrello [1972], (11) Findley [1987], (12) Pachman [1987], (13) Mpodozis et al. [1983], (14) Gibson and Wright [1985], and (15) Leitch and Scheibner [1987].

Source: Forsythe et al, (1993)

Figure 7-6: The Famatinian – Taconic Orogen in the Middle Ordovician

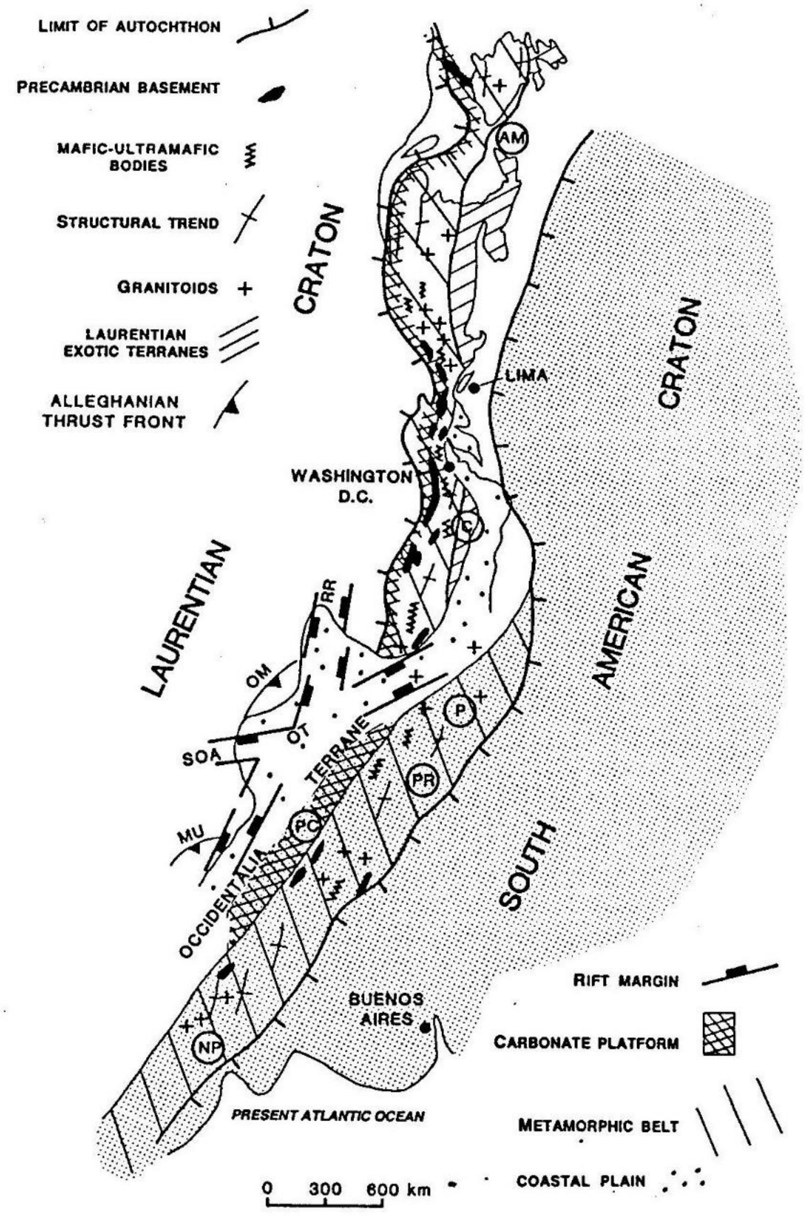


Figure 3. Reconstruction of Taconic-Famatinian orogenic belt as proposed for Middle Ordovician. Laurentia: AM—Avalon-Meguma terrane; C—Carolina terrane; MU—Marathon uplift; OM—Ouachita fold belt; OT—Ouachita trough; RR—Reelfoot rift; SOA—South Oklahoma aulacogen. South America: NP—North Patagonia massif; P—Puna; PC—Precordilleran belt; PR—Pampean Ranges.

Source: Dalla Salda et al, (1992b)

Figure 7-7: The Ordovician of the Central Andes (Cunningham et al., 1994b)

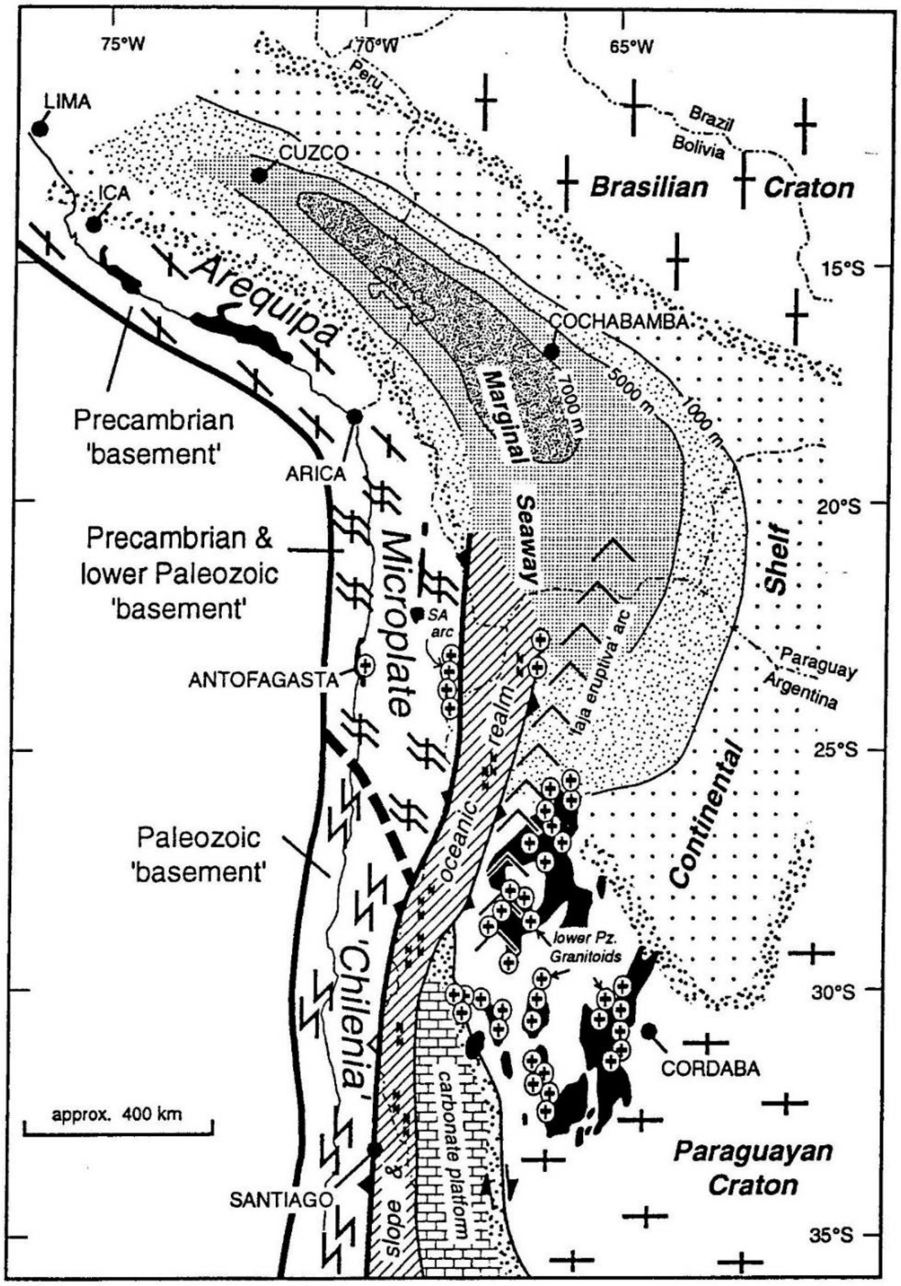


Fig. 1. Tectonostratigraphic map of the Central Andes. Modified from Delmarac et al. [1980], Martinez [1980], Dalziel and Forsythe [1985], Coira et al. [1982], and Ramos et al. [1986]. Contours indicate approximated thicknesses of Ordovician strata, and blackened areas are the principal outcrop areas of Precambrian and lower Paleozoic metamorphic basement rocks. Small pluses and inverted v symbols are lower to middle Paleozoic calcalkaline magmatic suites. Study area is the "SA arc" just to the east of Antofagasta.

Source: Forsythe et al, (1993)

7.2.2 Tacsarian Cycle (Upper Cambrian to Ordovician)

During the Upper Cambrian to Caradoc Tacsarian Cycle a broad marine back-arc rift basin existed in Bolivia-Peru with its axis in the Eastern Cordillera. There was oceanic spreading in the southern part of the basin (Figure 7-6), the Puna Straits in NW Argentina, preserved as ophiolites, with intrusions of basic dikes and sills further north in the Bolivian basin. A possible magmatic arc on the Arequipa Terrane to the west of the basin, represented by calc-alkaline plutonic and volcanic rocks dated at 487-429 Ma (Mpodozis & Ramos, 1989), separated the back arc basin from a forearc. The Arequipa microplate swung about a hinge to the NW to form the Puna Straits and Bolivia-Peru back arc basin, as a Gulf of California-type basin (Sempere, 1991) or Japan-type basin (Forsythe et al., 1993). This was bordered to the east by another subduction-related magmatic arc in western Argentina, the Puna arc, and its southward continuation, the Sierras Pampeanas magmatic arc, represented by a granitoid belt (Mpodozis & Ramos, 1989). The Ocloyic Orogeny closed the Puna Straits Ocean basin during the Llanvirn-Caradoc, as evidenced by granitic magmatism.

In SW Bolivia, the sedimentary sequence begins with shallow marine clastic sediments of the basal Tremadoc transgression, which grade upwards into open marine thick graptolitic shales intercalated with subordinate turbidites and slumps of late Cambrian – Llanvirn age. The base of this super sequence outcrops in several localities along the Cochabamba-Chapare Road (central part of the Eastern Cordillera), which were described as part of the Limbo Group and of other Cambrian formations (Castaños & Rodrigo, 1978).

The majority of the sequence consists of thick and monotonous Lower to Middle Ordovician shale beds, with subordinate siltstones and sandstones are part of the Cochabamba Group, which from base to top includes the Capinota, Anzaldo, and San Benito Formations. In the southern part of Tarija, the sequence base includes shallow marine clastic rocks. These grade upward to thick, marine graptolitic shales with subordinate Cambrian turbidites of the Condado, Torohuayco, and Sama Formations (Castaños & Rodrigo, 1978). Farther north, the sequence consists of thick graptolitic and cephalopodic shales: which have localized the main decollement zone during the Neogene, and consequently older rocks are rarely exposed in the Bolivian Andes.

In southern Bolivia the shales were affected by the Ocloyic deformation with development of folding, cleavage and schistosity. The effects of this orogeny diminished to the east and north, and are not identified north of 20°S. In the north and east, the basin developed as a marine foreland basin during deformation which was infilled with the deposition of a thick, monotonous sequence of shallowing upward, shallow marine siliciclastic interbedded sandstone and shale in the Middle to Late Ordovician (Llanvirn - Caradoc) (Sempere, 1990a, b, 1991, 1993).

7.2.3 The Cordilleran Cycle (Late Ordovician to Late Devonian)

During the Late Ordovician to Late Devonian Cordilleran Cycle (Chuquisaca Super sequence), the Bolivia-Peru basin occupied a back-arc setting, then from the late Llandovery formed a marine foreland basin. These basins lay east of the Puna arc on the Arequipa block, which continued south as the Sierra Pampeanas magmatic arc granitoid belt until the Early Carboniferous. These arcs were related to an eastward-dipping subduction regime east of the Precordillera. The cratonic Chilenia Terrane of the Cordillera Frontal collided with the continental margin in the latest Devonian to early Carboniferous, and the collision caused intense deformation in the western Precordillera. (Mpodozis & Ramos, 1989; Ramos et al., 1986; Ramos, 1988; Sempere, 1993).

The Cordilleran cycle began in Bolivia with rapid deepening of the basin as a back-arc with black pyritic-shale deposition (Tokochi Formation) followed by resedimented glacial-marine diamictites sediments in the Ashgill (Cancañiri Formation) with rare thin fossiliferous limestones. These are overlain by thickly bedded, thinning-upward turbidites (Llallagua Formation) and/or dark shales with minor turbidites (Uncía/Kirusillas Formation) from late Llandovery to Ludlow. Deposition in the basin was controlled by active normal faulting. Facies succession was induced by a major glacio-eustatic sea level low (the Ashgillian ice age) which developed between two maximum flooding episodes. The Uncía/Kirusillas Formation was the first of three main shallowing-up megasequences, which began with thick dark shales and ended with sandstone dominated units, of late Llandovery - Lochkovian, Pragian - early Giventian and late Giventian - middle Famennian ages. These were deposited in a large subsiding marine foreland basin covering the Bolivian Andes, Subandean zone and Chaco-Beni plains, reaching as far as the SW edge of the craton where they onlap the Chiquitos Supergroup (Litherland et al., 1986). This interval was a time of onlap towards the northeast and of deposition of major hydrocarbon source rocks in Bolivia. (Sempere, 1990a; b;1991; 1993).

The Cordilleran Cycle is generally considered to have been terminated by the Late Devonian to Early Carboniferous Hercynian Orogeny, which has been defined in Perú where the effects are much more evident. The presence of Hercynian orogenesis in Bolivia has been questioned however, due to Late Triassic U-Pb zircon age dates of 225 Ma (Farrar et al., 1990) for both foliated and weakly foliated facies of the Zongo-Yani granite, and by implication its wide metamorphic aureole, which was assigned an "Eohercynian" age by Bard et al. (1974).

7.2.4 Subandean (Gondwana) Cycle (Upper Paleozoic)

The Upper Paleozoic Gondwana Cycle was characterized by establishment of eastward subduction along the new Pacific margin west of Chilenia (Cordillera Frontal) and development of a broad forearc accretionary prism, which contains blue schists and ocean floor fragments. A magmatic arc lay to the east of the subduction zone. This cycle was terminated by deformation during the lower Triassic Gondwanide orogeny, the effects of which southward. (Mpodozis & Ramos, 1989; Ramos et al., 1986; Ramos, 1988).

In Bolivia, the Upper Paleozoic Subandean Cycle is characterized by the Late Devonian (Late Famennian) - Early Carboniferous (Mississippian) Villamontes Supersequence, deposited in the Subandean zone, Chaco and Titicaca basin, is mainly marine and comprises mudstone, black shale, sandstone, coal, glacial-marine sediments, diamictites and slumps, the stratigraphy of which is conflictive due to rapid facies variations (Sempere, 1993). The Eastern Cordillera was emergent. This was a period of high epeirogenic activity and synsedimentary tectonic instability coeval with the Hercynian deformation in Peru. Sempere (1993) considers the Mississippian sedimentation to have been the culmination of the Silurian - Devonian evolution.

Subsequently the Late Carboniferous (Pennsylvanian) - Early Triassic Cueva Supersequence was developed during a period of low subsidence and subtropical climate. In western Bolivia there was a shallow carbonate platform in the Titicaca Basin (Copacabana Formation) with deposition of white littoral-fluvial-eolian sands and evaporites on the eastern platform in the Subandean zone. The compressional Gondwana (Late Hercynian) deformation in the middle Permian of the Eastern Cordillera of Peru had weak effects in the Eastern Cordillera of Bolivia.

This deformation was accompanied by transgression of the marine carbonate platform to the east. Post-orogenic calc-alkaline magmatism in the Early - Middle Triassic evolved in the late Middle Triassic toward continental tholeiitic compositions, reflecting the extension which initiated the Andean Cycle (Sempere, 1990a; b; 1993; Soler & Sempere, 1993).

7.2.5 The Mesozoic to Cenozoic Andean Cycle: The Serere, Puca and Corcoro Supersequences

The Andes developed during the Mesozoic to Cenozoic Andean Orogenic Cycle. Distension in the Middle to Upper Triassic related to the initial break up of Gondwana marked the start of the Andean Cycle. In the first part of the cycle, from Triassic to mid Cretaceous, an eastward dipping subduction zone existed along the length of the Pacific margin of Peru and Chile with a magmatic arc and back-arc basin, which in some segments had oceanic crust. In Chile, the arc was superimposed on the Late Paleozoic accretionary prism and an eastward younging coastal batholith intruded. (Cobbing, 1985; Dalziel, 1986; Mpodozis & Ramos, 1989).

During the Middle Triassic - Middle Jurassic, the Andean region of Bolivia was part of a stable cratonic regime. An initial rifting process of late Middle Triassic age developed in several areas, and numerous narrow grabens were filled by fluvio-lacustrine red beds and evaporites, accompanied by tholeiitic to transitional basalts (Sempere, 1990a; 1993; Soler & Sempere, 1993). Cessation of rifting in Bolivia was probably a consequence of a regional tectonic reorganization at about 220 Ma, which probably marked the resumption of subduction along the Pacific margin. The subsequent Late Triassic - Middle? Jurassic onlapping sedimentation of fluvial and eolian sands was probably controlled by post-rift thermal subsidence. The environment was of sandy deserts on the craton, akin to the Arabian Shield (Sempere, 1990a; 1993). These deposits of the Serere Supersequence occur in the Eastern Cordillera and Subandean Zone.

Since the Late Jurassic, Bolivia has been part of the Pacific subduction regime. This was marked by a Kimmeridgian rifting event in Bolivia, the “Araucana Phase”, with extrusion of alkaline basalts which initiated the Puna Supersequence (Sempere et al., 1989; Sempere, 1993; Soler & Sempere, 1993). Bolivia was set in a back arc setting to the east of the Pacific margin arc and back-arc basin, with deposition of coarse clastic continental sediments and alkali basalts in the Potosí and Titicaca basins in a distensive regime related to a transtensional continental margin until the Aptian (Sempere et al., 1989).

The Upper Cretaceous and Cenozoic of Perú - Chile was characterized by a subduction-related continental magmatic arc with no back-arc basin. In Peru, the 110 - 60 Ma Coastal Batholith was emplaced into the Jurassic - Early Cretaceous back-arc basin volcanic pile between the Mochica and Incaic 1-fold phases (Pitcher et al., 1985). At the same time in the Central Andes the magmatic arc migrated eastwards. Large parts of the forearc zone and Mesozoic arc were removed during the Cretaceous and Tertiary, either by subduction erosion or by longitudinal strike-slip faults such as the Atacama Fault (Mpodozis & Ramos, 1989).

The mid Cretaceous compressive event inverted the Tarapacá back-arc basin of north Chile (Late Triassic - Early Cretaceous) to form the proto-Domeyko Cordillera fold-thrust belt (Mpodozis & Ramos, 1989). In Bolivia, sedimentation of the Puca Supergroup continued in a distal external foreland basin, with deposition controlled by rifting and eustatic marine transgressions from the NW. The sequence is transgressive with successively younger units covering greater areas and reaching a total thickness of up to 5,600 m in the Sevaruyo area. The strata consist of fine red-bed sediments, evaporites and alkali basalts, with marine red shales in the Aptian and marine carbonates in the Cenomanian, Campanian and Maastrichtian. (Riccardi, 1988; Sempere et al., 1989; Soler & Sempere, 1993). The end of the Puca Supersequence is marked by an important unconformity developed at the end of the Paleocene, followed by deposition of thick red beds in the Altiplano and Eastern Cordillera in an external continental foreland basin during the Eocene and Oligocene (53 - 27 Ma; Sempere 1990a).

The Cenozoic evolution of Bolivia was dominated by considerable horizontal shortening (Sempere, 1990). Cenozoic basins of the Corocoro Supersequence developed in the Cordillera and in the plains in that time are related to the uplift of the Andes. During the Lower Paleocene-Lower Oligocene, a foreland basin formed east of the Andes. A thickening of the crust enabled the accumulation of 2.5 km of red beds in the Altiplano and Eastern Cordillera (Sempere, 1995).

7.2.6 The Andean Orogeny

The first major deformation in the Andean Cycle in Bolivia occurred during the Late Oligocene to Early Miocene (27-19 Ma) when the orogenic front jumped from west of Bolivia to the Eastern Cordillera, and the Bolivian Andes started to develop as a mountain belt. Major crustal shortening by thrusting occurred in the Eastern Cordillera, and deformation of the Subandean Zone also began. Since the Late Oligocene, the Altiplano has functioned as an intermontane foreland basin with deposition of thick continental sediments, with smaller intermontane basins in the Eastern Cordillera.

The external foreland basin moved east to the Subandean - Llanura (Beni-Chaco) Basin. The second major period of thrusting occurred between 11-5 Ma. Thrusting is mainly eastward-verging towards the foreland, with an important west-verging back-thrust belt in the eastern Altiplano and western side of the Eastern Cordillera.

7.2.7 Mesozoic to Cenozoic Magmatism

Extension-related granites were intruded in the Cordillera Real in the Triassic–Jurassic (227-180 Ma) (Everden et al., 1977; McBride, 1977; Grant et al., 1979; Farrar et al., 1990).

Alkaline volcanic activity was initiated in the Late Oligocene (28-21 Ma) in the Western Cordillera and western Altiplano, coincident with the first major period of deformation. At the same time granitoid plutons intruded in the southern part of the Cordillera Real (Illimani, Quimsa Chata, Santa Vera Cruz) with related tin-tungsten-silver-lead-zinc-polymetallic mineralization (28-20 Ma). Similar deposits also developed to the south as far as Potosi, such as Colquiri and Chicote Grande. These deposits are hosted by Paleozoic sediments and related to buried plutons of this age. The main period of magmatism was the Middle Miocene (17-12 Ma) with an eastward "breakout" of magmatism in an unusually broad arc across the Western Cordillera, Altiplano and Eastern Cordillera, generally forming small extrusive (domes) and intrusive (stocks, sills) bodies. Further magmatism occurred across this wide arc during the Late Miocene (10-5 Ma) during the second main period of crustal shortening. This was characterized by stratovolcanoes, ash-flow calderas, and major ignimbrite shields such as Los Frailes and Morococala in the Eastern Cordillera. (Baker, 1981; Baker & Francis, 1978; Evernden et al., 1977; Grant et al., 1979;

McBride et al., 1983; Redwood, 1987; Redwood & Macintyre, 1989; Soler & Jimenez, 1993; Thorpe et al., 1982.)

7.3 Local Geology

The Porco silver-zinc-tin deposit is located 35 km southwest of the Cerro Rico de Potosí deposit on the southeastern edge of the Los Frailes volcanic field. It was the first silver deposit discovered in Bolivia, with exploitation dating to pre-colonial times. The geology has been described by Sugaki et al. (1983), Cunningham et al. (1993, 1994a, b) and Jiménez et al. (1998).

The deposit is hosted by a north-south-elongated caldera that is 5.0 km x 3.0 km and formed at 12.0 ± 0.4 Ma with the eruption of the crystal-rich dacitic Porco Tuff. Well-defined topographic walls of the caldera cut Ordovician phyllites and Cretaceous sandstones. The 12.1 ± 0.4 Ma Apo Porco stock (4,886 masl) occurs on the southern margin of the caldera. Mineralization is associated with the younger 8.6 ± 0.3 Ma Huayna Porco stock (4,528 masl) in the center of the caldera. Radial dykes, alteration and metals are zoned around the stock. To the north, the Porco Tuff is overlain by the ignimbrites of the Los Frailes Formation dated at 6 to 9 Ma.

Mineralization occurs in NNE to NE-trending veins that cut the Porco Tuff about 1 km east of the Huayna Porco stock. The deposit is zoned around the stock with cassiterite proximal to the stock and base metals, mainly sphalerite and galena, further away. The upper parts of the veins are silver-rich with pyrargyrite, acanthite and stephanite. The main structure is the San Antonio vein which strikes N10º - 30ºE and dips between 70º and 85º to the east. It is 300 m in vertical extent and 1.2 m to 2.0 m in width. To the south, the vein branches into the Oriente, Misericordia, and Santos veins, whose lengths vary between 500 m to 1,500 m. The main ore minerals are pyrite, sphalerite, galena, argentiferous galena, native silver, chalcopyrite, and arsenopyrite in a gangue of quartz. Other important structures are the Muestra Grande vein on Huayna Porco Hill, where the grade reached 2,300 g/t Ag (Sugaki et al., 1983), and the Rajo Zúñiga vein, which strikes N30ºE and dips 75º-80ºE. The latter vein, with widths between 1.0 m and 1.5 m, was exploited in a 100 m x 20 m open pit. This altered dacite-hosted vein is accompanied by associated veinlets and disseminations in the wall rock and consists of cassiterite, wolframite, galena, silver sulphosalts, and pyrite.

Figure 7-8: Geological Map of the Porco Caldera (Cunningham et al., 1994b)

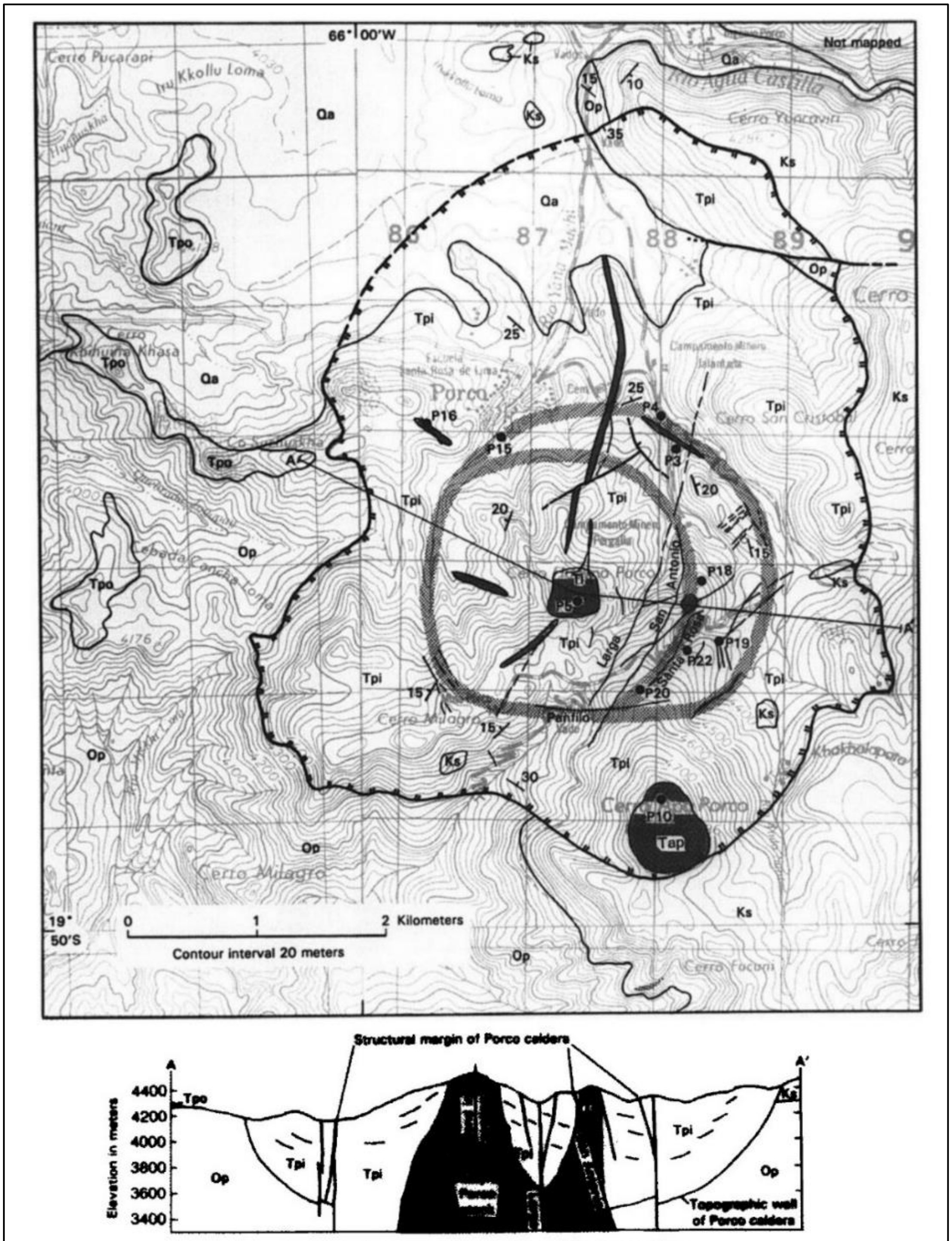


FIG. 3. Geologic map and cross section of the Porco caldera.

Source: Cunningham et al, (1994)

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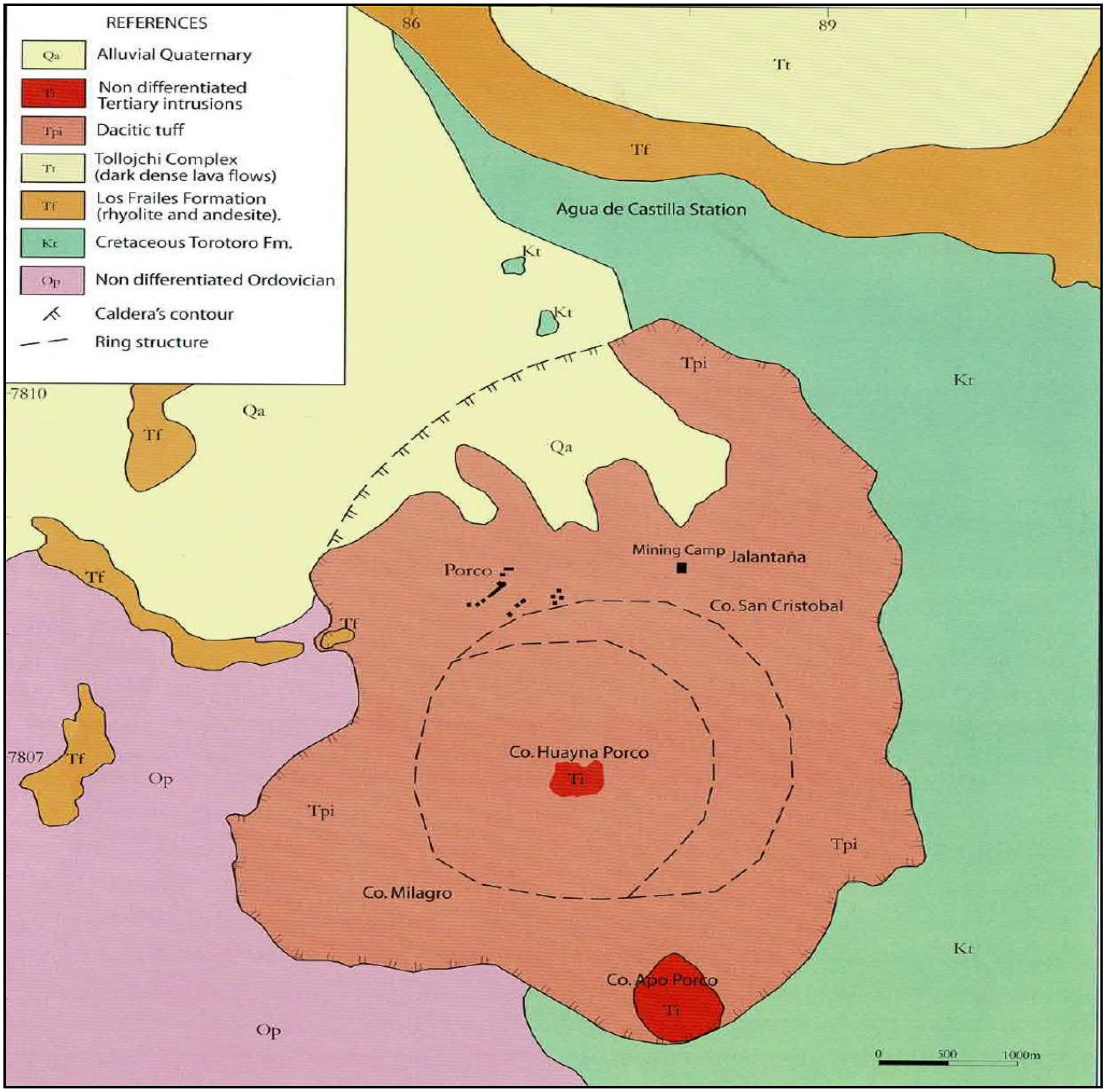
7.4 Property Geology

A definitive reference for the Porco deposit is that of Arce-Burgoa, 2009 which states “the deposit is hosted by a north south trending collapsed caldera that is 5 km by 3.5 km. The caldera is composed of Tertiary nested domes and acidic to dacitic tuffs of the Aqua Dulce and Nesteria formations (Mendieta et al, 1963). In addition, two younger dacitic stocks are exposed in Cerro Huayna Porco and Cerro Apa Porco (Figure 7-7). The sedimentary basement consists of Ordovician phylites that discordantly underlay Cretaceous sandstones (Jiminez et al, 1998).

Figure 7-9: Simplified Geologic Map of the Porco Deposit (modified from Jiminez et al, 1998)



Source: Arce-Burgoa (2009)

Mineralized flows and tufts in the northeast are partially covered by flows of that Tollojchi Complex, which were dated at 10.5 ± 0.3 Ma and 11.5 ± 0.42 Ma (Schneider and Halls, 1985). To the northwest, the tufts and the Paleozoic and Mesozoic rocks are overlain by the ignimbrites of the Los Friales formation which have reported ages of 12.0 ± 0.4 Ma. Sanidine from the Huayna Porco stock shown in Figure 7-7 is dated at 8.6 ± 0.3 Ma.

The igneous complex hosts numerous mineralized structures developed in both the dacites and altered tuffs. The main structure hosts the San Antonio vein which strikes N 10o 230oE and dips between 70o and 85o to the east, it is 300 m in vertical extent, and 1.2 to 2.0 m in width. To the South, the vein branches into the Orient, Misericordia and Santos veins, whose lengths vary between 50 to 1,500 m. The main minerals are pyrite sphalerite, galena, argentiferous galena, native silver, chalcopyrite, and arsenopyrite in a dominant gangue of quartz.

Other important structures in the deposit host the Muesta Grande vein located at Cerro Huayna Porco (Sugaki et al, 1993), and the Rajo Zuniga vein, which strikes N 30o East and dips 75 to 80oE. The latter vein, with widths between 1.0 m and 1.5 m, which was exploited in a 100 m by 20 m open pit. This altered dacite hosted vein is accompanied by associated veinlets and disseminations in the wall rock and consists of cassiderite, wolframite, galena, silver sulfosalts, and pyrite. Fluid inclusion data collected from several zones of the deposit show some important variations with respect to the homogenization temperatures and salinities (Table 7-1), (Sugaki et al, 1981).

Table 7-1: Fluid Inclusion Results

Zone	Homogenization Temperatures (degrees)	Salinities (wt.% NaCl eq.)
Sn-Py	210-360	11.5 - 30.4
Sn-Ag	150-287	10.4 - 20.2
Ag	150-258	2.2 - 8.9

Source: Sugaki et al, (1991)

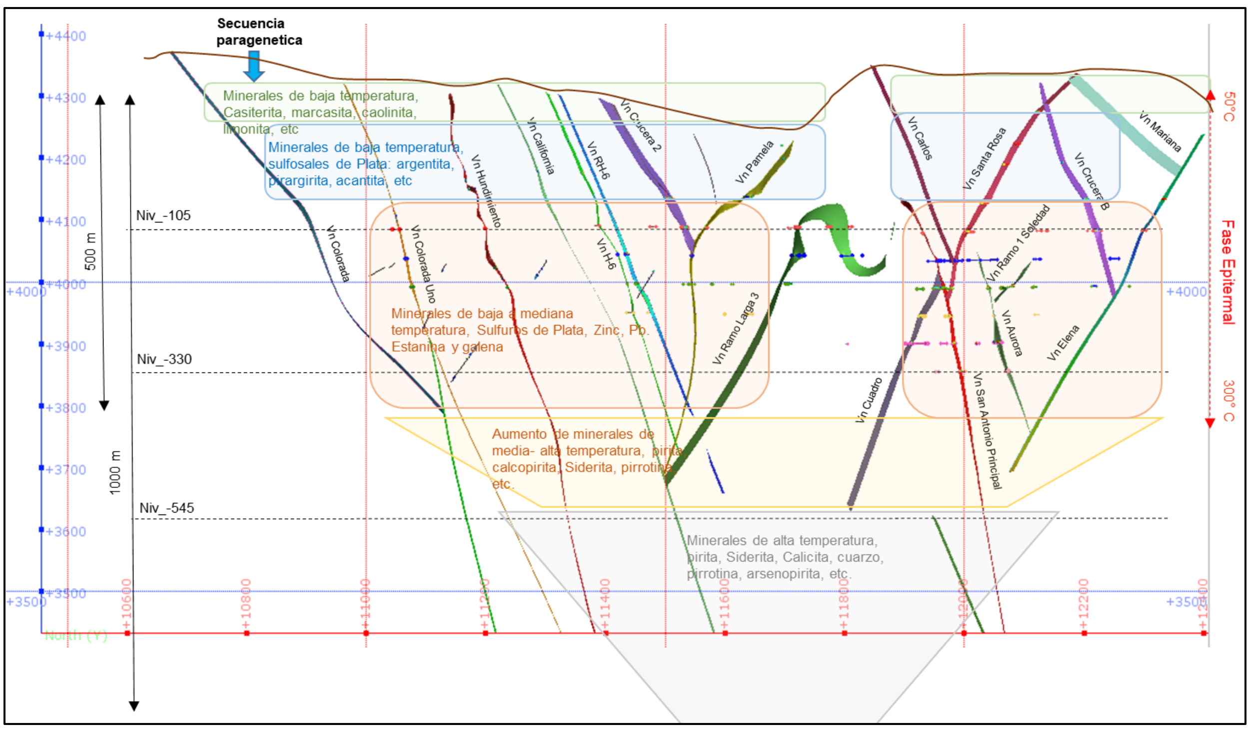
7.5 Mineralization

The characterization of the mineralization at the Porco site as theorized in Figure 7-8 may be summarized as follows:

- Hydrothermal reservoir;
- Epithermal phase, which allows the uptake of base metals (Zn, Pb, Cu) and (Au-Ag) of low sulphidation;
- Vein type;
- Temperature range, 50°C - 300°C;
- Deposit depth, between 50 m-500 m depth from the surface;
- Mineralization can be internally heterogeneous, with low to high-strength sectors and sterile sectors;

- Filled in fractures or zones of weakness;
- Vein systems can be parallel, reticular, convergent and or conjugate;
- Plutonic rocks of intermediate to acidic composition are favorable;
- Epithermal deposits are generally associated with Tertiary volcanism and very few older deposits;
- Alteration is predominantly sericitization, hydration, carbonatization, pyritization and propylitization; and
- The Porco deposit is typical Philonian type deposit, the mineralization to refill the fractures within the superjacent Ordovician slate north of the deposit.

Figure 7-10: Conceptual Model of the Mineralogical Genesis of the Porco Deposit



Source: Glencore (2020)

The mineralized zones or veins are polymetallic, monoclinal banded structures but may also be crustiform or in geodes presenting in rosary form. Thicknesses range from between 0.01 m to 4.0 m but can reach widths of ~10.0 m usually in rameada form interspersed with country rock or mineral gangue.

7.5.1 Veta San Antonio Principal

The San Antonio structure is located in the main corridor striking N 10° - 30°E with dips ranging between 60°-75° and is developed from the Santacruz level to the -330 level.

The mineralogy of the San Antonio Principal vein, located in the central sector of the deposit), consists of sphalerite, pyrite, galena, marcasite, which correspond to the intermediate phase of the mineralization this is changing towards depth enriching in marmatite, pyrite.

7.5.2 Elena Vein

The structure is located in a fault-oriented N 10° - 50°E and dipping between 40°-62° which is developed from the San Cayetano level to the -330 level.

The mineralogy of the vein consists of sphalerite, pyrite, galena, siderite kaolin, which corresponds to the intermediate phase of the mineralization this changing at depth enriching in marmatite and pyrite.

7.5.3 Vein Ramo Elena

The structure is located between the main San Antonio and Elena veins in direction and diving ranging from N 70° - 80°W/50°-75° in vertical longitude is developed from level 105 to level -195.

The mineralogy of the vein consists of marmatite pyrite galena, and they correspond to the late phase of mineralization.

7.5.4 Vein Rosario

The Rosario structure is located between the Elena and Ramo Elena veins-oriented N 10° - 30° W and dipping 55°-65° which developed from level 60 to level -195.

The mineralogy of the vein consists of sphalerite, pyrite, galena, siderite kaolin, which corresponds to the intermediate phase of mineralization.

7.5.5 Vein RH6

The RH6 structure is located at the intersection of the Huayna Porco stock and Apo Porco becoming part of the Pamela, Crucera II, Larga 3, Crucera IV, Crucera Pamela, Ramo Pamela and H-6 vein system. This corridor has high concentrations of silver sulfosalts compared to the rest of the corridors.

All the structures that are contained in this vein system-oriented N 10°W - N 40°E and dipping 60°SW- 70°SE which has been developed from the Huayna Porco level to the -240 level.

The mineralogy of the vein consists of sphalerite, marmatite, pyrite, galena, sulfosalts, siderite, and that correspond to the intermediate phase of the mineralization.

7.5.6 Veta Colorada Uno

The Veta Colorada Uno is located along a corridor north of the Huayna Porco stock that emerges from the main Hundimiento vein, with an orientation of N 5°E.

Located in Tertiary age dacitic rocks the vein has approximate length of 500 m in length with thicknesses that average 2 m and occur in the form of massive veins.

The mineralogical content consists of ~70% sphalerite, ~10% pyrite, ~10% galena and ~10% marmatite. However, at deeper levels the percentages are reversed reducing to 45% sphalerite and 5% galena, with the marmatite and pyrite proportionally increases at depth.

7.5.7 Veta Hundimiento

The Hundimiento zone corridor intersects the Huayna Porco stock at an orientation of N 15°E.

It is hosted in Tertiary age dacitic rocks extending ~1,000 m in length with average widths of 3 m in the form of massive veins.

The mineralogical content consists of ~30% sphalerite, ~50% pyrite, ~10% galena, ~5% marmatite and ~5% siderite. However, the percentages are decrease at depth to ~25% sphalerite and ~2% galena; while pyrite proportionally increases at depth but marmatite and siderite remain at depth.

7.5.8 Vein California

Veta California is located in the Hundimiento zone corridor where it intersects the Huayna Porco stock parallel to the Hundimiento vein at an orientation of N 15-20° E.

Veta California is hosted in Tertiary age dacitic rocks extending approximately 1,000 m with average widths of 1.5 m in the form of gaped veins.

The mineralogical content consists of ~60% sphalerite, ~10% pyrite, ~5% galena and ~25% marmatite. However, as the vein deepens the percentages decrease to ~45% sphalerite and ~20% marmatite; while pyrite increases proportionally, and siderite begins to appear.

8 DEPOSIT TYPES

The most important ore deposits of the Eastern Cordillera are polymetallic hydrothermal deposits mined principally for Sn, W, Ag and Zn, with sub-product Pb, Cu, Bi, Au and Sb. They are related to stocks, domes and volcanic rocks of Middle and Late Miocene age (22 to 4 Ma). Mineralization occurs in veins, fracture swarms, disseminations and breccias. The deposits of the Eastern Cordillera are epithermal vein and disseminated systems of Au, Ag, Pb, Sb, as that have been telescoped on to higher temperature mesothermal Sn-W veins and, in some cases, porphyry Sn deposits. The “telescoping” is a characteristic of these deposits and is the product of the collapse of a hydrothermal system, whereby younger lower temperature fluids overprint the alteration and mineralization developed by older higher temperature fluids. The systems show a fluid evolution from a high temperature, low sulfidation state to intermediate sulfidation epithermal and high sulfidation epithermal.

A typical example is the Cerro Rico where high temperature veins at depth, with a low sulfidation assemblage of cassiterite, wolframite, pyrite, arsenopyrite, bismuthinite and minor pyrrhotite (the main tin-tungsten ore stage), are overprinted at higher levels by an intermediate sulfidation epithermal assemblage of Ag-Pb-Sb sulfosalts (the main silver ore stage), with disseminated high sulfidation epithermal silver mineralization in the upper part of the system (a major silver resource).

These polymetallic deposits have been described as Bolivian Polymetallic Vein Deposits by the U.S. Geological Survey with the following characteristics (Ludington et al., 1992; Redwood, 1993; Sillitoe et al., 1975):

1. **Lithological Control**. Paleozoic, Mesozoic and Cenozoic sedimentary rocks and metasediments;

2. **Structural Control**. Hinge zones of regional anticlines;

3. **Subvolcanic Intrusions**. Spatially and genetically related to stocks and volcanic rocks with 60-70 % SiO_2, clusters of dikes and/or porphyritic domes of rhyolite, dacite, rhyodacite, or quartz latitite composition with alkaline tendencies. The mineralization can occur within the stocks and domes, in volcanic rocks (e.g., Porco, Caballo Blanco), or in sedimentary rocks distal to stocks (e.g., Bolivar) or inferred to be related to buried stocks (e.g., Huanuni);

4. **Style of Mineralization**. Disseminated, parallel veins, veinlets, fracture swarms, breccias;

5. **Ore Minerals**. Pyrite, marcasite, pyrrhotite, sphalerite, galena, cassiterite, arsenopyrite, chalcopyrite, stibnite, stannite, teallite, tetrahedrite, tennantite, wolframite, bismuth, bismuthinite, argentite, gold, and Ag-Sb-sulphosalts (freibergite, andorite), Pb-Sb-sulfosalts (zinkenite, boulangerite, jamesonite), Pb-Sn-Sb-sulfosalts (franckeite, cylindrite), and Bi sulfosalts. Telescoping of intermediate sulphidation epithermal mineralization of Au, Ag, Pb, Sb, As, etc. on to higher temperature mesothermal, low sulphidation Sn-W mineralization is characteristic;

6. **Gangue Minerals**. Quartz, barite, and Mn carbonate. There is a transition upward from massive sulfides, to quartz, quartz-barite, and barite-chalcedony towards the upper parts of the deposits; and

7. **Hydrothermal Alteration**. Sericitic (sericite-quartz-pyrite) often with tourmaline in the central part and zoned outward to argillic and propylitic alteration. The upper zones have advanced argillic lithocaps with alunite, residual vuggy silica and silicification. Breccias are common.

The Porco deposit is considered a “Bolivian-type” polymetallic deposit (Figure 8-1) which has the primary reference and quoted as described in Arce-Burgao (2009) and Heuschmidt (2000). The Bolivian vein deposits can be identified into three subgroups:

1. Deposits associated with tin porphyries;

2. Deposits associated with volcanic domes and sub volcanic stocks; and

3. Deposits associated with sedimentary rocks. This classification is based mainly on host rock lithology.

One of the most common types of mineralization in the country, the Bolivar-type is the product of widespread hydrothermal activity between 22 Ma and 4 Ma. The deposits are characterized by a polymetallic signature which is usually telescoped coexistence of low and high temperature minerals and are spatially related to epi-zonal and meso-zonal intrusions. Early stages of mineralization are high temperature, high salinity, and high pressure, indicative of great formations depths. Several overlapping stages of lower temperature events, due to later igneous events and supergene process during evolution of the Andes, occurred between 11 and 4 Ma. Several of these deposits are classified as giant, such as Sierra Rico de Potosi and Llallagua or “world class” such as Oruro and Huanumi.

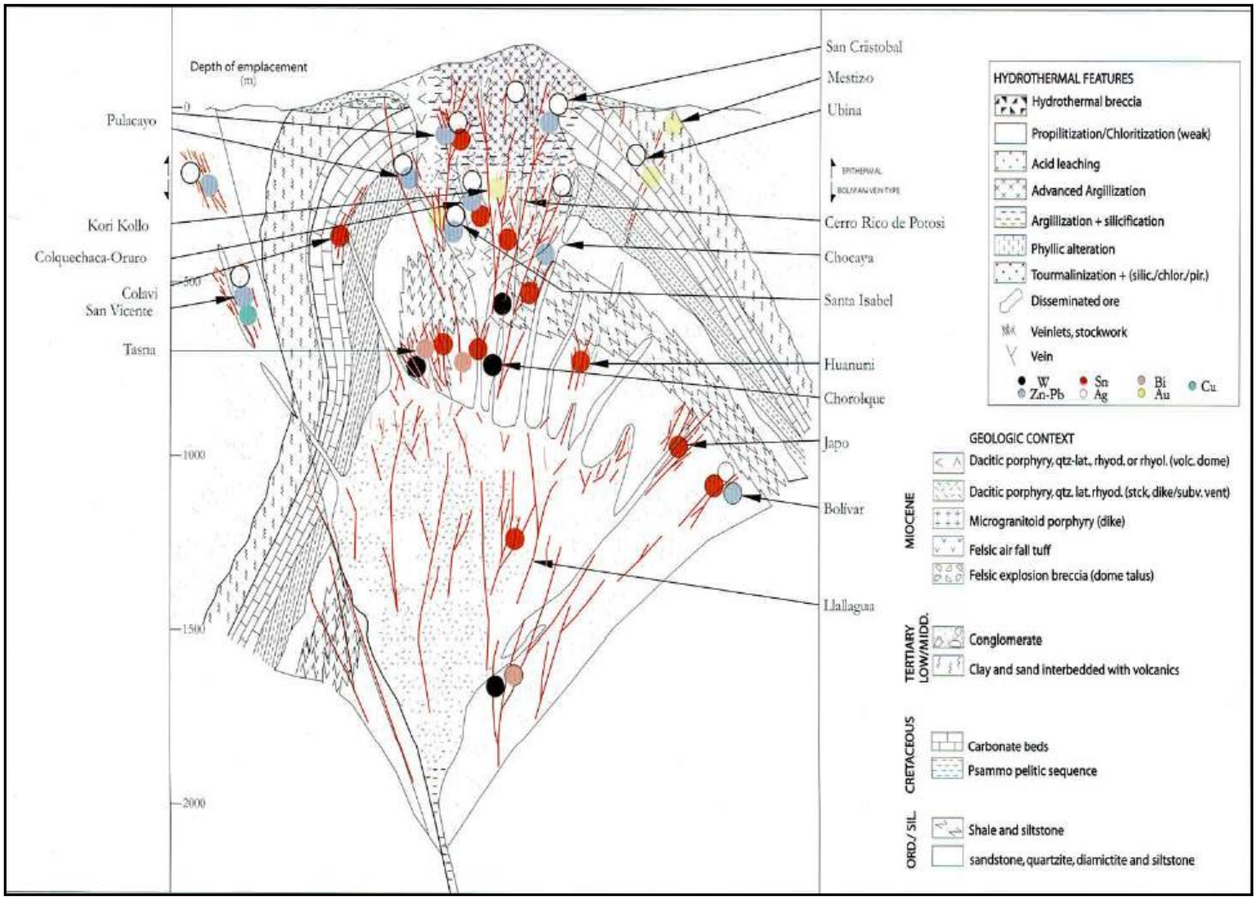
On a district scale, deposits from the different subgroups may sometimes be spatially and or genetically associated. The style of mineralization includes groups of veins, subsidiary vane swarms, veinlets, stockwork, and dissemination mineralization. The veins are hosted in a variety of host rocks that include Paleozoic sedimentary and metasedimentary rocks, meso-zonal and epi-zonal stocks, and syn-kinematic flows, dikes and volcanic domes that are generally of rhyolitic, dacitic, and acidic compositions. In general, the deposits have similar origins although they differ with respect to metal signatures and/or fluid geochemistry.

The main metallic minerals, although not necessarily present in every deposit, are cassiterite, sphalerite, galena, pyrite, pyrrhotite, arsenopyrite, chalcopyrite, stibnite, stannite, tetrahedrite, wolframite, native bismuth, bismuthinite, argentite, native gold, and complex sulphosalts such as teallite, franckeite, and cylindiite. The main economically exploitable minerals are tin and silver, with less important tungsten, bismuth, an antimony.

The temperatures of homogenization and the salinities obtained from fluid inclusions in quartz and in sphalerite, and less commonly in cassiderite and barite, average 300 degrees C and 20% weight equivalent NaCl, respectively. Turneaure (1970), identified an early boiling during mineral deposition examining fluid inclusions, which was confirmed by later studies that showed boiling occurred intermittently during all stages of mineral deposition (Arce Burgoa and Nambu 1989).

The Porco zinc-tin deposit is located 50 km southwest of Potosi City in Antonio, Quijarro Province.

Figure 8-1: Conceptual Model of Bolivian Polymetallic Vein Type Deposits (modif. From Heuschmidt, 2000)



Source: Heuschmidt (2000)

9 EXPLORATION

No exploration has been carried out on behalf of Santacruz.

10 DRILLING

10.1 Drilling Summary

The Porco Mine is an “advanced property” and is a well-established, active mining operation. Glencore and subsequently Santacruz Silver has performed exploration and resource expansion drilling of 203 surface and underground drillholes at the Porco project since 2000 totalling 55,804.3 m.

As of January 2023, Santacruz had drilled 26 holes for a total of 5,163 m at the Porco Mine since the acquisition from Glencore. Table 10-1 and Table 10-2 summarizes the historical drilling at Porco, respectively. Note that the Santacruz drilling is highlighted in **blue**.

Table 10-1: Porco Drilling Programs in 2000 through 2022

Phase	Year	Hole ID	Type	Total (m)	Core Size	Target	Total Program Budget ($US)
I	2000	DDHP01 - DDHP09	Surface	2,656	HQ/NQ	vn: California, Hundimiento	252,320
II	2001	DDHP10 - DDHP11	Surface	632	HQ/NQ	vn: Hundimiento, California	60,040
III	2005-2006	DDHP12 - DDHP54	Surface / UG	16241	HQ/NQ	vn: Hundimiento, California, Colorada Uno, San Antonio, Larga,	1,818,953
IV	2007	DDHP55 - DDHP64	Surface	3,799.6	HQ/NQ	vn: Hundimiento	425,555
V	2008	DDHP65 - DDHP71	Surface	2,414.2	HQ/NQ	vn: California, Hundimiento	270,390
VI	2009	DDHP72 - DDHP79	Surface / UG	2,546.1	HQ/NQ	vn: Hundimiento, Elena, Monica	285,163
VII	2010	DDH_POR_CB_80s - DDH_POR_CB_85s	Surface	2,035.35	HQ/NQ	vn: Crucera B, Ramo 1 Soledad	227,959
VIII	2011	DDH_POR_CB_86s DDH_POR_PA_87s - DDH_POR_PA_94s	Surface	2,799.55	HQ/NQ	vn: Crucera B, Pamela, H5	330,347

Phase	Year	Hole ID	Type	Total (m)	Core Size	Target	Total Program Budget ($US)
IX	2014	DDH_PO_CU_95i - DDH_PO_CU_99i ; DDH_PO_H_100i - DDH_PO_H_104s	Surface / UG	2,428	HQ/NQ	vn: Colorada Uno, Hundimiento	316,126
X	2015	DDH_PO_H_105s - DDH_PO_H_106s	Surface	595	HQ/NQ	vn: Hundimiento	72,977
XI	2017	DDH_PO_CF_107i - DDH_PO_CF_112i; DDH_PO_C2_113i - DDH_PO_C2_116i; DDH_PO_AU_117i - DDH_PO_AU_121i; DDH_PO_H_122i - DDH_PO_H_123i	UG	2,762	HQ/NQ	vn: California, Colorada, Aurora, hundimiento	344,845
XII	2018	DDH_PO_CU_1124i - DDH_PO_CU_131i	UG	1,645	HQ/NQ	vn: Colorada uno, California	201,719
XIII	2019	DDH_PO_CU_132i - DDH_PO_CU_147i; DDH_PO_H_133i - DDH_PO_H_142i; DDH_PO_CF_141Ai - DDH_PO_CF_152i	UG	3,407	HQ/NQ	vn: Colorado uno, Hundimiento, California	473,744
XIV	2020	DDH_PO_CU_153i - DDH_PO_CU_187i; DDH_PO_H_154i - DDH_PO_H_172i; DDH_PO_CF_161i - DDH_PO_CF_182i; DDH_PO_R1S_166i - DDH_PO_R1S_173i; DDH_PO_SAP_174i - DDH_PO_SAP_179i	UG	6,781	HQ/NQ	vn: Colorada Uno, Hundimiento, California, Ramo 1 Soledad, San Antonio Principal.	827,713
XV	2022	DD_PO_OR_188i - DDH_PO_OR_189i; DDH_PO_CAR_190i - DDH_PO_CAR_194i; DDH_PO_H_192i - DDH_PO_H_213i; DDH_PO_CE_197i - DDH_PO_CE_198i; DDH_PO_C2_200i - DDH_PO_C2_212i; DDH_PO_EL_201i - DDH_PO_EL_205i; DDH_PO_RCA_203i - DDH_PO_RCA_204i	UG	5,163	HQ/NQ	vn: Oriente, Carla, Hundimiento, Cecilia, Colorada, Elena, Ramo Camila	664,189

The drilling has been primarily focused upon the extension of the veins to depth particularly for definition and delineation of inferred resources. Figure 10-1 shows a plan view of drillhole locations along with the underground channel sample data. Figure 10-2 through Figure 10-4 shows representative section views of the drilling along with channel sample data and topography for the Porco mine.

Drilling methods and procedures including drilling, sampling, chain-of-custody, security and measurements such as downhole surveying and recoveries, are consistent for Bolivar, Caballo Balance and Porco.

Figure 10-1: Plan View of Drillhole Locations at Porco

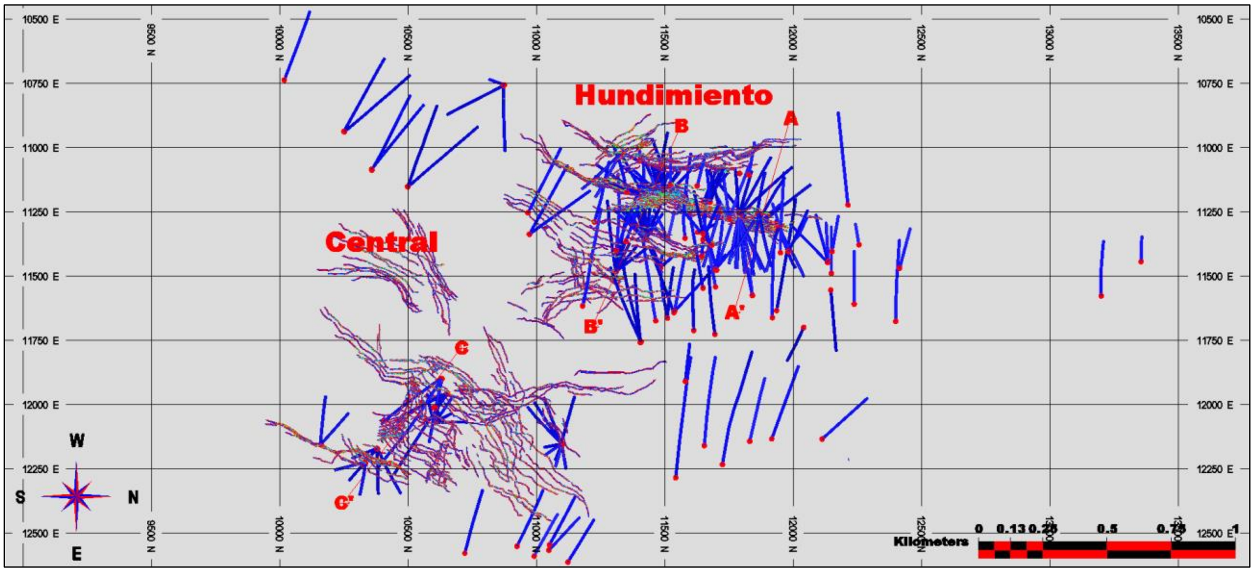


Figure 10-2: Section View A-A' (azimuth 16°)

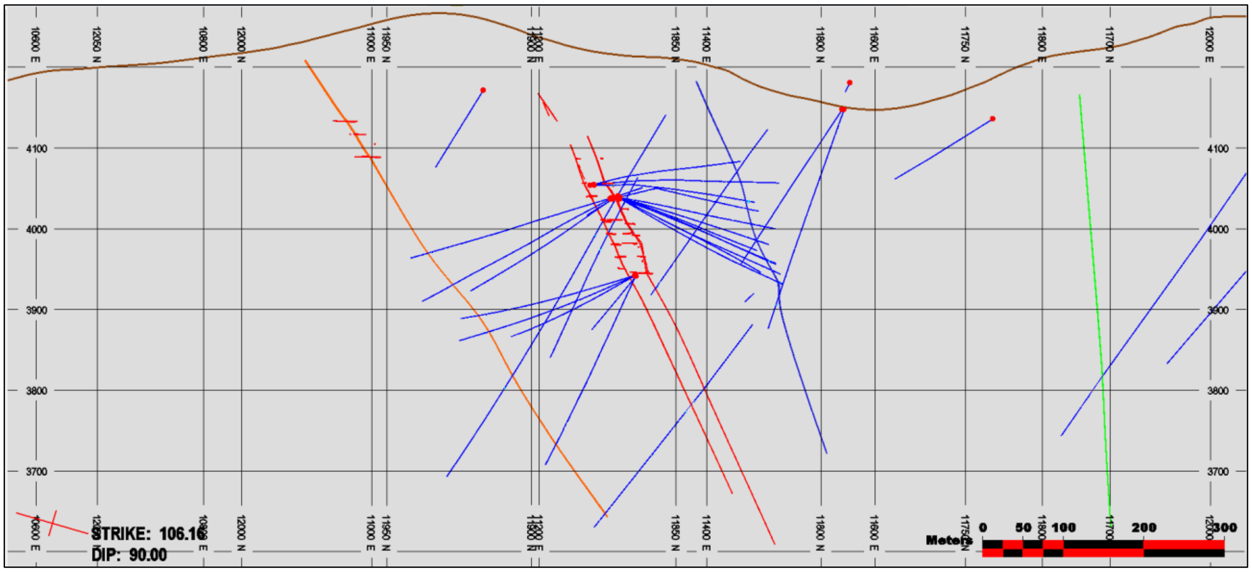


Figure 10-3: Section View B-B' (azimuth 113°)

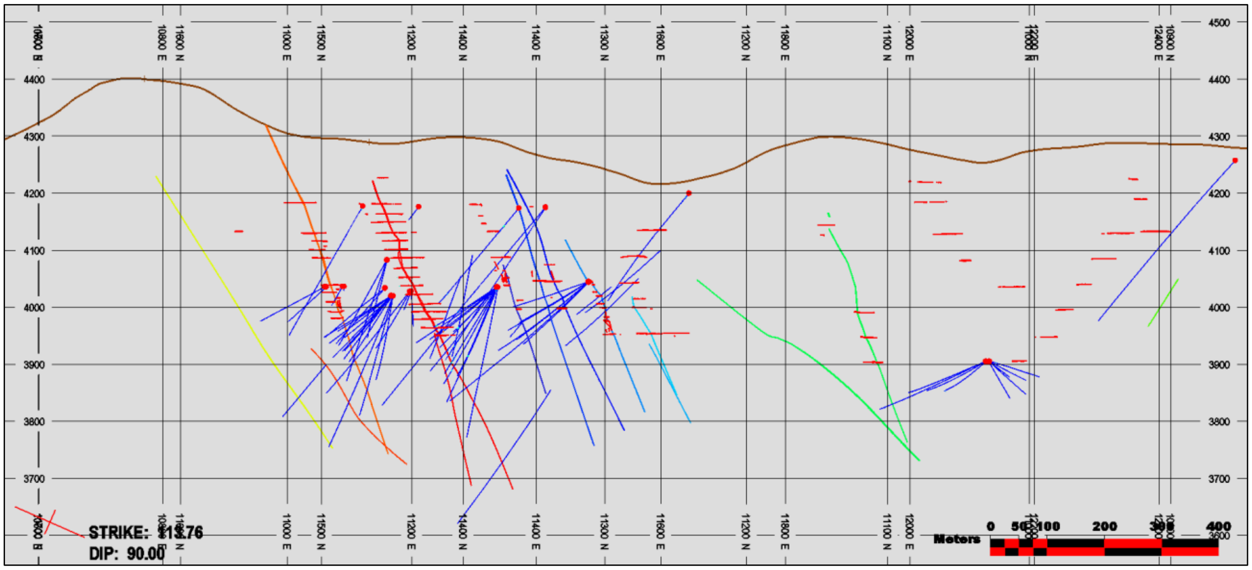
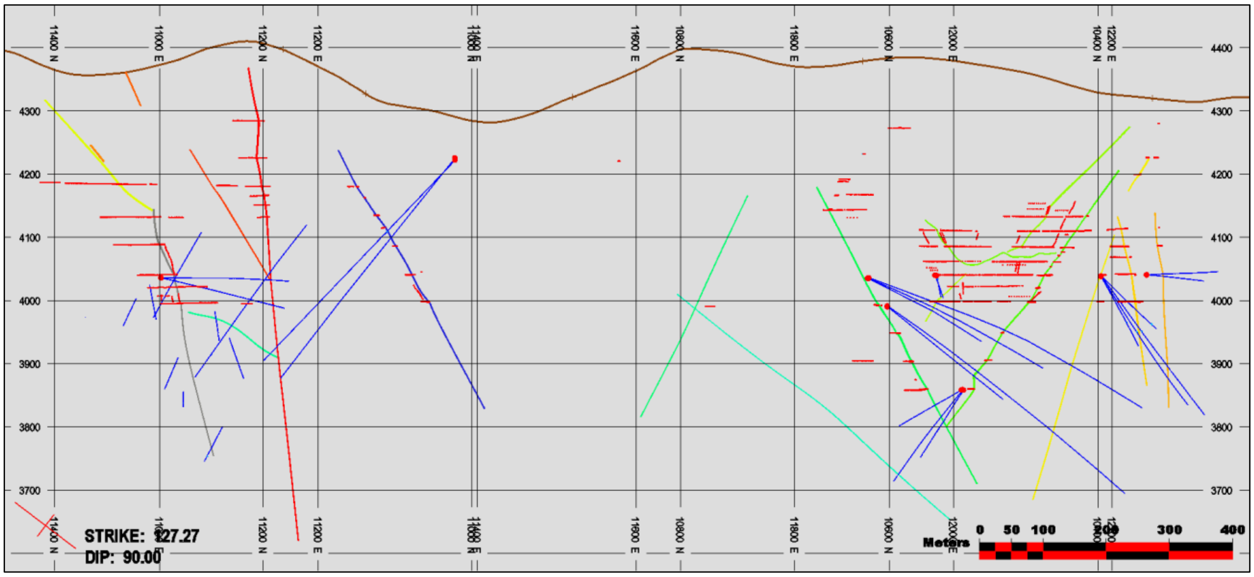


Figure 10-4: Section View C-C' (azimuth 127°)



10.2 Drilling Programs

Drills were operated by Maldonado Exploraciones of La Paz, Bolivia, Xplomine of Lima, Peru and Geodrill S.A. of La Serena, Chile. The surface and underground drilling was performed by drilling larger diameter HQ core at the early stage of the hole and reduced to NQ size if drilling conditions became difficult.

Drillhole collar surveys were completed using a differential GPS (UTM WGS-84) and the collars of the underground holes are surveyed in using total station by company survey staff. Downhole surveys were derived using either Tropary, Flexit or Reflex depending on the year and the drilling contractor.

The details for the surface and underground drilling program for the Porco Mine from 2010 to 2023 are summarized in Table 10-2.

Table 10-2: Porco Drilling Details from 2000 through January 2023

Contractor / Company	Phase	Year	# Holes	Meters drilled	Downhole Survey Instrument Used
Surface					
Maldonado Exploraciones	I	2000	7	2556	Trópary
Maldonado Exploraciones	II	2001	2	632	Trópary
Maldonado Exploraciones	III	2005-2006	25	12321.6	Trópary
Geodrill	IV	2007	10	3799.6	Flexit
Geodrill	V	2008	7	2414.2	Flexit
Geodrill	VI	2009	3	730	Flexit
Geodrill	VII	2010	6	2035.35	Flexit
Xplomine	VIII	2011	9	2799.55	Flexit
Maldonado Exploraciones	IX	2014	2	631	Reflex
Maldonado Exploraciones	X	2015	2	595	Reflex
Underground					
Maldonado Exploraciones	III	2005-2006	10	3919	Trópary
Geodrill	VI	2009	5	1816	Flexit
Maldonado Exploraciones	IX	2014	8	1797	Reflex
Maldonado Exploraciones	XI	2017	17	2762	Reflex
Maldonado Exploraciones	XII	2018	8	1645	Reflex
Maldonado Exploraciones	XIII	2019	21	3407	Reflex
Maldonado Exploraciones	XIV	2020	35	6781	Reflex
Maldonado Exploraciones	XV	2022	26	5163	Reflex

Prior to 2010, downhole survey measurements were taken every 50 m however since then, based on recommendations, the frequency was increased every 25 m. Downhole survey results were corrected for magnetic declination however in instances where pyrrhotite is encountered, this may occasionally cause downhole survey anomalies that require mitigation. These are identified by the geologist during the survey measurement process and corrected by taking another survey measurement above or below the point giving the faulty readings.

Prior to commencement of drilling, the exploration geology supervisor set out the number of runs needed to reach total depth using steel bars and the blocks to be inserted by the driller into the core boxes at the appropriate depth delineated using permanent marker. Unless issues are encountered, the standard drill run length is 3 m. Then the exploration geology supervisor verifies this process by counting the number of steel bars introduced in the hole against the remaining steel bars left to complete total length of hole. Completed core is placed in wooden core boxes which are covered by wooden lids and secured with metal nails prior to being transported by mine staff from drill site to core logging facility.

For underground drillholes, orientations are marked before drill enters to drill site area, with the locations being measured using total station. The orientation of the drillhole is painted on both walls of the drift by the exploration geologist to insure correct alignment and positioning of the drill. Once the equipment mobilized and installed, the drill is leveled, and the direction is set. Finally, the dip is checked with a clinometer or compass.

Core recoveries were high, and by utilizing several drill core sizes, Glencore and Santacruz were able to ensure drillhole target completion. The majority of drillholes were drilled perpendicular to the strike and dip of the veining and therefore significantly represent true thickness of the veining.

There are no known drilling or core recovery factors that could materially impact the accuracy of these results.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Drillhole and Sub-Surface Sampling and Security

As reported in Section 10 Drilling, the surface and sub-surface diamond drilling was performed primarily by Maldonado Exploraciones, Xplomine and GeoDrill S.A. from 2000-2023. The surface diamond drilling is utilized primarily for resource expansion and delineation identify extensions of structures and specifically to define inferred resources. However, the sub-surface drift and slope development sampling is the primary and significant data source for defining and estimating resources which is performed by Santacruz geological staff.

Sampling methods and procedures are consistent including drill core handling, sample collection, chain-of-custody and security in addition to assay preparation, assay analysis and QA/QC procedures are consistent for Bolivar, Caballo Balance and Porco.

The secure, sealed core and channel samples are delivered by Santacruz mine staff for analysis to the ISO Certified (NB/ISO/IEC 17025: 2018) Don Diego assay laboratory which is located within the Don Diego mill and processing complex. The Don Diego Complex including the assay laboratory is owned and operated by the Issuer, Santacruz Silver. All samples undergo both assay preparation and assaying at the Don Diego laboratory which also employs industry accepted QA/QC programs.

All analytical results are entered and reside upon the centralized database called LIMS Laboratory Information Management System which is the responsibility and under the supervision of the Don Deigo laboratory staff. The assay information is provided to geological staff via live, non read-write access for import into the industry recognised geological modelling and estimation software systems such as LeapFrog™ and Datamine™.

Sample rejects and remaining half-core is stored in a secure location and labelled for access and retrieval. These facilities are fully controlled by perimeter fencing and security on the property.

11.1.1 Drill Core Logging, Photography, Sampling and Security

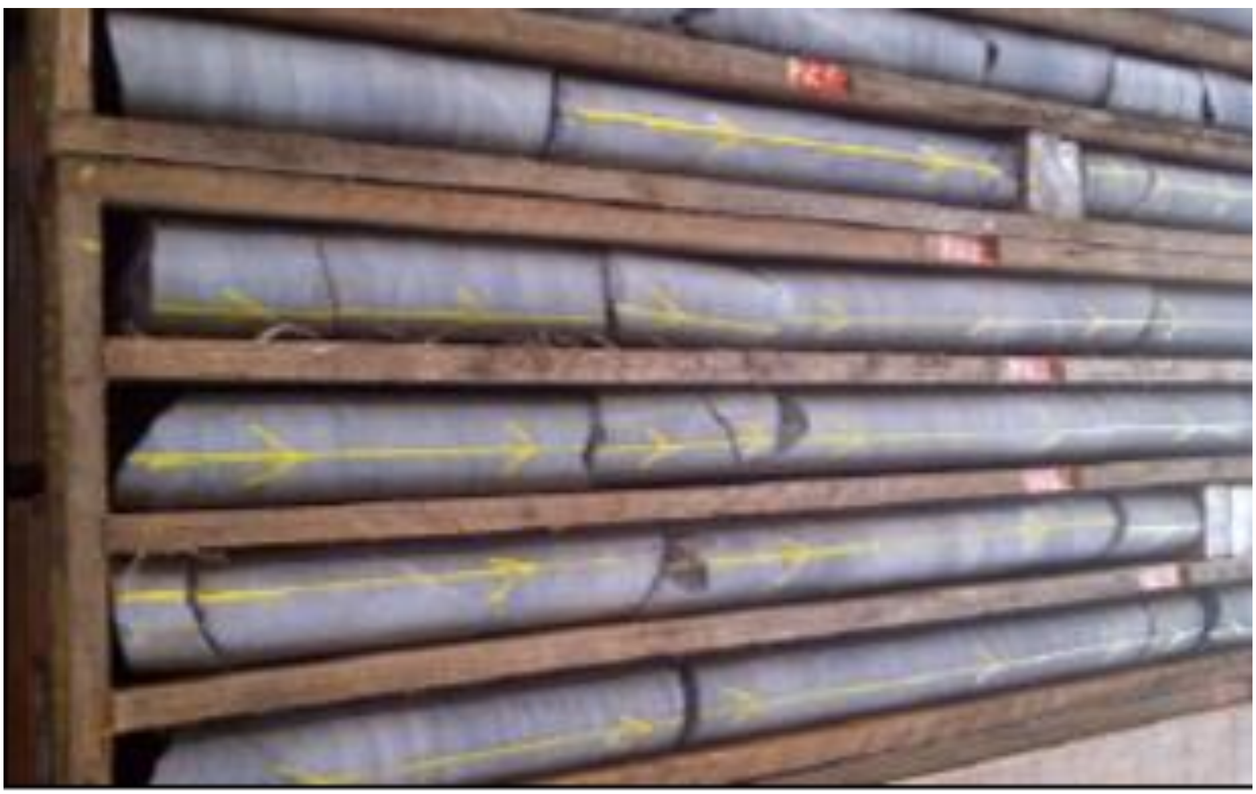
Drill core from surface and underground was stored in wooden labelled boxes, from the drill and transported from the drill to the core logging facility. Before core splitting and logging commences, drill core is systematically photographed using tripod-mounted camera in high resolution and digitally archived for reference as part of the drill and sample database.

Logging and sampling were undertaken on site by company personnel under a QA/QC protocol developed by Glencore. Technicians first prepared the core boxes by reviewing drillhole depth tags, re-assembling broken sections, and mis-placed or mis-aligned core. Core is then washed and cleaned, then marked every meter using permanent marker. Core logging is performed to identify lithology, alteration, RQD, structure, mineralization and sampling selection for core sawing was completed by technicians under the direction of the geologist.

A digital photographic record was performed on each core box, with each photo containing two to a maximum of three boxes. These photos are taken with natural light and each box are marked with their general description, such as project, sample name, box number, and start and end depths.

The exploration geologist is responsible for marking core interval depending on interest structure in mineralization zones, from one to two meters. The typical sample lengths are 1.0 to 1.5 m with a minimum sample width of 1m and maximum lengths of approximately 2.0 m; sample lengths were based on the lithology and alteration. The geologist also marks the saw line along the core, with each side containing roughly an equivalent amount of mineralization, and also marks the start and end of each sample interval as shown in Figure 11-1. The technician records the core intervals entering then into an Excel™ spreadsheet.

Figure 11-1: Example of Core Marked for Splitting



Technicians secure the sample boxes while they are transported to the dedicated enclosure for cutting. Samples cutting is performed by trained, specialized personnel equipped with appropriate personal protective equipment (PPE) operating a Target Portasaw™ brand diamond disc cutting machine as shown in Figure 11-2. This type of cutting machine is used because it allows the operator to safely split the core longitudinally with precision. It is also possible to make perpendicular cuts and to cut segments greater than 45 centimeter (cm) can be split.

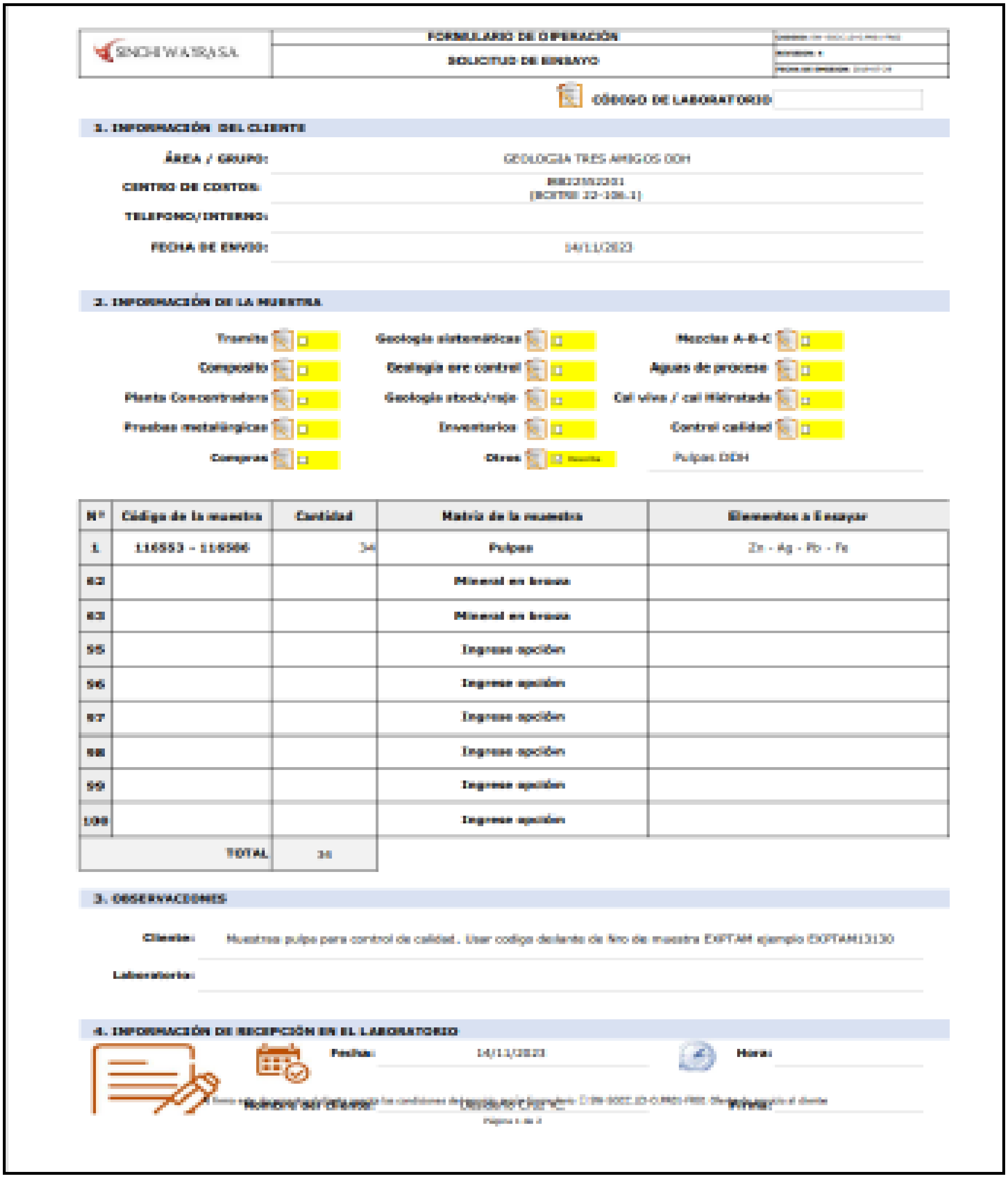
Figure 11-2: Core Splitting Facilities

Once the core is cut, half of the drill core is inserted into sample bags along with a sample ticket, tied with plastic straps and then placed in consecutive order according to sequential coding. Then, seven to ten samples are placed in rice bags, based on weight and not exceeding 25 kg. Then the rice sacks are grouped into batches and order maintaining as shown Figure 11-3.

Figure 11-3: Samples Prepared for Analysis Transport

The samples are then delivered to the laboratory through an analysis request form which lists the required elements for reporting. The form also includes details about the quantity of samples sent, how many sacks they are transported in, and indicate if they are special samples as shown in Figure 11-4.

Figure 11-4: Sample Submission Form



SINCHI WAYRA S.A.

FORMULARIO DE OPERACIÓN

SOLICITUD DE ENSAYO

CÓDIGO DE LABORATORIO

1. INFORMACIÓN DEL CLIENTE

ÁREA / GRUPO: GEOLOGIA TRES AMIGOS DDH

CENTRO DE COSTOS: [illegible] (BCRTRE 22-108.1)

TELEFONO/INTERNO:

FECHA DE ENVIO: 14/11/2023

2. INFORMACIÓN DE LA MUESTRA

Tramite | Geologia sistemáticas | Mezclas A-B-C
Composito | Geologia ore control | Aguas de proceso
Planta Concentradora | Geologia stock/rajo | Cal viva / cal hidratada
Pruebas metalúrgicas | Inventarios | Control calidad
Compras | Otros: Muestra | Pulpas DDH

N°	Código de la muestra	Cantidad	Matriz de la muestra	Elementos a Ensayar
1	116553 - 116586	34	Pulpas	Zn - Ag - Pb - Fe
92			Mineral en bruto	
93			Mineral en bruto	
95			Ingrese opción	
96			Ingrese opción	
97			Ingrese opción	
98			Ingrese opción	
99			Ingrese opción	
100			Ingrese opción	
	TOTAL	34		

3. OBSERVACIONES

Cliente: Muestras pulpa para control de calidad. Usar codigo delante de Nro de muestra EXPTAM ejemplo EXPTAM13130

Laboratorio:

4. INFORMACIÓN DE RECEPCIÓN EN EL LABORATORIO

Fecha: 14/11/2023 Hora:

Nombre del cliente: Dandero Cruz C. Firma:

Página 1 de 1

All core boxes that have completed the entire logging and sampling process are stored in the logging area sequentially. They are then transported to the permanent secured core storage facilities and then stored on covered metal shelves as shown in Figure 11-5. Each core box is labelled and coded for easy identification and access.

Figure 11-5: Drill Core Storage Facilities

11.1.2 Sub-Surface Sampling and Logging

The sub-surface sampling is primarily performed within horizontal drift development in addition to face and stope development. Prior to entering the designated underground sampling areas, inspection is performed to ensure or establish adequate ventilation and to perform scaling to eliminate hazards. The structure is washed by pressure hose prior to sampling and the faces marked with white spray paint to delineate length and orientation of sampling transverses. Then a ladder is secured if samples are being taken from the back or at heights up the drift walls to insure safe access. Samples are the taken using a hammer and chisel, collected into an un-used sample bag. Alternatively, samples are collected onto a cleaned and washed tarp, or a specialized tarp lined sample collection pocket for transfer into sample bags. Samples are collected from a 10 cm wide and at least 2 cm depth channel using the hammer and chisel by following the white painted markings. The sampling is performed as two person teams with one operating the hammer and chisel, and the other collected the rock and mineralized fragments. A new sample bag or freshly cleaned tarp is used for each sample. In the case where the sample width is greater than approximately one meter then more than one sample must be taken. For stope sampling, systematic samples are taken every four meters. These samples are split depending upon the structure being sampled and the character of the mineralization encountered as shown in Table 11-1. Samples are then introduced to a polyethylene bag with its sample number labeled, sample tag inserted and gathered for transport to the surface for delivery to the analytical laboratory by Santacruz staff of analysis.

Table 11-1: Underground Sample Mineralization Codes

Code	Description
BM	Mineralized Breccia
CM	Mineralization Stock
VM	Massive Vein
VB	Brecciated Vein
F	Fault
CM	Wall, back, floor, shoulder waste
FM	Mineralized Fault

11.2 Sample Preparation and Analysis

Samples were transported to the Don Diego laboratory, which is ISO-17025 accredited, for sample preparation and analysis where they are documented and entered to the Laboratory Information Management System (LIMS) for tracking and secure reporting of data and results. It is important to note that the Don Diego Laboratory is owned and operated by the Issuer, Santacruz, and the was owned and operated by Glencore prior to the purchase of all of the Sinchi Wayra operations.

Once received the samples are laid out for sample preparation which entails crushing and pulverizing the drill core down to 95% passing -140 µm. The resulting pulps are weighed and individually packaged into envelopes and loaded onto carts for assaying. The resulted prepared samples are then assayed for silver, lead, zinc and iron using an Atomic Absorption Spectroscopy (AAS) for silver, lead, zinc and iron followed by a Gravimetric finish for silver samples > 2100 g/t and Volumetric for lead > 16% and zinc > 20% as shown in Figure 11-6.

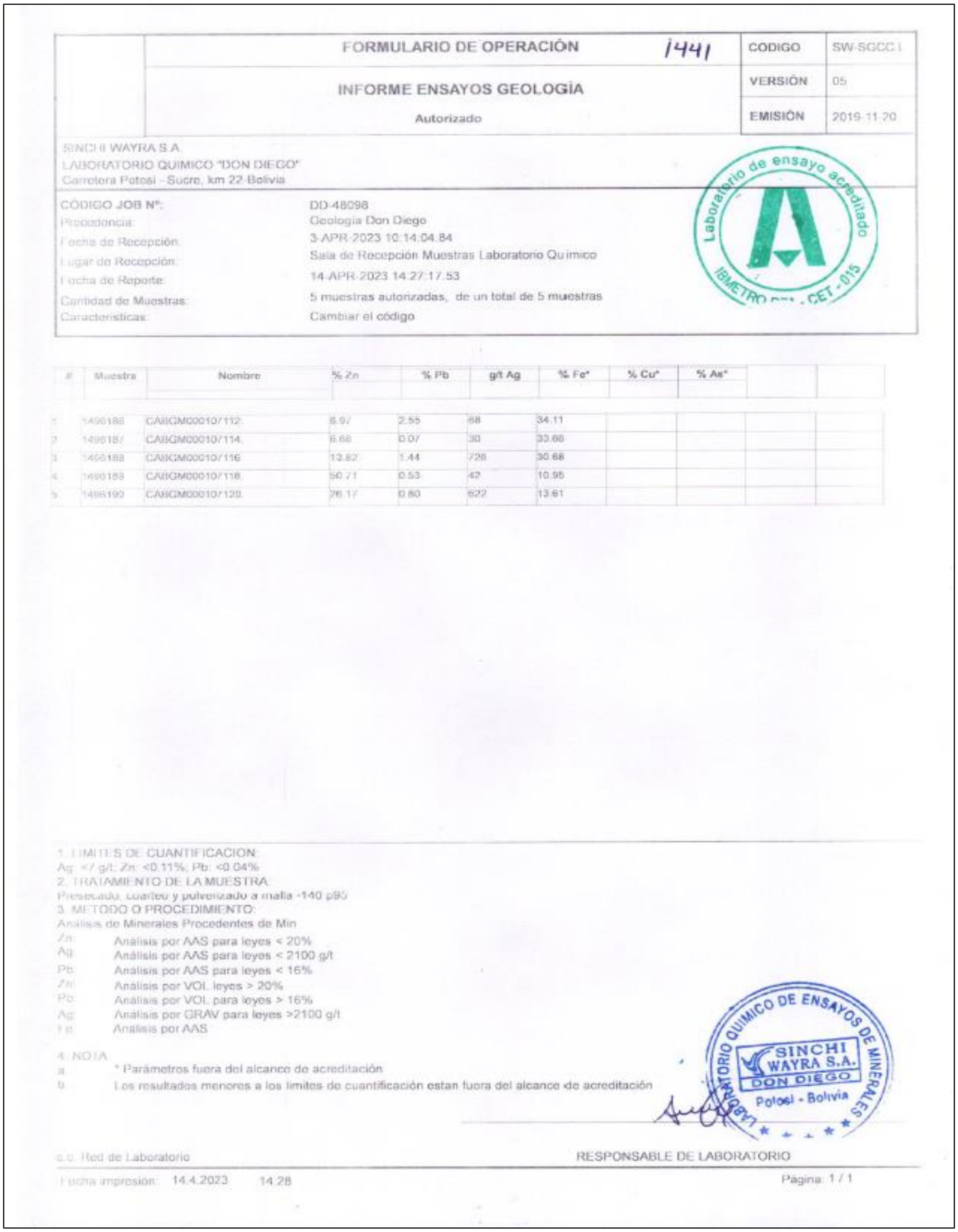
Figure 11-6: Assay Methods Employed at the Porco Mine

1. LIMITES DE CUANTIFICACION:
Ag: <7 g/t; Zn: <0.11%; Pb: <0.04%
2. TRATAMIENTO DE LA MUESTRA:
Presecado, cuarteo y pulverizado a malla -140 p95
3. METODO O PROCEDIMIENTO:
Análisis de Minerales Procedentes de Min

Zn:	Análisis por AAS para leyes < 20%
Ag:	Análisis por AAS para leyes < 2100 g/t
Pb:	Análisis por AAS para leyes < 16%
Zn:	Análisis por VOL leyes > 20%
Pb:	Análisis por VOL para leyes > 16%
Ag:	Análisis por GRAV para leyes >2100 g/t
Fe:	Análisis por AAS

Analytical results are provided via secure servers and pdf formatted assay certificates as shown in Figure 11-7.

Figure 11-7: Example of Don Diego Laboratory Assay Certificate



	FORMULARIO DE OPERACIÓN 1441	CODIGO	SW-SGCC I
	INFORME ENSAYOS GEOLOGÍA	VERSIÓN	05
	Autorizado	EMISIÓN	2019-11-20

SINCHI WAYRA S.A.
LABORATORIO QUIMICO "DON DIEGO"
Carretera Potosí - Sucre, km 22 Bolivia

Laboratorio de ensayo acreditado IBMETRO ... CET-015

CÓDIGO JOB N°:	DD-48098
Procedencia:	Geologia Don Diego
Fecha de Recepción:	3-APR-2023 10:14:04.84
Lugar de Recepción:	Sala de Recepción Muestras Laboratorio Quimico
Fecha de Reporte:	14-APR-2023 14:27:17.53
Cantidad de Muestras:	5 muestras autorizadas, de un total de 5 muestras
Caracteristicas:	Cambiar el código

#	Muestra	Nombre	% Zn	% Pb	g/t Ag	% Fe*	% Cu*	% As*		
1	1496186	CABGM000107112	6.97	2.55	68	34.11				
2	1496187	CABGM000107114	6.68	0.07	30	33.66				
3	1496188	CABGM000107116	13.82	1.44	728	30.68				
4	1496189	CABGM000107118	50.71	0.53	42	10.95				
5	1496190	CABGM000107120	26.17	0.80	622	13.61				

1. LIMITES DE CUANTIFICACION:
Ag: <7 g/t; Zn: <0.11%; Pb: <0.04%
2. TRATAMIENTO DE LA MUESTRA:
Presecado, cuarteo y pulverizado a malla -140 p95
3. METODO O PROCEDIMIENTO:
Analisis de Minerales Procedentes de Min
Zn: Análisis por AAS para leyes < 20%
Ag: Análisis por AAS para leyes < 2100 g/t
Pb: Análisis por AAS para leyes < 16%
Zn: Análisis por VOL leyes > 20%
Pb: Análisis por VOL para leyes > 16%
Ag: Análisis por GRAV para leyes >2100 g/t
Fe: Analisis por AAS

4. NOTA
a. * Parámetros fuera del alcance de acreditación
b. Los resultados menores a los limites de cuantificación estan fuera del alcance de acreditación

LABORATORIO QUIMICO DE ENSAYOS DE MINERALES SINCHI WAYRA S.A. DON DIEGO Potosí - Bolivia

c.c. Red de Laboratorio — RESPONSABLE DE LABORATORIO

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Santacruz database files are stored and managed in Access and Excel™ formats before being transferred to LeapFrog™ and Datamine™ software.

All half-core is stored at a dedicated core storage facility that is locked and is within a fully controlled perimeter wall and fencing with security on the property.

11.3 QA/QC Procedures and Discussion of Results

The purpose of Quality Assurance and Quality Control (QA/QC) is to ensure that the laboratory procedures may be relied upon by guarding against sample contamination and test whether the equipment used to prepare the samples has been sufficiently cleaned between sequential assays. In addition, it is standard and highly recommended practice to insert additional "control" samples to continually test the precision and accuracy of the resulting analyses.

Since 2000, Sinchi Wayra has implemented QA/QC programs to varying degrees which employ industry standards and accepted practices for drillcore and channel sampling. This includes the regular insertion of blanks and standards randomly into the sample stream along with performing duplicate analysis of pulps and coarse rejects to assess analytical precision and accuracy. Additionally, beginning in 2012, the practice of including coarse and pulp duplicate QA/QC samples was employed.

Field blanks are non-mineralized material sourced locally and inserted into the sample series particularly preceding and following mineralization runs. Field blanks are inserted to test for any potential carry-over contamination which might occur in the crushing phase of sample preparation, because of laboratory poor cleaning practices.

Duplicate analysis of pulps and quarter-core are used to evaluate analytical precision and to determine if any biases exist between laboratories. Duplicate analysis of coarse rejects is used to analyze preparation error. Table 11-2 details the QA/QC sample insertion rate.

Table 11-2: QA/QC Sample Insertion Rates

Sample Type	Notes
Blanks	Usually inserted at the end of mineralized runs to measure carry-over
Pulp Duplicates	Undertaken at second laboratory with same analytical technique. High- and low-grade mineralized samples are usually chosen
Coarse Duplicates	Normally choose mineralized samples, used to measure laboratory sample preparation

In 2022, a total of 250 control samples within a sample population of as shown in Table 11-3 were assigned for QA/QC purposes and accounted for approximately 9% of total samples taken during the program.

Table 11-3: Quantity of Control Samples by Type

Control Type	#
Field Blanks	83
Coarse Duplicates	85
Pulp Duplicates	82
Total	250

Contamination and determining whether adequate cleaning practices are being performed at the laboratory is evaluated through the direct incorporation of sample blanks. Blank samples are do typically have some level of very low grade, background values depending upon where they are sourced from so the results should be at that value or within acceptable error (±) thresholds. The placement of blanks within the sample stream is typically in the middle of an identified mineralized structure or immediately at the end of the section or sample run. Figure 11-8 through Figure 11-10 show results show zero failures or 0% Failure rate for silver, lead and zinc indicating good cleaning practices and no background levels present.

Figure 11-8: Plot of Ag g/t Values for Field Blanks

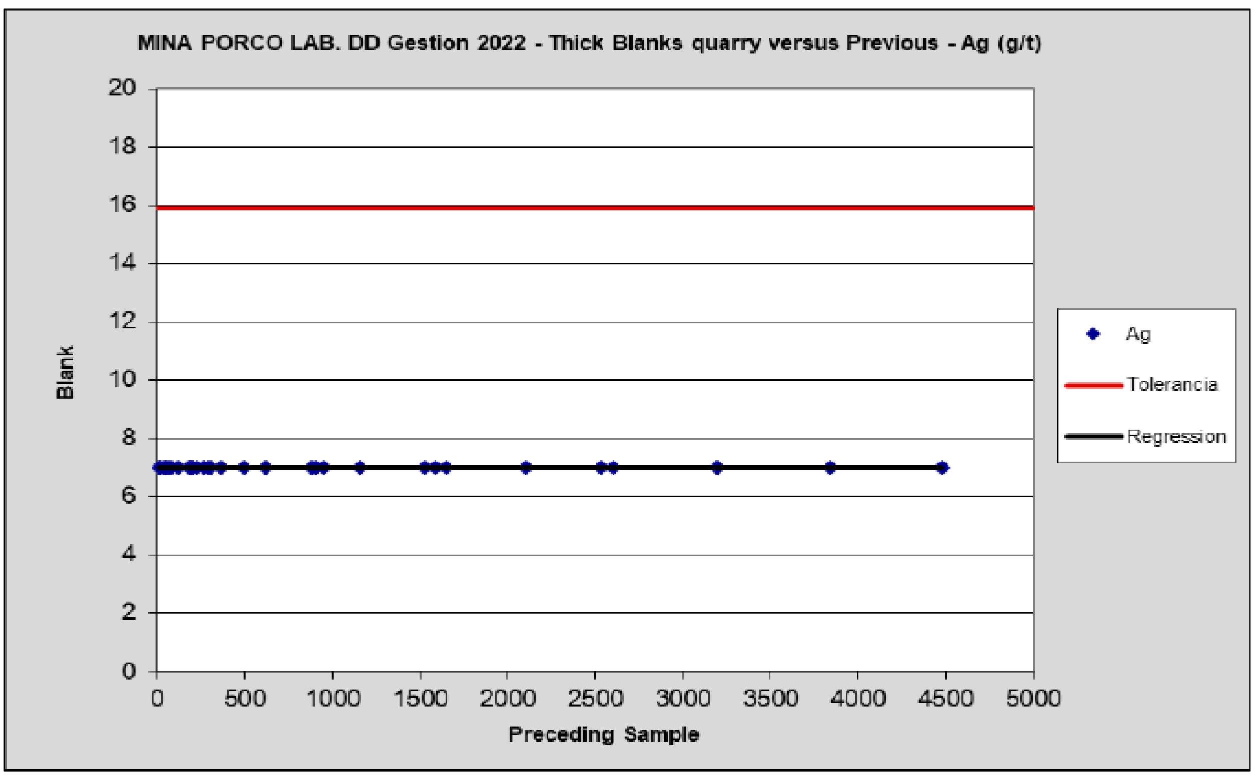


Figure 11-9: Plot of Pb% Vaues for Field Blanks

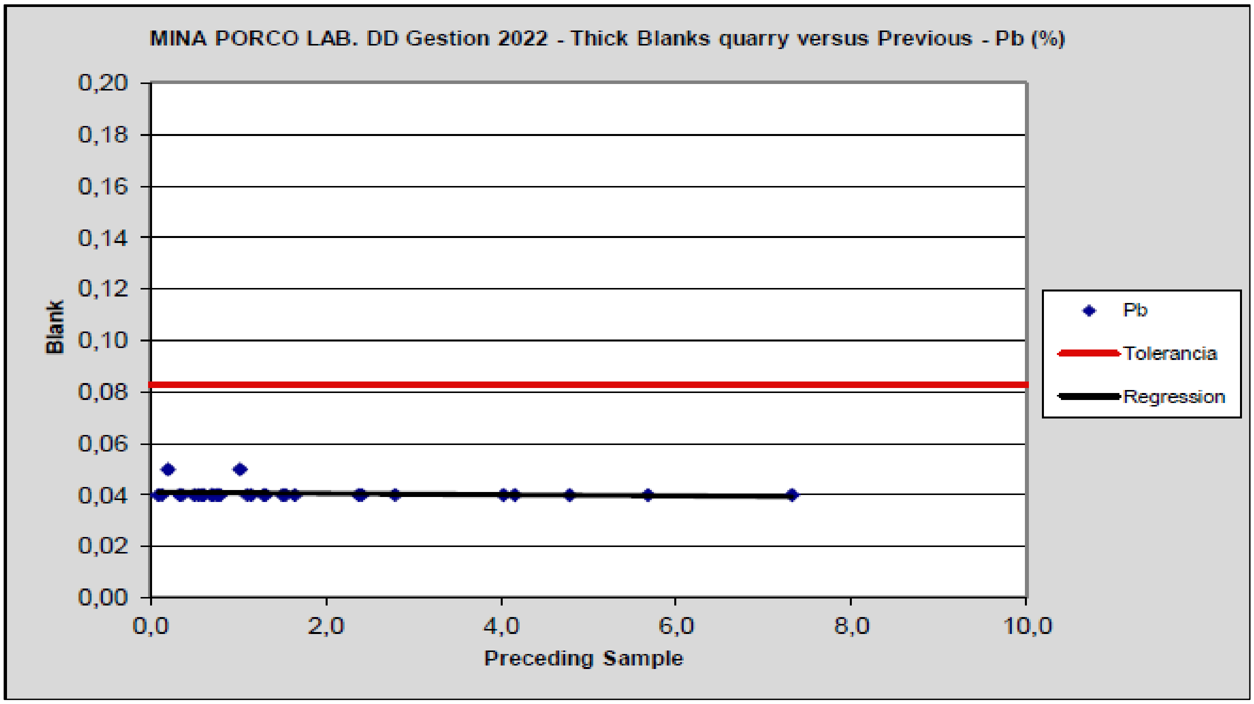
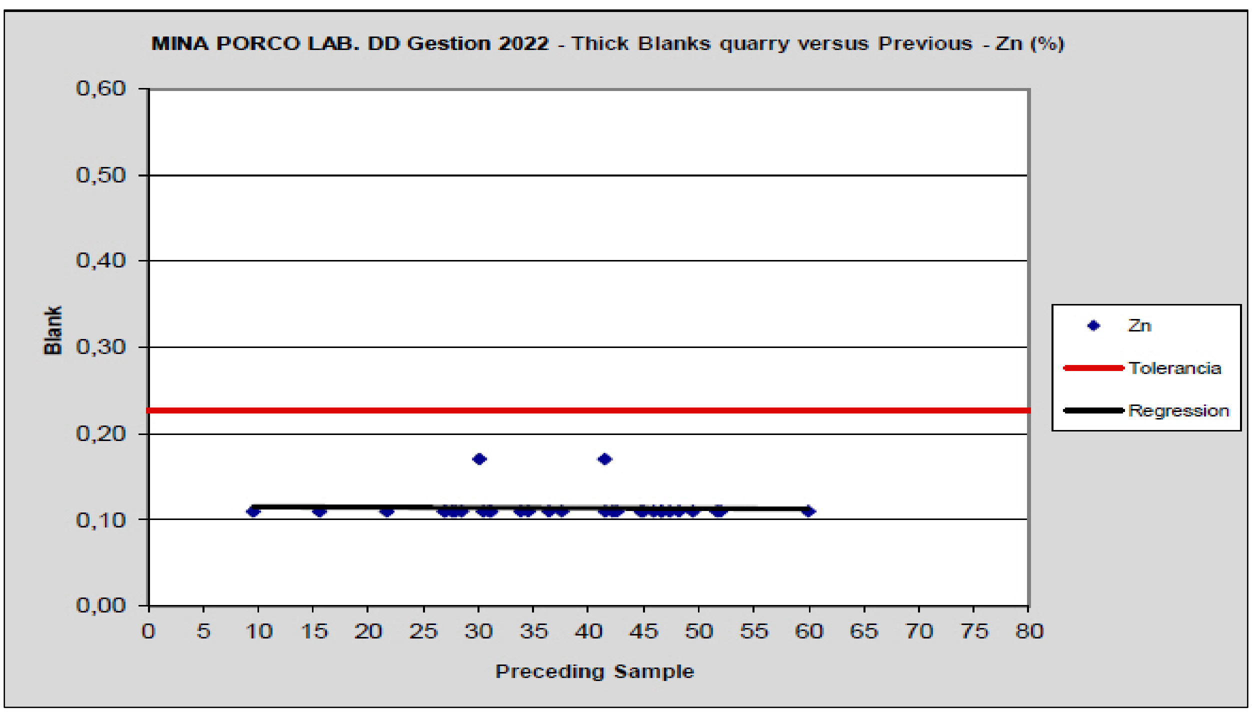


Figure 11-10: Plot of Zn% Vaues for Field Blanks



Precision is a measure of reproducibility which is measured by introducing duplicate samples randomly into the sample stream. At the Porco mine, both coarse and pulp duplicates are performed in order to ensure appropriate levels of precision are being attained at the Don Diego laboratory facilities. Coarse duplicates entail taking a physical split of the sample at the sample collection stage and then including that duplicate blindly into the sample stream. Pulp duplicates entail taking a physical split of the sample at the culmination of the sample preparation stage at the laboratory and re-inserted into the sample stream.

Figure 11-11 through Figure 11-13 shows the comparative results for the original versus duplicate grades for silver, lead and zinc, respectively. Note that a ±10% relative difference threshold is denoted as a red line. Of the 85 coarse duplicate analyses, the results show excellent results with zero failures and zero warnings for a failure rate of 0%. These results show that the sample preparation stage is to high standards and that the samples possess excellent reproducibility.

Figure 11-11: Plot of Coarse Reject Duplicates – Ag g/t

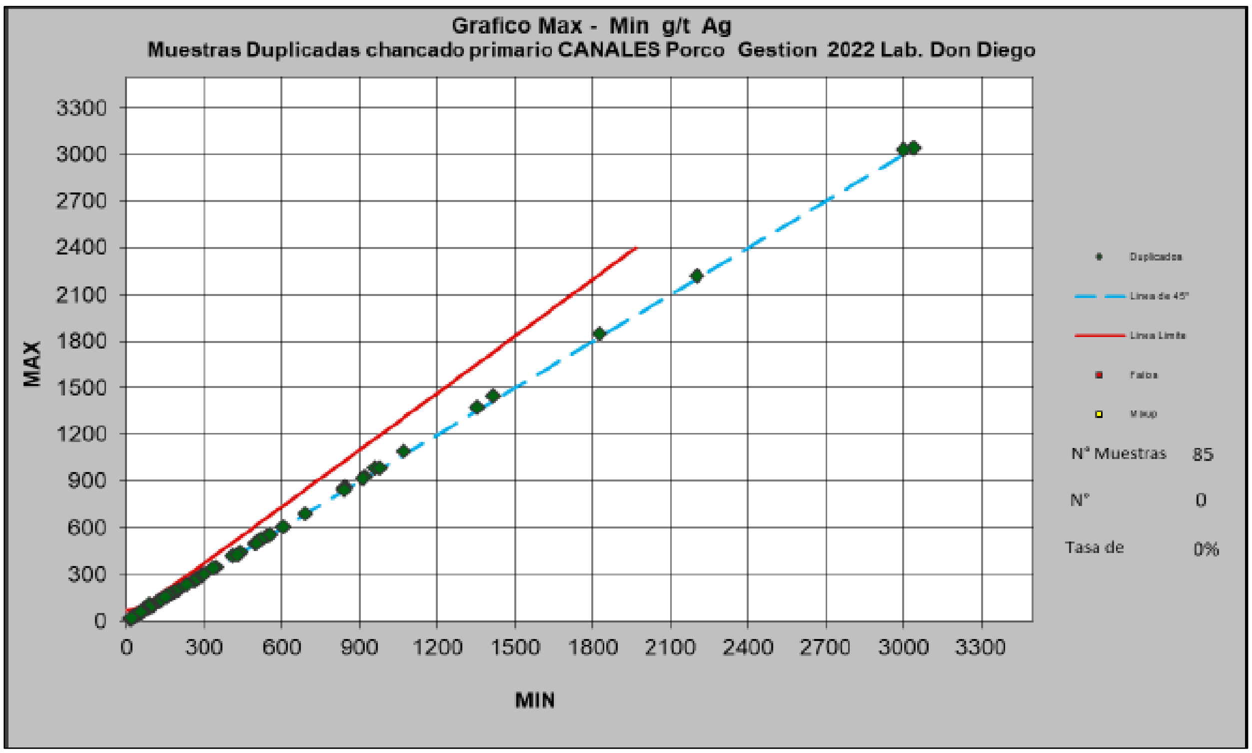


Figure 11-12: Plot of Coarse Reject Duplicates – Pb%

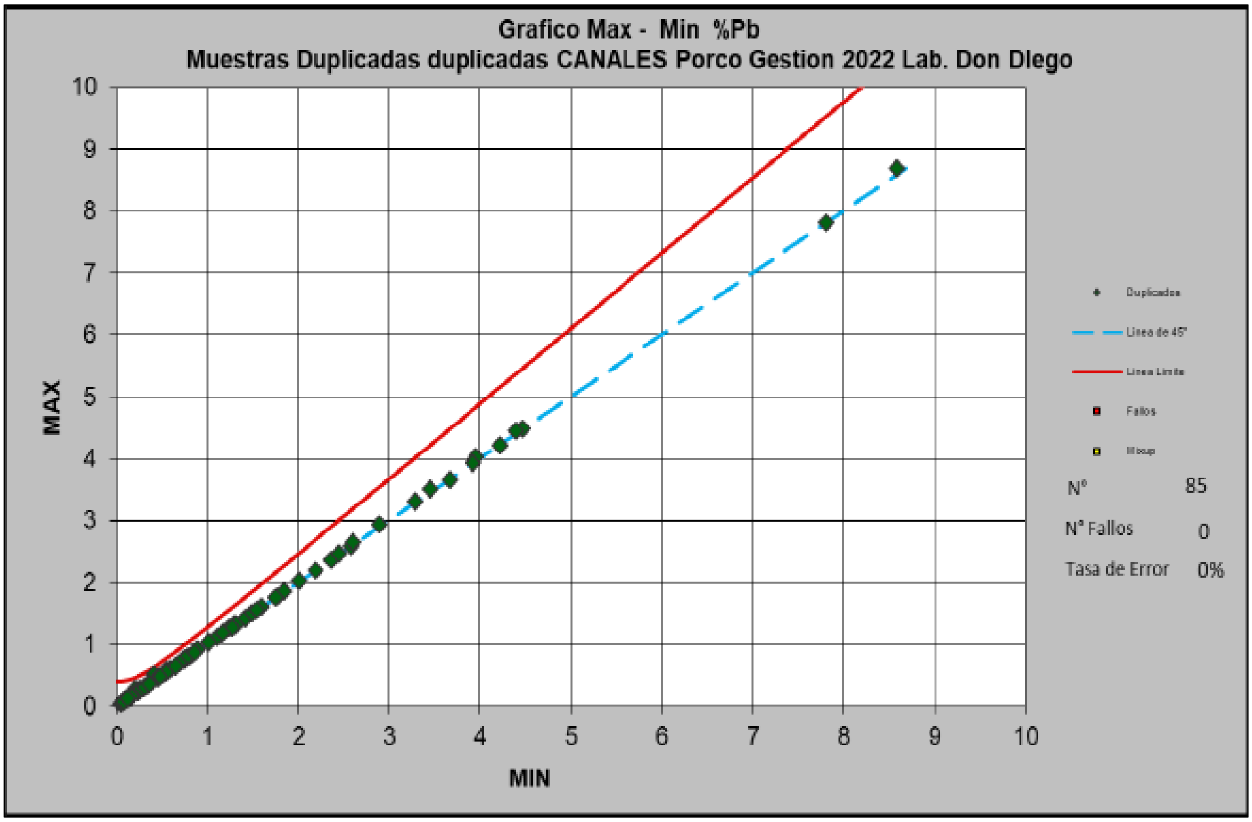


Figure 11-13: Plot of Coarse Reject Duplicates – Zn%

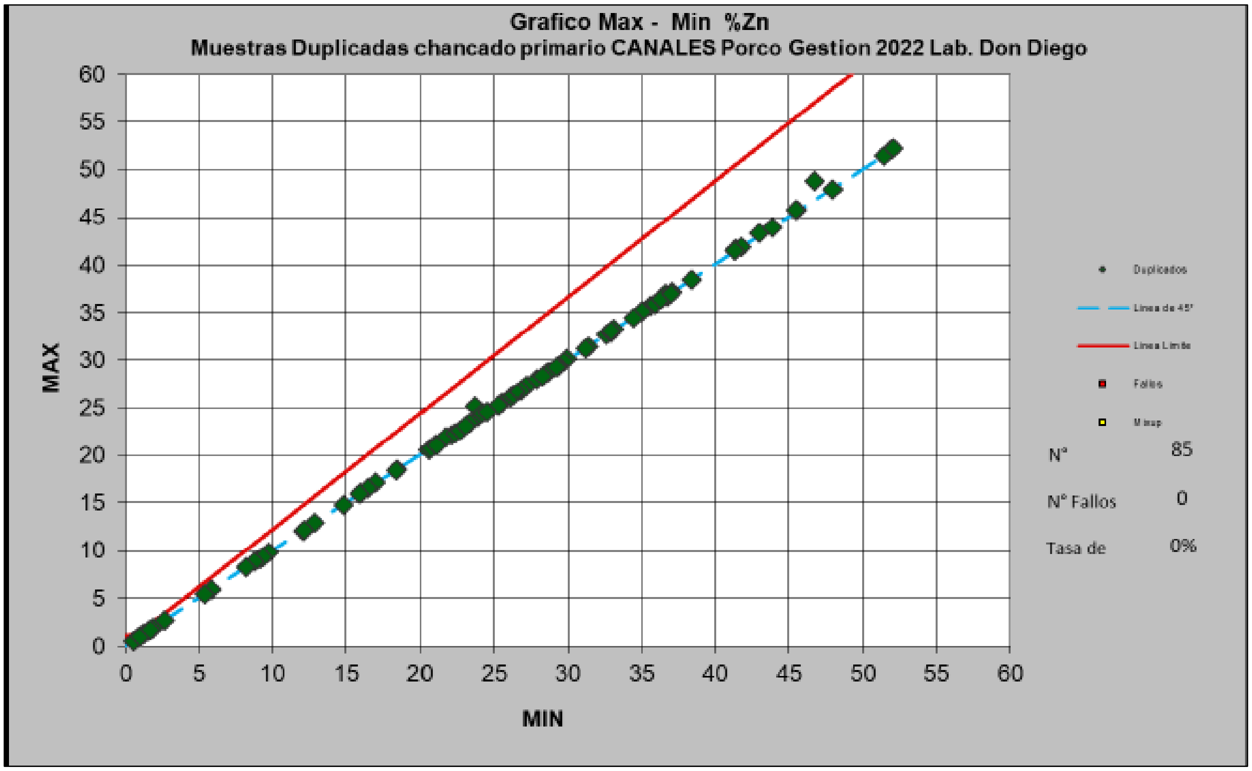


Figure 11-14 through Figure 11-16 shows the comparative results for the original versus duplicate grades for silver, lead and zinc pulp duplicates, respectively. Again, note that a ±10% relative difference threshold is denoted as a **red** line.

Of the 74 pulp duplicate analyses, the results show poor results with six silver failures and three warnings, three lead failures and four warnings and, one zinc failure and four warnings as shown in Figure 11-14 through Figure 11-16. It was reported that the reason for the failures was due to sample mix-up and mislabelling however as these failures occurred over time, this may not be the root cause. Therefore, further investigation is warranted and increase in the rate of pulp duplicate insertion particularly, blind insertion is recommended.

Figure 11-14: Plot of Pulp Duplicates – Ag g/t

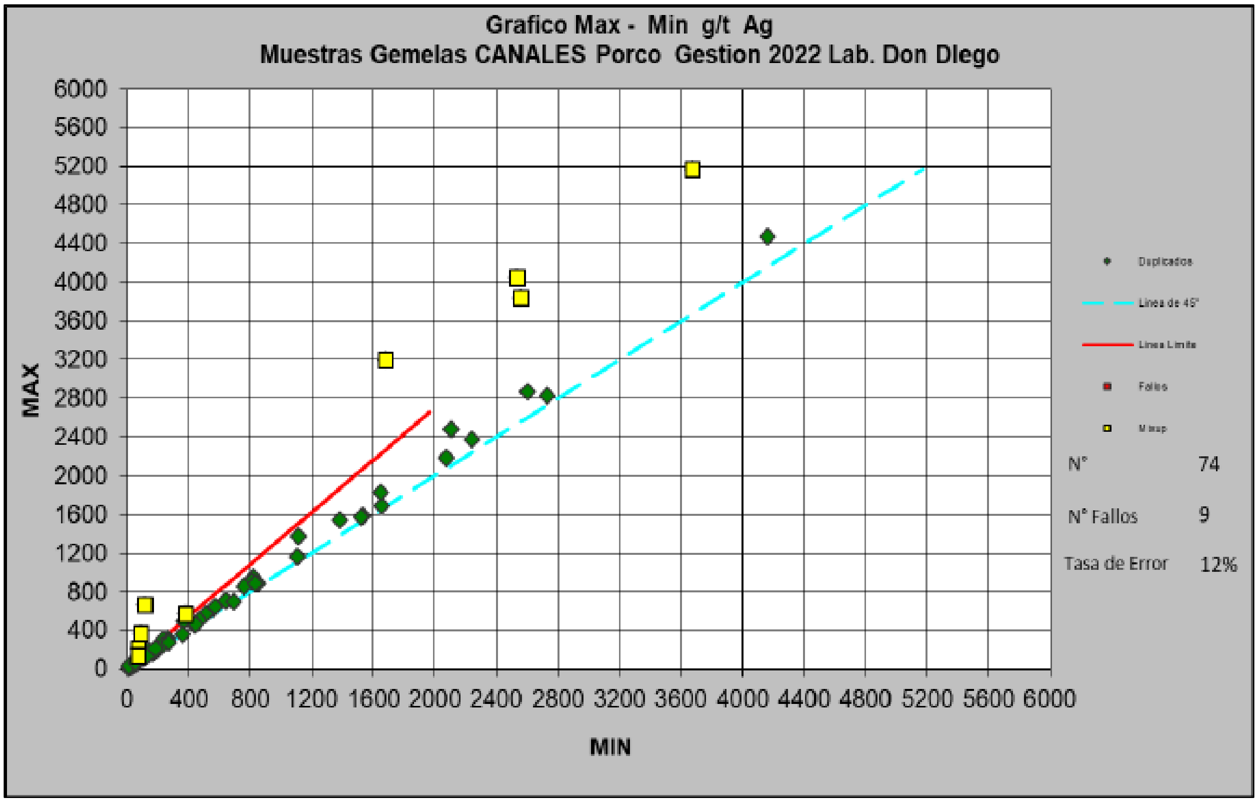


Figure 11-15: Plot of Pulp Duplicates – Pb%

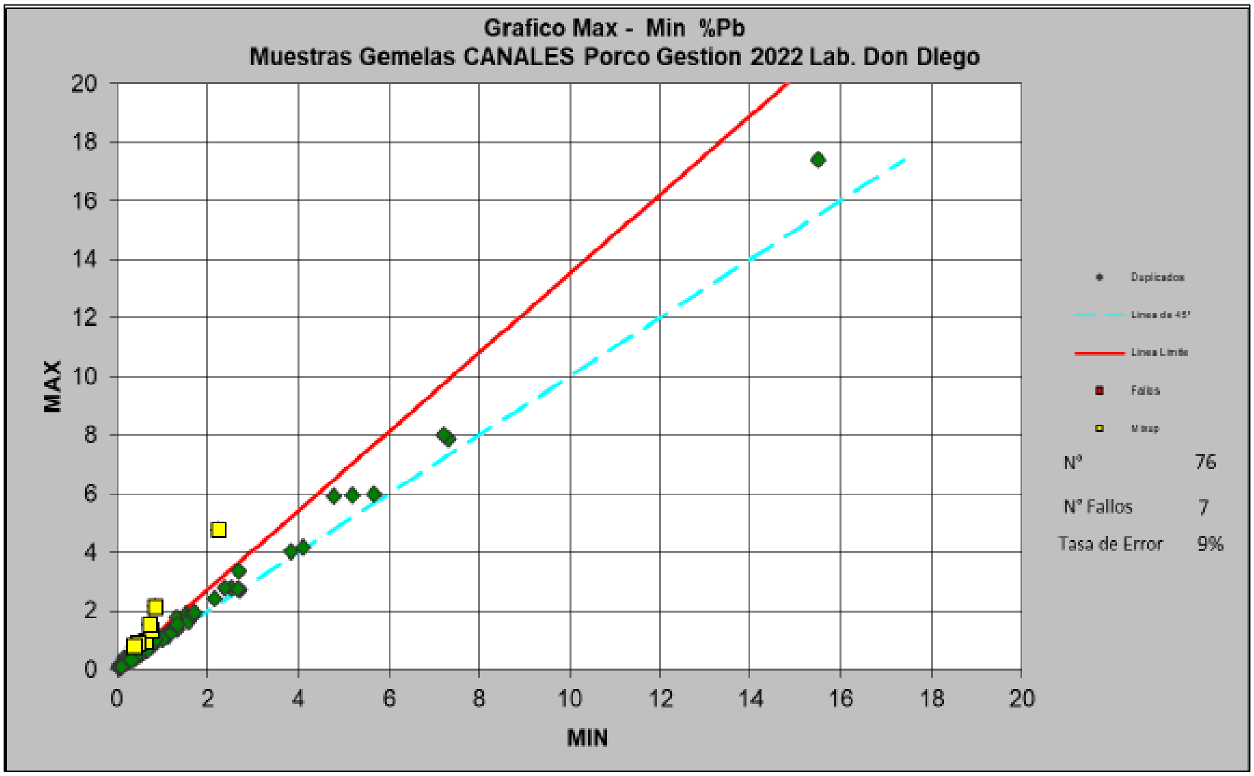
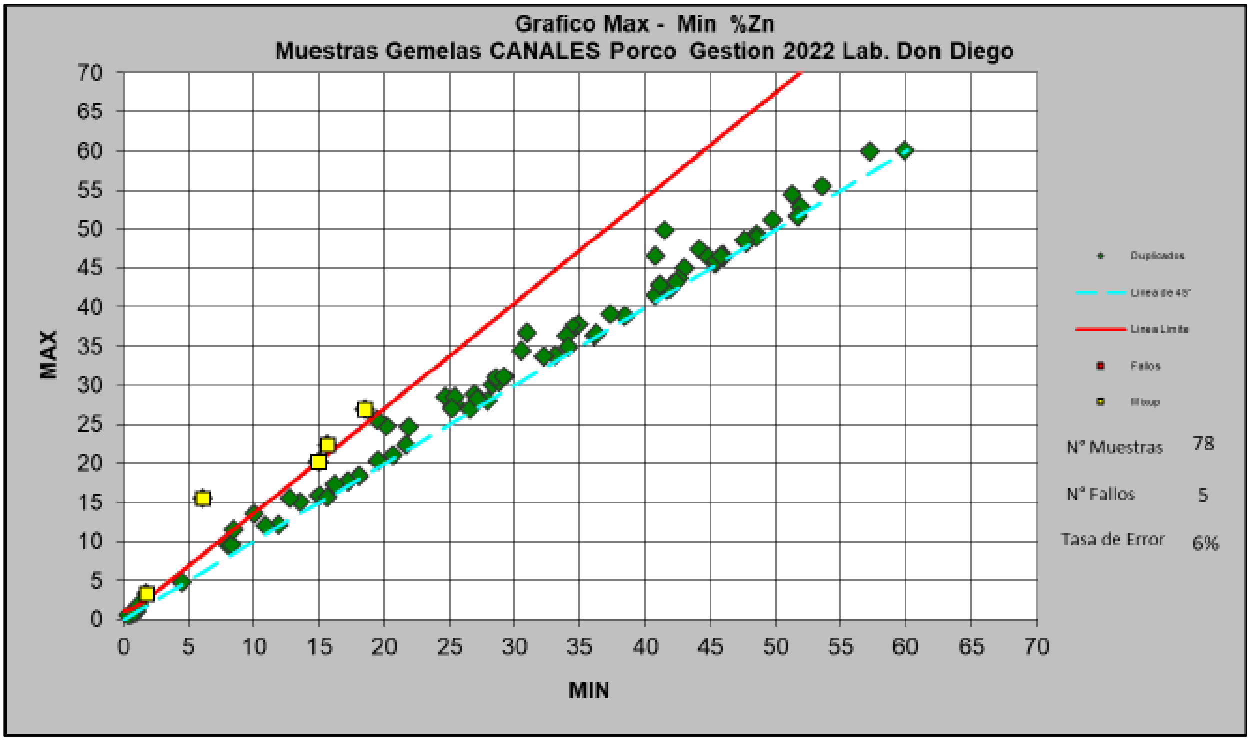


Figure 11-16: Plot of Pulp Duplicates – Zn%



In summary, the quality assurance and quality practices and methods employed are reasonable and produce relatively good results although issues should be investigated to insure reliability or results. Recommendations with respect to the QA/QC sample selections that the company should investigate obtaining Certified Reference Material form an outside accredited source for blanks, particularly barren blanks, and for specific Ag, Pb, Zn standards.

The LIMS system is widely used and accepted at the laboratory while interfaces to users are automated and trusted. The system is also highly secure which is critical in ensuring that data is not tampered with or prone to inadvertent error however, this also makes it difficult to access, review and report data externally. In addition, reporting functions are relatively dated and system upgrades should be investigated, and some additional customization would also be desirable.

11.4 QP Statement

It is the opinion of the QP, Garth Kirkham, P.Geo., that the sampling preparation, security, analytical procedures and quality control protocols used by Santacruz are consistent with generally accepted industry best practices and therefore reliable for the purpose of resource estimation.

12 DATA VERIFICATION

12.1 Verifications by the Authors of this Technical Report

The following details the data verification performed by the Qualified Persons for the completion of this Technical Report. Verification activities were performed on sampling methods and results, assay database, geological interpretation and lithological models, resource estimation procedures, models and results, metallurgy and processing, mining design and dilution, along with reserves models and results.

Multiple site visits were conducted by the QPs, as detailed in Section 2: Introduction.

There have been no limitations or failures to conduct data verification that were identified by the QPs in the preparation of this Technical Report.

12.1.1 Site Visit & Verification

The purpose of these visits is to fulfill the requirements specified under NI 43-101, to gain familiarization with the property, to validate the existence, location, extent and the mineralization and deposits. In addition, the site visits are an important component for verification of all information and data being submitted by the company for inclusion into the NI43-101 technical report including sample data, geology, QA/QA procedures and mineral resource models and results. These site visits consisted of underground tours of non-mineralized development headings, sampling, storage areas and existing infrastructure. In addition to gathering on-site data and reports, performing interviews, walking through procedures, and investigating areas of discrepancy, the identification and collection of independent verification data such as samples are all critical activities that make up a site visit.

Prior to the site visits, the author reviewed all collected data sources and reports. The primary sources of data for inspection were the drillhole and underground channel sample data, related assay data, QA/QC data and analyses, assay certificates and LIMS databases. In addition, internal company reports and demonstrations were provided detailing the methods and procedures for sample collection, handling and chain-of-custody, QA/QC procedures and results, and resource estimation methods and reporting.

The QP, Garth Kirkham, P.Geo., visited the property between August 10 through August 13, 2021 and March 15 through March 30, 2023. The site visit included an inspection of the property, offices, underground operations, core storage facilities, and tours of major centres and surrounding villages most likely to be affected by any potential mining operation.

The August 2021 site visit performed by the QP to support the Technical Report dated December 17, 2021 included a tour of the offices, core logging, and storage facilities which showed clean, well-organized, professional environments. Santacruz geological staff and on-site personnel led the QP through the chain of custody and methods used at each stage of the logging and sampling process. All methods and processes are to common industry standards and common best practices, and no issues were identified. The 2021 site visit also entailed attending all operations including the Boliva miner, Porco Mine and the Caballo Blanco complex which included separate attendance to the Tres Amigos, Colquechaquita and Reserva mines. Visits to the underground operations showed extensive, on-going mining operations. In addition, the tour included tours through the Don Diego Milling and Processing Complex along with the sample storage facilities.

The tour of the property showed a clean, well-organized, professional environment. On-site staff led the author through the methods used at each stage of the resource estimation process. All methods and processes are up to industry standards and reflect leading practices, and no issues were identified.

12.1.2 Sample Database Verification

Verification of the Porco drillhole and underground sample assay database was primarily focused on silver, lead and zinc in addition to iron, arsenic, sulphur and tin. Sample databases were supplied in Excel™ format and in LeapFrog™. Checks against source data and assay certificates showed agreement. Statistical analyses used to investigate and identify errors were performed and resulted in minor issues. These have been corrected and it is recommended that a continued program of random "spot checking" the database against assay certificates be employed.

12.1.3 Independent Sampling

No verification samples were taken during the 2021 site visit due to severe limitations on transport of materials due to COVID at that time. In addition, the 2021 site visit was performed in support of the Technical Report which did not include a resource estimate and was performed prior to transfer of ownership of all properties from Glencore and Santacruz.

The 2023 site visit included a visit of the Don Diego mill complex which included a tour of the Don Diego laboratory which included an extensive review of the methods and procedures along with gathering appropriate documentation for reporting.

Also, during the 2023 site visit, an extensive independent sampling verification plan was implemented with a total of 80 samples collected across from the Bolivar, Porco and Caballo Blanco operations. The Don Diego laboratory is an NB/ISO/IEC 17025:2018 accredited laboratory which performs all assay analyses for the mining and processing operations for Sinchi Wayra including Porco.

In order to ensure reliability of results particularly as the data is being used for resource estimation purposes with this Technical Report, independent verification duplicate samples are sent to an accredited external umpire laboratory. These verification samples were secured and transported to SGS Peru for analysis and comparison. SGS Peru is a well-established certified assay laboratory that possess and maintains ISO 14000 accreditation. Individual samples were placed in plastic bags with a uniquely numbered tag, after which all samples were collectively placed in a larger bag and delivered by independent transport to the SGS laboratory in Lima Peru for analysis. The selection was a combination of acid digestion and Induced Coupled-Plasma Atomic Emission Spectroscopy (ICP) along with screening and hydroxide precipitation for overlimit values.

A total of 14 samples which were comprised of 5 coarse duplicates and 9 pulp duplicates were sent for independent analysis as shown in Table 12-1.

Table 12-1: Porco Independent Verification Sampling

Sample	Ag ppm	As ppm	Cu ppm	Fe%	Pb%	S%	Sn ppm	Zn%
107113	63	1183	192	>15	2.34	38.89	159	6.04
107115	23	5726	473.1	>15	0.06	>40	298	5.91
107117	767	>10000	1.64	>15	1.42	>40	>10000	13.64
107119	42	1371	2023.9	11.26	0.53	36.62	187	49.52
107121	596	1101	650.9	13.22	0.77	22.88	529	24.87
104780	58	119	800.3	12.25	0.17	31.8	245	37.46
104793	10	246	29.8	11.38	0.06	14.32	55	1.05
95114	74	6144	510.7	>15	0.58	>40	219	21.57
95139	45	748	2157.3	>15	0.28	39.33	182	27.37
95158	13	212	95.8	>15	0.01	26.43	37	5.00
95181	153	7977	1.015	>15	0.08	>40	6210	6.20
104864	18	1631	52.9	4.43	0.32	6.24	108	6.43
104883	460	>10000	1.129	>15	0.06	>40	8283	11.65
106716	124	8852	497.3	>15	4.12	27.65	431	12.09

Results of the verification samples are presented in Figure 12-1 through Figure 12-3 for silver, lead and zinc, respectively. In all cases, the correlation between the original source Don Diego assay data and that of the duplicate SGS umpire analyses, are perfect as evidenced by the respective R2 being 1. R2 is a measure of the goodness of fit of a model. In regression, the R2 coefficient of determination is a statistical measure of how well the regression predictions approximate the real data points. This sentence is inserted to confirm if this report has been reviewed, please confirm. An R2 of 1 indicates that the regression predictions perfectly fit the data.

Although, these results are not a complete audit of the laboratory, they do verify that the assay results are suitable for resource estimation purposes.

Figure 12-1: Results of Independent Verification Sampling for Ag g/t

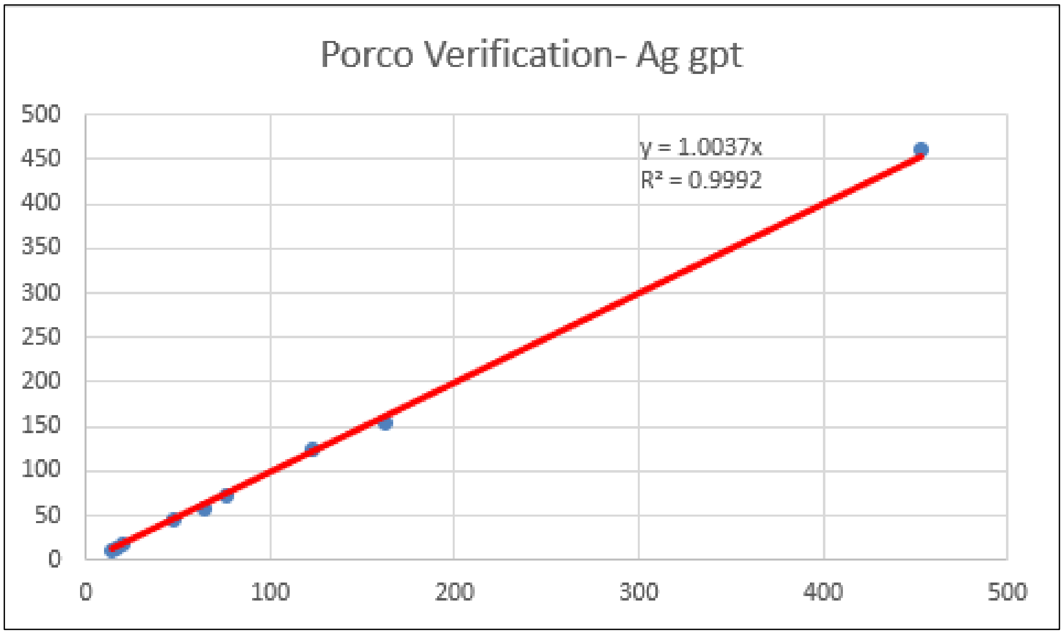


Figure 12-2: Results of Independent Verification Sampling for Pb%

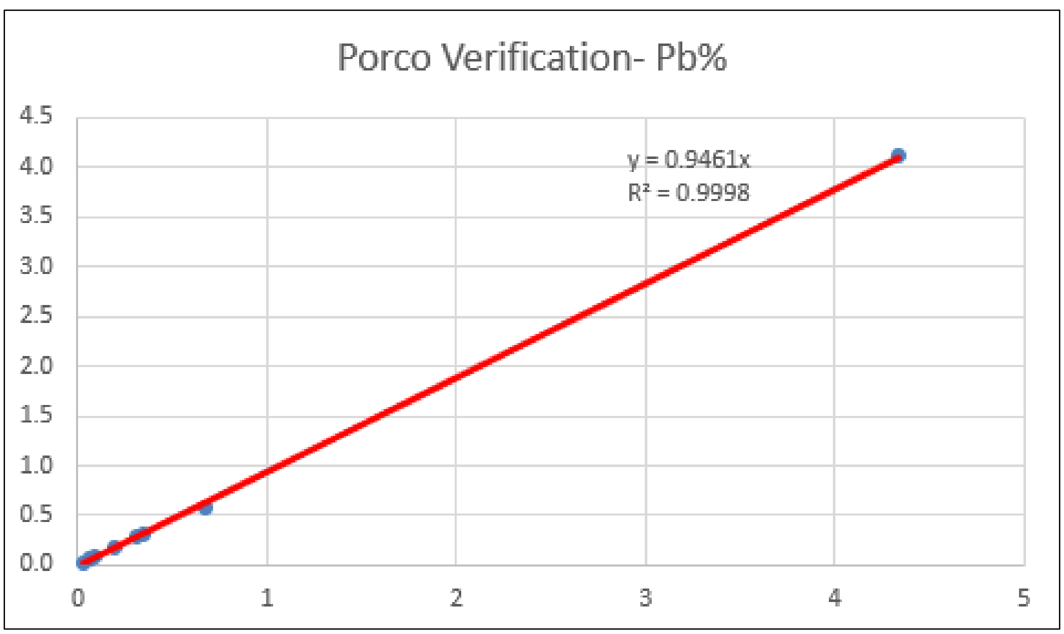
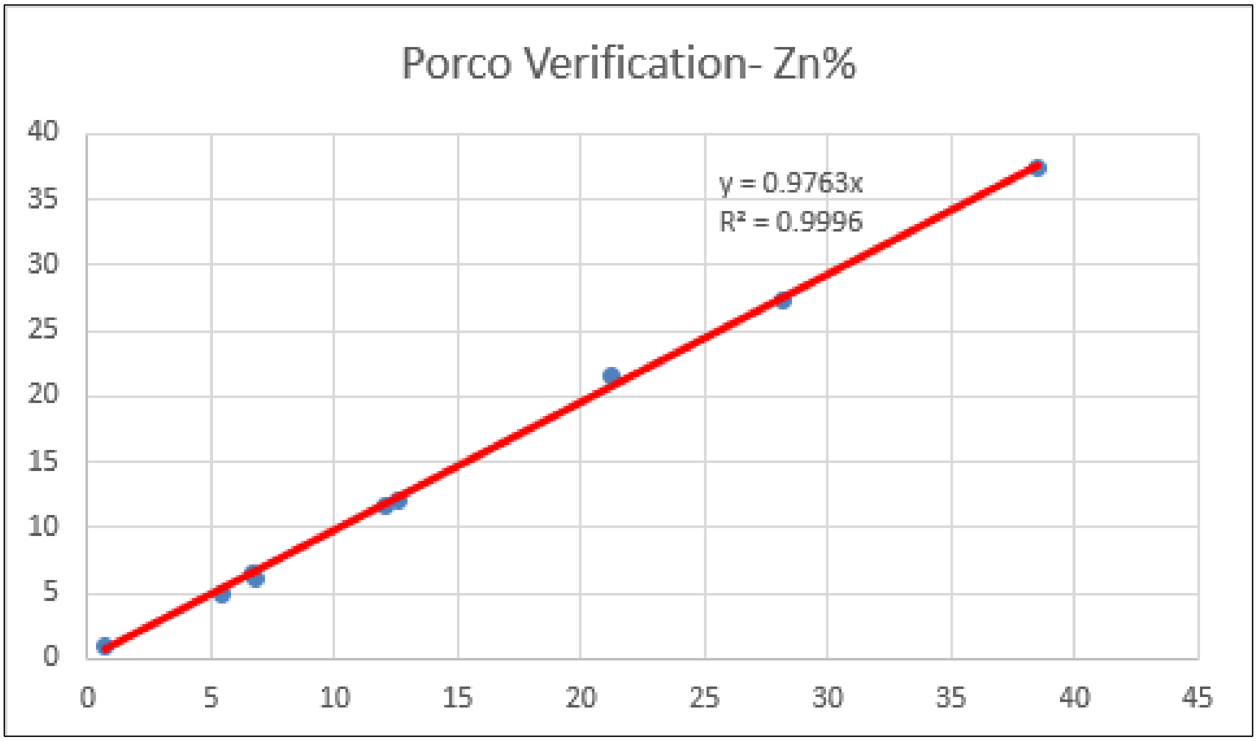


Figure 12-3: Results of Independent Verification Sampling for Zn%



12.1.4 Geological Model Verification

The geological and lithological solid domain models were supplied by Santacruz in both Datamine™ and LeapFrog™ which are both industry-leading software systems. The QP imported the multiple vein domains into a similar system called MineSight™ to verify solids volumes and ensure matching of the solids domains against the drillhole and sample database. Results confirmed location and extent of volumes are appropriate to resource estimation purposes.

12.1.5 Resource Estimation Verification

Resource block models were supplied in Datamine™ format which is an industry recognized software system used for resource estimation. These models were then imported to MineSight™ for verification of the resource estimation. In addition, independent estimations were run using the verified sample data and vein domains employing inverse distance estimations to ensure reasonableness and verify the resources independently. Results illustrated good agreement between the original and verification models.

Verification of the SG regression analysis was also performed by comparing measured versus calculated density values.

12.1.6 Conclusions

The QP is confident that the data and results are valid based on the site visits and inspection of all aspects of the project, including the methods and procedures used. It is the opinion of the QP that all work, procedures, and results have adhered to best practices and industry standards as required by NI 43-101.

12.1.7 Adequacy Statement

It is the opinion of Kirkham that the data used for estimating the current mineral resources for the Porco Mine is adequate for this Resource Estimate and may be relied upon to report the mineral resources contained in this report.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

The processing plant at the Porco Mine has been in continuous production since it was built in 1992. The Porco process uses differential flotation to a lead and a zinc concentrate. The mill processes feed from both the company mined deposit and toll material.

The processing plant targets approximately 45% of the feed to be toll feed, due to the prevalence of artisanal miners in the area. The artisanal miners can loosely be separated into “legal” (Cooperatives), and “illegal” (or documented and undocumented) groups. The Porco mill only receives feed from the “legal” artisanal miners.

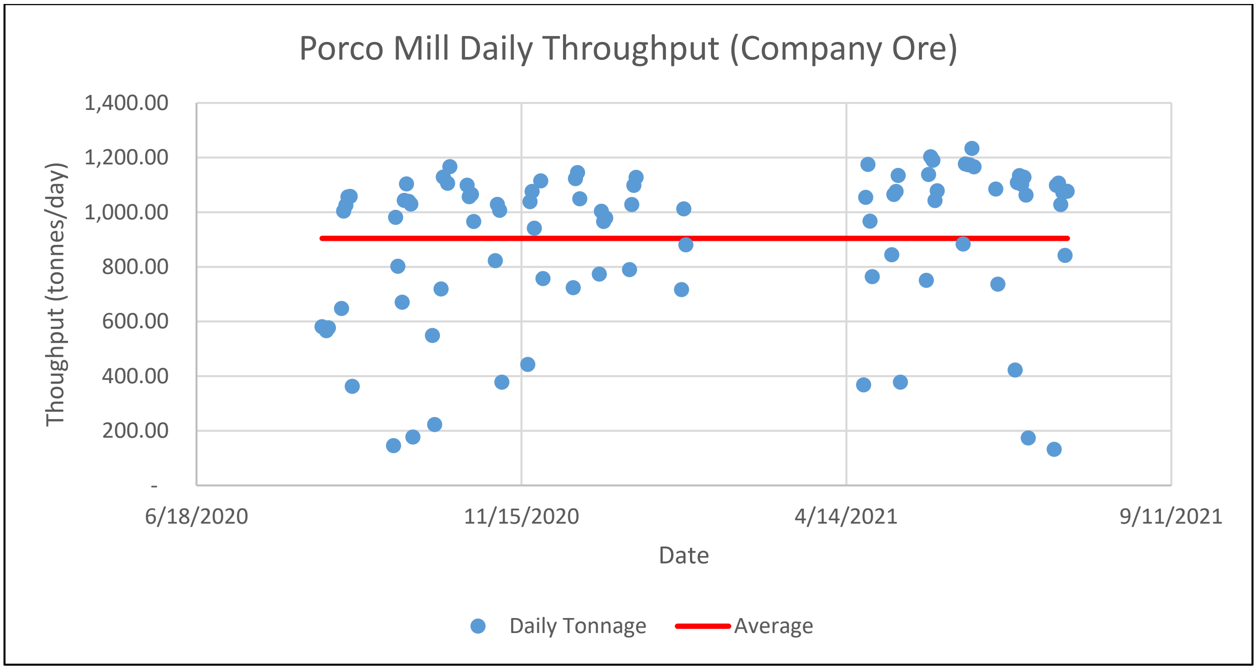
13.1 Company Feed Processing

Data from August 2020 to July 2021 was used to develop the expected metallurgical performance of the Porco mill. This data was used to determine throughput, recovery and concentrate grade relationships. The results will be discussed in the upcoming sections.

13.1.1 Mill Throughput

The expected availability for the mill is 95.5% and the utilization is 95% for an expected operating time of 90.7%. The actual throughput from August 2020 to July 2021 can be found in Figure 13-1.

Figure 13-1: Porco Mill Company Feed Throughput 2020/2021



The throughput of company feed through the Porco mill during the analyzed period was a little lower than the stated target, with the average of the days it operated being 904 t/d. During the analyzed period, the mill ran company feed over 91 whole or partial days and processed 82,290 tonnes of feed. The data suggests that the feed rate is not achieving the target throughput for company feed.

The target grind for the Porco plant has a P_{80} of 100 µm.

13.1.2 Feed Grades

For the period examined, the unreconciled feed grades for the company feed were 7.82% zinc, 0.67% lead, and 124 g/t silver. The feed was somewhat variable with standard deviations of 1.05, 0.20, and 67.94 for zinc, lead, and silver respectively. These values fall within the expected ranges for Porco feed. The unreconciled feed grades can be seen in Figure 13-2 through Figure 13-4.

Figure 13-2: Zinc Feed Grade 2020/2021

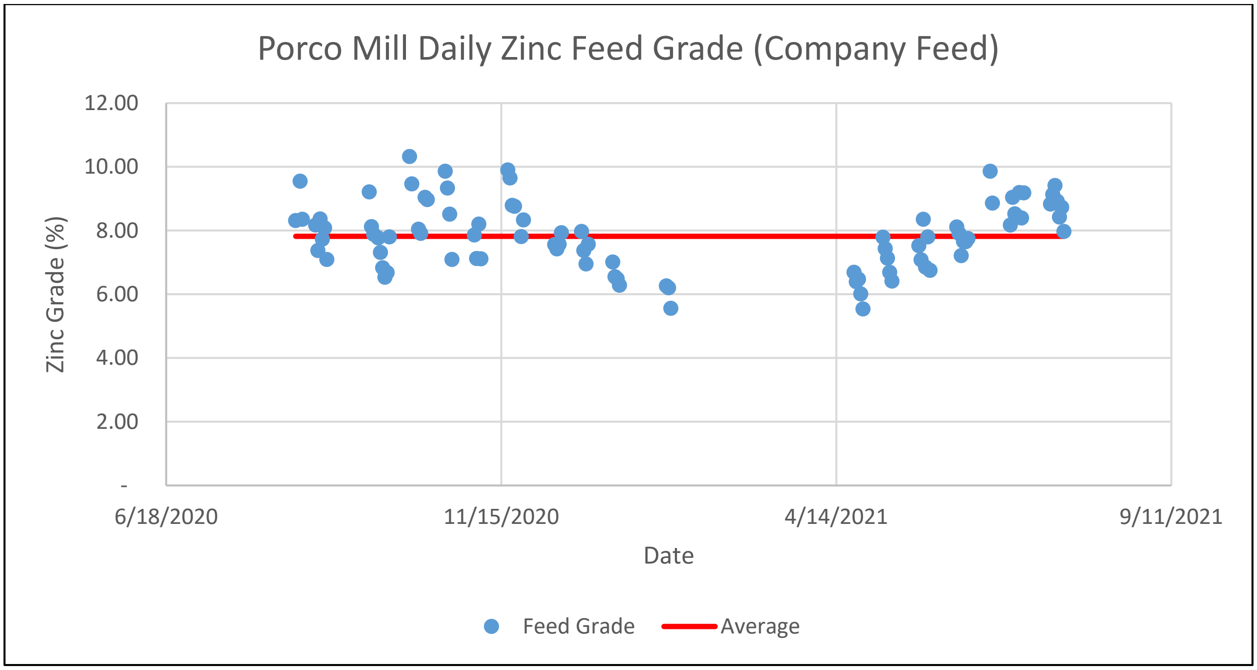


Figure 13-3: Lead Feed Grade 2020/2021

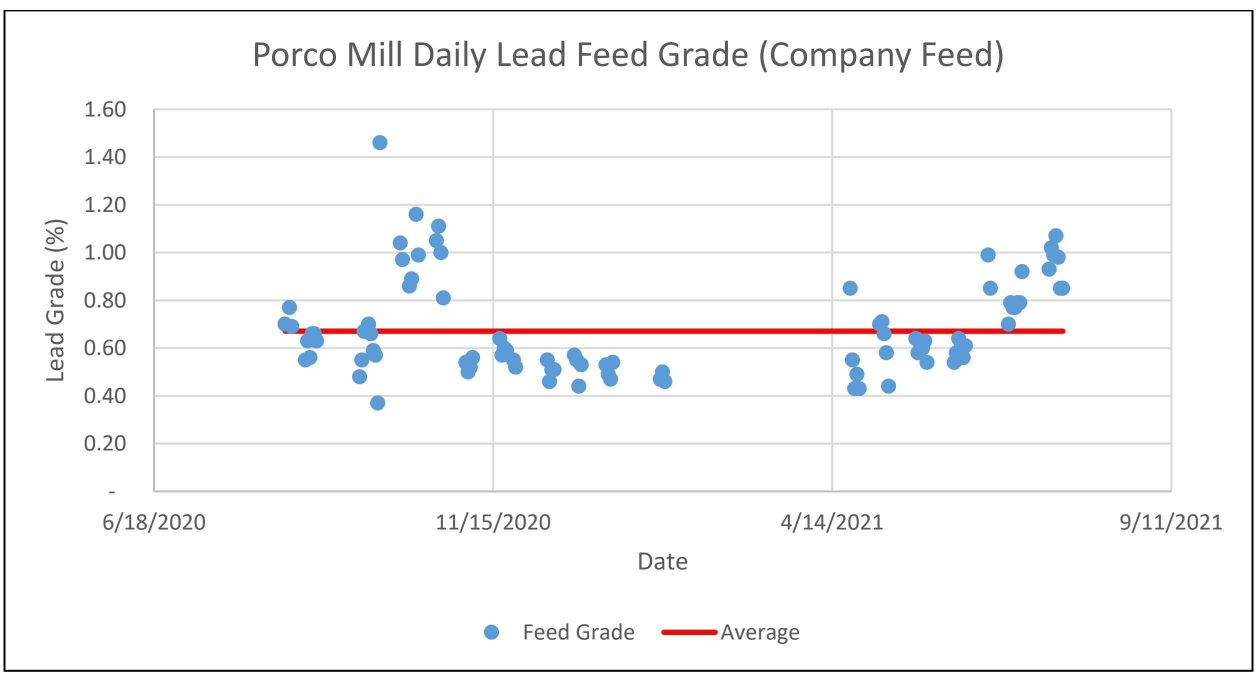
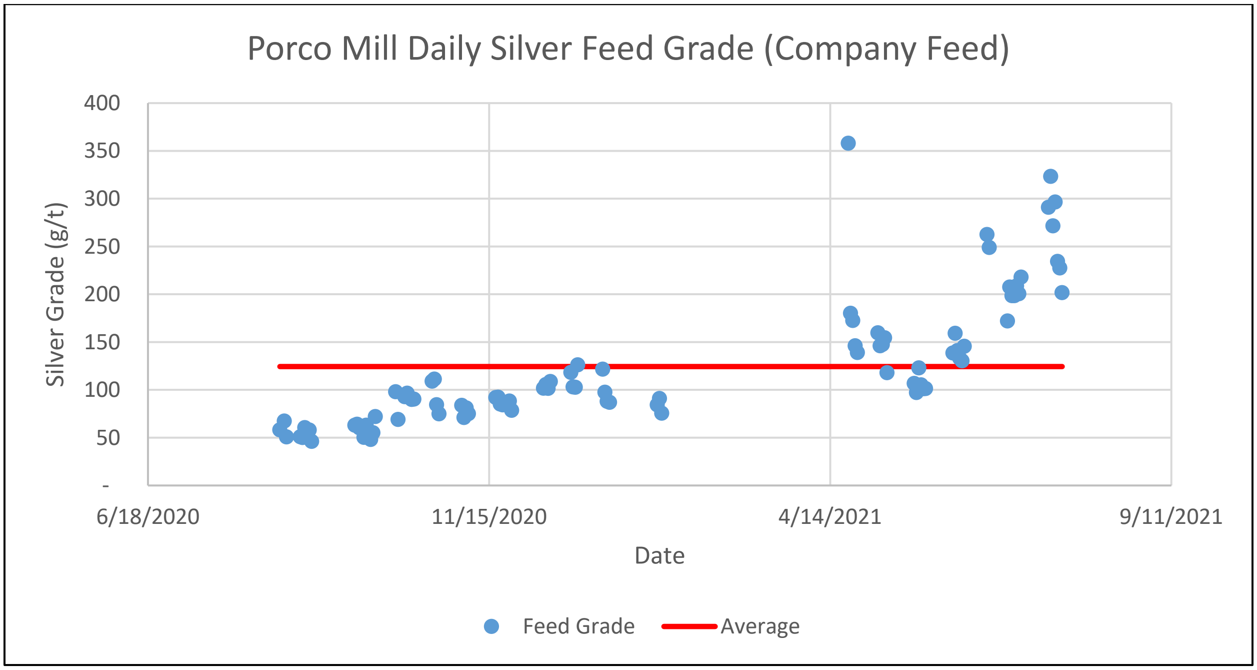


Figure 13-4: Silver Feed Grade 2020/2021



The mill feed grades are measured at the lead circuit flotation feed or also known as the cyclone overflow.

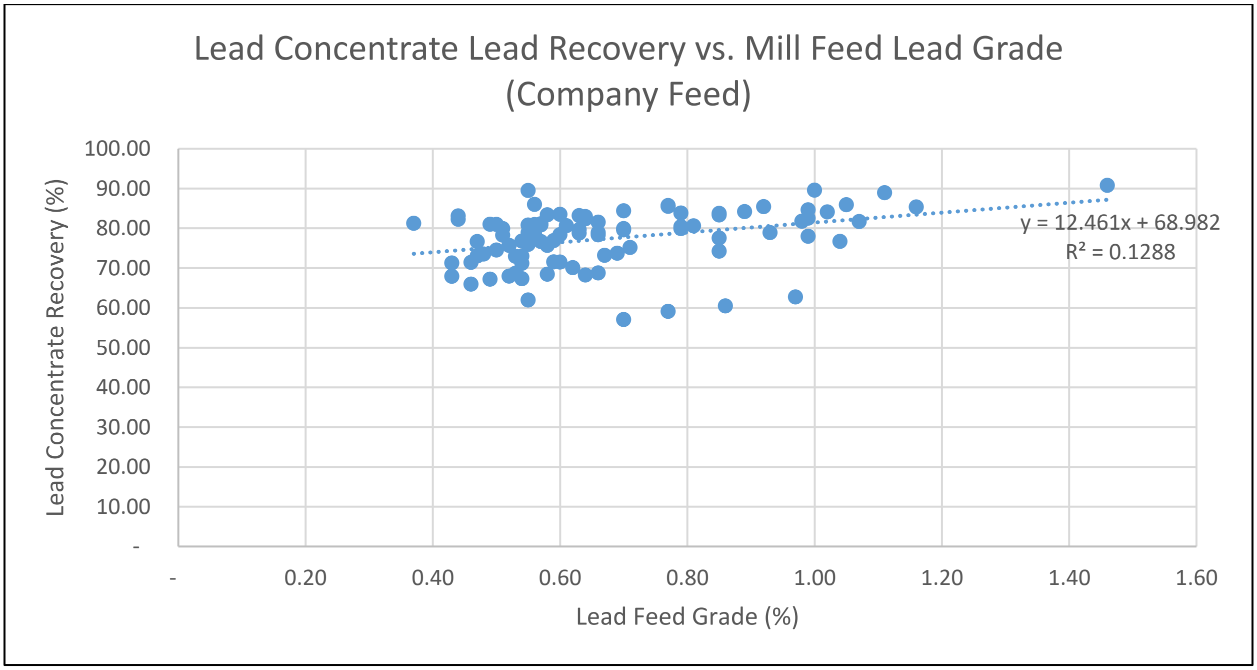
13.1.3 Lead Production

The lead concentrate produced during evaluated period measured 844 t which represents 1.03% of the feed to the plant.

The average grade of the lead concentrate was 51.27% lead, 11.77% zinc, and 6,480 g/t silver. The recoveries to the lead concentrate were 77.56%, 49.79%, and 1.50% for lead, silver, and zinc respectively.

The relationship between the lead feed grade and the lead recovery to the lead concentrate can be seen in Figure 13-5. While there is some variability, especially in the lower lead feed grades, a clear relationship can be seen between lead feed grade and recovery to the lead concentrate.

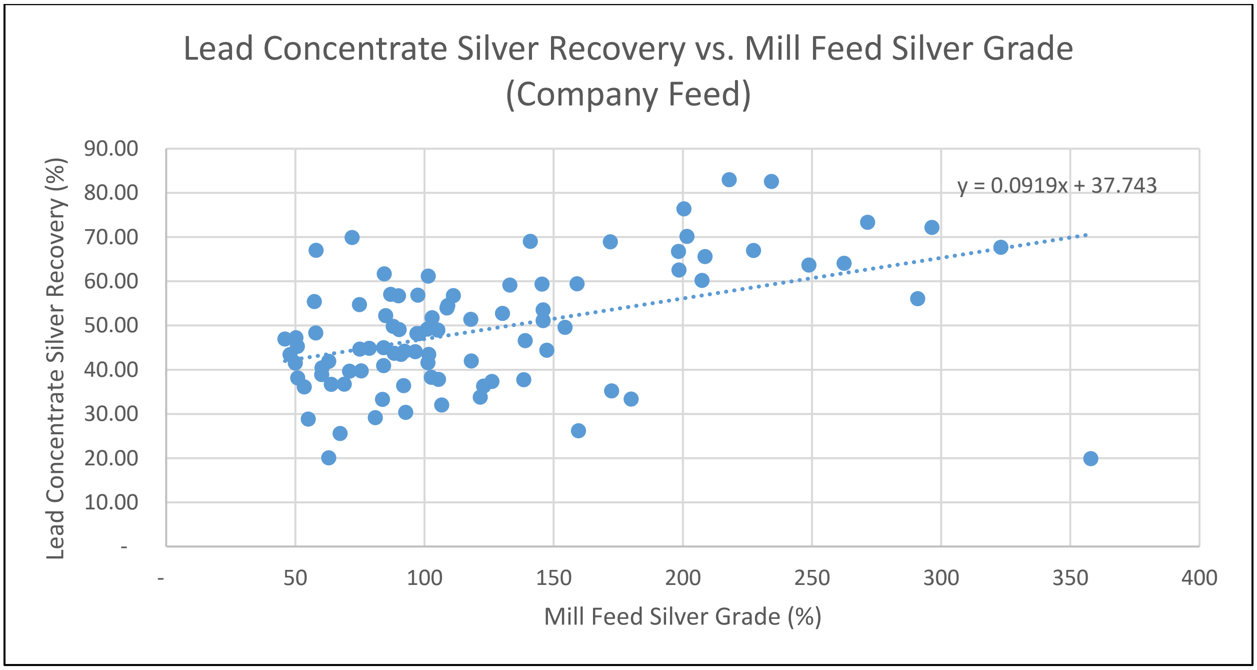
Figure 13-5: Mill Lead Concentrate Recovery vs. Lead Feed Grade



From the above analysis, the recovery relationship for lead to the lead concentrate will be considered: 12.46*(Lead feed grade %) + 68.98.

The silver recovery to both the lead and zinc concentrates is a byproduct of the flotation process; the silver is associated with the lead and zinc minerals and follows them into the concentrates. The recovery of silver to the lead concentrate can be seen in Figure 13-6, In this case, the silver recovery appears to be correlated to the silver grade in the feed (although the relationship is weak) and therefor the relationship of 0.0919*(Silver feed grade %) + 37.743 will be used for this report.

Figure 13-6: Silver Recovery to the Lead Concentrate vs. Mill Feed Silver Grade



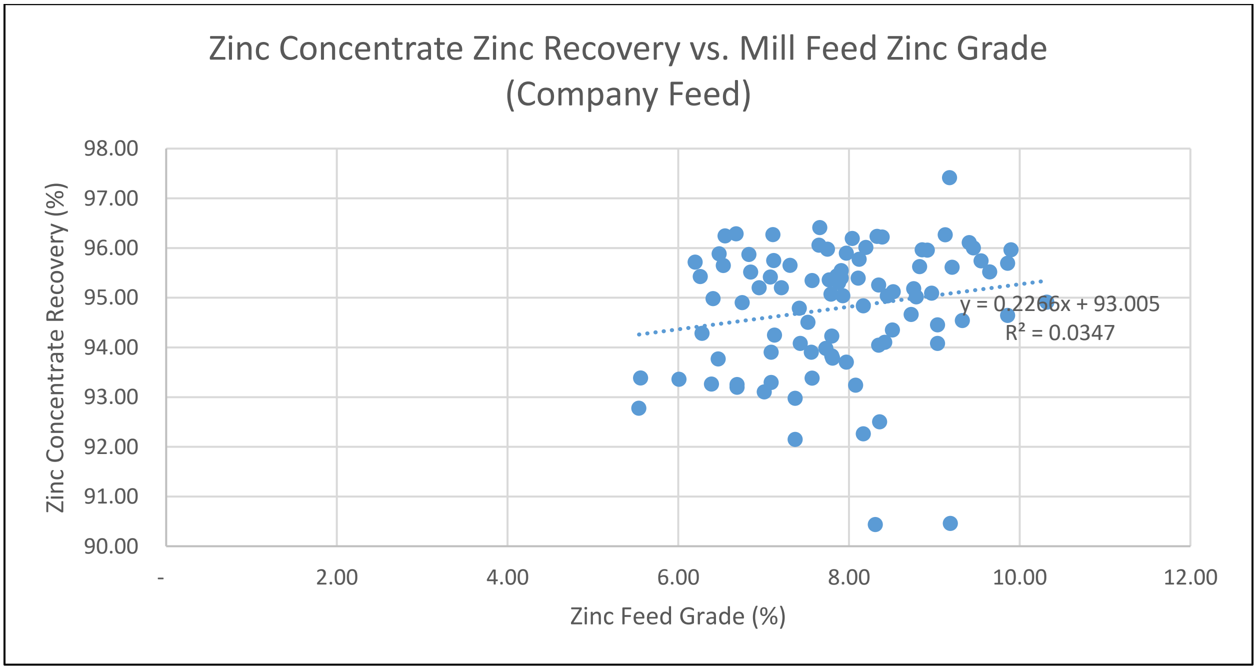
13.1.4 Zinc Production

The lead rougher and cleaner tailings report to the zinc circuit conditioning tanks where copper sulphate and additional collector and frother are added to float a zinc concentrate, with silver. The zinc concentrate accounts for approximately 14.87% of the feed mass.

Over the period analyzed, the unreconciled zinc concentrate production was 12,240 t with average grades of 49.81% zinc, 0.39% lead, and 273 g/t silver. The recoveries to the zinc concentrate were 94.78, 35.24, and 8.78 for zinc, silver, and lead respectively.

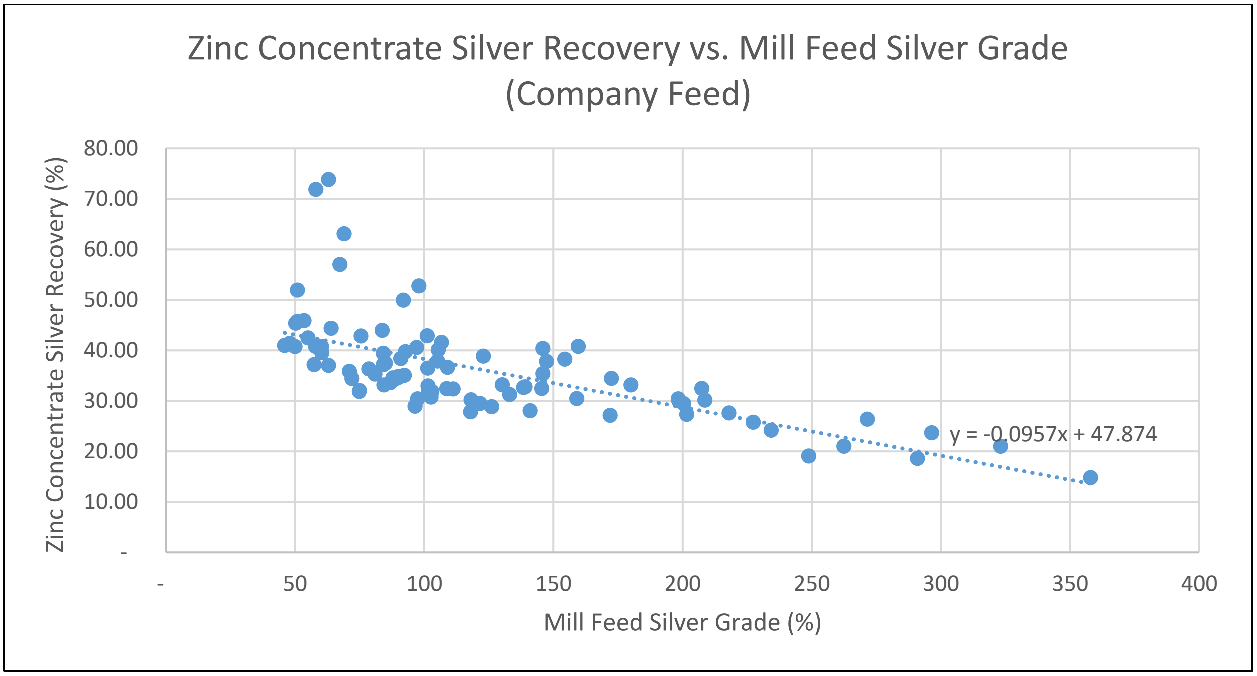
The zinc recovery as a function of the feed grade was examined and found to be a poor relationship for determining expected zinc recovery to the zinc concentrate as can be seen in Figure 13-7. It was determined in this case that the best option was to assign a zinc recovery to the zinc concentrate of 93%, which is the average value over the period examined.

Figure 13-7: Zinc Recovery to the Zinc Concentrate vs. Mill Feed Zinc Grade



The silver recovery to the zinc concentrate can be seen in Figure 13-8. In this case, the recovery has a negative relationship to the feed grade, presumably due to the positive correlation that the silver recovery to the lead concentrate has with the silver feed grade. The relationship for the silver recovery to the zinc concentrate will be taken as -0.0957 x (Silver Feed Grade) + 47.874.

Figure 13-8: Silver Recovery to the Zinc Concentrate vs. Mill Feed Silver Grade



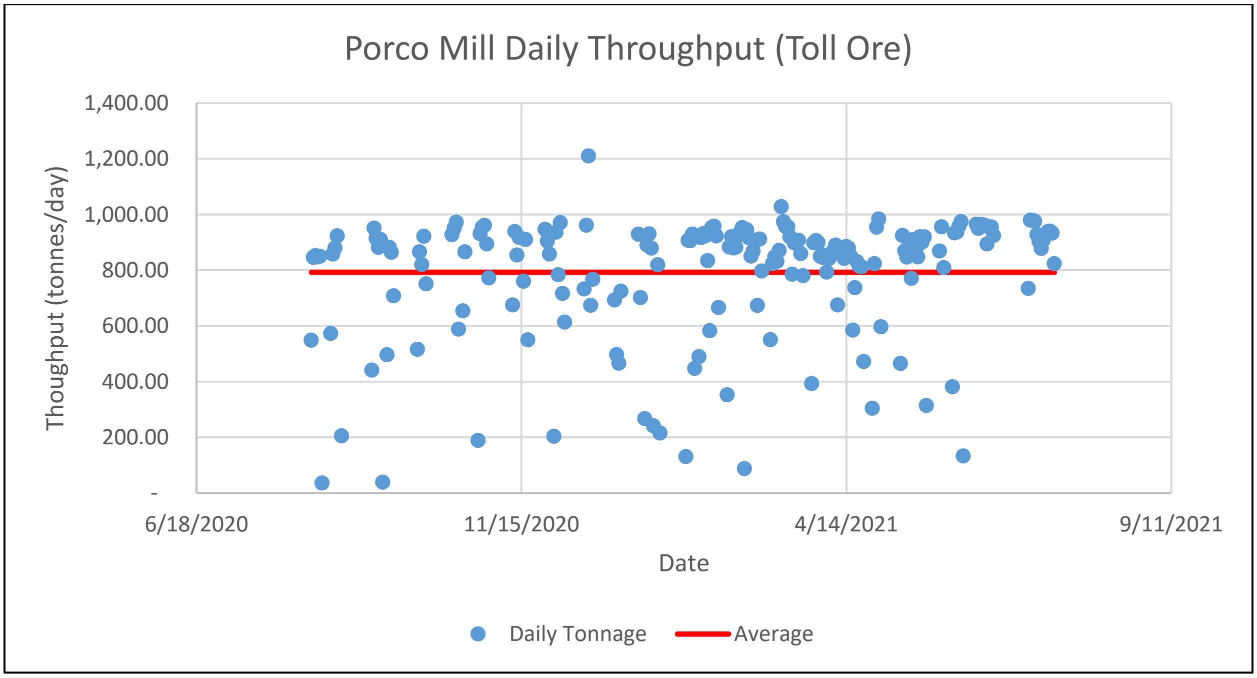
13.2 Toll Feed Processing

Data from the same time period, August 2020 to July 2021, was used to develop the expected metallurgical performance of the Porco mill on toll feed. As was the case for the company feed, the data was used to determine throughput, recovery and concentrate grade relationships.

13.2.1 Mill Throughput

As with the company feed, the expected availability for the mill is 95.5% and the utilization is 95% for an expected operating time of 90.7% for the toll feed. A summary of the throughput from August 2020 to July 2021 can be found in Figure 13-9.

Figure 13-9: Porco Mill Toll Feed Throughput 2020/2021



The throughput of company feed through the Porco mill during the analyzed period was slightly lower than the stated target, with the average of the days it operated being 792.44 t/d. During the analyzed period, the mill ran company feed over 194 whole or partial days and processed 153,733 t of feed. The data suggests that the feed rate is slightly below the target throughput for toll feed.

The target grind for the Porco plant toll feed has a P_{80} of 100 µm.

13.2.2 Feed Grades

For the period examined, the unreconciled feed grades for the company feed were 11.92% zinc, 1.40% lead, and 144 g/t silver. The feed was somewhat variable with standard deviations of 1.75, 0.37, and 33.78 for zinc, lead, and silver respectively. These values fall within the expected ranges for Porco toll feed. The unreconciled feed grades can be seen in Figure 13-10 through Figure 13-12.

Figure 13-10: Toll Feed Zinc Grade 2020/2021

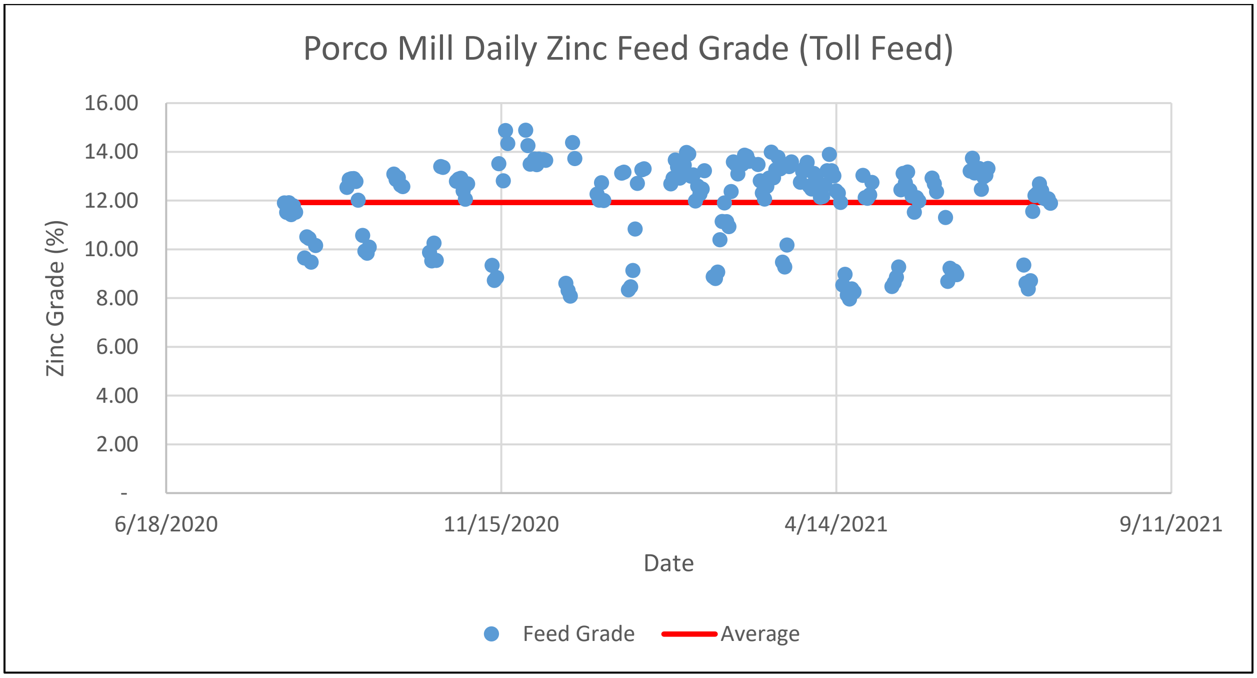


Figure 13-11: Toll Feed Lead Grade 2020/2021

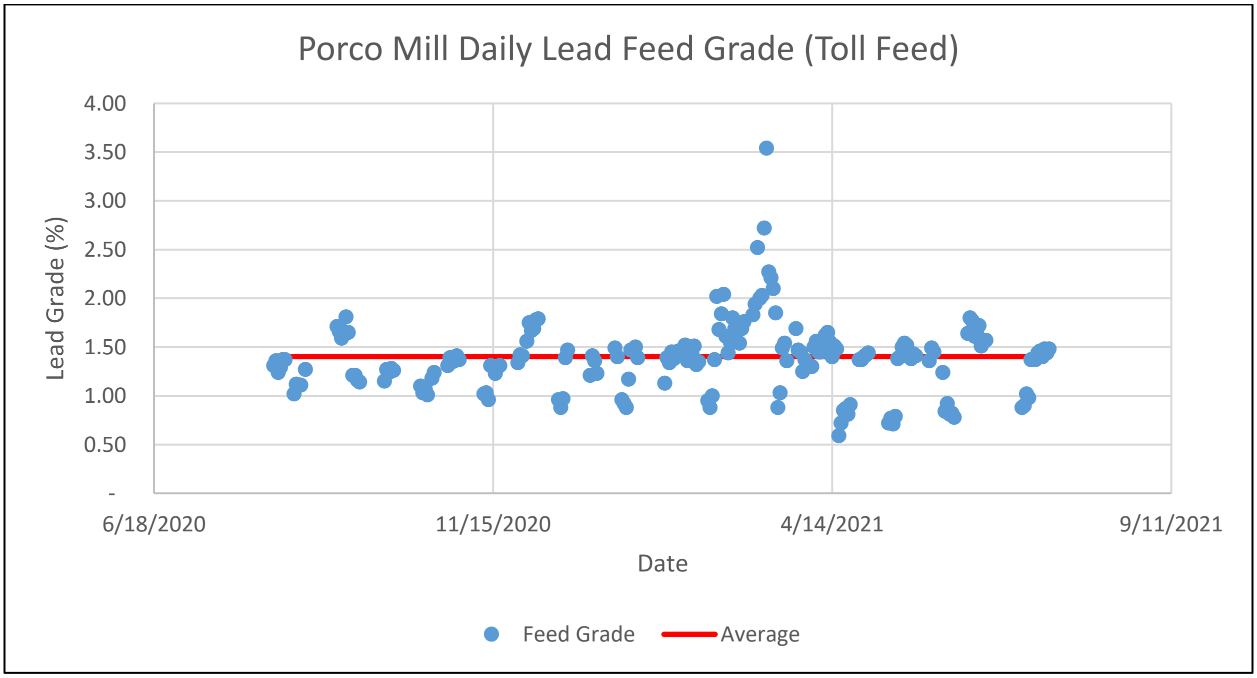
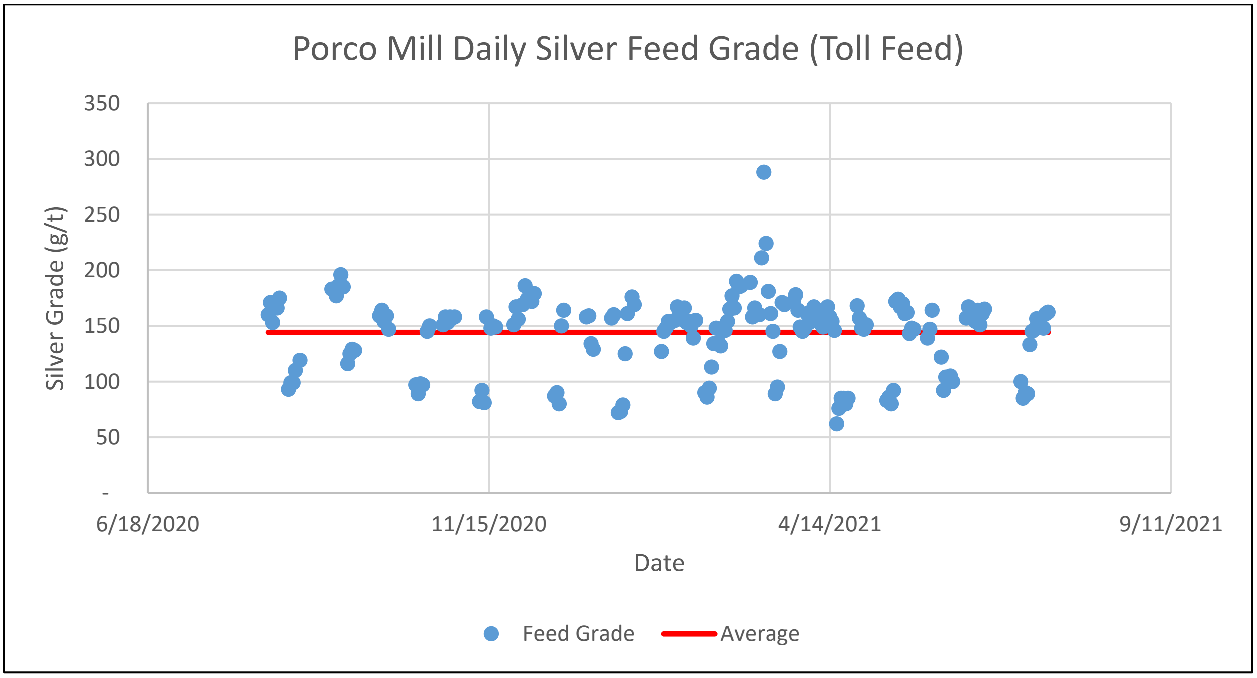


Figure 13-12: Toll Feed Silver Grade 2020/2021



The toll feed head grades were measured in the same location as the company feed.

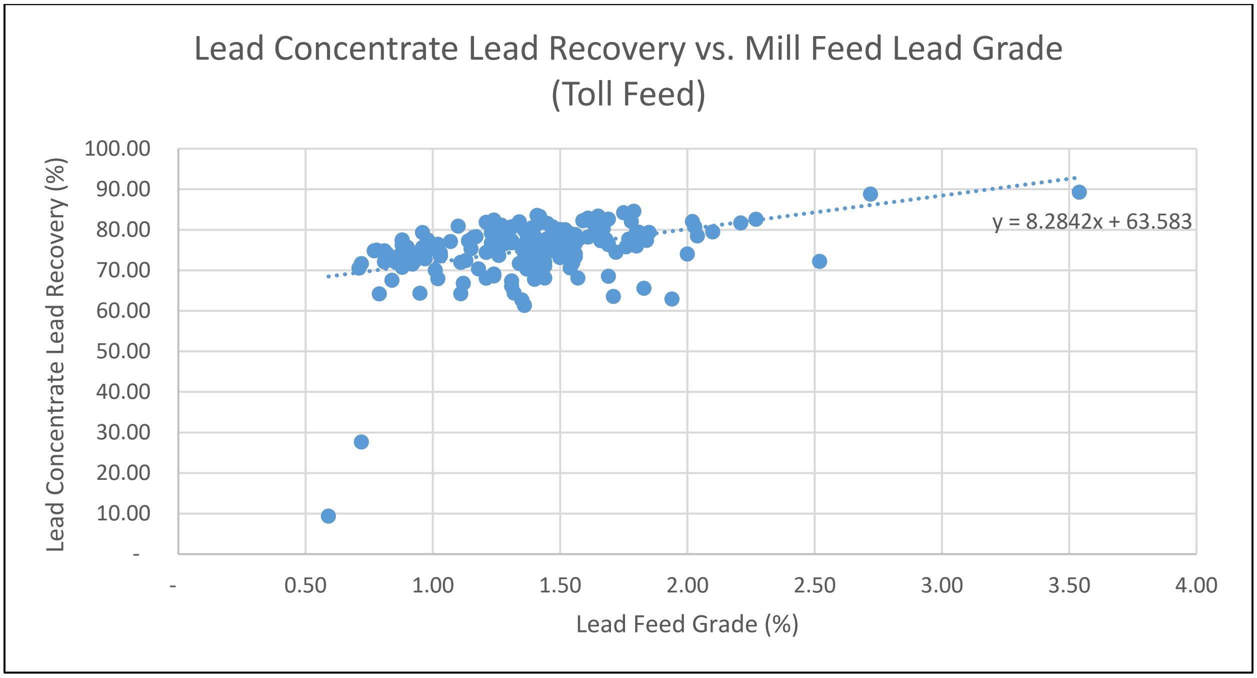
13.2.3 Lead Production

The toll feed utilizes the same reagents as the company feed, in similar dosages. The lead concentrate produced during evaluated period measured 2,912 t which represents 1.89% of the feed to the plant.

The average grade of the lead concentrate was 56.37% lead, 12.54% zinc, and 2,902 g/t silver. The recoveries to the lead concentrate were 75.4%, 37.82%, and 1.95% for lead, silver, and zinc respectively.

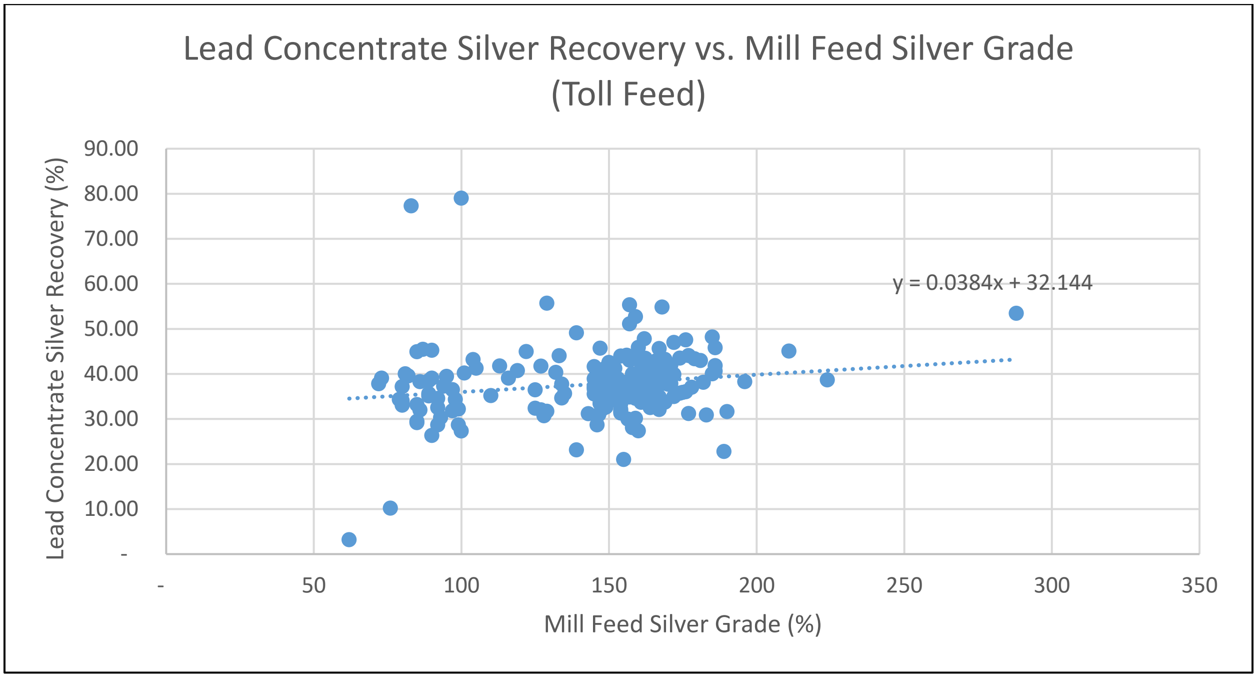
The relationship between the lead feed grade and the lead recovery to the lead concentrate can be seen in Figure 13-13. The recovery relationship for lead to the lead concentrate was determined to be: 8.28*(Lead feed grade %) + 63.58.

Figure 13-13: Mill Lead Concentrate Recovery vs. Lead Feed Grade



The silver recovery to both the lead and zinc concentrates is a byproduct of the flotation process; the silver is associated with the lead and zinc minerals and follows them into the concentrates. The recovery of silver to the lead concentrate can be seen in Figure 13-14, In this case the silver recovery appears to be uncorrelated to the silver grade in the toll feed and therefore a silver recovery of 32, which is the average of the toll feed silver recovery to the lead concentrate, will be used.

Figure 13-14: Silver Recovery to the Lead Concentrate vs. Mill Feed Silver Grade

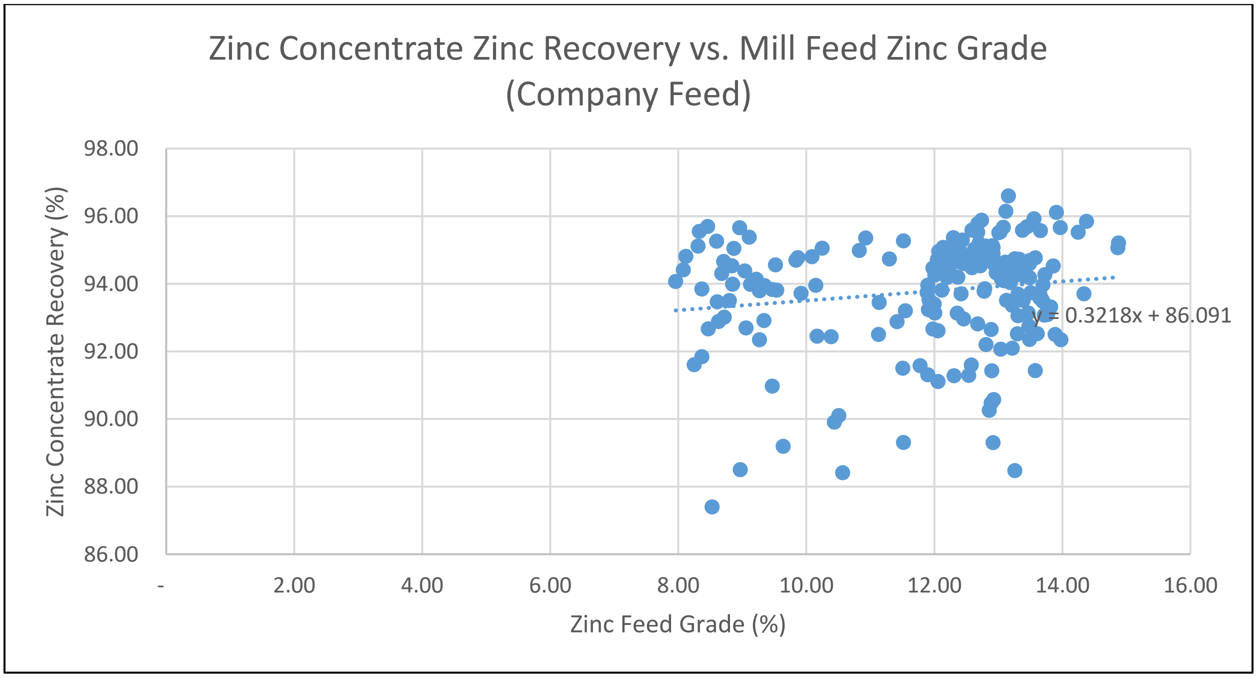


13.2.4 Zinc Production

Over the period analyzed, the unreconciled zinc concentrate production was 33,898 t with average grades of 50.73% zinc, 0.56% lead, and 311 g/t silver. The recoveries to the zinc concentrate were 93.79%, 47.68%, and 8.96% for zinc, silver, and lead respectively. The higher lead in the zinc concentrate is due to the low recovery of lead to the lead concentrate.

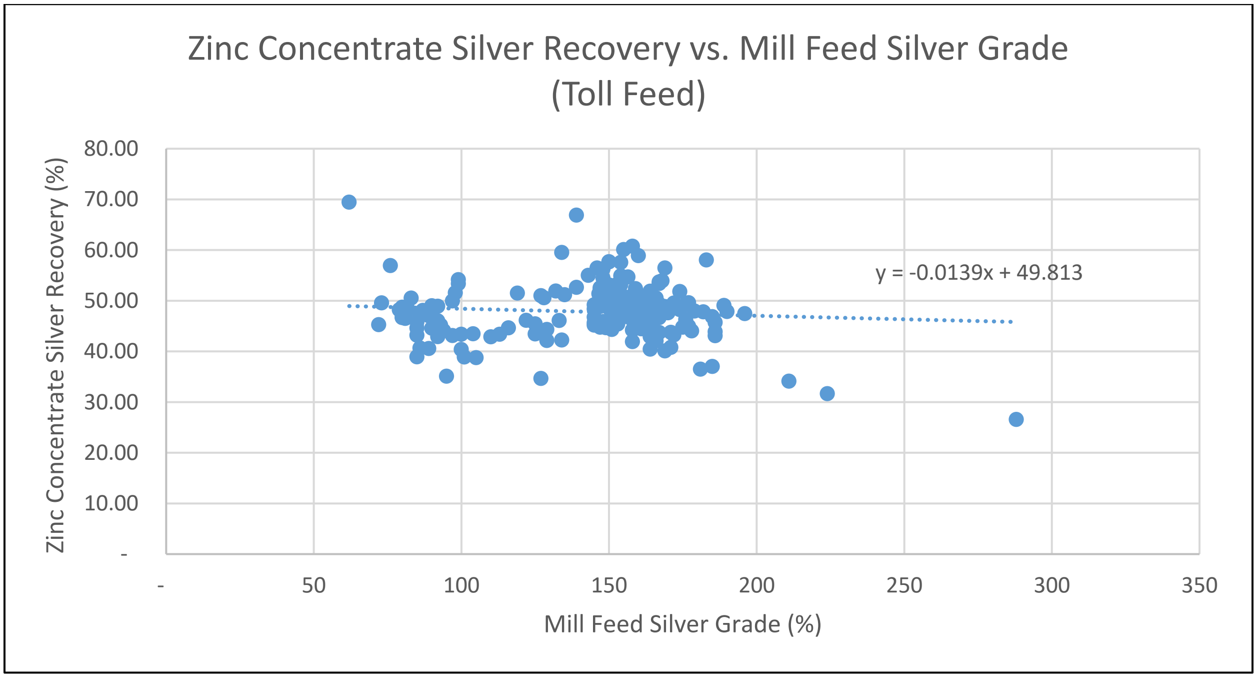
The zinc recovery as a function of the feed grade was examined and found to be similarly poor for determining expected zinc recovery to the zinc concentrate as with the company feed. This relationship can be seen in Figure 13-15. The relationship used for the purposes of this report for the zinc recovery to the zinc concentrate is 86.0.

Figure 13-15: Zinc Recovery to the Zinc Concentrate vs. Mill Feed Zinc Grade



The average silver recovery to the zinc concentrate is approximately recovery of 47.68%. The recovery of silver to the zinc concentrate, with the stated adjustments, can be seen in Figure 13-16, As with the lead concentrate, the silver recovery to the zinc concentrate appears to have a poor correlation to the silver grade in the toll feed. A silver recovery of 50% to the zinc concentrate, which was the average for the data, was chosen for this report.

Figure 13-16: Silver Recovery to the Zinc Concentrate vs. Mill Feed Silver Grade



13.3 Metallurgical Assumptions

The metallurgical assumptions for recoveries and concentrate grades can be found in Table 13-1. The recoveries for each of the metals to each of the concentrates is expressed as a function of the feed grade, or as a constant recovery in the case where a relationship was not determined by the data.

Table 13-1: Recovery and Concentrate Grade Estimates

Parameter	Unit	Concentrates			
		Lead Concentrate		Zinc Concentrate	
		Company Feed	Toll Feed	Company Feed	Toll Feed
Zn Recovery	%	N/A	N/A	93	86
Pb Recovery	%	12.46*(Lead feed grade %) + 68.98	8.28*(Lead feed grade %) + 63.58	N/A	N/A

Parameter	Unit	Concentrates			
		Lead Concentrate		Zinc Concentrate	
		Company Feed	Toll Feed	Company Feed	Toll Feed
Ag Recovery	%	0.919 x (Silver Feed Grade) + 37.743	32	-0.0957 x (Silver Feed Grade) + 47.874	50
Concentrate Grade					
Zn	%	12	12	50	50
Pb	%	51	56	0.39	0.55
Ag	g/t	6,480	2,900	273	310

14 MINERAL RESOURCE ESTIMATE

14.1 Introduction

The purpose of this report is to document the resource estimations for the Porco deposit. This section describes the work undertaken by Kirkham Geosystems, including key assumptions and parameters used to prepare the mineral resource models for Porco which herein to be reporting using zinc-equivalent (ZnEq) cut-offs based upon updated commodity pricing and actual operating costs.

In addition, this Technical Report serves as a first-time disclosure for mineral resources for the Porco deposit, together with appropriate commentary regarding the merits and possible limitations of such assumptions.

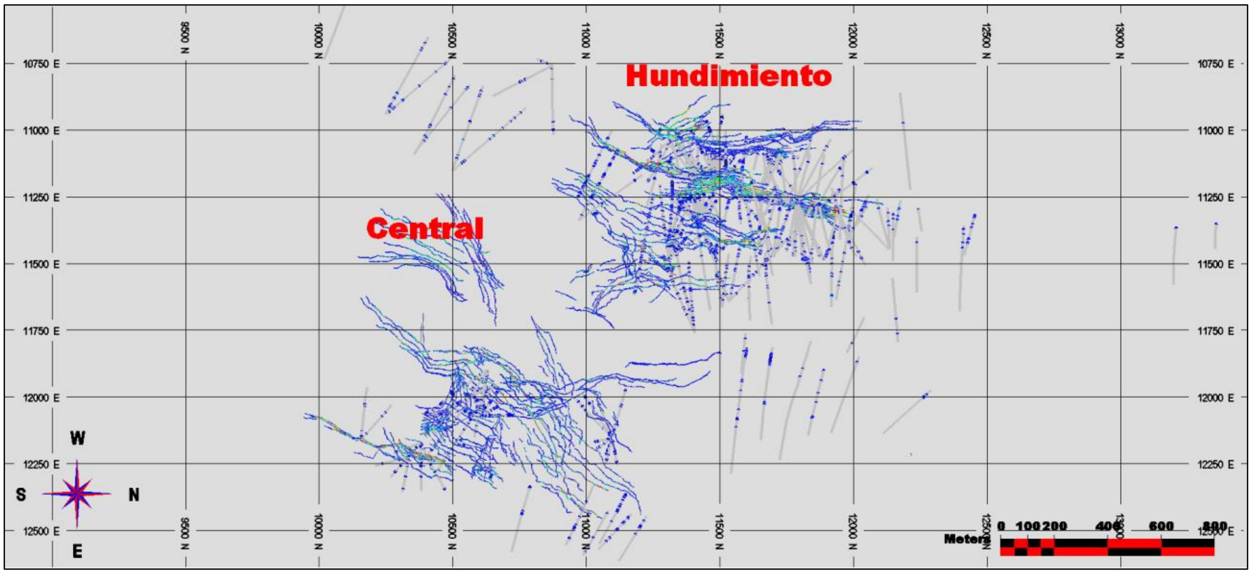
14.2 Data

The 205 drillholes and 30,348 underground channels in the database were supplied in electronic format by Santacruz. This included collars, downhole surveys, lithology data and assay data (i.e., Ag g/t, Pb%, Zn%, Fe%). Table 14-1 lists that individual data file statistics. Validation and verification checks were performed during importation of data to ensure there were no overlapping intervals, typographic errors or anomalous entries. Anomalies and errors were validated and corrected. Figure 14-1 shows a plan view of the supplied drillholes and underground channel samples.

Table 14-1: Data File Statistics

	Collar	Survey	Assay	Zinc	Lead	Silver	Iron
#	30,543	31,288	36,184	36,184	36,184	36,184	6,327

Figure 14-1: Plan View of Porco Drillholes



14.3 Geology Model

Solid models (Figure 14-2 through Figure 14-4) were created from sections and based on a combination of lithology, grades and site knowledge. It is important to note that the Porco Mine has been producing for many years which means that a great deal is known about the mineralized structures such then there is a high level of confidence in the location, orientation, and dimensions of the modelled geological domains.

Figure 14-2: Plan View of Porco Mineralized Zones and Drillholes

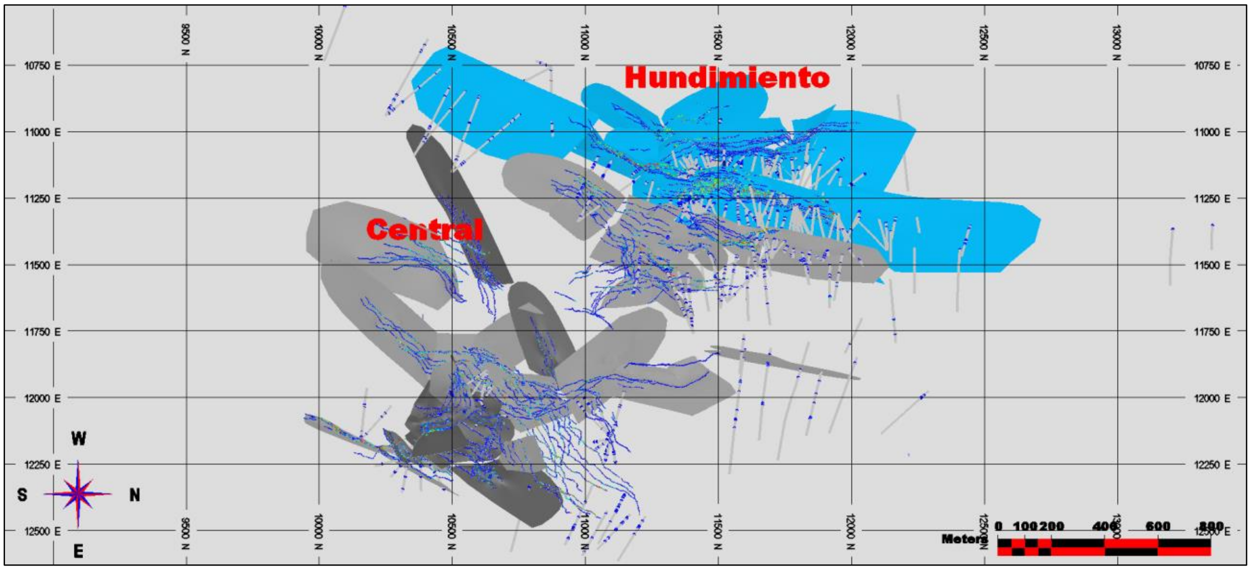


Figure 14-3: Section View of Porco Mineralized Zones and Drillholes Looking South

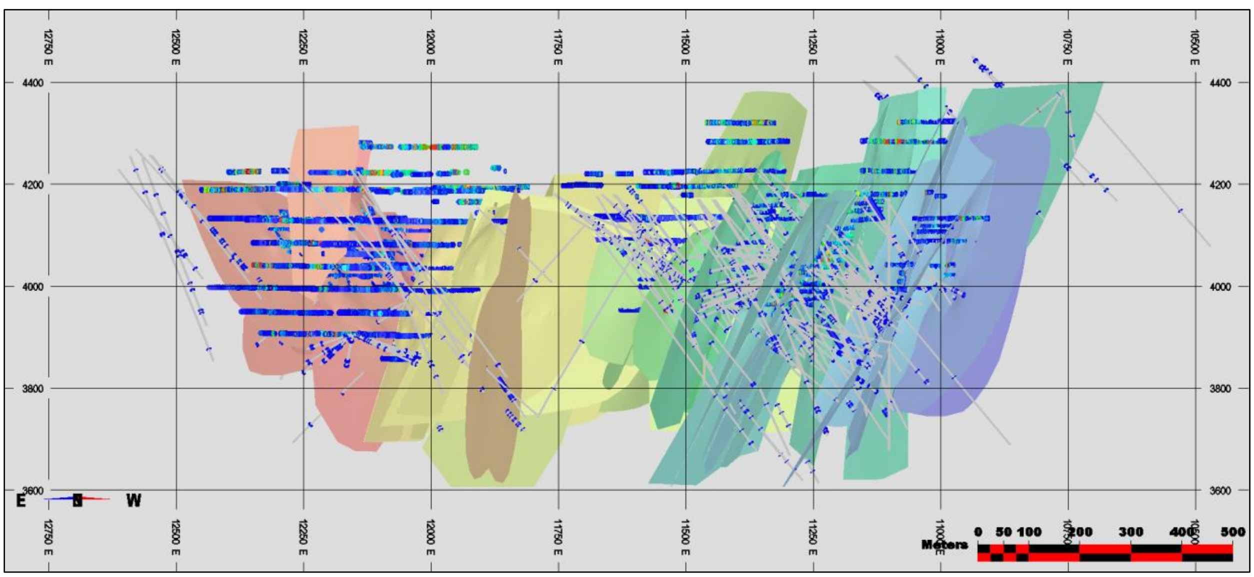
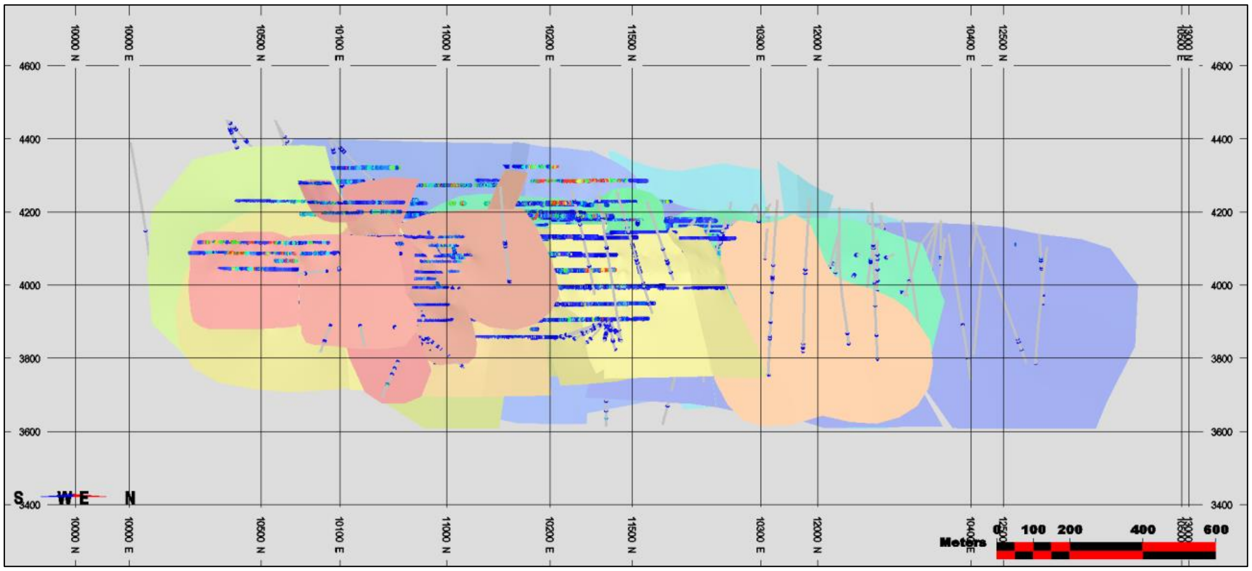


Figure 14-4: Long Section View of Porco Mineralized Zones and Drillholes Looking West



All zones were modelled based on current drilling and assay data using LeapFrog™ and then imported into MineSight™ for interpretation and refinement. Intersections were inspected, and the solids were then manually adjusted to match the drill intercepts. Once the solid models were created, they were used to code the drillhole assays and composites for subsequent statistical and geostatistical analysis. The solid zones were used to constrain the block model by matching assays to those within the zones. The orientation and ranges (distances) used for search ellipsoids in the estimation process were derived from strike and dip of the mineralized zone, site knowledge and on-site observations by Santacruz geological staff.

14.4 Data Analysis

Each of the veins within the Porco deposit are identified and individually numerically coded as shown in Table 14-2.

Table 14-2: Vein Codes and Names for the Porco Deposit

Area	Code	Vein or Vein Group
Hundimiento	2000	Camila
	2001	Ramo Camila
	2010	Colorada
	2011	Karlita

Area	Code	Vein or Vein Group
	2020	Colorada Uno
	2030	PE
	2040	Hundimiento
Central	2050	California
	2060	H_6
	2061	H_6_C
	2064	H_6_H
	2070	Ramo_H6
	2075	Crucera 22
	2077	Crucera Dos
	2080	Pamela
	2082	Larga
	2085	Pobre Rico 3
	2086	Sapi
	2088	Cuadro
	2090	San Antonio Principal
	2095	Aurora
	2101	Sap N
	2110	Ramo 1 Solidad
	2120	Crucera B
	2140	Elena
	2141	Ramo Elena
	2142	Rosario
	2143	Cecilia
	2145	Carla
	2147	Carla 2
	2155	Ramo Carla

Once the database was the numerically coded using these individual mineralized solids, a statistical analysis was performed. Table 14-3 through Table 14-5 shows the simple statistics for the zinc, lead and silver assays by vein, respectively. Note that the zinc assays within all the vein domains possess a relatively low degree of variability which is evidenced by the low Coefficient of Variation (CV) which is a unit independent quantitative measure of variability.

Table 14-3: Statistics for Zinc by Vein

Area	Code	Min	Max	Mean	1Q	Median	3Q	SD	CV
Hundimiento	2000	0.04	51.94	17.26	8.40	16.42	25.30	11.03	0.6
	2010	0	52.67	12.35	2.79	10.24	19.39	10.91	0.9
	2011	0.22	44.25	20.87	10.83	21.57	30.06	12.51	0.6
	2012	0.11	38.39	14.34	9.32	14.13	21.14	8.78	0.6
	2020	0.01	51.5	13.88	4.97	12.06	20.54	10.69	0.8
	2030	0.06	62.78	20.52	9.09	18.56	29.35	13.58	0.7
	2040	0	89.77	12.05	4.56	10.41	17.10	9.53	0.8
Central	2050	0	53.6	11.15	3.40	8.87	16.79	9.59	0.9
	2060	0.01	44.87	7.29	1.80	4.97	10.75	7.30	1.0
	2061	0	41.57	11.36	4.43	10.20	16.58	8.09	0.7
	2062	4.79	48.12	26.68	15.27	23.64	38.68	12.90	0.5
	2065	11.9	38.36	17.88	12.05	12.05	12.05	10.95	0.6
	2070	0.11	54.55	18.07	10.07	15.88	23.43	11.17	0.6
	2075	0.14	30.49	9.37	4.30	7.73	11.05	6.84	0.7
	2077	0.01	48.29	8.58	2.10	5.55	11.24	9.21	1.1
	2078	0.73	35.88	19.11	15.65	20.99	22.22	8.26	0.4
	2080	0	60.06	12.92	4.17	10.39	19.52	10.69	0.8
	2082	0.01	48.65	12.61	3.89	9.77	19.50	10.67	0.8
	2085	0.01	45.36	9.46	4.10	8.25	12.77	7.24	0.8
	2086	1.05	37.39	10.81	7.37	9.82	14.21	6.20	0.6
	2088	0.01	44.75	8.04	2.57	6.27	11.31	7.28	0.9
	2090	0	57.76	14.42	4.24	11.42	21.72	12.42	0.9
	2095	0.01	47.16	11.46	3.76	8.97	17.48	9.45	0.8
	2101	16.4	20.72	17.80	16.39	16.39	20.72	2.03	0.1
	2110	0	55.15	15.07	2.81	12.37	25.11	13.09	0.9
	2120	0.02	43.85	13.11	5.18	11.34	19.09	9.79	0.7
	2140	0	58.73	16.51	5.44	13.54	25.67	12.99	0.8
	2141	0	58.9	20.32	11.86	18.52	26.55	12.03	0.6
	2142	0.23	55.22	26.41	18.50	27.14	34.96	11.32	0.4
	2143	0.09	55.01	18.50	7.95	15.67	28.07	13.53	0.7
	2145	0.06	54.52	24.88	15.09	25.09	34.89	12.82	0.5
	2146	0.5	36.84	12.69	5.72	10.92	19.33	8.07	0.6
	2147	2.86	43.26	25.09	16.99	26.67	33.48	10.80	0.4

Area	Code	Min	Max	Mean	1Q	Median	3Q	SD	CV
	2155	0.06	48.13	7.21	0.20	2.40	4.36	11.78	1.6
	Total	0	89.77	13.54	4.44	10.92	19.95	11.25	0.8
	All	0	89.77	12.81	3.26	9.93	19.27	11.49	0.9

In contrast to zinc, the lead and silver assays exhibit a higher level of variability in a significant number of the veins. Therefore, it is prudent to ensure that extremely high grades do not unduly over-influence the resource as a whole. So, the goal of compositing and grade cutting will be to temper the effect of extreme grades so as not to spread or smear beyond reasonable distances.

Table 14-4: Statistics for Lead by Vein

Area	Code	Min	Max	Mean	1Q	Median	3Q	SD	CV
Hundimiento	2000	0.01	30	0.75	0.15	0.31	0.67	1.66	**2.2**
	2010	0	37.93	1.48	0.20	0.58	1.73	2.71	1.8
	2011	0.11	37.98	3.48	0.68	1.86	3.86	6.36	1.8
	2012	0.04	13.92	0.64	0.05	0.11	0.30	1.99	**3.1**
	2020	0	41.98	1.74	0.22	0.74	1.90	3.26	1.9
	2030	0	68.21	2.41	0.37	1.14	2.66	3.75	1.6
	2040	0	41.71	0.72	0.16	0.34	0.68	1.64	**2.3**
Central	2050	0	51.25	1.30	0.15	0.44	1.26	2.89	**2.2**
	2060	0	18.44	0.94	0.15	0.36	1.06	1.63	1.7
	2061	0	12.12	1.97	0.50	1.11	2.40	2.38	1.2
	2062	0.04	2.39	0.35	0.11	0.21	0.37	0.47	1.3
	2065	0.01	0.39	0.10	0.01	0.01	0.22	0.14	1.3
	2070	0.04	15.49	1.42	0.30	0.88	1.75	1.94	1.4
	2075	0.01	29.79	1.31	0.26	0.54	1.32	2.79	**2.1**
	2077	0	4.35	0.47	0.07	0.26	0.55	0.65	1.4
	2078	0.07	3.16	1.53	0.81	1.34	2.22	0.80	0.5
	2080	0	35.33	0.80	0.07	0.29	0.93	2.01	**2.5**
	2082	0	59	0.75	0.06	0.16	0.55	2.69	**3.6**
	2085	0	13.29	0.27	0.05	0.10	0.23	0.69	**2.5**
	2086	0.1	4.63	0.57	0.17	0.24	0.48	0.87	1.5
	2088	0	40.7	0.90	0.16	0.41	0.85	2.85	**3.2**
	2090	0	33.48	0.53	0.03	0.09	0.27	1.70	**3.2**

Area	Code	Min	Max	Mean	1Q	Median	3Q	SD	CV
	2095	0	36	0.51	0.06	0.12	0.35	2.16	**4.2**
	2101	0.05	0.18	0.09	0.05	0.05	0.18	0.06	0.7
	2110	0	50.4	0.99	0.11	0.38	1.06	2.28	**2.3**
	2120	0	30	1.32	0.12	0.49	1.27	2.80	**2.1**
	2140	0	26.53	0.75	0.14	0.35	0.82	1.40	1.9
	2141	0	14.12	1.32	0.34	0.80	1.67	1.55	1.2
	2142	0.04	23.8	1.44	0.25	0.82	1.97	1.80	1.3
	2143	0	15.51	0.91	0.05	0.36	1.32	1.40	1.5
	2145	0.02	31.14	1.78	0.41	0.99	2.11	2.49	1.4
	2146	0.03	15.63	1.31	0.17	0.57	1.45	2.43	1.9
	2147	0.04	19.67	3.79	0.71	2.40	4.48	4.37	1.2
	2155	0.02	4.18	1.69	0.11	0.93	4.18	1.68	1.0
	Total	0	68.21	0.98	0.11	0.33	0.94	2.30	**2.3**
	All	0	68.21	0.93	0.10	0.30	0.87	2.25	**2.4**

Table 14-5: Statistics for Silver by Vein

Area	Code	Min	Max	Mean	1Q	Median	3Q	SD	CV
Hundimiento	2000	0	6,715	238.3	32.1	131.1	297.7	461.1	1.9
	2010	0	3,561	285.0	34.0	176.9	389.0	353.0	1.2
	2011	7	2,218	738.7	132.3	374.0	1340.7	714.1	1.0
	2012	7	352	82.7	37.3	57.1	88.0	78.1	0.9
	2020	0	3,015	91.2	25.1	54.9	103.9	149.9	1.6
	2030	0.02	13,890	554.8	64.2	189.1	506.9	1127.7	**2.0**
	2040	0	22,737	293.0	51.0	144.0	339.8	662.9	**2.3**
Central	2050	0	12,857	191.2	35.1	86.0	187.9	381.3	**2.0**
	2060	0	2,200	122.1	27.3	67.9	148.7	185.0	1.5
	2061	0	930	115.6	27.3	74.9	139.8	148.7	1.3
	2062	9	161	58.9	32.1	60.1	69.9	33.1	0.6
	2065	2	86	25.7	2.2	2.0	44.0	34.9	1.4
	2070	7	26,993	301.6	55.1	123.0	291.8	906.5	**3.0**
	2075	1	2,564	187.4	34.0	101.9	208.9	307.7	1.6
	2077	0	1,313	91.6	14.0	36.0	101.0	158.5	1.7
	2078	14	208	109.8	91.2	118.1	146.8	43.8	0.4

Area	Code	Min	Max	Mean	1Q	Median	3Q	SD	CV
	2080	0	10,193	181.6	23.2	57.9	153.9	498.7	2.7
	2082	0	1,954	138.3	23.2	74.1	179.8	185.5	1.3
	2085	0	158	2.2	0.3	0.4	0.8	9.2	4.2
	2086	18	751	266.1	138.2	211.0	382.8	175.8	0.7
	2088	0	6,198	91.0	23.2	49.0	94.7	304.6	3.3
	2090	0	3,323	131.1	13.2	49.0	113.9	289.7	2.2
	2095	0	1,862	67.5	15.1	39.0	78.8	129.9	1.9
	2110	0	5,040	182.6	18.1	64.1	149.8	484.2	2.7
	2120	0	11,889	311.9	20.2	64.1	265.9	848.0	2.7
	2140	0	1,344	62.2	15.1	40.1	76.9	84.9	1.4
	2141	0	3,350	113.8	52.1	81.1	118.8	199.4	1.8
	2142	7	1,366	127.2	45.1	83.0	140.9	162.2	1.3
	2143	0	7,704	96.8	25.1	66.0	108.8	229.1	2.4
	2145	0.05	17,601	592.3	82.1	182.1	538.0	1283.8	2.2
	2146	0	2,480	225.2	50.2	108.9	240.8	387.6	1.7
	2147	17	7,109	454.2	123.1	262.0	636.8	754.9	1.7
	2155	3.5	157	48.3	3.5	27.1	77.7	48.7	1.0
	Total	0	26,993	193.1	23.2	71.9	179.8	518.7	2.7
	All	0	26,993	176.7	16.2	63.0	164.9	484.7	2.7

Table 14-6 shows the statistical analysis of assay interval lengths shows that the average sample length is 1.8 m. Therefore, the data is negatively skewed meaning that there is a preponderance of small sample lengths in comparison to greater thicknesses.

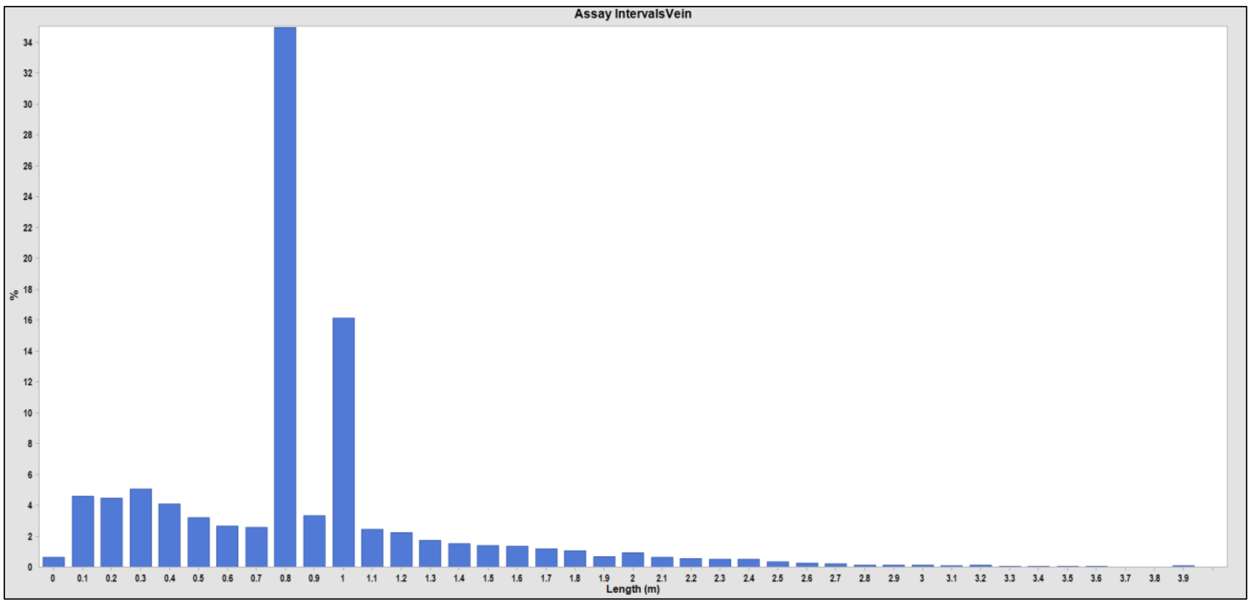
Table 14-6: Statistics Assay Interval Lengths for the Porco Deposit by Vein

Area	Code	Min	Max	Mean	1Q	Median	3Q	SD	CV
Hundimiento	2000	0.05	2.2	0.76	0.40	0.80	1.00	0.38	0.5
	2010	0.05	3	1.05	0.80	1.00	1.10	0.51	0.5
	2011	0.05	0.9	0.44	0.35	0.40	0.50	0.18	0.4
	2012	0.05	1	0.68	0.45	0.77	0.96	0.28	0.4
	2020	0.05	3.8	1.34	1.00	1.00	1.70	0.64	0.5
	2030	0.01	1.45	0.67	0.45	0.70	0.90	0.28	0.4

Area	Code	Min	Max	Mean	1Q	Median	3Q	SD	CV
	2040	0.02	6.15	1.57	0.80	1.30	2.20	0.87	0.6
Central	2050	0.02	4.1	1.12	0.80	0.80	1.50	0.61	0.5
	2060	0.03	3.65	1.09	1.00	1.00	1.20	0.45	0.4
	2061	0.05	1.4	0.77	0.60	0.80	1.00	0.25	0.3
	2062	0.1	0.83	0.38	0.25	0.34	0.42	0.19	0.5
	2064	0.08	0.08	0.08	0.08	0.08	0.08	0.00	0.0
	2065	0.15	0.83	0.63	0.28	0.83	0.83	0.29	0.5
	2070	0.05	1.3	0.64	0.40	0.70	0.80	0.27	0.4
	2075	0.1	1.6	0.80	0.80	0.80	0.80	0.21	0.3
	2077	0.1	1.6	0.84	0.80	0.80	0.80	0.16	0.2
	2078	0.1	0.52	0.38	0.27	0.40	0.45	0.11	0.3
	2080	0.05	3.6	1.03	0.80	0.80	1.15	0.44	0.4
	2082	0.05	3.8	1.00	0.80	0.80	1.10	0.41	0.4
	2085	0.8	4.1	1.36	0.80	1.20	1.80	0.63	0.5
	2086	0.15	1.2	0.79	0.60	0.80	1.00	0.23	0.3
	2088	0.8	2.4	0.91	0.80	0.80	0.80	0.30	0.3
	2090	0.05	3.5	1.19	0.80	1.00	1.40	0.56	0.5
	2095	0.27	2.7	0.97	0.80	0.80	1.00	0.30	0.3
	2101	0.15	0.31	0.26	0.15	0.31	0.31	0.08	0.3
	2102	0.05	0.3	0.26	0.30	0.30	0.30	0.09	0.3
	2103	0.6	0.6	0.60	0.60	0.60	0.60	0.00	0.0
	2110	0.08	2.6	0.98	0.80	0.80	1.00	0.36	0.4
	2120	0.05	1.6	0.93	0.80	1.00	1.00	0.20	0.2
	2140	0.05	3	1.01	0.80	1.00	1.05	0.42	0.4
	2141	0.05	1.7	0.64	0.40	0.60	0.86	0.30	0.5
	2142	0.05	2.2	0.73	0.40	0.70	1.00	0.38	0.5
	2143	0.05	1.65	0.72	0.40	0.80	1.00	0.30	0.4
	2145	0.02	3.3	0.87	0.60	0.80	1.00	0.46	0.5
	2146	0.8	1.4	0.85	0.80	0.80	0.80	0.12	0.1
	2147	0.16	1.07	0.73	0.51	0.70	1.00	0.25	0.3
	2155	0.12	0.84	0.53	0.47	0.51	0.84	0.22	0.4
	Total	0.01	6.15	1.18	0.80	1.00	1.40	0.66	0.6
	All	0.01	42	1.28	0.80	1.00	1.35	2.34	1.8

Figure 14-5 also illustrates this negative skewness and also illustrates that the assay lengths are predominately <1 m in length with the most common sample length being 0.8 m and with approximately 20% of all vein samples being >1 m.

Figure 14-5: Assay Interval Lengths

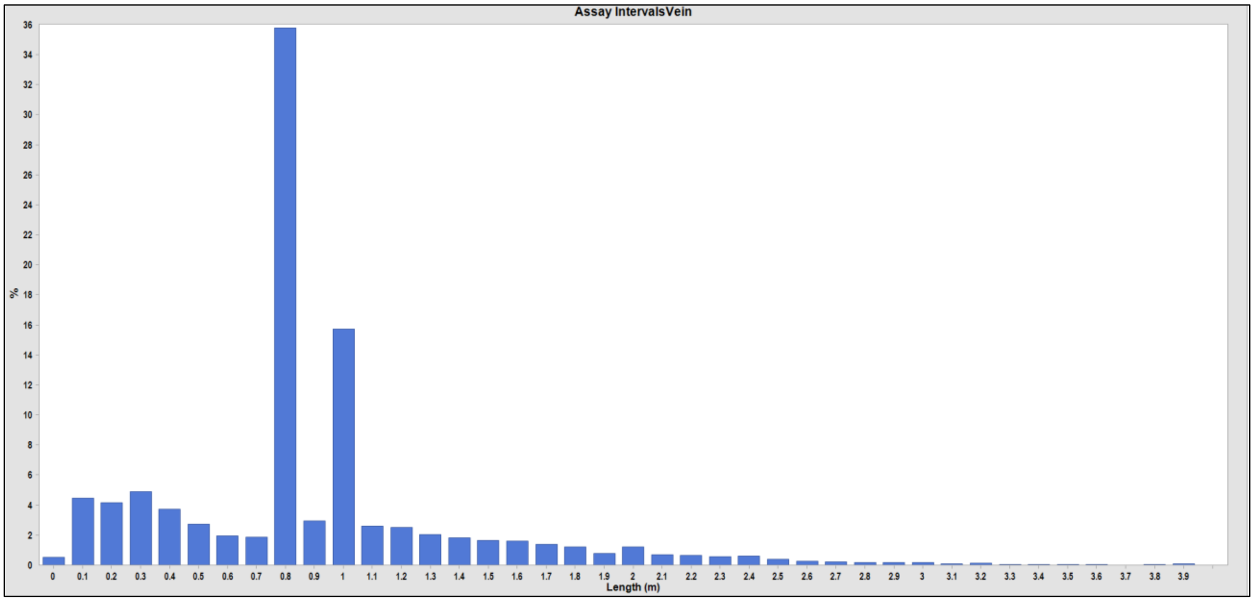


14.5 Composites

It was determined that a 1.0 m composite length offered the best balance between supplying common support for samples and minimizing the smoothing of the grades with ~80% of the samples within the mineralized zones being <1 m in length. The 1.0 m sample length is also approximately consistent with the distribution of sample lengths within the mineralized domains as shown in the histogram of assay lengths.

Figure 14-6 shows the sample lengths for the data composited to the full width of the veins to determine the actual effect of compositing. Note that the histograms are comparatively similar which shows that the assay data was samples across the complete width of the vein for the most part therefore the act of composting has relatively little effect. Therefore, cutting will be the necessary as the predominant tool for treating the anomalous outlier grades in order the reduce variability and reduce the influence of the high-grade populations.

Figure 14-6: Full Vein Composite Interval Lengths



It should be noted that although 1.0 m is the composite length, any residual composites of lengths greater than 0.5 m were retained to represent a composite, while any composite residuals less than 0.5 m were combined with the previous composite. However, as the composite lengths are significantly similar to the original assay sample lengths, the number of “tails” is minimal. Note that the composite data was not declustered however analysis shows that there are small variations in the mean grades between native and declustered composites. Due to the high degree of reliance on underground sample data for the estimation process, consideration should always include review of declustering to ensure appropriate data support.

The box plots for the zinc, lead and silver composites illustrate that each of the individual vein domains have differing statistical characteristics and grade distributions. Figure 14-7 through Figure 14-9 provide the statistical distributions in the way for box plots for the Hundimiento area while Figure 14-10 through Figure 14-12 illustrate those for the Central area. These statistical representations show that there is not a case combine any or all of the vein domains for estimation and as such, they are treated independently utilizing hard boundaries.

Figure 14-7: Box Plot of Zn Composites for the Hundimiento Area

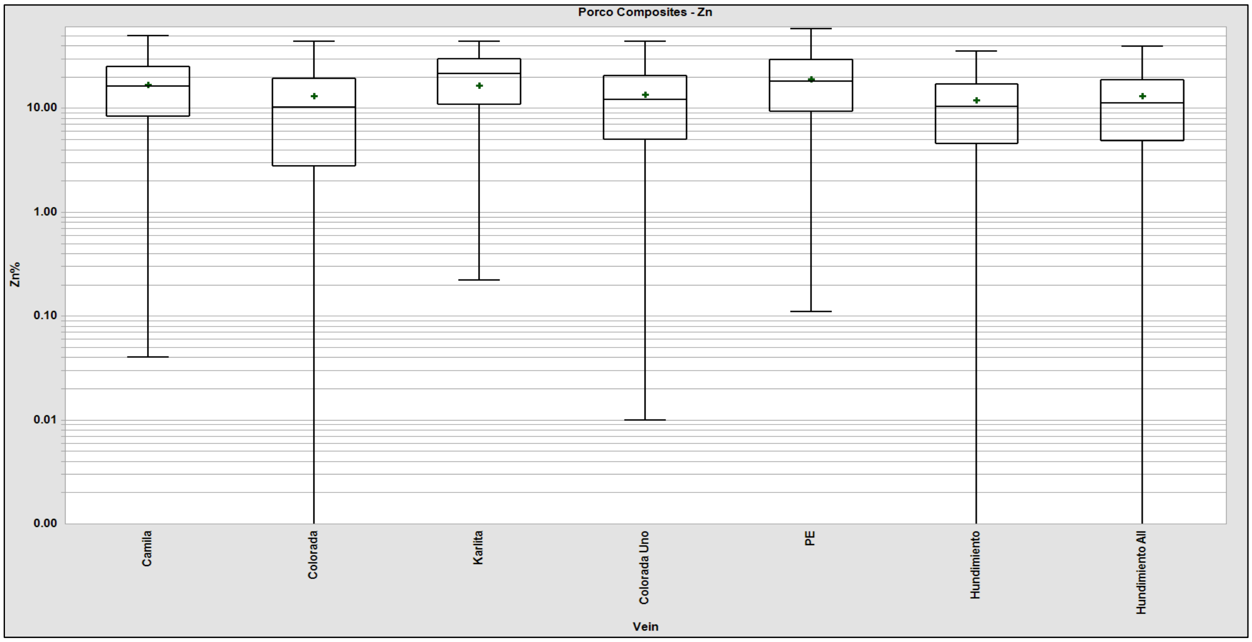


Figure 14-8: Box Plot of Pb Composites for the Hundimiento Area

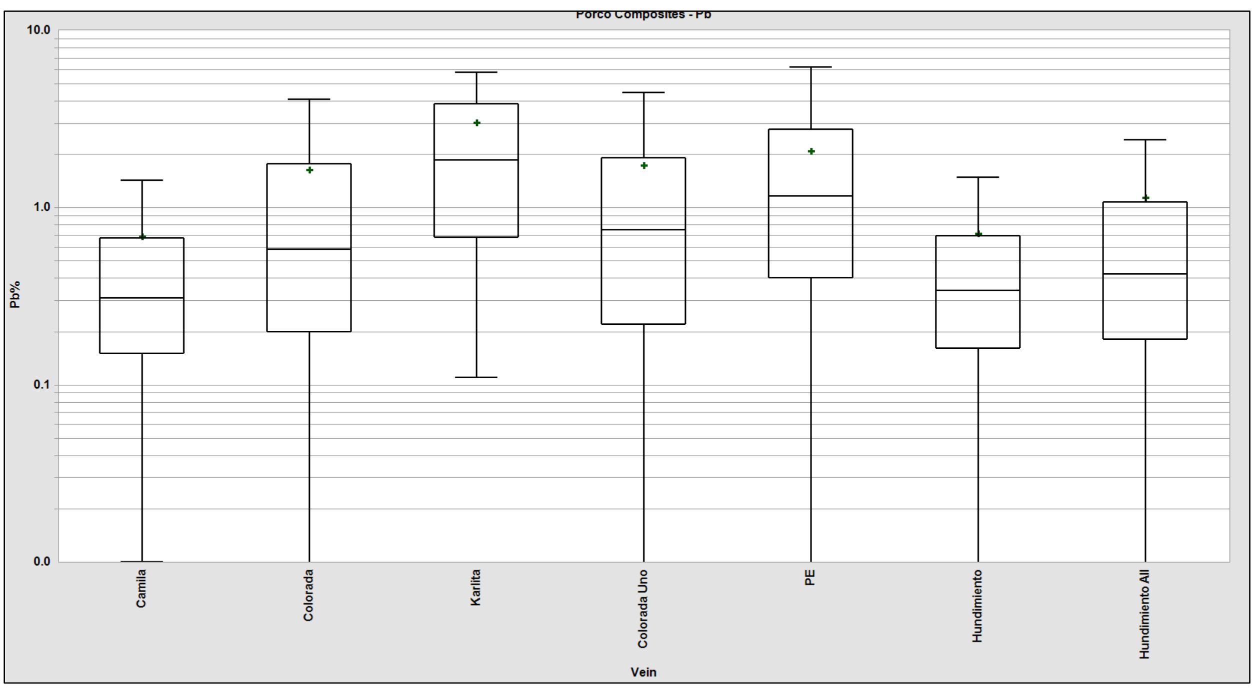


Figure 14-9: Box Plot of Ag Composites for the Hundimiento Area

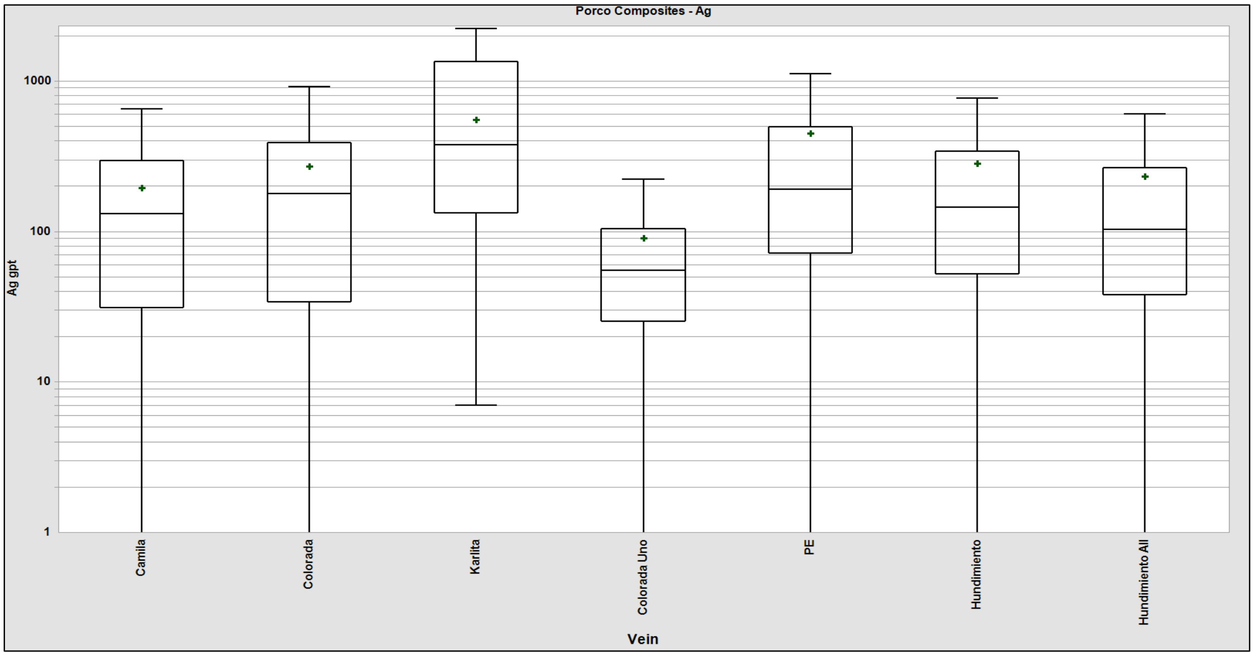


Figure 14-10: Box Plot of Zn Composites for the Central Area

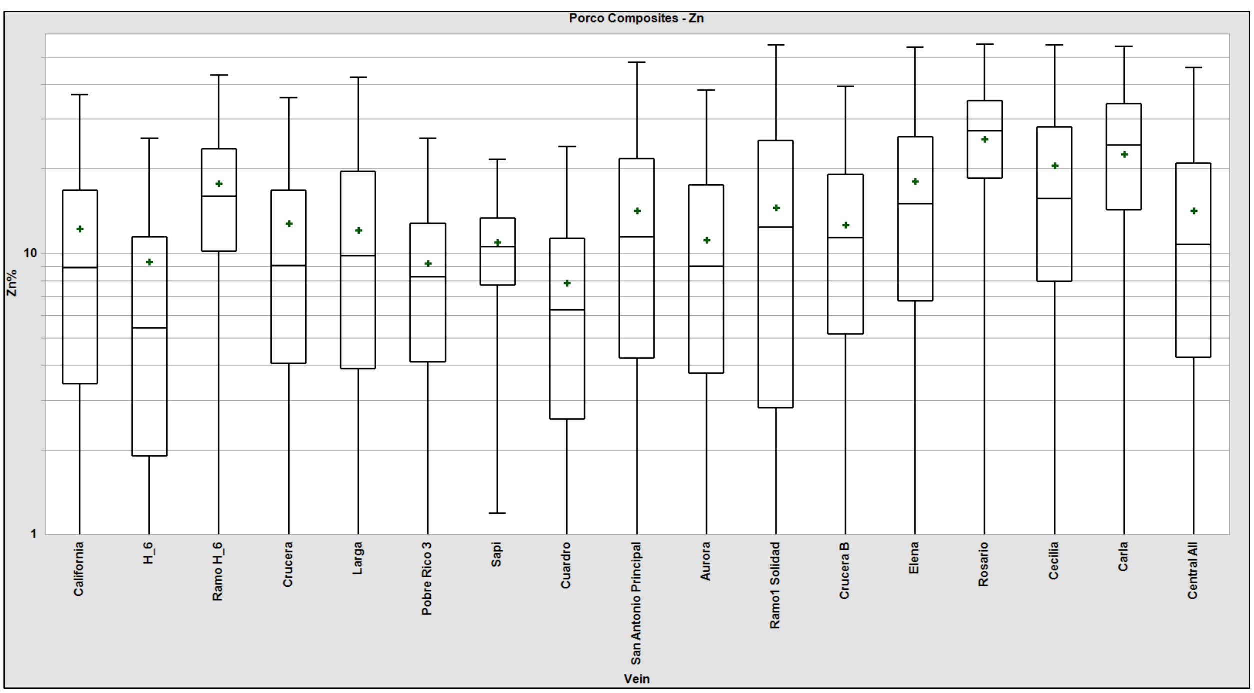


Figure 14-11: Box Plot of Pb Composites for the Central Area

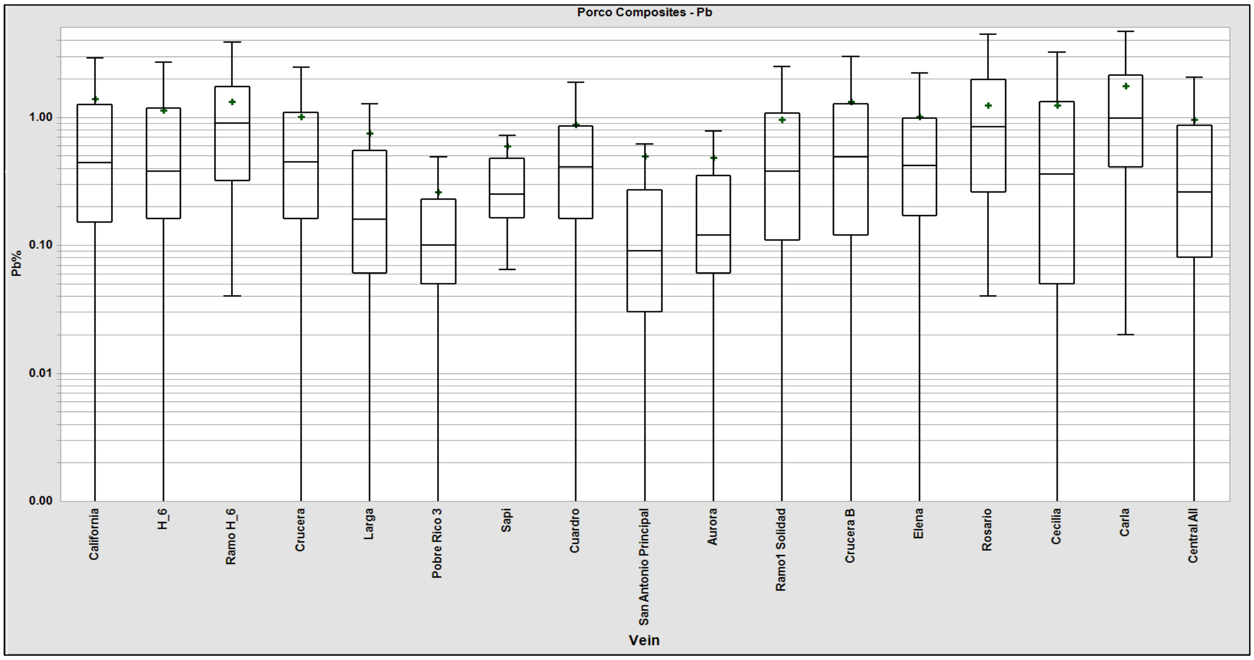


Figure 14-12: Box Plot of Ag Composites for the Central Area

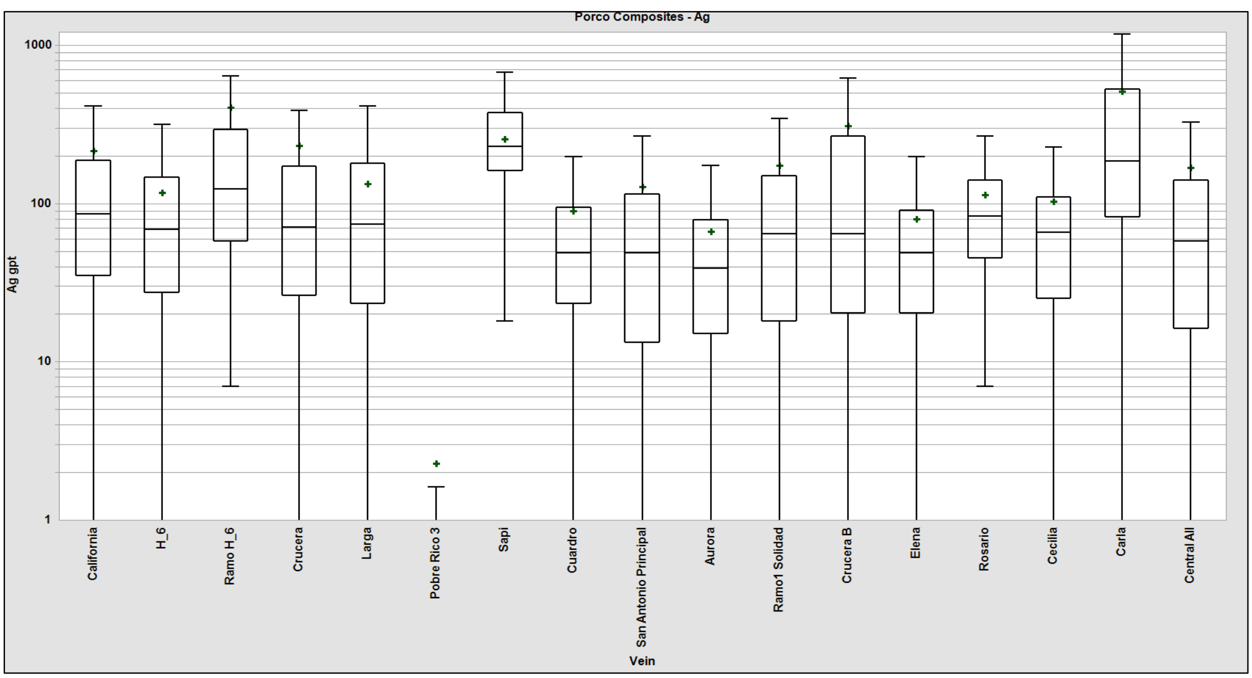


Figure 14-13: Histogram of Ag Composites for the Porco Deposit

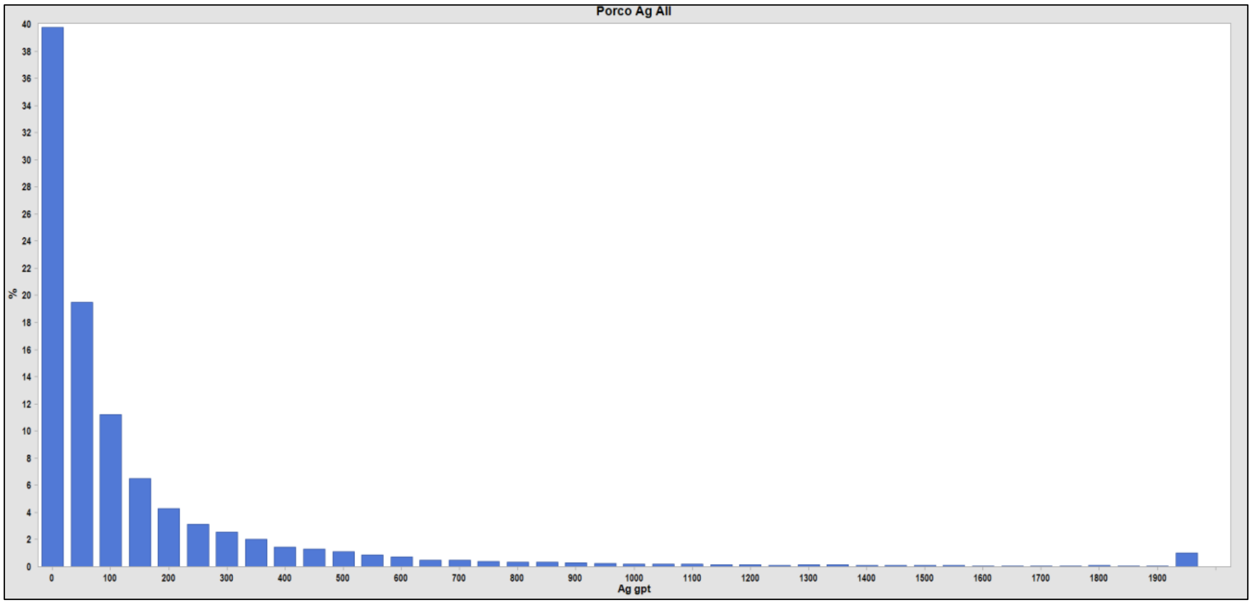


Figure 14-14: Histogram of Zn Composites for the Porco Deposit

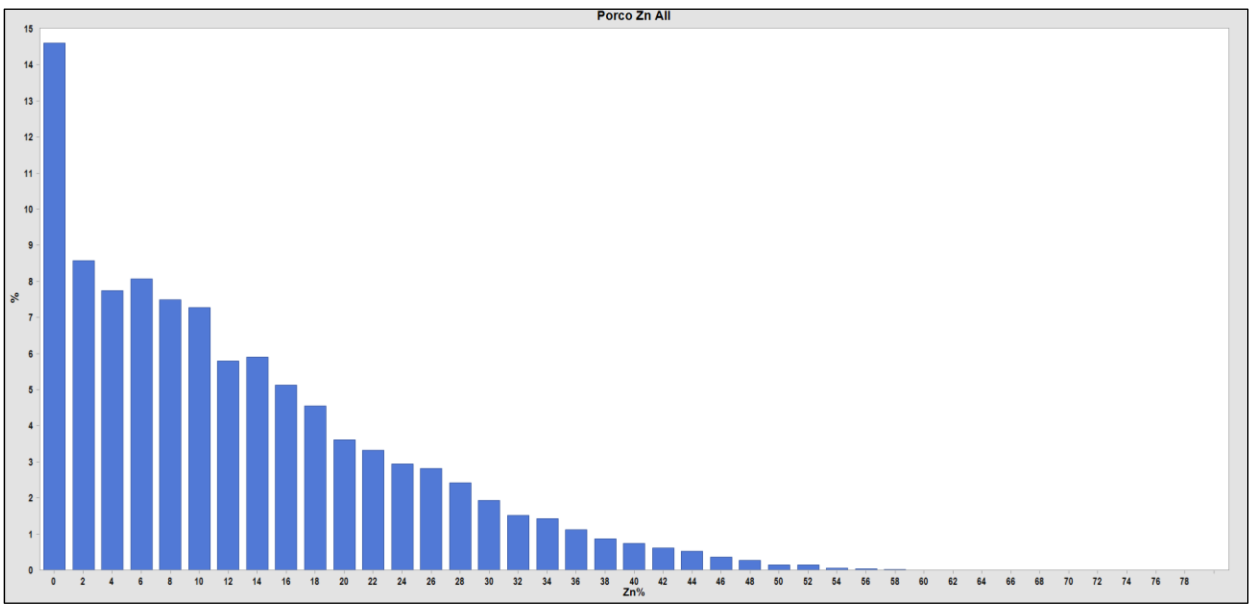
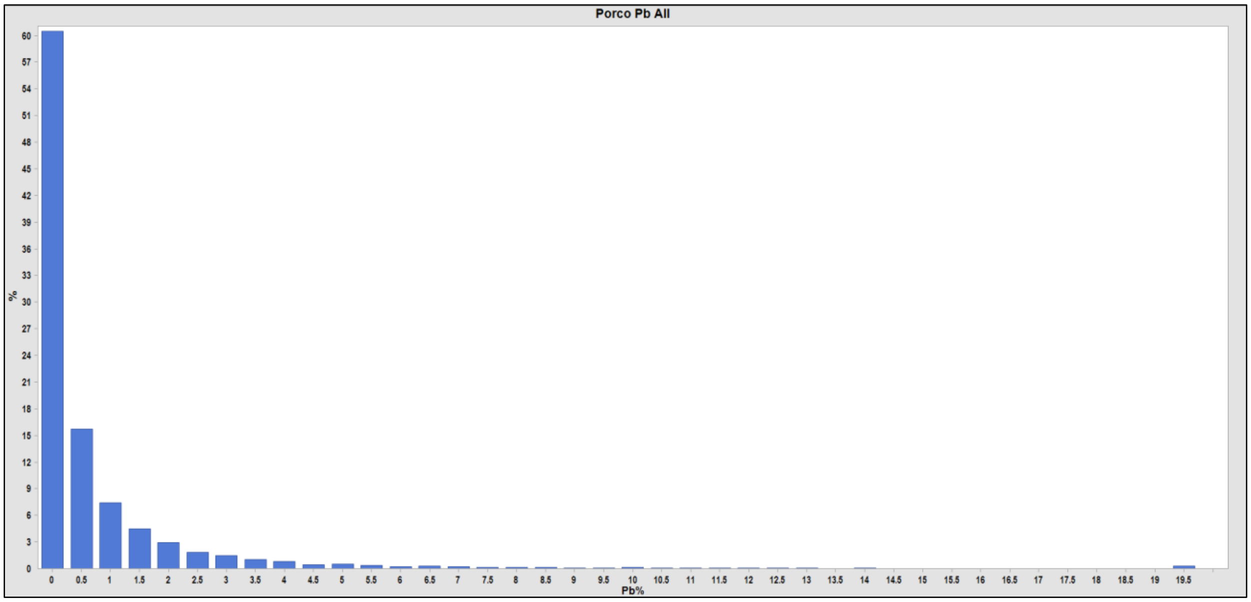


Figure 14-15: Histogram of Pb Composites for the Porco Deposit



14.6 Evaluation of Outlier Assay Values

An evaluation of the probability plots suggests that there may be outlier assay values that could result in an overestimation of resources as previously discussed. Although it is believed that this risk is relatively low, it was considered prudent to cut the silver, lead and zinc composites to varying thresholds for each mineralized vein to reduce the effects of outliers. As previously discussed, the CV's, which are a unit independent measure of variability, were relatively low for the assay data. This may be mitigated or resolved by cutting or grade limiting. An evaluation of the cumulative frequency plots suggests that there may be outlier values or populations that could result in an overestimation or smearing of grade.

Examples of the cumulative frequency plots are shown in the following figures and are limited to the complete Hundimiento area and specifically to the PE vein for the sake of brevity with Figure 14-16 and Figure 14-17 for silver, Figure 14-18 and Figure 14-19 for lead and Figure 14-20 and Figure 14-21, respectively. The cumulative plots illustrate the points that indicate where there may be secondary high-grade populations which require treatment. These points or thresholds are demonstrated by "breaks" or shifts at the approximately the 99th percentile that indicate the outlier population as illustrated in the figures.

Figure 14-16: Cumulative Probability of Ag Composites for All Veins within the Hundimiento Area

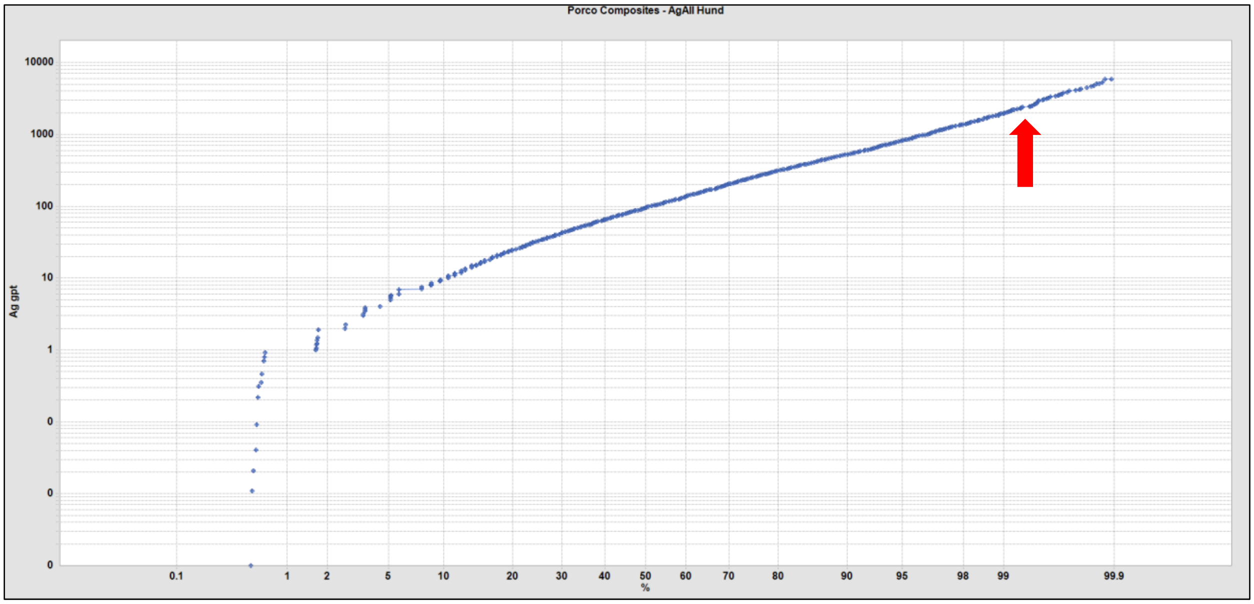


Figure 14-17: Cumulative Probability of Ag Composites for the Pe Vein within the Hundimiento Area

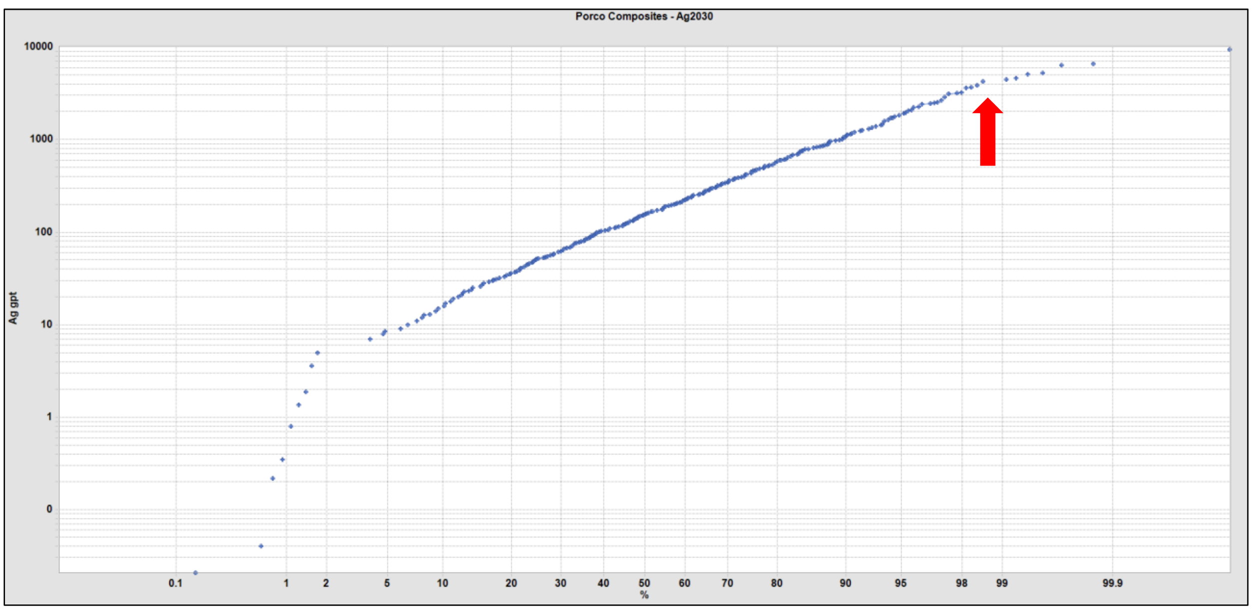


Figure 14-18: Cumulative Probability of Pb Composites for All Veins within the Hundimiento Area

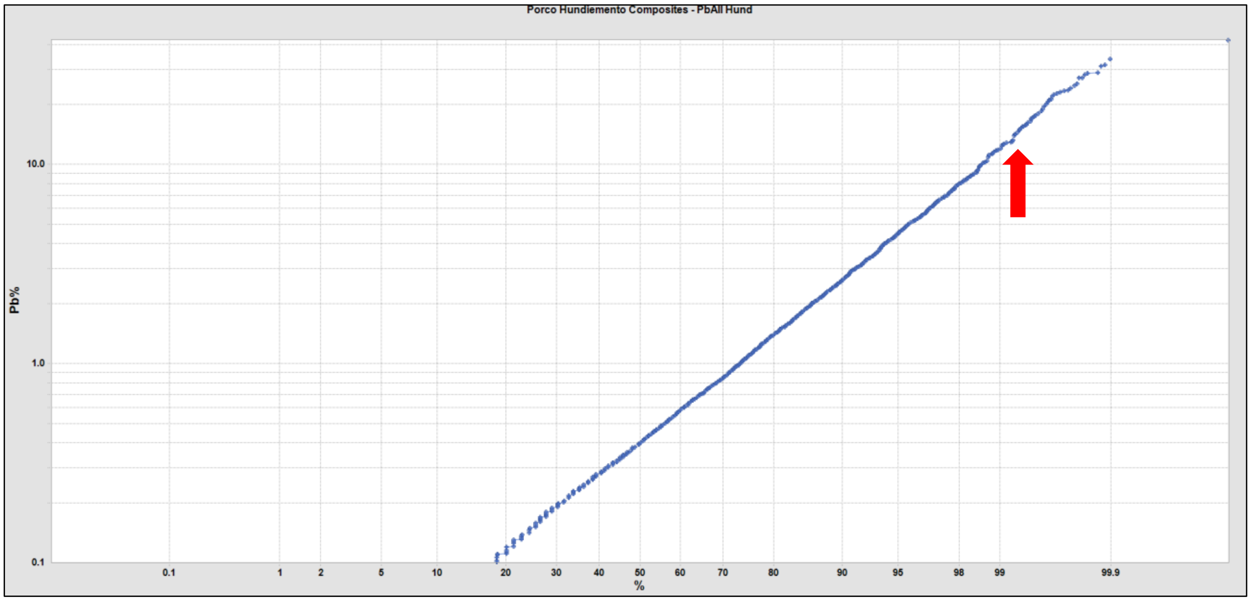


Figure 14-19: Cumulative Probability of Pb Composites for the Pe Vein within the Hundimiento Area

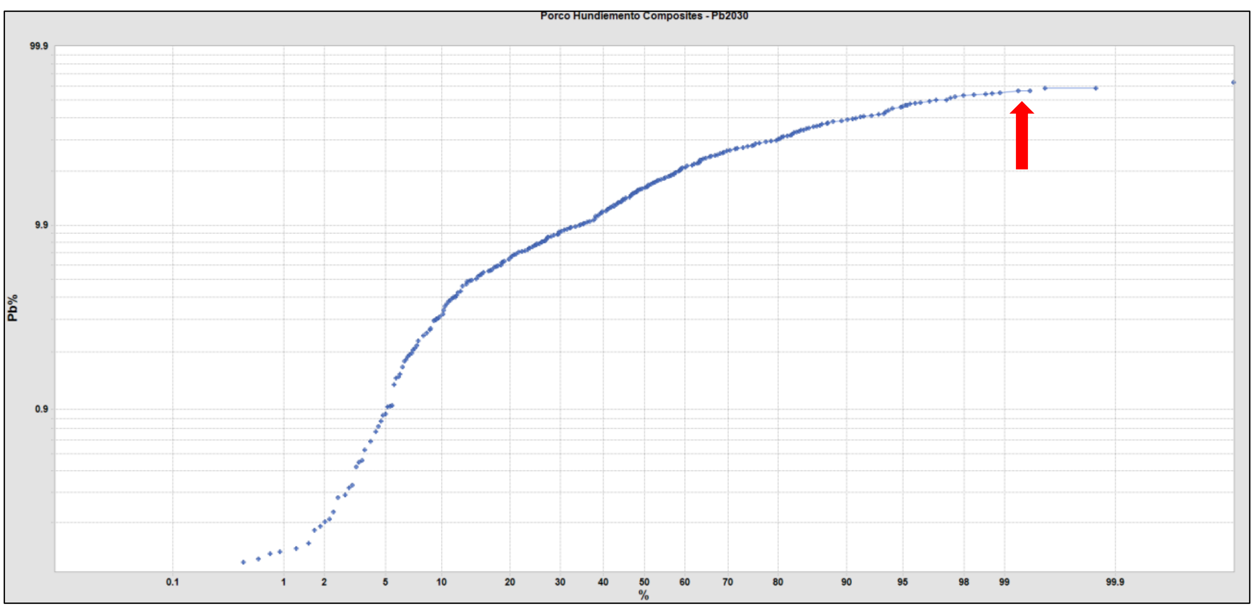


Figure 14-20: Cumulative Probability of Zn Composites for All Veins within the Hundimiento Area

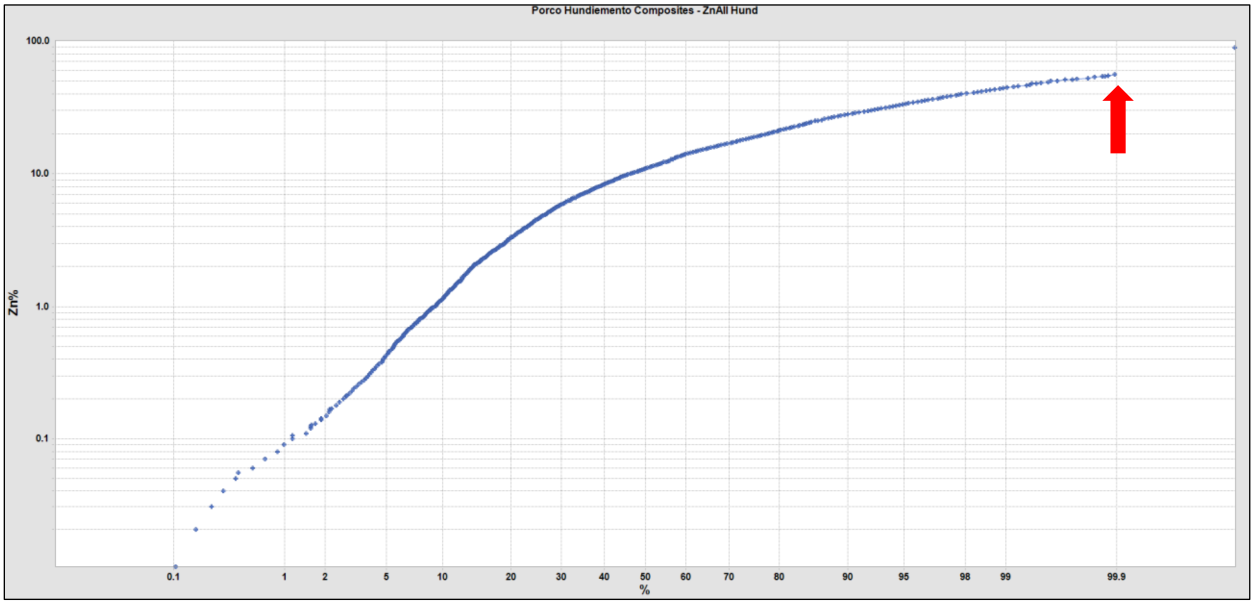
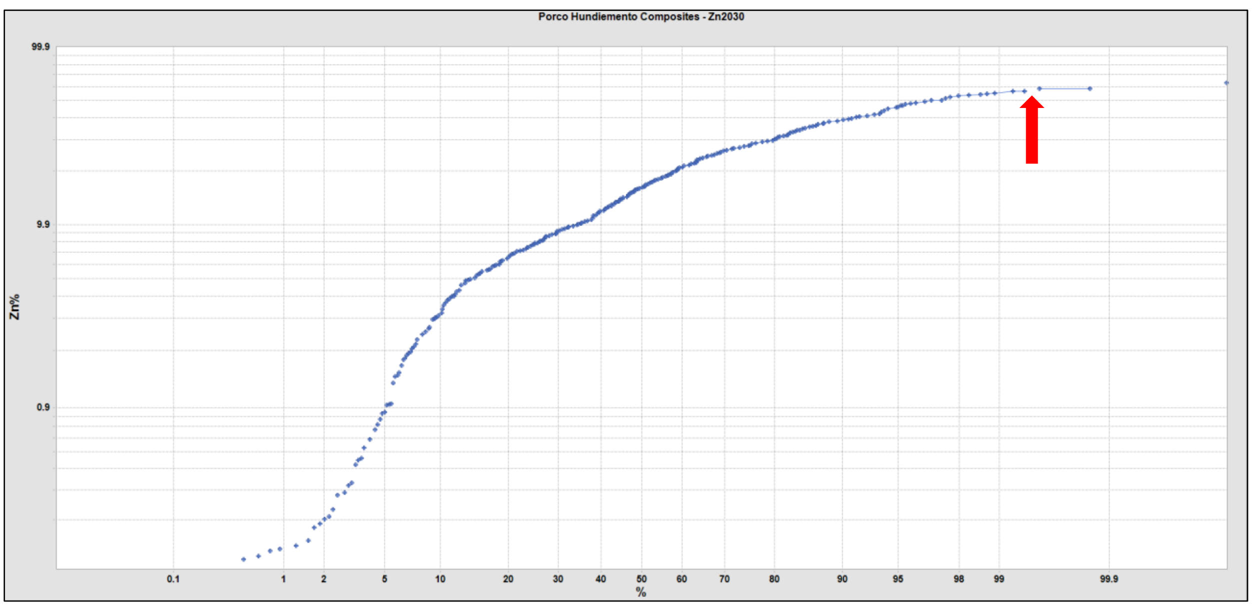


Figure 14-21: Cumulative Probability of Zn Composites for the Pe Vein within the Hundimiento Area



Therefore, for composites above those "breaks" or thresholds, the composites are limited or capped. Table 14-7 lists the cut thresholds applied to the composite data for each individual vein for zinc, silver and lead, respectively. The results show a modest reduction of metal in addition to a modest reduction in variability as illustrated by the reduction in the CV's.

Table 14-7: Outlier Cutting Analysis for the Porco Deposit

Area	Code	Vein	Zn%	Ag g/t	Pb%
Hundimiento	2000	Camila	42	535	1.8
	2001	Ramo Camila	32.4	186	1
	2010	Colorada	36	1155	8.9
	2011	Karlita	36.3	1569	5.9
	2020	Colorada Uno	45.1	868	18.1
	2030	PE	39.9	1429	5.1
	2040	Hundimiento	38.2	2625	6
Central	2050	California	37.2	1156	9.7
	2060	H_6	22	609	6.4
	2061	H_6_C	22	609	6.4
	2064	H_6_H	43.8	2579	7.8
	2070	Ramo_H6	43.8	2579	7.8
	2075	Crucera 22	18.5	480	3.5
	2077	Crucera Dos	43.8	2579	7.8
	2082	Larga	45	550	7.5
	2085	Pobre Rico 3	33	15	1.5
	2086	Sapi	32	684	2.3
	2088	Cuadro	28	400	5
	2090	San Antonio Principal	49.4	1558	7.9
	2095	Aurora	40	405	4.5
	2101	Sap N	49.4	1558	7.9
	2110	Ramo 1 Solidad	47.2	640	7
	2120	Crucera B	25.9	217	2
	2140	Elena	50	306	3.5
	2141	Ramo Elena	44	268	5.1
	2142	Rosario	50.3	427	4.9
	2143	Cecilia	47	192	4
	2145	Carla	50	306	3.5
	2147	Carla 2	47.8	3415	2.9
	2155	Ramo Carla	31.3	215	4.6

14.7 Specific Gravity Estimation

Bulk densities were based a multiple-element linear regression formula was calculated with the use of a Python script which was used to determine the density from weighted factors for the zinc and lead. This the Multiple Linear Regression Formula is as follows:

$$\text{Density} = 2.821 * \text{Exp}\ (0.0077 * (\text{Pb\%} + \text{Zn\%}))$$

Table 14-8 shows the calculated density statistics for each vein. In general, the density values range from 2.82 t/m^3 to 5.65 t/m^3 and average 3.15 t/m^3.

Going forward is recommended to continue to gather measured density data in addition to ensuring that iron is included in the analysis so as to test and improve the density conversion calculation.

Table 14-8: Calculated Specific Gravity by Vein

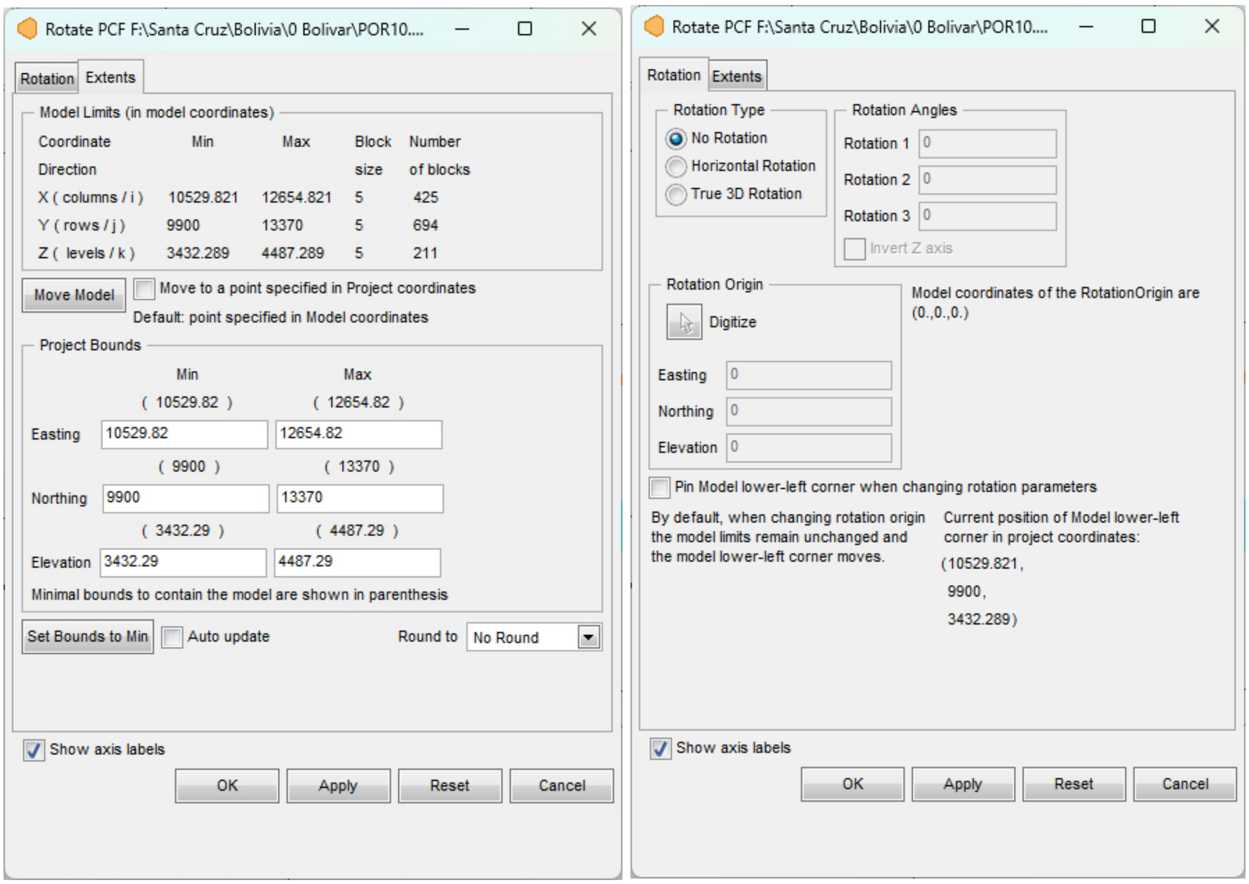
Area	Code	Min	Max	Mean	1Q	Median	3Q	SD	Variance	CV
Hundimiento	2000	2.82	4.32	3.25	3.02	3.22	3.45	0.29	0.08	0.1
	2010	2.82	4.23	3.15	2.91	3.09	3.32	0.30	0.09	0.1
	2011	2.83	4.14	3.42	3.08	3.37	3.68	0.37	0.14	0.1
	2012	2.82	3.79	3.17	3.04	3.18	3.32	0.22	0.05	0.1
	2020	2.82	4.83	3.20	2.95	3.14	3.37	0.30	0.09	0.1
	2030	2.82	4.83	3.39	3.04	3.31	3.67	0.41	0.16	0.1
	2040	2.82	5.65	3.12	2.93	3.07	3.24	0.25	0.06	0.1
Central	2050	2.82	4.44	3.12	2.90	3.05	3.26	0.27	0.07	0.1
	2060	2.82	4.01	3.01	2.87	2.95	3.09	0.20	0.04	0.1
	2061	2.82	4.03	3.13	2.94	3.10	3.29	0.24	0.06	0.1
	2062	2.93	4.1	3.49	3.17	3.39	3.81	0.35	0.13	0.1
	2064	3.28	3.28	3.28	3.28	3.28	3.28	0.00	0.00	0.0
	2065	3.1	3.8	3.26	3.10	3.10	3.10	0.29	0.09	0.1
	2070	2.82	4.36	3.29	3.07	3.21	3.44	0.32	0.10	0.1
	2075	2.82	3.85	3.07	2.93	3.02	3.13	0.20	0.04	0.1
	2077	2.82	4.11	3.03	2.87	2.95	3.10	0.24	0.06	0.1
	2078	2.84	3.74	3.32	3.23	3.34	3.39	0.22	0.05	0.1
	2080	2.82	4.53	3.15	2.92	3.07	3.31	0.29	0.08	0.1
	2082	2.82	4.64	3.14	2.91	3.05	3.30	0.28	0.08	0.1
	2085	2.82	4.04	3.05	2.92	3.01	3.12	0.18	0.03	0.1

Area	Code	Min	Max	Mean	1Q	Median	3Q	SD	Variance	CV
	2086	2.85	3.86	3.08	2.99	3.05	3.16	0.17	0.03	0.1
	2088	2.82	4.44	3.03	2.89	2.98	3.10	0.21	0.04	0.1
	2090	2.82	4.43	3.18	2.92	3.09	3.36	0.33	0.11	0.1
	2095	2.82	4.1	3.10	2.91	3.03	3.24	0.25	0.06	0.1
	2101	3.2	3.31	3.24	3.20	3.20	3.31	0.05	0.00	0.0
	2102	2.86	3.42	2.94	2.86	2.86	2.86	0.20	0.04	0.1
	2103	2.96	2.96	2.96	2.96	2.96	2.96	0.00	0.00	0.0
	2110	2.82	4.86	3.21	2.89	3.13	3.46	0.35	0.13	0.1
	2120	2.82	4.34	3.16	2.95	3.12	3.31	0.27	0.07	0.1
	2140	2.82	4.44	3.24	2.96	3.15	3.46	0.35	0.12	0.1
	2141	2.82	4.44	3.35	3.11	3.29	3.52	0.33	0.11	0.1
	2142	2.83	4.32	3.51	3.29	3.50	3.72	0.30	0.09	0.1
	2143	2.82	4.34	3.30	3.00	3.20	3.55	0.37	0.14	0.1
	2145	2.82	4.37	3.48	3.21	3.48	3.76	0.36	0.13	0.1
	2146	2.83	3.87	3.15	2.96	3.08	3.31	0.23	0.05	0.1
	2147	2.9	4.06	3.54	3.31	3.62	3.78	0.29	0.08	0.1
	2155	2.82	4.1	3.04	2.83	2.97	2.97	0.31	0.09	0.1
	Total	2.82	5.65	3.17	2.93	3.09	3.33	0.31	0.09	0.1
	All	2.82	5.65	3.15	2.90	3.06	3.30	0.31	0.10	0.1

14.8 Block Model Definition

The block model used to estimate the resources was defined according to the limits specified in Figure 14-22. The block model is orthogonal and rotated 47 degrees, reflecting the orientation of the deposit. The chosen block size was 5 m by 5 m by 5 m and subsequently sub-blocked to 1 m x 0.1 m x 1 m to facilitate underground mine planning and scheduling. Note that MineSight™ uses the centroid of the blocks as the origin.

Figure 14-22: Dimensions, Origin and Orientation for the Porco Block Model



14.9 Resource Estimation Methodology

Variograms and variogram models were generated for silver, lead and zinc grades which were utilized for the estimation via ordinary kriging. However, in the cases where insufficient data did not produce meaningful results, inverse distance to the second power using anisotropic search ellipsoids were employed.

The resource estimation plan includes the following items:

- Mineralized zone code of modelled mineralization in each block;
- Estimated block silver, lead, and zinc grades by ordinary kriging with the exception of inverse distance to the second power being employed for veins that possess insufficient samples for creation of effective variograms;

- Three-pass estimation strategy for each mineralized vein domain as detailed in Table 14-9 and Table 14-10. The three passes enable better estimation of local metal grades and infill of interpreted solids and to facilitate classification; and

- Assignment on sterilized and mined out areas coded into the block model for exclusion.

Table 14-9: Search Ellipse Parameters for the Hundimiento Area

Vein	Pass	Range 1 (m)	Range 2 (m)	Range 3 (m)	Min # Composites	Max # Composites
2000	1	13	20	17	8	20
	2	20	30	25	5	20
	3	50	75	75	3	30
2001	1	13	13	7	8	10
	2	25	20	10	5	15
	3	40	40	20	3	5
2010	1	17	13	7	12	25
	2	25	25	10	5	30
	3	75	60	30	3	30
2011	1	13	13	13	6	12
	2	25	25	20	8	20
	3	75	75	60	3	5
2020	1	20	15	13	8	20
	2	40	30	20	8	30
	3	80	60	40	3	10
2021	1	23	33	27	7	20
	2	35	50	40	12	26
	3	88	125	100	3	3
2030	1	20	15	13	7	10
	2	40	30	20	11	20
	3	80	60	40	3	15
2040	1	23	28	21	8	20
	2	34	43	32	9	30
	3	89	107	81	3	40
2042	1	23	28	21	8	20
	2	34	43	32	10	30
	3	89	107	81	3	40

Table 14-10: Search Ellipse Parameters for the Central Area of the Porco Deposit

Vein	Pass	Range 1 (m)	Range 2 (m)	Range 3 (m)	Min # Composites	Max # Composites
2050	1	19	20	13	5	10
	2	29	30	22	10	15
	3	74	76	54	3	30
2060	1	23	22	12	8	17
	2	34	33	18	8	35
	3	85	83	45	3	30
2061	1	23	22	12	8	17
	2	34	34	18	5	35
	3	132	132	70	3	10
2064	1	17	9	17	5	17
	2	25	25	25	5	24
	3	100	100	80	3	10
2070	1	17	17	17	5	11
	2	25	25	25	5	24
	3	63	35	63	3	30
2075	1	17	17	13	4	11
	2	26	26	20	5	22
	3	65	65	50	3	30
2077	1	17	17	17	5	12
	2	25	25	25	4	24
	3	100	100	80	3	10
2080	1	15	15	10	6	25
	2	25	25	20	5	20
	3	75	75	60	3	20
2082	1	27	27	13	4	11
	2	41	41	20	6	22
	3	103	103	50	3	30
2085	1	26	25	13	8	20
	2	39	38	20	4	30
	3	98	95	50	3	30
2086	1	12	12	10	4	10
	2	25	25	20	5	20
	3	63	63	50	3	30
2088	1	21	21	11	4	11
	2	32	31	17	2	22
	3	80	78	43	3	30

Vein	Pass	Range 1 (m)	Range 2 (m)	Range 3 (m)	Min # Composites	Max # Composites
2090	1	27	27	20	5	15
	2	40	40	30	4	20
	3	100	100	75	3	30
2095	1	20	20	13	10	19
	2	30	30	20	5	30
	3	75	75	50	3	30
2101	1	23	27	20	8	15
	2	35	40	30	8	20
	3	140	160	75	3	20
2110	1	29	27	13	8	20
	2	44	44	20	7	30
	3	110	100	50	3	30
2120	1	20	20	15	8	22
	2	30	30	20	8	30
	3	75	75	50	3	30
2140	1	33	19	12	5	20
	2	50	29	18	5	30
	3	125	73	45	3	5
2141	1	15	15	13	4	11
	2	30	30	20	4	20
	3	60	60	40	3	30
2142	1	12	8	10	7	14
	2	25	15	15	5	20
	3	50	30	30	3	30
2143	1	13	15	10	6	12
	2	25	30	20	5	20
	3	60	50	40	3	20
2145	1	33	19	12	5	20
	2	50	29	18	5	30
	3	125	73	45	3	5
2147	1	20	18	10	8	20
	2	40	40	20	4	20
	3	80	60	40	2	20
2155	1	15	15	15	5	15
	2	30	30	30	4	15
	3	75	75	60	2	10

14.10 Mineral Resource Classification

Mineral resources were estimated in conformity with generally accepted CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (2019). Mineral resources are not mineral reserves and do not have demonstrated economic viability.

The mineral resources may be impacted by further infill and exploration drilling that may result in an increase or decrease in future resource evaluations. The mineral resources may also be affected by subsequent assessment of mining, environmental, processing, permitting, taxation, socio-economic and other factors. There is insufficient information in this early stage of study to assess the extent to which the mineral resources will be affected by factors such as these that are more suitably assessed in a scoping or conceptual study.

Mineral resources for the Porco deposit were classified according to the CIM Definition Standards for Mineral Resources and Mineral Reserves (2014) as approved by Garth Kirkham, P.Geo., an “independent qualified person” as defined by National Instrument 43-101.

Drillhole spacing in the Porco deposit is sufficient for preliminary geostatistical analysis and evaluating spatial grade variability. Kirkham Geosystems is, therefore, of the opinion that the amount of sample data is adequate to demonstrate very good confidence in the grade estimates for the deposit.

The estimated blocks were classified according to the following:

- Confidence in interpretation of the mineralized zones;
- Number of data used to estimate a block;
- Number of composites allowed per drillhole; and
- Distance to nearest composite used to estimate a block.

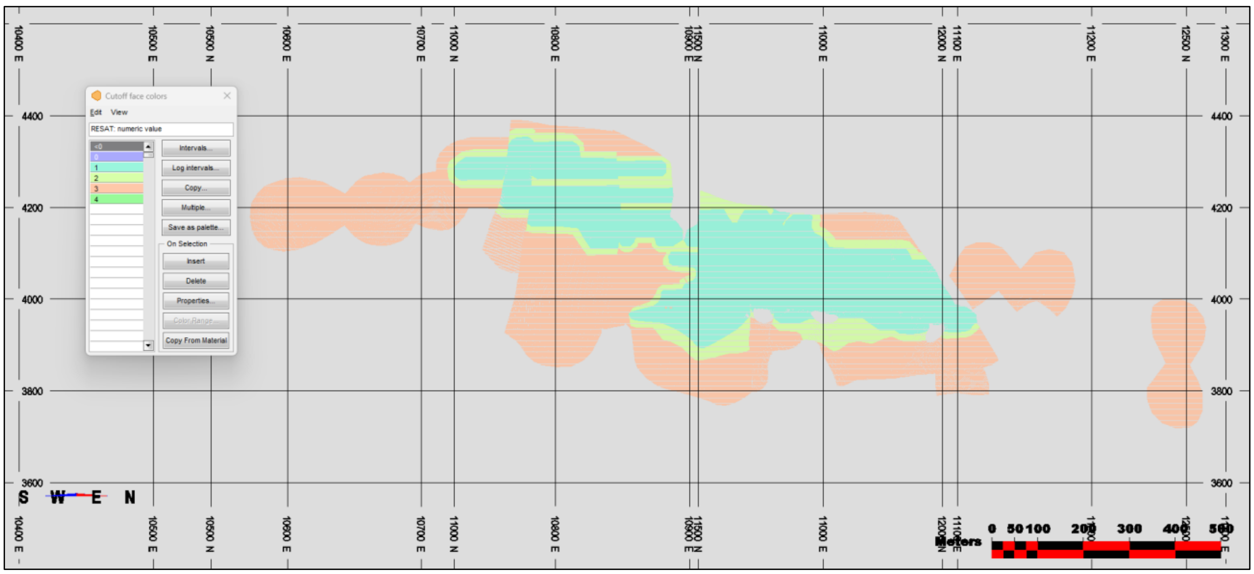
The classification of resources was based primarily on distance to the nearest composite; however, all of the quantitative measures, as listed here, were inspected and taken into consideration. In addition, the classification of resources for each zone was considered individually by virtue of their relative depth from surface and the ability to derive meaningful geostatistical results.

The estimation plan entailed a multiple pass strategy where each pass utilized increasingly restrictive search distances and parameters. Each individual vein employs differing search distances and parameters as discussed. Therefore, blocks that are estimated within the first pass are assigned as measured, those estimated within the second pass are assigned indicated and those estimated in the third pass are assigned as inferred.

Furthermore, an interpreted boundary was created for the indicated and inferred threshold in order to exclude orphans and reduce “spotted dog” effect. The remaining blocks may be unclassified and may be considered as geologic potential for further exploration.

Furthermore, in consideration for the requirement for resources to possess a "reasonable prospect of eventual economic extraction" (RP3E), underground mineable shapes were created that displayed continuity based on cut-off grades and classification. Additionally, these RP3E shapes also took into account must-take material that may fall below cut-off grade but will be extracted by mining in the event that adjacent economic material is extracted making below cut-off material by virtue of the mining costs being paid for.

Figure 14-23: Long Section View of the Porco Deposit Showing Resource Block by Classification



14.11 ZnEq Calculation

The mineral resources reported herein are reporting based on zinc equivalent or ZnEq. Cut-off criteria was developed based on a ZnEq formula as follows:

$$ZnEq = Zn\% + 1.14 \times Pb\% + 0.044 \times Ag\ (g/t)$$

14.12 Mined Out and Sterilized Areas

Due to the fact that the Porco mine, as shown in plan view in Figure 14-24, has been and continues to be in production for a significant number of years, it is extremely important to identify and exclude areas that are no longer available for future mining. This includes areas that have development and ramping, areas that have been mined out, areas that have been sterilized by mining operations or other reasons and pillars that have been left behind but not accessible. Figure 14-25 shows a long section view of the block model coded into the existing underground development, pillars, mined out areas along with areas sterilized be mining or geotechnical hazards.

Figure 14-24: Plan View of Development, Pillars, Mined Out and Sterilized

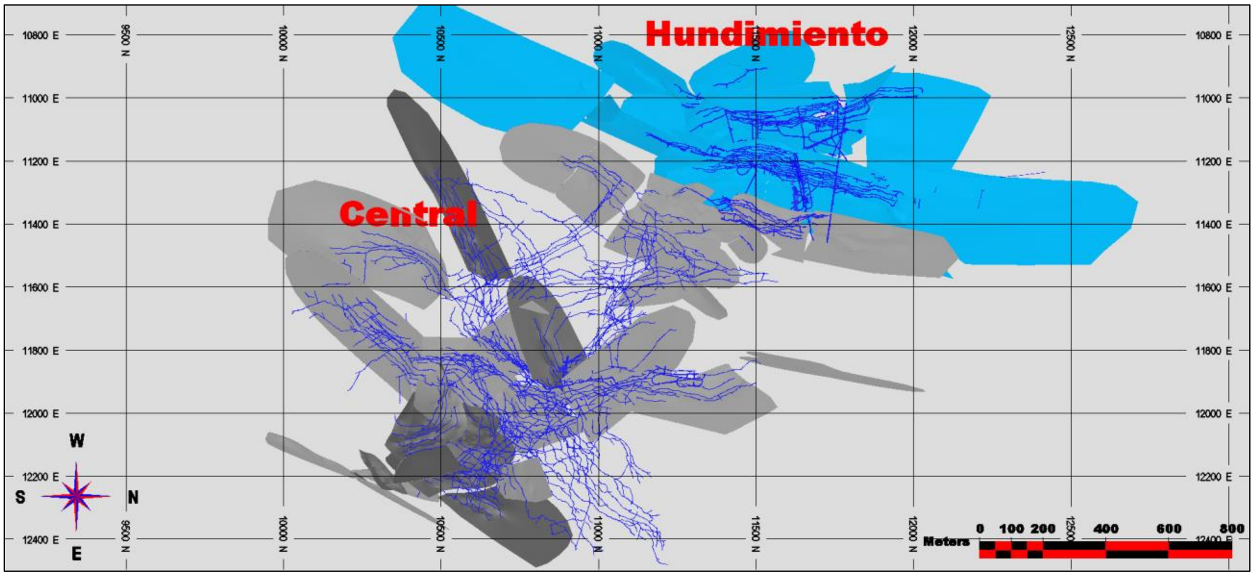


Figure 14-25: Classified Resources with Mined Out and Sterilized Areas (Dark Blue)

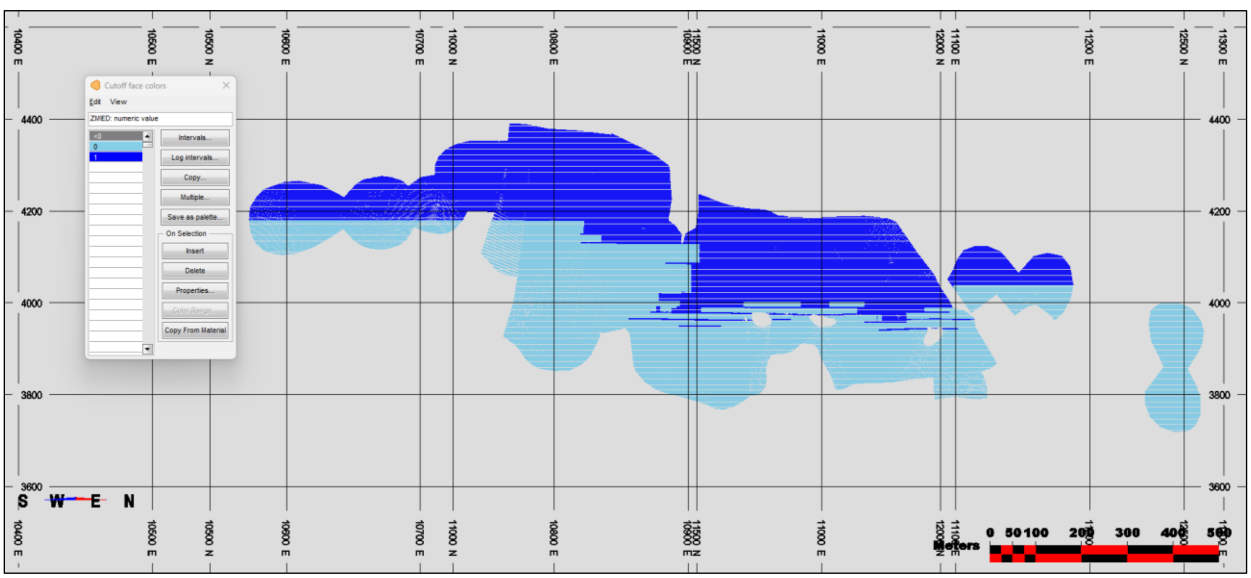
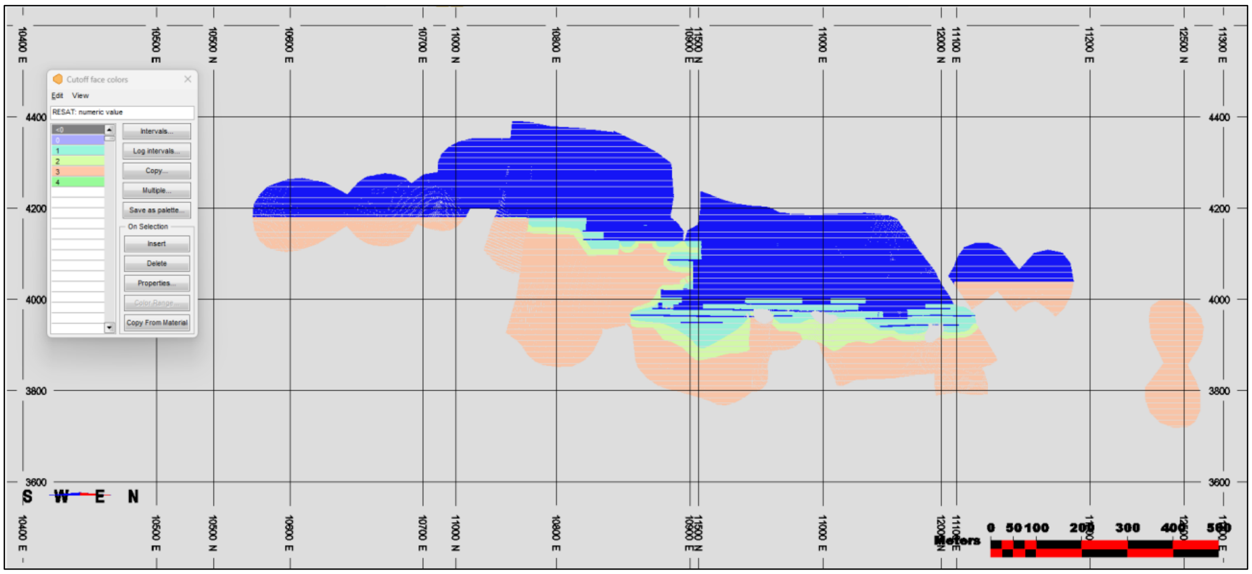


Figure 14-26 illustrates the long section view of the classified resources with the classified block model for the Porco Mine with the development, pillars, mined out and sterilized material colour coded in blue.

Figure 14-26: Classified Resources with Mined Out and Sterilized Areas (Dark Blue)



14.13 Resource Validation

A graphical validation was completed on the block model illustrated in Figure 14-27 through Figure 14-29. This type of validation serves the following purposes:

- Checks the reasonableness of the estimated grades based on the estimation plan and the nearby composites;
- Checks that the general drift and the local grade trends compare to the drift and local grade trends of the composites;
- Ensures that all blocks in the core of the deposit have been estimated;
- Checks that topography has been properly accounted for;
- Checks against manual approximate estimates of tonnages to determine reasonableness; and

- Inspects for and explains potentially high-grade block estimates in the neighborhood of the extremely high assays.

Cross sections, long sections and plans were used to digitally check the block model; these showed the block grades and composites. There was no indication that a block was wrongly estimated, and it appears that block grades could be explained as a function of the surrounding composites and the applied estimation plan.

The validation techniques included the following:

- Visual inspections on a section-by-section and plan-by-plan basis;
- Use of grade-tonnage curves;
- Swath plots comparing kriged estimated block grades with inverse distance and nearest neighbor estimates; and
- Inspection of histograms showing distance from first composite to nearest block, and average distance to blocks for all composites which gives a quantitative measure of confidence that blocks are adequately informed in addition to assisting in the classification of resources.

A full set of cross sections, long sections and plans were used to digitally check the block model; these showed the block grades and composites. There was no indication that a block was wrongly estimated, and it appears that every block grade could be explained as a function of the surrounding composites and the applied estimation plan.

Figure 14-27: Long Section View of Porco Block Model with ZnEq Cut-off Grades

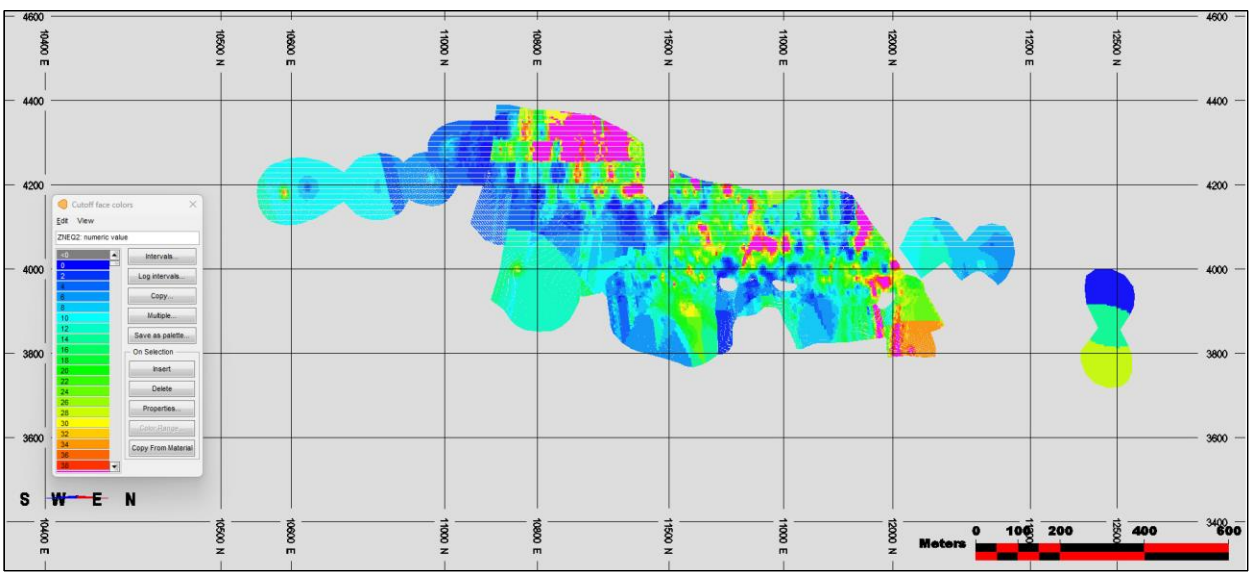


Figure 14-28: Long Section View of Measured, Indicated and Inferred Blocks with ZnEq Cut-off Grades along with Mined Out and Sterilized Areas

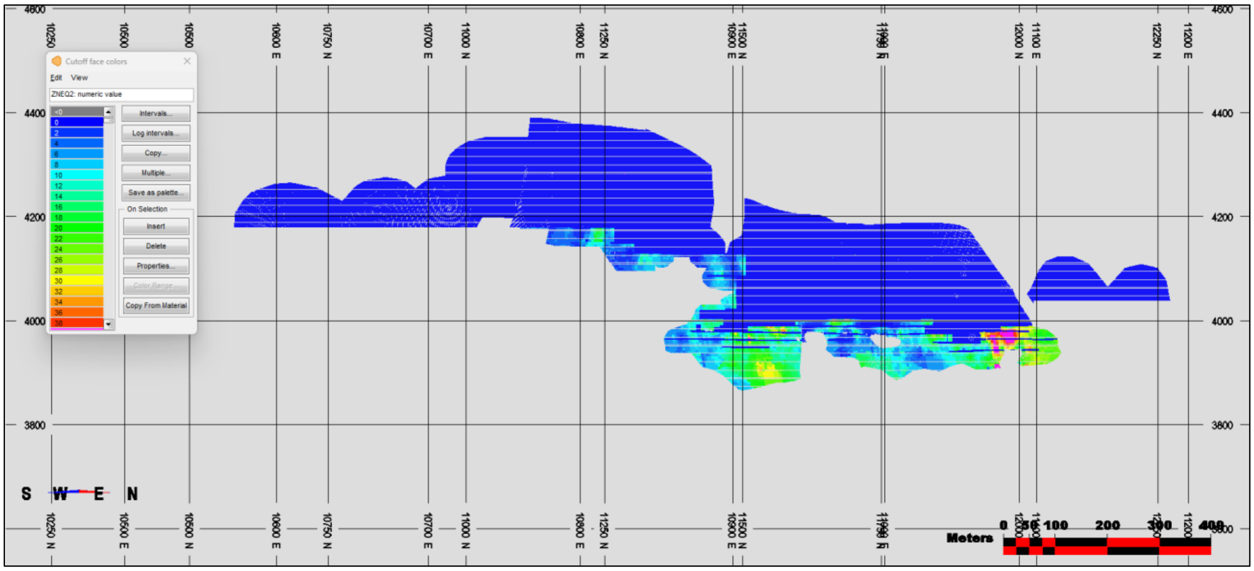
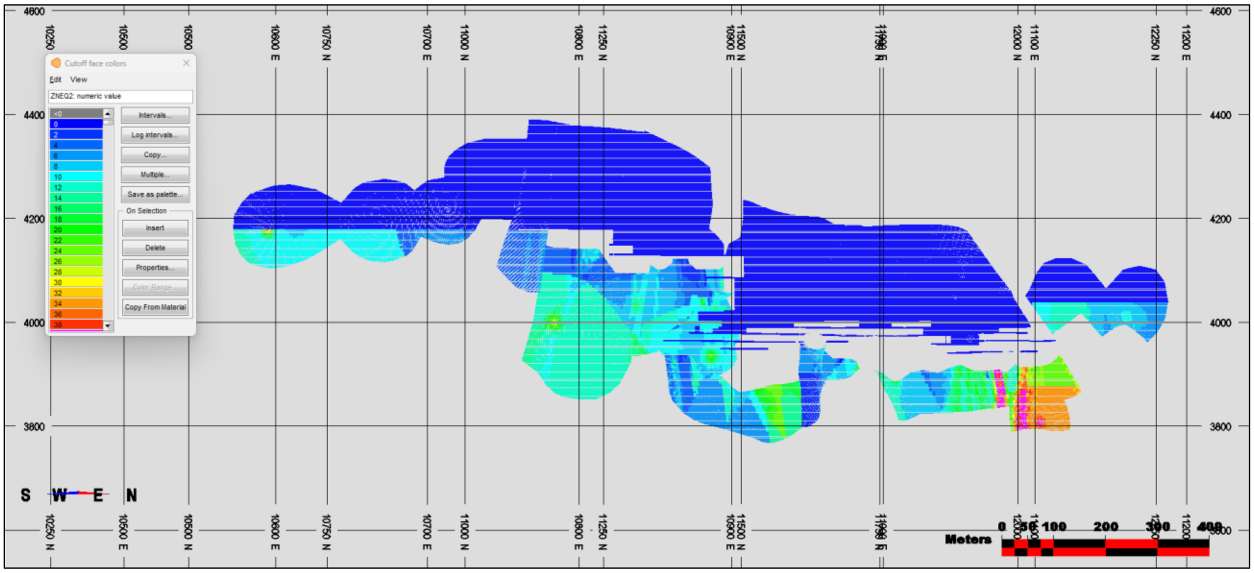


Figure 14-29: Long Section View of Inferred Blocks with ZnEq Cut-off Grades along with Mined Out and Sterilized Areas



14.14 Sensitivity of the Block Model to Selection Cut-off Grade

The mineral resources are not particularly sensitive to the selection of cut-off grade. Table 14-11 shows the total resources for all metals at varying ZnEq cut-off grades. The reader is cautioned that these values should not be misconstrued as a mineral reserve. The reported quantities and grades are only presented as a sensitivity of the resource model to the selection of cut-off grades.

Note that the base case cut-off grades presented are based on potentially underground, mineable resources at the base case of 11.2% zinc equivalent.

Table 14-11: Sensitivity Analyses at Various ZnEq Cut-off Grades for Measured, Indicated and Inferred Resources

Classification	Cut-off	Tonnes	ZnEq	Sg	Thickness	Zn	Ag	Pb
Measured	>=14	485,576	29.44	3.28	0.91	18.49	224.64	0.94
	>=12	544,446	27.67	3.26	0.91	17.51	207.59	0.90
	>=11.2	566,213	27.05	3.25	0.91	17.17	201.71	0.88
	>=10	610,875	25.84	3.23	0.93	16.52	190.02	0.85
	>=8	688,137	23.95	3.20	0.93	15.45	172.82	0.79
	>=6	762,178	22.31	3.18	0.93	14.47	158.91	0.74
	>=4	829,331	20.91	3.16	0.92	13.60	147.97	0.70
	>=2	872,265	20.03	3.14	0.91	13.04	141.35	0.68
Indicated	>=14	213,442	27.14	3.27	0.64	17.81	183.96	1.09
	>=12	239,157	25.61	3.24	0.64	16.86	171.82	1.05
	>=11.2	252,989	24.85	3.23	0.64	16.38	165.89	1.02
	>=10	277,066	23.61	3.21	0.64	15.63	156.26	0.97
	>=8	314,419	21.87	3.18	0.65	14.56	142.77	0.90
	>=6	347,785	20.45	3.16	0.65	13.67	132.21	0.85
	>=4	379,379	19.17	3.14	0.65	12.84	123.19	0.79
	>=2	393,039	18.61	3.13	0.65	12.47	119.43	0.77
Inferred	>=14	842,537	23.01	3.23	0.46	16.40	125.09	0.97
	>=12	975,843	21.64	3.20	0.46	15.38	118.26	0.93
	>=11.2	1,006,855	21.33	3.20	0.46	15.16	116.62	0.92
	>=10	1,050,930	20.88	3.19	0.46	14.85	113.91	0.90
	>=8	1,232,966	19.11	3.16	0.47	13.61	103.26	0.84
	>=6	1,340,873	18.12	3.14	0.47	12.95	96.94	0.79

Classification	Cut-off	Tonnes	ZnEq	Sg	Thickness	Zn	Ag	Pb
	>=4	1,436,731	17.25	3.12	0.48	12.34	92.03	0.76
	>=2	1,482,966	16.81	3.12	0.47	12.02	89.71	0.74

Notes:

1) The current Resource Estimate was prepared by Garth Kirkham, P.Geo., of Kirkham Geosystems Ltd.
2) All mineral resources have been estimated in accordance with Canadian Institute of Mining and Metallurgy and Petroleum (CIM) definitions, as required under National Instrument 43-101 (NI43-101).
3) The Mineral Resource Estimate was prepared using a 11.2% zinc equivalent cut-off grade. Cut-off grades were derived from $25.20/oz silver, $1.38/lb zinc and $1.20/lb lead, and process recoveries of 94.3% for zinc, 75.6% for lead, and 88.6% for silver. This cut-off grade was based on current smelter agreements and total OPEX costs of $125.02/t based on 2022 actual costs plus capital costs of $21.79/t. All prices are stated in $USD.
4) An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.
5) Mineral resources are not mineral reserves until they have demonstrated economic viability. Mineral resource estimates do not account for a resource's mineability, selectivity, mining loss, or dilution. All figures are rounded to reflect the relative accuracy of the estimate and therefore numbers may not appear to add precisely.

14.15 Mineral Resource Statement

Table 14-12 shows the Mineral Resource Statement for the Porco deposit. Table 14-13 illustrates the mineral resources defined within the Hundimiento and Central areas.

The Qualified Person evaluated the resource in order to ensure that it meets the condition of "reasonable prospects of eventual economic extraction" as suggested under NI 43-101. The criteria considered were confidence, continuity and economic cut-off. The resource listed below is considered to have "reasonable prospects of eventual economic extraction".

Table 14-12: Base-Case Total Mineral Resources at 11.2% ZnEq Cut-off

Total Porco 2023 Mineral Resources					
Mine	**Category**	**Tonnes ('000)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**
Porco	Measured	566	17.17	0.88	202
	Indicated	253	16.38	1.02	166
	Total M+I	819	16.92	0.92	191
	Inferred	1,007	15.16	0.92	117

Notes:

1) The current Resource Estimate was prepared by Garth Kirkham, P.Geo., of Kirkham Geosystems Ltd.
2) All mineral resources have been estimated in accordance with CIM definitions, as required under NI43-101.
3) The Mineral Resource Estimate was prepared using a 10.6% zinc equivalent cut-off grade. Cut-off grades were derived from $25.20/oz silver, $1.38/lb zinc and $1.20/lb lead, and process recoveries of 91% for zinc, 70% for lead, and 89.7% for silver. This

cut-off grade was based on current smelter agreements and total OPEX costs of $120.22/t based on 2022 actual costs plus capital costs of $48.68/t, with process recoveries of 91.0% for zinc, 70.0% for lead, and 89.7% for silver. All prices are stated in $USD.

4) An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

5) Mineral resources are not mineral reserves until they have demonstrated economic viability. Mineral resource estimates do not account for a resource's mineability, selectivity, mining loss, or dilution. All figures are rounded to reflect the relative accuracy of the estimate and therefore numbers may not appear to add precisely.

Table 14-13: Base-Case Total Mineral Resources at 11.2% ZnEq Cut-off Split by Area

Porco Mineral Resources					
Mine	**Category**	**Tonnes ('000)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**
Hundimiento	Measured	155	13.78	1.05	190.04
	Indicated	74	15.79	1.03	165.74
	Total M+I	229	14.43	1.05	182.20
	Inferred	458	14.57	0.88	111.26
Central	Measured	41	18.45	0.82	206.11
	Indicated	179	16.63	1.02	165.95
	Total M+I	590	17.89	0.88	193.92
	Inferred	549	15.65	0.95	121.08
Total Porco	Measured	566	17.17	0.88	202
	Indicated	253	16.38	1.02	166
	Total M+I	819	16.92	0.92	191
	Inferred	1,007	15.16	0.92	117

Notes:

1) The current Resource Estimate was prepared by Garth Kirkham, P.Geo., of Kirkham Geosystems Ltd.

2) All mineral resources have been estimated in accordance with CIM definitions, as required under NI43-101.

3) The Mineral Resource Estimate was prepared using a 10.6% zinc equivalent cut-off grade. Cut-off grades were derived from $25.20/oz silver, $1.38/lb zinc and $1.20/lb lead, and process recoveries of 91% for zinc, 70% for lead, and 89.7% for silver. This cut-off grade was based on current smelter agreements and total OPEX costs of $120.22/t based on 2022 actual costs plus capital costs of $48.68/t, with process recoveries of 91.0% for zinc, 70.0% for lead, and 89.7% for silver. All prices are stated in $USD.

4) An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

5) Mineral resources are not mineral reserves until they have demonstrated economic viability. Mineral resource estimates do not account for a resource's mineability, selectivity, mining loss, or dilution. All figures are rounded to reflect the relative accuracy of the estimate and therefore numbers may not appear to add precisely.

14.16 Discussion with Respect to Potential Material Risks to the Resources

The current political and socio-economic climate in Bolivia poses risks and uncertainties that could delay or even stop development as reported within the Fraser Institute Annual Report 2022 where Bolivia ranks very low in many non-technical metrics. Bolivia has been ranked consistently low for the past five years and ranks in the lower quartile on all metrics that gauge risk and uncertainty. It is difficult to gauge or qualify the level or extents of the risks however, all companies working in Bolivia must continue to be aware of the potential risks and develop mitigation strategies. A significant risk related to the Santacruz Bolivian mineral assets and in particular the mineral resources and mineral reserves is the significant artisanal activity that continues to exist. This activity is not only a socio-economic risk but also effects access to resources and reserves along with potentially resulting in potential sterilization of mineral resources.

Apart from political and socio-economic risks there are no other known environmental, permitting, legal, taxation, title or other relevant factors that materially affect the resources apart from commodity price fluctuations particularly on the downside.

The Porco deposit consists of very many high-grade thin veins. These types of deposits are very sensitive to grade as the size and geometry must be economically viable as they must support selective mining methods and be able to withstand high levels of dilutive material.

15 MINERAL RESERVE ESTIMATE

15.1 Summary

This January 1, 2023 reserve estimate represents the validation of Santacruz's internally-generated mineral reserve estimate by the QP. This was done by conducting the following activities:

- An NSR calculation and cut-off grade (COG) was developed by the QP using data provided by SC;
- The reserve estimation methodology was reviewed, checked, and approved by the QP;
- Mine technical staff prepared a Life of Mine Plan (LOM) for the deposits using the NSR and COG provided by the QP. The LOM plan was prepared specifically for this reserve estimation, as the annual budget includes mining in inferred resources; and
- All LOM models were downloaded and reviewed by the QP for conformance to the methodology, proper application of the NSR cut-off grade, and correct application of agreed upon dilution and recovery factors.

The QP is satisfied that this exercise resulted in a valid reserve determination.

15.2 Definitions

A Mineral Reserve is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors. This Feasibility Study includes adequate information and considerations on mining, processing, metallurgical, infrastructure, economic, marketing, environmental and other relevant factors that demonstrate, at the time of reporting, that economic extraction could reasonably be justified.

Mineral Reserves are those parts of Mineral Resources which, after the application of all mining factors, result in an estimated tonnage, and grade which, in the opinion of the Qualified Person(s) making the estimates, is the basis of an economically viable project after taking account of all relevant Modifying Factors. Mineral Reserves are inclusive of diluting material that will be mined in conjunction with the Mineral Reserves and delivered to the treatment plant or equivalent facility. The term "Mineral Reserve" need not necessarily signify that extraction facilities are in place or operative or that all governmental approvals have been received. It does signify that there are reasonable expectations of such approvals.

Mineral Reserves are subdivided in order of increasing confidence into Probable Mineral Reserves and Proven Mineral Reserves. A Probable Mineral Reserve has a lower level of confidence than a Proven Mineral Reserve.

The reserve classifications used in this report conform to the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) classification of NI 43-101 resource and reserve definitions and Companion Policy 43-101CP. These are listed below.

A "Proven Mineral Reserve" is the economically mineable part of a Measured Mineral Resource. A Proven Mineral Reserve implies a high degree of confidence in the Modifying Factors.

Application of the Proven Mineral Reserve category implies that the Qualified Person has the highest degree of confidence in the estimate with the consequent expectation in the minds of the readers of the report. The term should be restricted to that part of the deposit where production planning is taking place and for which any variation in the estimate would not significantly affect potential economic viability of the deposit. Proven Mineral Reserve estimates must be demonstrated to be economic, at the time of reporting, by at least a Pre-Feasibility Study. Within the CIM Definition standards the term Proved Mineral Reserve is an equivalent term to a Proven Mineral Reserve.

A "Probable Mineral Reserve" is the economically mineable part of an Indicated Mineral Resource, and in some circumstances a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Mineral Reserve is lower than that applying to a Proven Mineral Reserve.

15.3 NSR and COG Determinations

15.3.1 Operating Costs

Operating costs for the reserve estimation were based on actual costs derived from 2022 operations, as summarized in Table 15-1.

Table 15-1: Actual Operating Costs for 2022 by Category

Category	$/t
Mining	94.68
Processing	15.04
G&A	15.30
Total	**125.02**

15.3.2 Metal Prices

The metal prices used to determine the 2023 Mining Reserve are as follows:

- Lead $1.00 /lb;

- Zinc \$1.15 /lb; and
- Silver \$21.00 /oz.

The derivation and rationale for these price selections is discussed in discussed in Section 19.

15.3.3 Metallurgical Recoveries

The metallurgical recoveries of payable metals were based on 2022 mill operating performance as follows:

Lead: 75.6% to the lead concentrate

Zinc: 94.3% to the zinc concentrate

Silver: A total of 88.6% recovery; 50.2% to the lead concentrate and 38.5% to the zinc concentrate.

15.3.4 Smelter Terms

There are two concentrates that are sent to the Antofagasta smelter in Chile for shipment overseas. Both concentrates are sold to Glencore. Smelter terms were based on actual invoicing. These include typical payment terms for all payable metals (Pb, Zn, Ag) and deductions for deleterious elements (Sb and Bi in the zinc concentrate and SiO_2 in the lead concentrate. Off-site costs for freight, port fees, sampling, and silver refining are included in the analysis at the actual rates.

15.4 Net Smelter Return and Cut-off Criteria

The combination of all factors discussed in this section results in the following NSR formula for the 2023 Mining Reserve:

$$NSR = \$9.36 \times Zn\% + 10.63 \times Pb\% + 0.41 \times Ag\ (g/t)$$

Cut-off criteria was developed based on a ZnEq formula as follows:

$$ZnEq = Zn\% + 1.14 \times Pb\% + 0.044 \times Ag\ (g/t)$$

A cut-off grade of 13.4% ZnEq was applied to the reserve estimation based on this equation.

15.5 Estimation Methodology

The reserves were estimated in Deswik. The NSR formula and ZnEq were applied to the block model. Stope optimization was then performed to the resource to generate stope shapes for evaluation.

Table 15-2 shows the stope optimization parameters that were used for the two mines at Porco, segregated by mine and stoping method.

Table 15-2: Stope Optimization Parameters by Mine and Stoping Method

Method	Vein	Min Stope Width (m)	Minimum Stope Dip	Min. Waste Pillar Width (m)	Max. Stope Width (m)	Min. Stope Height (m)	Max Stope Height 9m)
SLOS	All	1.10	30	5	10	10	12
Shrinkage	All	0.80	30	5	10	15	22

Dilution and recovery factors were varied by stoping method as follows:

- Development: 95% recovery without dilution applied;
- Sublevel Open Stoping mining method: 85% recovery and 12.5% dilution; and
- Shrinkage Stoping: 80% recovery and 10% dilution.

Once generated, solids below the COG of 12.7% ZnEq were then eliminated as well as any inferred resources.

A development layout was then prepared for each stope to determine access requirements. A development and production schedule were then prepared in Deswik.

15.6 Mineral Reserve Estimate

The Mineral Reserve Estimate for Porco Mine is shown in Table 15-3.

Table 15-3: Mineral Reserve Estimate for Porco Mine (January 1, 2023)

Mine	Category	Tonnes	Zn (%)	Pb (%)	Ag (g/t)
Hundimiento	Proven	95,647	10.35	0.73	208
	Probable	48,381	11.99	0.94	192
	Total	144,028	10.90	0.80	203
Central	Proven	66,202	15.67	0.61	143
	Probable	108,943	13.30	0.69	120
	Total	175,145	14.19	0.66	129

Mine	Category	Tonnes	Zn (%)	Pb (%)	Ag (g/t)
Total Porco	Proven	161,849	12.53	0.68	181
	Probable	157,323	12.90	0.77	142
	Total	319,172	12.71	0.72	162

These reserves could be impacted by illegal mining activities, changes to mine operating costs, metallurgical recoveries, changes to permitting status, and the availability of tailings storage. No significant variations from current assumptions for these aspects are currently anticipated.

16 MINING METHODS

16.1 Introduction

The Porco Mine has been in continuous operation for 500 years. The application of mining methods has thus been an adaptation of mining equipment technologies, evaluation and monitoring tools to the specific mineralized zones. The last decade of operations under the guidance of Glencore, the mine has seen a move to more mechanized methods where applicable to improve safety performance and mine productivity.

The deposits within Porco Mine exhibit various characteristics. The steeply dipping and relatively wide mineralized zones were intuitively adaptable to mechanization, however, more narrow and irregular zones still favor the use of conventional, more selective methods. In addition to historical and empirical knowledge about the deposit, a systematic evaluation included such other deposit qualities as:

- Safety aspects, Environmental risks, Social impacts;
- Shape, geometry, consistency, and volume;
- Both mineralization and wall rock quality (strength, Fracture characterizations, in-situ strength, regional stress);
- Stability, and Support requirements;
- Grades, NSR Value, potential extraction rate;
- Mechanization/automation, use of gravity, flexibility and adaptability; and
- Unit costs, time to production, dilution, development requirements.

Based on continuously evaluated performance of the selected mining system, improvements are always being considered based on the aforementioned criteria and economic performance.

The mine currently operates at a production rate of approximately 540 t/d with a current LOM of two years based on the current reserve.

16.2 Geotech Analysis & Recon

Geotechnical analysis is a useful tool at Porco to determine support requirements and to assess stability to rock conditions mine-wide. Analysis was also required when considering the use of Sub Level Stoping in the Hundimiento Zone at Porco. Currently this exploitation method is applied in the Hundimiento Zone in mineral structures with rock mass characteristics (RMR) from fair to good in the specific mineralized areas where the hanging and footwalls are very competent and the mineral structure is less competent.

The geomechanical characterization is shown in the following table.

Table 16-1: Geomechanical Characterization

<table>
<tr><th>Structural Domain</th><th>RMR</th><th>Type</th><th>Quality</th><th>Max Openings (m)</th><th>Self-Sustainability Time</th><th>Excavation Length (m)</th><th>AR Observations</th></tr>
<tr><td rowspan="2">Hangingwall</td><td rowspan="2">45 a 55</td><td>R III-B</td><td>Regular B</td><td>3.9</td><td>2 Months</td><td>2.4</td><td rowspan="2">Stable Zone</td></tr>
<tr><td>R III-A</td><td>Regular A</td><td>6.2</td><td>2 Years</td><td>3.0</td></tr>
<tr><td rowspan="2">On the Vein</td><td rowspan="2">35 a 45</td><td>R IV-A</td><td>Bad A</td><td>2.5</td><td>2 Weeks</td><td>1.2</td><td rowspan="2">Potentially Unstable Zone</td></tr>
<tr><td>R IV-B</td><td>Regular B</td><td>3.9</td><td>2 Months</td><td>2.4</td></tr>
<tr><td rowspan="2">Footwall</td><td rowspan="2">50 a 65</td><td>R III-A</td><td>Regular A</td><td>4.9</td><td>7 Months</td><td>2.4</td><td rowspan="2">Stable Zone</td></tr>
<tr><td>R II</td><td>Good</td><td>8.0</td><td>8 Years</td><td>3.6</td></tr>
</table>

Source: Santacruz (2022)

Due to the geological characteristics and parameters of the rock mass in the structural domains of Mina Porco, the Sub Level Stoping exploitation method has been selected for mineral vein structures (vein/mine) with widths greater than 1.0 m and with dips greater than 60°.

Table 16-2: Geomechanical Stability Analysis

<table>
<tr><th rowspan="3">Stability Status</th><th colspan="9">Stope Design Dimensions - Stability Status</th></tr>
<tr><th colspan="3">Hangingwall (Regular R III-B)</th><th colspan="3">On the Vein (Bad R IV-A)</th><th colspan="3">Footwall (Regular R III-A)</th></tr>
<tr><th>17 x 40 m</th><th>15 x 40 m</th><th>15 x 20 m</th><th>17 x 40 m</th><th>15 x 40 m</th><th>15 x 20 m</th><th>17 x 40 m</th><th>15 x 40 m</th><th>15 x 20 m</th></tr>
<tr><td>Stable without Support</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>Transition</td><td></td><td></td><td></td><td></td><td>X</td><td>X</td><td></td><td></td><td></td></tr>
<tr><td>Stable with Support</td><td></td><td></td><td></td><td>X</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Stability Status	Stope Design Dimensions - Isoprobability Stability Contours								
	Hangingwall (Regular R III-B)			On the Vein (Bad R IV-A)			Footwall (Regular R III-A)		
	17 x 40 m	15 x 40 m	15 x 20 m	17 x 40 m	15 x 40 m	15 x 20 m	17 x 40 m	15 x 40 m	15 x 20 m
Stable without Support	86%	91%	95%				83%	85%	96%
Transition					5%	6%			
Stable with Support				4%					

Source: Santacruz (2022)

16.3 Overview

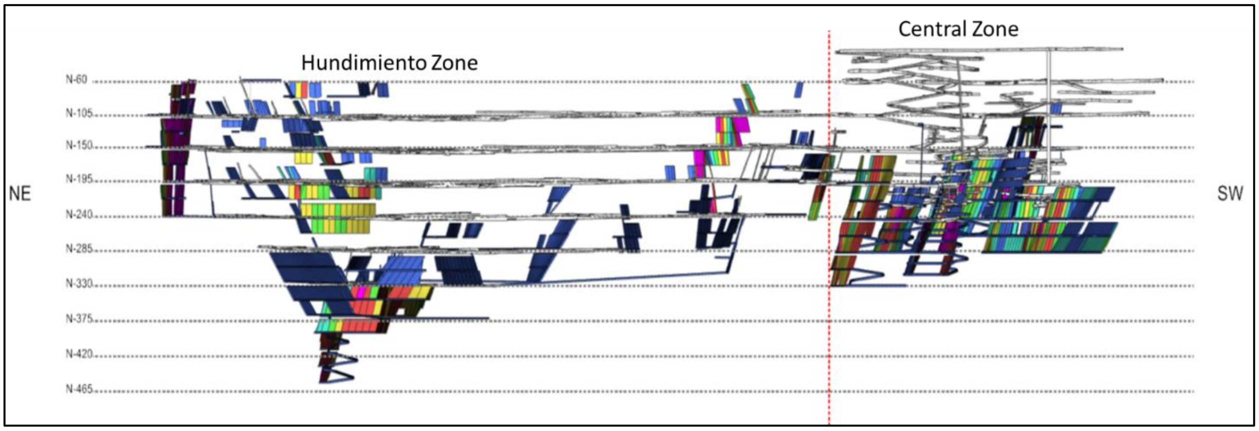
The active production originates from two main areas; Hundimiento and Central zones. Each mineralized zone employs one of two mining methods based on vein and surrounding ground characteristics. The Porco deposit consists of multiple, relatively thin high-grade veins. The mining methods used vary according to the continuity, dip, and width of these veins. Current mining methods employed include sublevel longhole stoping with backfill, shrinkage stoping.

- “Hundimiento” is the more modern section of the mine and is developed mostly with trackless methods using an access ramp to move men and materials between levels. The mineralized zones are predominantly wider and steeper dipping thus, stoping utilizes mechanized sub level stoping with backfill. Some shrinkage stoping is also done in this area where applicable. All waste rock stays in the mine; and

- “Central” utilizes conventional shrinkage mining exclusively. Veins are generally thin and high grade and the wall rock competent. Mineralized material is hauled via rail on each active level to the shaft for hoisting to surface. Levels are spaced at a nominal 45 m and level connections are via manway raises and the main shaft. All waste rock stays in the mine.

Currently each mining area provides roughly 50% of the total mine production.

Figure 16-1: Underground Long Section of Both Mining Zones



Source: Santacruz (2023)

16.4 Mine Design

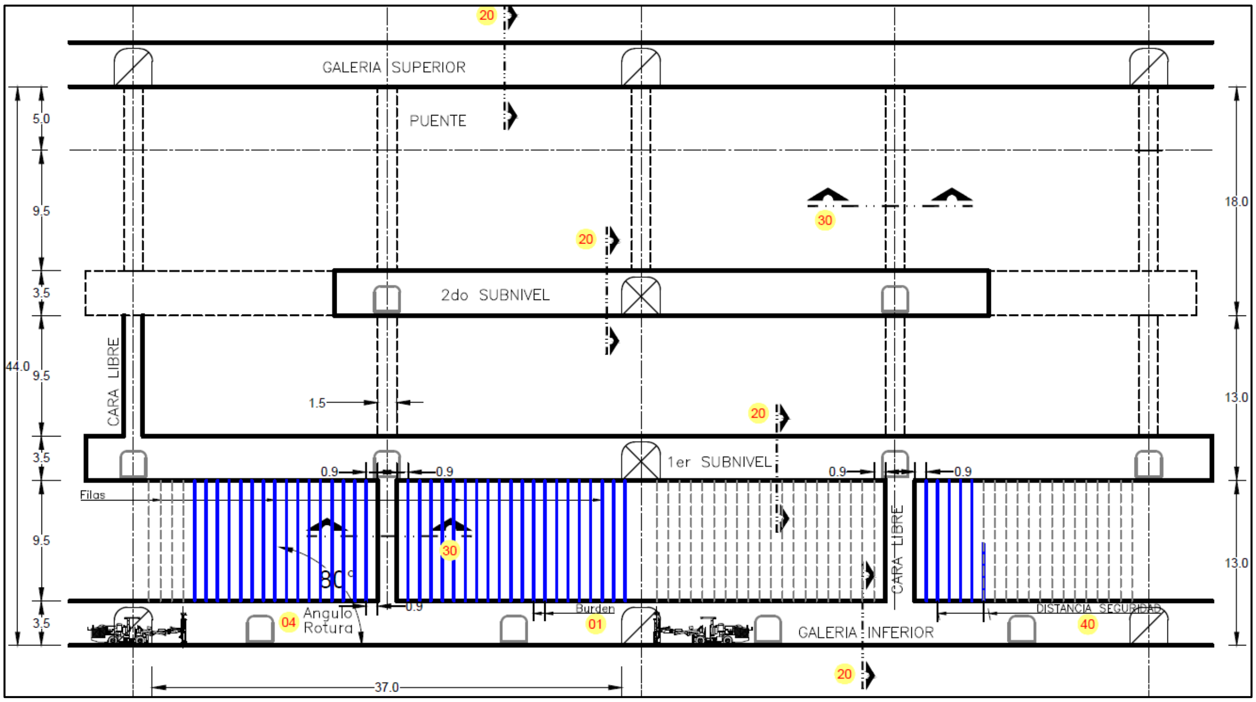
16.4.1 Stoping

Then Long hole method of stoping which is used in the Hundimiento zone uses mechanized and trackless equipment to prepare each stoping block. It begins with driving two main levels 45 m vertically apart with a section of 3.0 m x 3.5 m with their respective counter galleries and entrances every 40 m (section 3.0 x 3.0 m).

Two sublevels with a section of 3.0 x 3.5 m (1st sublevel and 2nd sublevel) are also developed for drilling and subsequent exploitation. All sublevels have a height of 13 m vertically, leaving a sill pillar of 5 m below the upper level for stability.

The primary development (ramps, counter galleries, cutouts, entrances, etc.) have support on the back and ribs with welded steel mesh and Hydrabolt bolts. The secondary development (levels, sublevels, etc.) have support on the back and ribs with welded steel mesh and Split Set bolts.

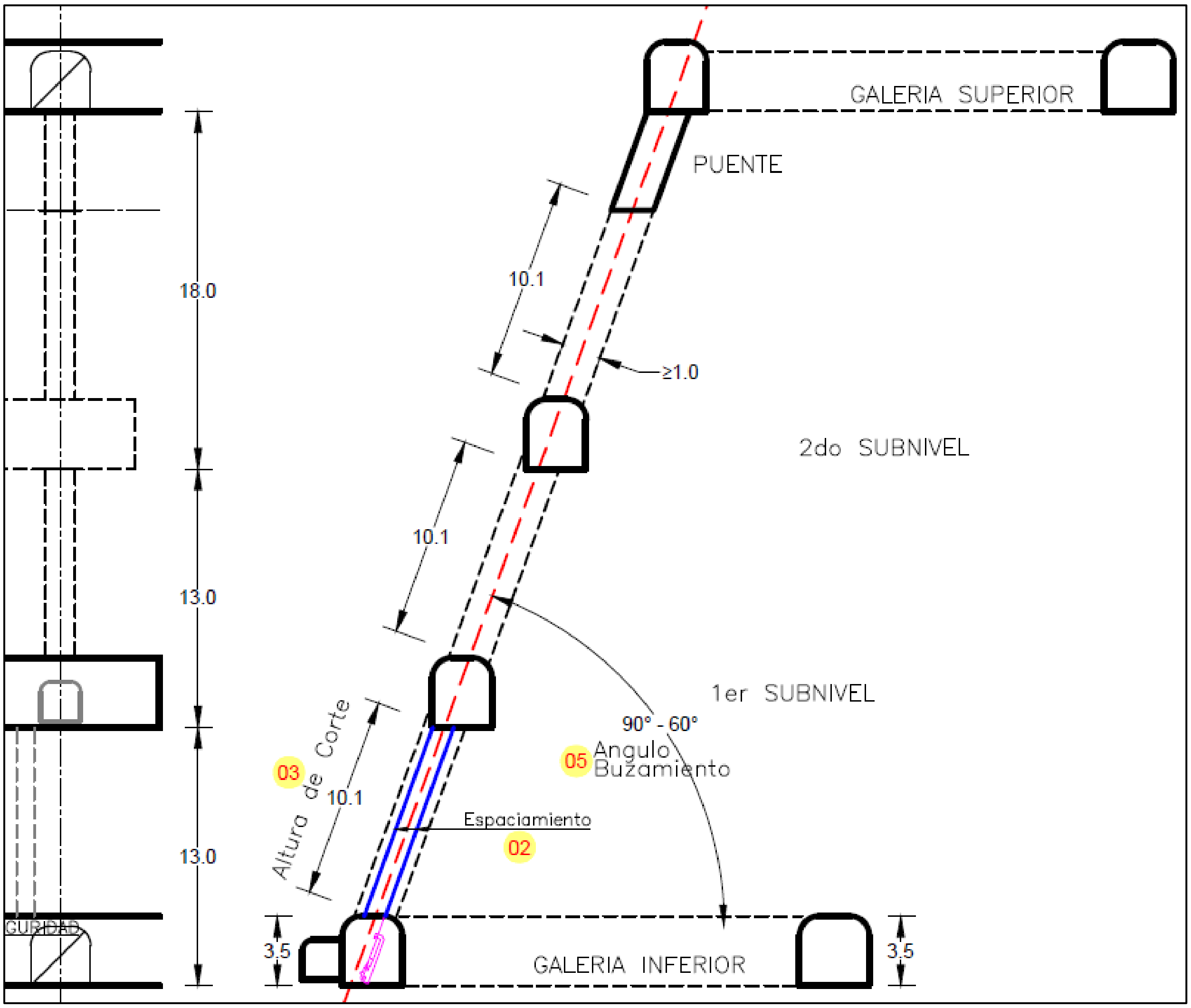
Figure 16-2: Long Section of Typical Sublevel Stoping Operation



Source: Santacruz (2022)

Depending on the dip, the true stope heights are approximately 10 m.

Figure 16-3: Cross Section of Typical Sublevel Stoping Operation



Source: Source: Santacruz (2022)

The stoping progresses upwards from the lowest mucking level with backfill placed behind the mining front to minimize the unsupported time of the stope walls. Once each stope panel is cleaned, they are filled through the upper sublevel (1st SUBN LEVEL) to generate a solid floor from which to drill and clean the next sublevel.

According to the 2022 production statistics, the contribution from the stopes using the Sub Level Stoping method represents approximately 19% of Mina Porco's total production. The mechanization of the Sub Level Stoping exploitation method is a safe method because the miner's direct exposure to the rock is minimized.

Among the most outstanding advantages are:

- The unit operating cost is low compared to conventional stoping;
- Higher production is possible and blending is facilitated;
- Greater safety performance;
- The mining cycle is continuous and independent; and
- No type of support is required during operation.

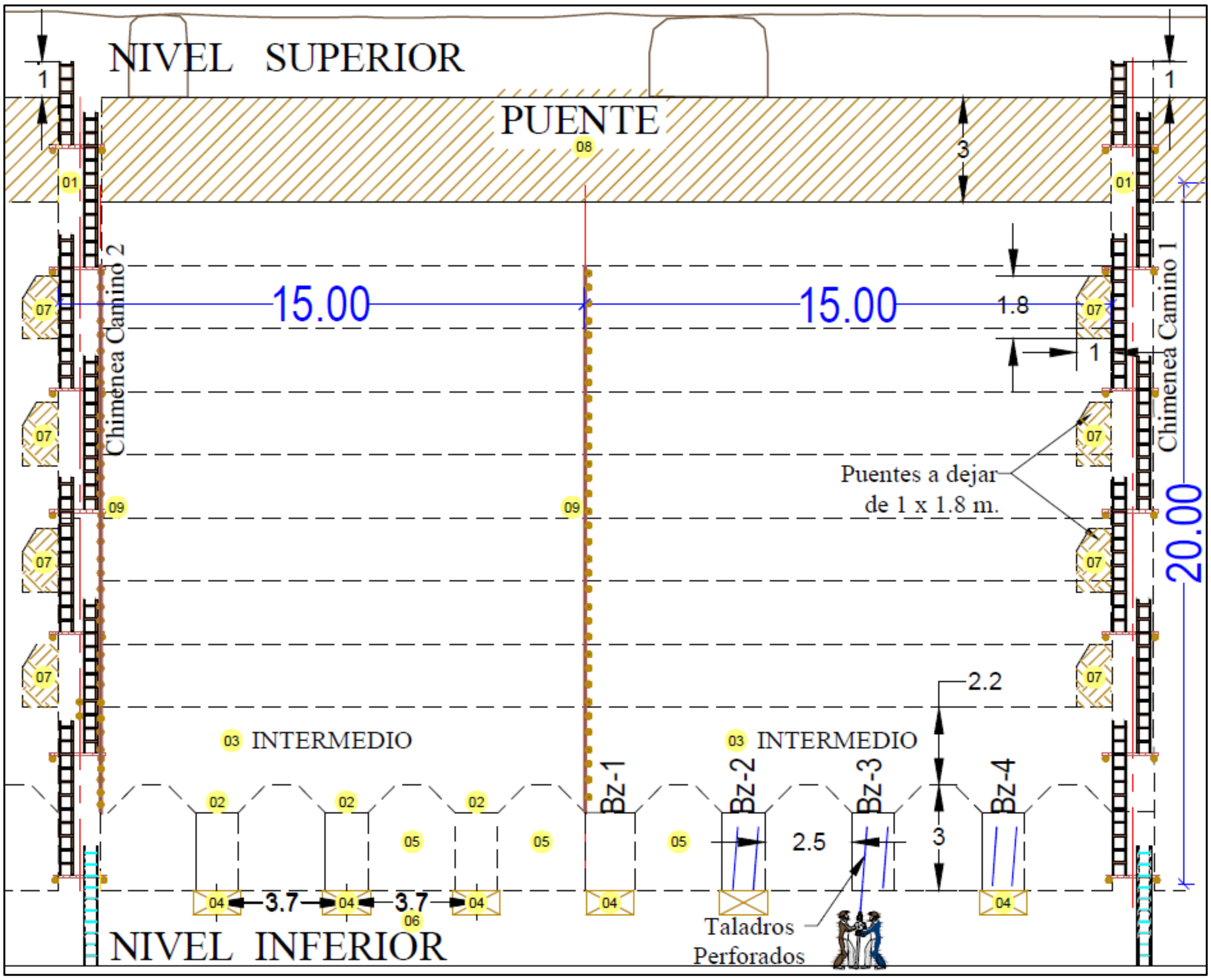
The disadvantages of the method are:

- Selectivity is low;
- Possibility of dilution if drilling and blasting are not controlled;
- There is a 95% recovery; and
- Variable fragmentation from stopes.

16.4.1.1 Shrinkage Stoping Method

Shrinkage is stoping method used for all stopes in the Central zone. It has smaller stope dimensions to allow rapid mining of smaller stopes and less mineral inventory stored in the stope. Dimensions of each panel are 15 m long and 20 m high.

Figure 16-4: Typical Long Section of Shrinkage Stope



Notes:
1) Long Raise (1.2 m x 1.2 m x 20 m long)
2) Short Raise (1.2 m x 1.2 m x 3.0 m long)
3) Intermediate Raise (1.5 m x 2.2 m)
4) Ore bins
5) Distance between short raises 3.7 m
6) Pillar (1.0 m x 1.8 m)
7) Pillars (2.5 m x 3.0 m)
8) Crown Pillar (3.0 m)
9) Stope Height (20.0 m)

Source: Santacruz (2022)

Shrinkage is used in veins with dips greater than 45° and with widths less than one meter and geomechanical characteristics of the rock mass of regular quality in relation to the hanging and footwalls of the vein.

The advantages of the mining method are the following:

- It is a selective method for narrow veins (less than one meter);
- Better control of dilution depending on the strike and dip of the vein;
- Better control of the fragmentation of broken material;
- Better control and stability of the rock mass during exploitation; and
- Consistent production as stopes are being emptied at completion.

The disadvantages of the method are the following:

- It is not very productive, so many stopes are needed for consistent production;
- Higher unit cost compared to a mechanized method;
- Greater exposure of miners to the face; and
- Low recovery of broken material (85% recovery).

16.4.2 Development

Mine Access to Hundimiento section is trackless via ramps which access all mining levels from the surface and are used to haul mineralized material, as well as men and materials. Central Zone is still accessed via shaft and rail drifts.

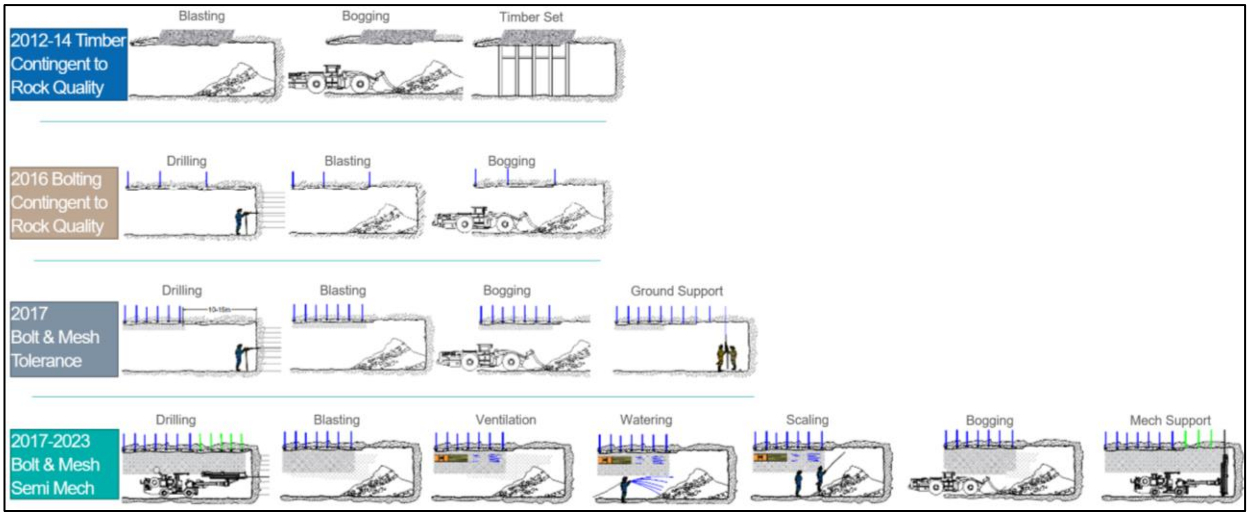
The methods for driving development openings have evolved over the past decade or so in response to a period of high accident frequency rates where it was determined that the main cause of severe injuries was related to rock falls. A systematic and progressive program was established to implement controls and methods to mitigate exposure to this danger.

Until 2014, support was only carried out with timber in the worst sectors according to informal evaluations of the rock conditions. Subsequently, the specific installation of support bolts (Split set or Hydrabolt) was implemented in the back of the drifts according to the evaluation of the rock mass. Currently the primary developments (ramps, counter galleries, cutouts, entrances, etc.) have support in the back and ribs with steel mesh and hydrabolts bolts.

The galleries of the secondary developments (levels, sublevels, etc.) are supported in the back and ribs with electro-welded mesh and Split Set bolts. Figure 16-5 illustrates the progression of methodology.

Subsequently, the specific installation of support bolts (Split set or Hydrabolt) was implemented on the roof of the gallery according to the evaluation of the rock mass.

Figure 16-5: Evolution of the Rock Mass Support System



Source: Glencore (2021)

In 2017, the installation of bolts (Split set or Hydrabolt) and electro-welded mesh on the roof of the gallery was standardized with a tolerance margin of 10 to 15 m without support on the advance front according to the quality assessment of the rock mass.

Currently, the support standard consists of the installation of bolts and electro-welded mesh on the roof and sides of the gallery (up to the gradient) to the advance front using electro-hydraulic equipment applying the 2 golden rules:

- Meter advancing, meter sustained; and
- Drilled hole, bolt installed.

The Central Zone is accessed and developed with a completely different system, with access and mineral transport via shaft and rail haulage on multiple levels. Most development is driven with jackleg drills and in some instances, overshot rail muckers. The transition to mechanized methods is slowly taking hold in the Central Zone.

16.5 Mine Services

16.5.1 Ventilation System

The ventilation system is independent for the zones: Central and Hundimiento.

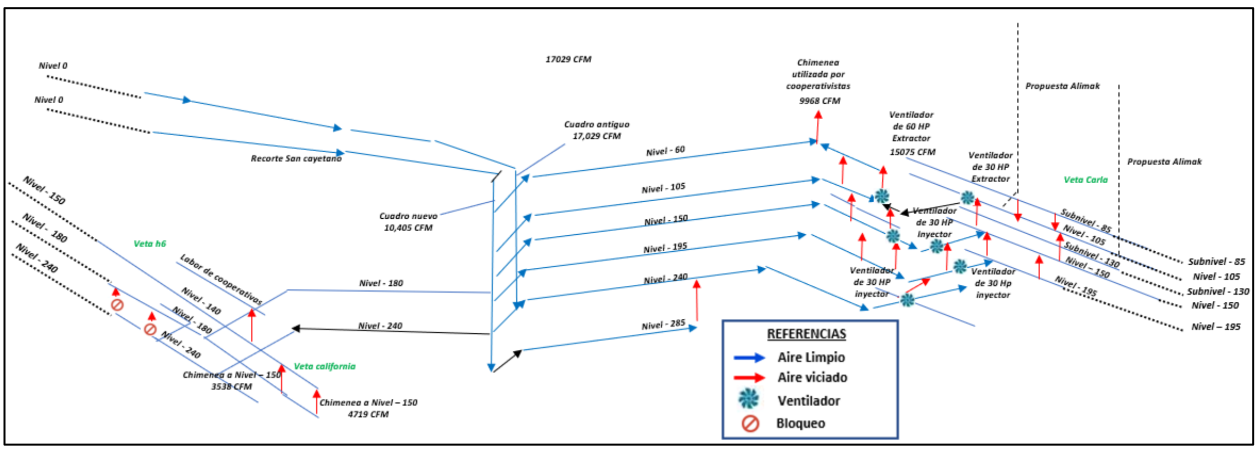
For the modelling and simulation of the ventilation system, the Ventsim software is used, which facilitates the monitoring and evaluation of the ventilation system.

Often illegal miners disrupt and damage or impair the ventilation system and flow through the mine. This is done by blocking the ventilation exhaust raises or using them for extraction, destroying ventilation fans, or stealing power cables.

16.5.1.1 Ventilation System – Central Zone

Since this area is mined conventionally with a minimum of diesel equipment, the flow requirements are modest. The ventilation of this area is simple and consists of two main natural inlets of fresh air from the surface to two main Shafts that lead the fresh air to the deeper levels and subsequently the air is led to the work fronts with exhaust air outlets through vertical raises.

Figure 16-6: Ventilation Scheme – Central Zone



The first entry of fresh air is through the San Cayetano Level to the New Shaft, reaching Level minus 330. The second entrance is through an Auxiliary Ramp from the surface to the Old Shaft reaching Level minus 240. According to the evaluation of flow monitoring and the requirement, the balance is shown in Table 16-3.

Table 16-3: Balance of Air Flows – Central Zone

			Airflow Balance		
Requirements Distribution	**m³/min**	**cfm**	**Airflow**	**m³/min**	**cfm**
Personnel Airflow	372	13,137	Required airflow	2,632	92,954
Blast Clearing (Explosives)	1,917	67,692	Air intake	760	26,823
Subtotal	2,289	80,829	Air outlet	766	27,036
Leakage	343	12,124	Coverage (%)	29%	
Required Airflow	2,632	92,954	Difference (cfm)	-66,131	

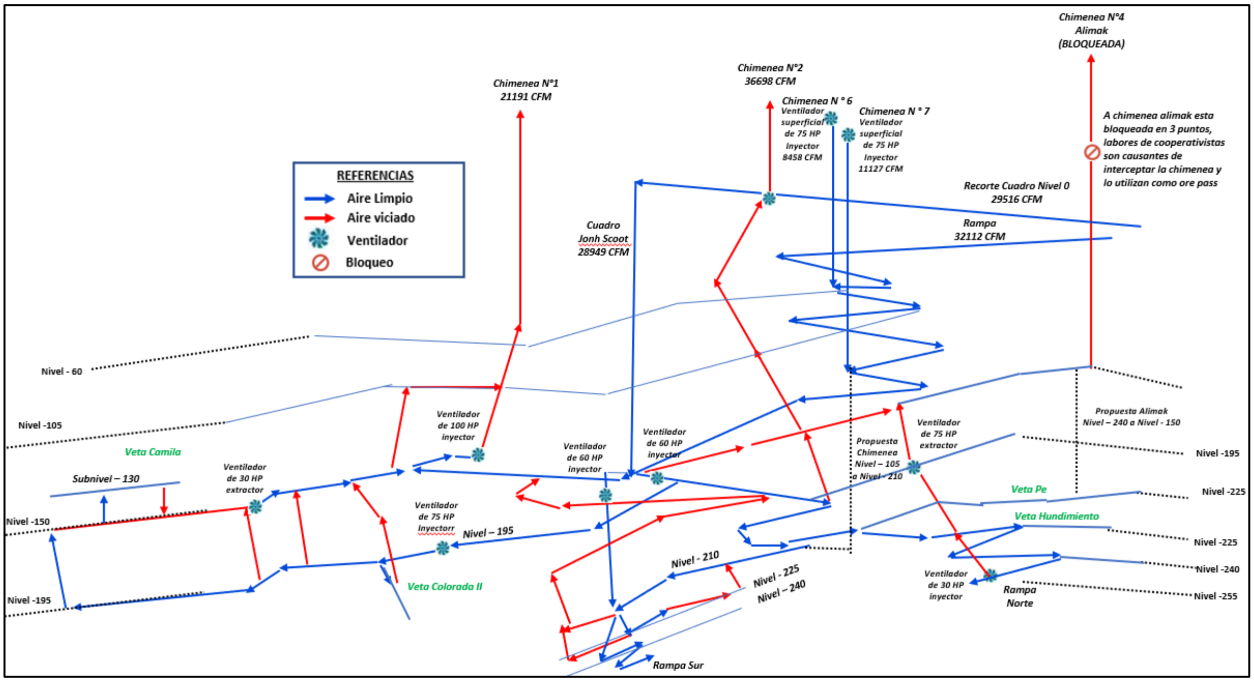
Source: Santacruz (2023)

"Auxiliary fans" are used for ventilation of the drift headings using fans of 30 HP.

16.5.1.2 Ventilation System – Hundimiento Zone

This system has two main intakes from the surface via the primary ramp and a cutout at level 0 that links to a shaft up to level -195.

Figure 16-7: Ventilation Scheme – Hundimiento Zone



Source: Santacruz (2023)

The fresh air is conducted through auxiliary fans and ventilation tubing to the active headings and the exhausted through vertical ventilation raises in addition to main Alimak raises at the southern and northern ends of the area. The flow requirement is greater compared to the Central Zone since it is almost entirely mechanized with diesel equipment.

The flow requirement and balance are shown in Table 16-4.

Table 16-4: Balance of Air Flows – Hundimiento Zone

			Airflow Balance		
Requirements Distribution	**m³/min**	**cfm**	**Airflow**	**m³/min**	**cfm**
Workers Airflow	300	10,595	Required airflow	2,487	87,818
Equipment	1,862	65,769	Air intake	1,575	55,626
Subtotal	2,162	76,363	Air outlet	12,612	52,109
Leakage	324	11,454	Coverage (%)	63%	
Required Airflow	2,487	87,818	Difference (cfm)	-32,192	

Source: Santacruz (2023)

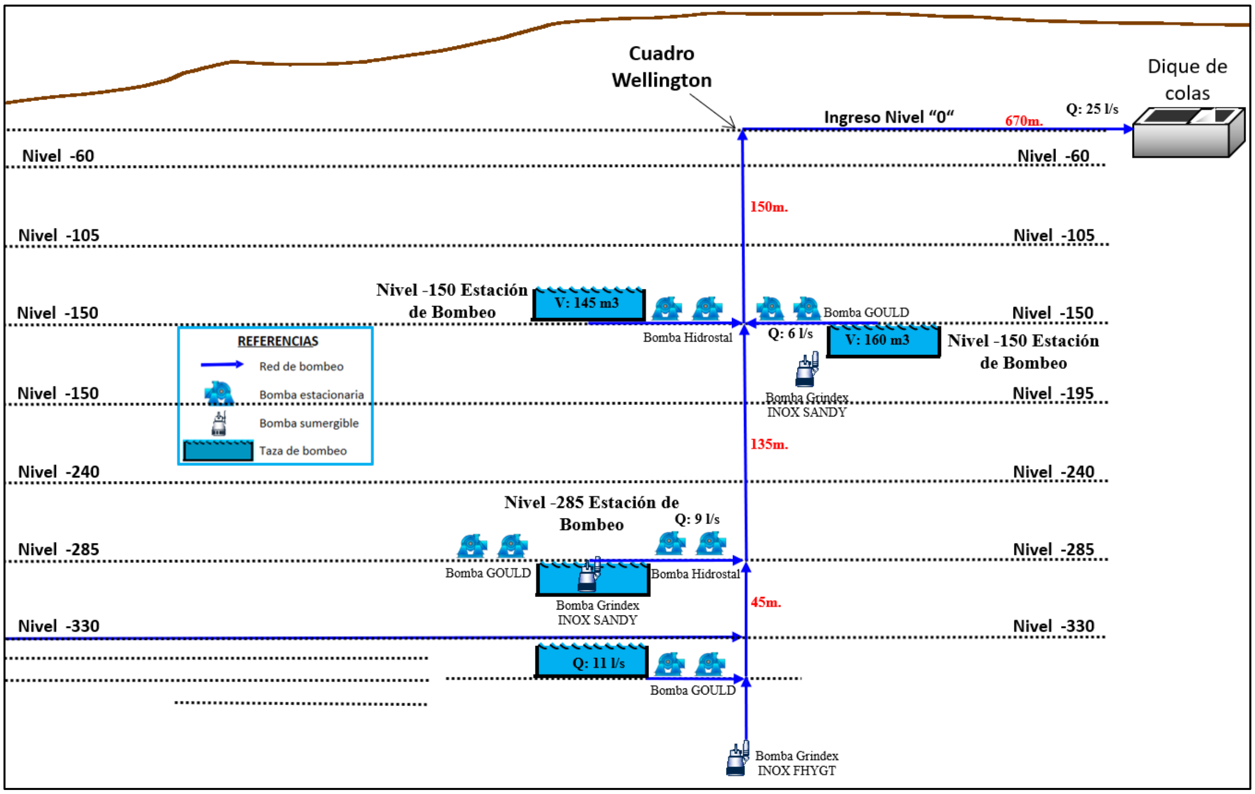
16.5.2 Dewatering

16.5.2.1 Pumping System – Central Zone

The pumping system in this area consists of 3 main pumping stations that are located at levels: -337, -240 and -150, built near the main shaft (Wellington) so that water can be pumped to the surface. The water from the working faces is pumped or transported by gravity through ditches in the drifts to the sumps of the pumping stations.

The flow rate is not significant, recording an average surface flow rate of approximately 25 liters/second.

Figure 16-8: Pumping Scheme – Central Zone

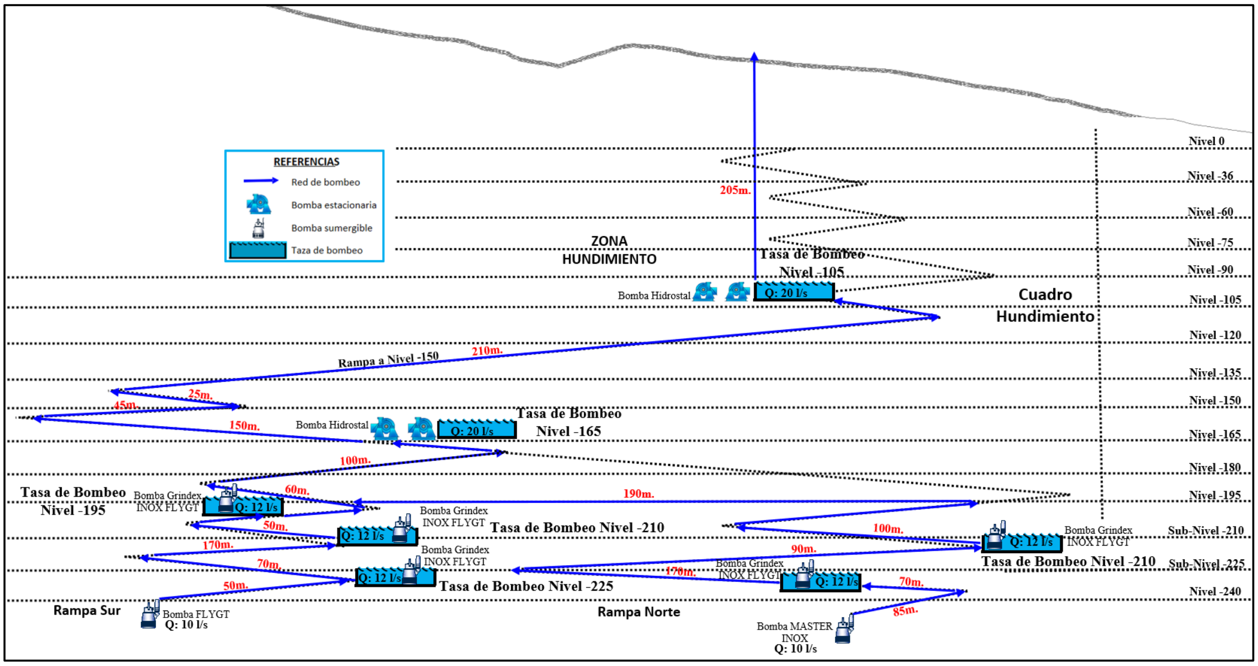


Source: Santacruz (2023)

16.5.2.2 Pumping System – Hundimiento Zone

The pumping system has 2 pumping stations at level -165 and -105 located on the Main Ramp, in addition there are auxiliary pumping sumps at levels: -195, -210, -225 and -240 associated with the ramps to pump water from the work headings.

Figure 16-9: Pumping Scheme – Hundimiento Zone



Source: Santacruz (2023)

The water is pumped from the work headings to the auxiliary sumps and subsequently via piping in the ramp to the central pumping station at level -105 from where the water is pumped to the surface.

The pumped flow varies between 20 and 30 liters/second, but due to the distances in depth, it is planned to build a main pumping station at level -240 to optimize the current pumping system with capacity for increased flow at depth.

16.5.3 Unit Operations

16.5.3.1 Stoping – Sublevel Stoping

Drilling is done using a Raptor 44 longhole drill, which is capable of radial drilling at angles from 0° to 360°.

- Burden = 1.0 m and spacing = 1.0 m;
- Longitudinal angle of 80°;
- Hole diameter of 56 mm;

- Drill steel 1.20 m coupled; and

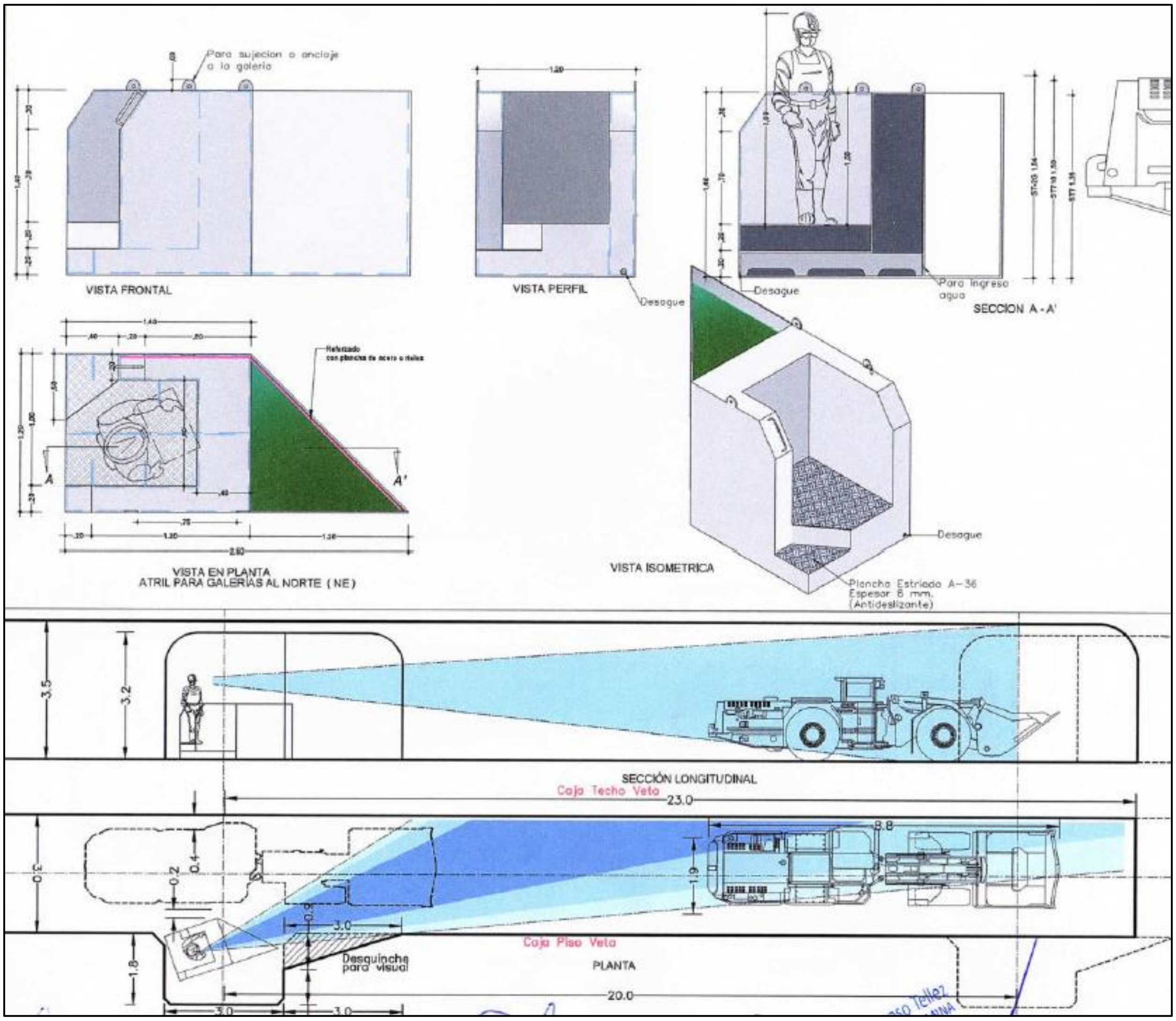
- Casing of the drilled holes with PVC.

Blasting: is carried out using a “V” relief sequence using long period delays. This sequence allows control of the hanging and footwalls, avoiding fracturing and instability.

Cleaning and extraction: the broken mineral is cleaned from the stopes (LOWER GALLERY) using a remote controlled Scooptram operated at a relevant safety distance where there is a shelter with a solid structure for the operator (bunker). Haulage is carried out using DUX dump trucks which transport the mineral to the shaft for hoisting (Antequera Shaft).

Filling: not until the cleaning stage is completed, are the voids filled with waste rock delivered via the upper sublevel (1st SUBN LEVEL) to generate a solid floor in the first SUBN LEVEL.

Figure 16-10: Remote Mucking Platform and Placement



Source: Santacruz (2023)

16.5.3.2 Stoping – Shrinkage

Preparation of short raises: 4 raises are driven with a section of 1.20 x 1.20 m and a length of 3.0 m in which chutes are assembled for stope extraction. Additionally, an access raise is driven at the edge of the stoping block.

The first cut is driven from the access drift intercepting all draw chutes in order to begin stoping. Stoping lifts of 1.80 m high and between 0.8 to 1.0 m wide depending on the width of the vein.

After each blast, enough mineral is pulled through the chutes, to provide a workspace for the next lift. This cycle is repeated until the completion of the stope, approximately 10 to 12 lifts depending on the size of the stoping block. The final step would be to empty the mineral from the stope. The exploitation method cycle lasts between 4 to 6 weeks.

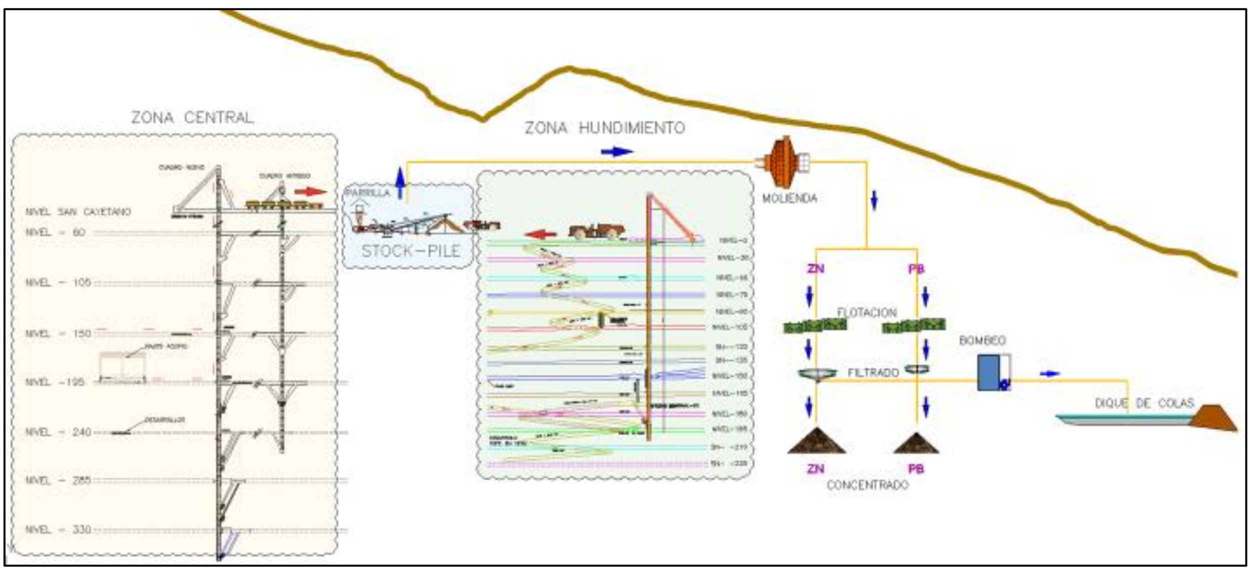
16.5.3.3 Extraction and Transport System

Extraction and Transportation System – Central Zone

Central Zone mineral is transported from the stopes via rail with Goodman type battery locomotives on levels -330, -285, -240, -195, -150, -105 and -60 to dumps on each level at the Nueva Shaft. Ore is hoisted to the San Cayetano level (zero level) in a 2.5 t skip.

At the San Cayetano Level, mineral is loaded into Granby style cars and hauled to the main dump for stockpiling prior to feeding to the process plant.

Figure 16-11: Extraction System Diagram



Source: Santacruz (2023)

Conventional Development - Currently, the Central Zone uses conventional drifting and stoping system, meaning that jackleg drills are used for horizontal drifting which is mucked using Eimco 12B pneumatic overshot rail shovels. The extraction of the Shrinkage stopes is carried out by loading U35 rail cars directly from the stope chutes which are transported by locomotives to their respective level dump pockets at the shaft.

Extraction and Transportation System – Hundimiento Zone

The extraction system of this area can be seen schematically in Figure 16-11, it has an extraction shaft to level 0 from level -195, with a main dump at level -173 and its respective skip loader at level -180. The skip capacity is 2 t.

The preparation and exploitation system are a combination between mechanized and conventional, with some drifting still being done with jacklegs, however, the extraction is completely mechanized through the use of scooptram to clean the fronts and mineralized material is subsequently transported by Dux-DT12 dump trucks to the main grate at level -173.

All production is transported vertically to Level 0 where it is deposited in the main extraction bins, from here the mineral is transported horizontally by conventional Type F12 dump truck to the main surface dump and stockpile.

16.6 Mine Equipment

16.6.1 Equipment List

Separate fleets of equipment are employed for each Central and Hundimiento Zones:

Development drilling for Mine infrastructure (primary development): ramps, counter galleries, cuts, entrances, loading stations, shelters, collection chambers, pumping sumps, etc. and everything related to waste rock infrastructure. The same fleet is also used for secondary development including main sublevels and cutouts:

- To carry out these tasks in the mechanized Hundimiento zone, electrohydraulic single boom drill jumbos are used, such as the Muki FF predominantly used as well as Jackleg drills depending on the section of the heading; and
- In the Central zone, conventional Jackleg Seco 250 type drills are used.

For installation of support:

- In Hundimiento, Muki FF electrohydraulic single boom jumbos or Jackleg Seco 250 conventional drilling rigs are used; and
- Central zone uses jackleg drills exclusively for support with the help of hydraulic jacks for installing mesh.

Mucking and stockpiling:

- In Hundimiento, this activity is carried out in all headings and muckbays using scooptrams with differing capacities depending on the section of the heading; and
- Central zone us several captive small capacity Scoops, but the rail drifts are driven mostly by the use of Eimco 12B pneumatic shovels.

Extraction and transportation:

- Haulage is by diesel low profile trucks in Hundimiento; and
- Central zone uses battery rail locomotives.

There are two Resemin Muki FF rigs with a power of 75 HP with capacities of between 2.4 and 3.0 m, and they are generally used for primary development and occasionally in secondary developments (box and vein developments) in level and sublevel development with dimensions 3.0 m x 3.0 m. Additionally, conventional Jackleg Seco 250 type drilling machines are used in the Central Zone for the execution of stope or raise developments, totalling about 10 to 15 active headings.

Table 16-5: Drifting Equipment

Item	Category	Mine/Zone	Equipment Code	Model	Brand	Capacity / Range	HP	Availability (%)	Utilization (%)
1	Jumbo Drills	Hundimiento	MK-01	MUKI FF	Resermin	3.0 M	75	85	20
2		Hundimiento	MK-03	MUKI FF	Resermin	3.0 M	75	85	20

Source: Santacruz (2023)

Two Raptor Long hole drills are used for “Sub Level Stoping” in Hundimiento. The monthly drilling production is approximately 1,200 m per month.

Table 16-6: Production Drilling

Item	Category	Mine/Zone	Equipment Code	Model	Brand	Capacity / Range	HP	Availability (%)	Utilization (%)
1	Longhole Drills	Hundimiento	RP-05	Raptor Mini DH	Resermin	15 M	100	85	20
2		Hundimiento	RP-06	Raptor 44	Resermin	15 M	100	85	20

Source: Santacruz (2023)

In the Hundimiento Zone there are 5 scooptrams (three Epiroc, one Overprime and one HES) and an Eimco 12B Pneumatic Shovel. In the Central Zone there is a Jarvis Clark 1 yd^3 and a Sandvik 1.5 yd^3 scooptram that are captive in specific areas, However the bulk of the mucking is completed with Eimco 12B Type pneumatic shovels.

Table 16-7: Scooptrams and Pneumatic Shovels

Item	Category	Mine/Zone	Equipment Code	Model	Brand	Capacity/ Range	HP	Availability (%)	Utilization (%)
1	Scooptrams	Hundimiento	ST-12	ST2G	EPIROC	2 yd^3	117	85	60
2		Hundimiento	ST-17	ST2G	EPIROC	2 yd^3	120	85	60
3		Hundimiento	ST-20	ST2G	EPIROC	2 yd^3	120	85	60
4		Hundimiento	ST-18	XLH05D-010-2018	OVERPRIME	1 yd^3	99	85	30
5		Hundimiento	ST-21	HS10E	HES	0.7 yd^3	40	85	30
6		Hundimiento - 140	PN-50	12B	EIMCO	0.17 m^3		85	60
7		Central	ST-06	JS-100E	JARVIS CLARK	1 yd^3	40	85	30
8		Central	ST-10	LH202E	SANDVIK	1.5 yd^3	60	85	30
9		Central -60	PN-9	12B	EIMCO	0.17 m^3		85	60
10		Central -85	PN-117	12B	EIMCO	0.17 m^3		85	60
11		Central -85	PN-12	12B	EIMCO	0.17 m^3		85	60
12		Central -85	PN-36	12B	EIMCO	0.17 m^3		85	60
13		Central -105	PN-18	12B	EIMCO	0.17 m^3		85	60
14		Central -105	PN-56	12B	EIMCO	0.17 m^3		85	60
15		Central -105	PN-5	12B	EIMCO	0.17 m^3		85	60
16		Central -130	PN-38	12B	EIMCO	0.17 m^3		85	60
17		Central -150	PN-37	12B	EIMCO	0.17 m^3		85	60
18		Central -175	PN-3	12B	EIMCO	0.17 m^3		85	60
19		Central -195	PN-8	12B	EIMCO	0.17 m^3		85	60
20		Central -195	PN-57	12B	EIMCO	0.17 m^3		85	60
21		Central -195	PN-10	12B	EIMCO	0.17 m^3		85	60

Item	Category	Mine/Zone	Equipment Code	Model	Brand	Capacity/ Range	HP	Availability (%)	Utilization (%)
22		Central -240	PN-30	12B	EIMCO	0.17 m^3		85	60
23		Central -240	PN-19A	12B	EIMCO	0.17 m^3		85	60
24		Central -285	PN-15	12B	EIMCO	0.17 m^3		85	60

Source: Santacruz (2023)

Depending on the type of work and the size of opening, the appropriate equipment is used for cleaning, stockpiling and loading the dump trucks. For extraction in the Hundimiento Zone, 3 Dux DT12 dump trucks are used to transport the mineral from the mineral loading points to the main shaft extraction dump.

In the Central Zone, the mineral is transported through the use of locomotives; currently 17 locomotives are used to cover the different production levels (2 Trident, 5 Titan BNX, 3 VEB, 4 Bessinger and 3 Goodman).

Table 16-8: Dump Trucks, Locomotives

Item	Category	Mine/Zone	Equipment Code	Model	Brand	Capacity / Range	HP	Availability (%)	Utilization (%)
1	Trucks	Hundimiento	MT-02	DT12	DUX	8 t	150	85	60
2		Hundimiento	MT-03	DT12	DUX	8 t	150	85	60
3		Hundimiento	MT-05	DT12	DUX	8 t	150	85	60
4		Central 0	LB – 50		Trident	6 t		85	60
5		Central 0	LB – 51		Trident	6 t		85	60
6		Central –105	LB – 41		Titan BNX	2.5 t		85	60
7		Central –195	LB – 42		Titan BNX	2.5 t		85	60
8		Central –150	LB – 32		Titan BNX	2.5 t		85	60
9		Central –150	LB - 45		Titan BNX	2.5 t		85	60
10		Central –240	LB – 03		Titan BNX	2.5 t		85	60
11		Central –105	LB – 62		VEB	3.5 t		85	60
12		Central –150	LB – 63		VEB	3.5 t		85	60
13		Central –150	LB – 24		VEB	3.5 t		85	60
14		Central –105	LB – 08		Bessinger	2.5 t		85	60
15		Central –180	LB – 10		Bessinger	3.5 t		85	60
16		Central –240	LB – 01		Bessinger	3.5 t		85	60
17		Central –285	LB – 16		Bessinger	3.5 t		85	60
18		Central –180	LB – 28		Goodman	3.5 t		85	60
19		Central –195	LB – 22		Goodman	2.5 t		85	60
20		Central –60	LB – 44		Goodman	2.5 t		85	60

Source: Santacruz (2023)

There is dedicated equipment for the transportation of personnel (Paus Minka IBA) and the maintenance of haulage ways and access roads.

Table 16-9: Inventory of Service and Transportation Equipment

Item	Category	Mine/Zone	Equipment Code	Model	Brand	Capacity / Range	HP	Availability (%)	Utilization (%)
1	Auxiliary Equipment	Hundimiento	TR-04	D4G	Caterpillar	1.9 m^3	45	85	30
2		Hundimiento	UT-01	SURI 22	Resermin	2 t	96	85	20
3		Hundimiento	CM-10	MINKA 18A	Paus	18 Passengers	125	85	60

Source: Santacruz (2023)

16.6.2 Availability and Utilization Factors

As can be seen in the above tables, the availability and utilization factors are not actually tracked, calculated, or reported. An availability of 85% has been assumed for all units of every type. Utilization is also uniformly applied by unit, with 20% assumed for all drilling equipment, 60% for all trucks and large scooptrams, and 30% for all small (< 2 yd^3) scooptrams.

This information should be tracked properly and used as a management tool to determine which units should be rebuilt or replaced and to avoid or minimize usage of the units with the highest operating costs.

16.7 Mine Personnel

Total Manpower at the mine site including Mine, Plant, Maintenance, Services, and General and administrative in 2022 totaled 618 people consisting of 358 direct employees and 260 contractors. In the breakout table below, the contractors fill mostly the services roles.

Table 16-10: List of Mine Personnel

Mine	243
Plant	44
Engineering and Maintenance	38
General & Administrative	33
Contractors	260
Total	**618**

Source: Santacruz (2023)

16.8 Production Schedule

Total mine production for 2022 is shown in Table 16-11.

Table 16-11: Total Mine Production in 2022

	Total
Production (tonnes)	181,153
Waste rock (tonnes)	45,710
Zinc (%)	7.10
Lead (%)	0.62
Silver (g/t)	118
Primary Devt Horizontal (m)	1,621
Primary Devt Vertical (m)	335
Secondary Devt Horizontal (m)	4,796
Secondary Devt Vertical (m)	1,643

Source: Santacruz (2023)

Mining in the upper areas, and adjacent to active mining operations, is carried out by "Cooperativas". These groups are independent miners with which Illapa has informal agreements allowing them to mine certain areas of the deposit. Ore mined under this agreement is processed at the Porco plant on a toll basis. In 2013, it was agreed that Contrato de Asociación Sociedad Minera Illapa S.A. would exploit the levels lower than elevations 4,213 and 4,225, in the central zone. However, members of the Cooperatives regularly violate the agreement and access active mining areas below these agreed boundaries, which is both a safety and production issue. As well, environmental licenses and controls are not in place for Cooperatives and little or nothing is done to regulate the environment in their work areas.

The production from cooperative mined areas is separate from that planned and exploited by Illapa. The Cooperative system is one method to reduce illegal activity and have some positive influence on operating standards and control over areas being mined, however the impacts of blocked mine access, unauthorized entry, and activities in active mining areas remain significant.

17 PROCESS DESCRIPTION / RECOVERY METHODS

17.1 Introduction

The Porco Mill, which has two sources of feed (company feed and toll feed), has been in production since 1992. The mill processes the company and toll feeds separately.

The mill uses a crushing, grinding, and flotation flowsheet to recover a lead concentrate and a zinc concentrate. Both concentrates are sold to Glencore via overseas shipping through Antafagasta, Chile.

The mill generally separates company and toll feed into different days, but there are a few days where the feed is processed on the same day, with a shutdown in between to separate them.

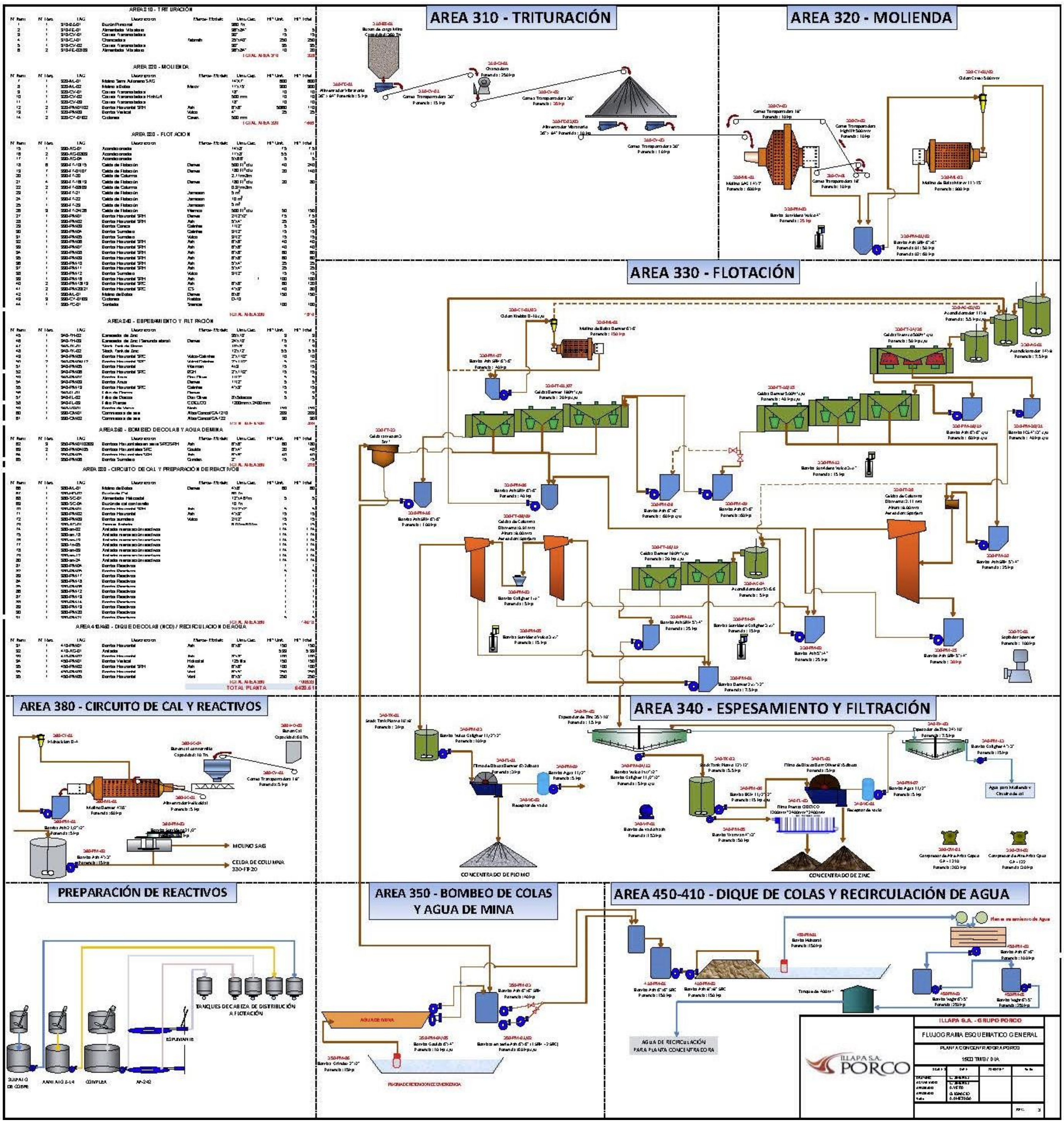
The feed grades for the company feed are measured as is typical for a processing plant, by taking samples from the process at the cyclone overflow and performing a reconciliation each month based on concentrate produced and tailings samples. The toll ore has extra sampling as part of the contract with the local minors. The ore is received by San Lucas, often in 1-2 t lots, where it is weighed and sampled. The ore is combined on a toll feed stockpile to be fed to the mill. The toll feed follows the same sampling and reconciliation procedure as the company ore.

The plant flowsheet for the Porco mill, which can be seen in Figure 17-1, is a typical differential flotation circuit to produce lead and zinc concentrates.

The ore is crushed in preparation for feed to the grinding circuit. The grinding circuit utilizes a SAG/Ball mill combination to

The flotation circuit recovers both lead and zinc to a bulk concentrate. The bulk concentrate then undergoes cleaner flotation to remove a lead concentrate. The tailings from the lead cleaning circuit becomes the zinc concentrate. Both of the concentrates are filtered for shipping to the smelter. The lead concentrate is bagged for shipping, while the zinc concentrate is shipped bulk in trucks.

Figure 17-1: Porco Mill Flowsheet



Source: Glencore (2021)

The concentrates produced at the Porco Mine are sold to the Glencore via overseas shipping through Antafagasta, Chile. The zinc concentrate is shipped as a bulk product. The lead concentrate, due to local laws, is bagged prior to shipping.

17.2 Process Plant Description

The processing plant is designed to process 1,200 tonnes/day of company feed or 900 t/d of toll feed. The plant produces two concentrates; a lead concentrate and zinc concentrate, both of which are high in silver.

17.2.1 Crushing

The plant feed is brought to the surface via haul truck and dumped into the crushing feed bin. The mineralized material is fed to a 25” x 40” Telesmith jaw crusher via vibrating grizzly feeder. The jaw crusher discharge is placed on the mill feed stockpile.

17.2.2 Grinding

The coarse ore stockpile is reclaimed by underground vibratory feeder to a 14’ dia. x 7’ EGL SAG mill. The SAG mill has a trommel screen to return oversize material to the SAG mill. The fine particles are pumped to a cyclone pack for size classification. The undersize reports to a 11’ dia. X 15’ EGL ball mill. The cyclones used for classification are CAVEX 500 mm cyclones. The cyclone overflow targets a product size, P_{80} of 100 µm for the flotation circuit.

The SAG and ball mill can be seen in Figure 17-2.

Figure 17-2: Porco Mill Grinding Circuit

17.2.3 Flotation

The flotation circuit at the Porco mill concentrates the lead, zinc, and silver into a bulk concentrate which is then separated into separate lead and zinc concentrates by differential flotation. The reagents utilized at the Porco mill are generally the same for the toll and company ores.

Figure 17-3 shows the Porco bulk rougher circuit.

Figure 17-3: Porco Mill Rougher Flotation Cells

17.2.3.1 Bulk Flotation Circuit

The grinding circuit product is directed to three conditioning tanks: 14' dia. by 8' tall, 11' dia. x 8' tall, and 5' dia. X 6.5' tall. In the 3 conditioning tanks frother, Aerophine 3418A, Aerofloat 242, copper sulphate, and Sodium Isopropyl Xanthate (Z-11) are added. The feed continues to the rougher flotation circuit which consists of three 500 cubic foot Wemco flotation cells followed by six 500 cubic foot Denver flotation cells. The rougher circuit tailings are then scavenged in a bank of seven 180 cubic foot Denver flotation cells and a single 5 m^3 Jameson flotation cell.

The scavenger flotation cell tailings reports to the final tailings pumpbox. The scavenger circuit concentrate is returned to the bulk circuit feed with the option to be reground in the regrind circuit to improve liberation.

The regrind circuit consists of a 6' diameter x 6' EGL Denver ball mill in closed circuit with three Krebs D-10 cyclones.

The bulk rougher concentrate is cleaned in a single 2.11 m diameter x 8 m tall flotation column. The tailings from the flotation column report to the second conditioning tank on the rougher feed. The concentrate from the flotation column reports to the lead/zinc differential flotation circuit.

17.2.3.2 Differential Flotation Circuit

The differential flotation circuit consists of a 5' diameter x 6.6' tall conditioning tank, four 180 cubic foot Denver flotation cells and two 0.91 m diameter x 8 m tall flotation columns. The rougher concentrate is pumped to the conditioning tank, where cyanide and zinc sulphate are added to depress the zinc. The conditioning tank discharge reports to a bank of four 180 cubic foot first cleaner Denver mechanical flotation cells. The 1st cleaner tailings report to the zinc concentrate thickener. The concentrate from the first two 1st cleaner cells report to the 2nd cleaner flotation column, a 0.91 m dia. X 8m tall flotation column. The concentrate from the second two 1st cleaner flotation cells is returned to the conditioning tank.

The 2nd cleaner flotation column concentrate reports to the 0.91 m dia. x 8 m tall 3rd cleaner flotation column, while the 2nd cleaner flotation column tailings is returned to the cleaner circuit conditioning tank.

The 3rd cleaner flotation column is the final stage in the differential flotation circuit. The concentrate from this column reports to the final lead concentrate, while the tailings reports back to the feed of the 2nd cleaner column.

17.2.4 Concentrate Dewatering

The concentrate dewatering circuit consists of two circuits, the lead concentrate dewatering circuit and the zinc concentrate dewatering circuit.

The concentrates produced at the Porco Mine are sold to Glencore via overseas shipping through Antafagasta, Chile. The zinc concentrate is shipped as a bulk product. The lead concentrate, due to local laws, is bagged prior to shipping. The products are transported by truck to the train loading facility that is approximately 10 km from the mine.

17.2.4.1 Lead Concentrate Dewatering

The lead dewatering circuit consists of a 10' diameter x 8' tall lead filter stock tank and a 6' diameter disc filter. The disk filter has 2 discs. Filtrate water from the disc filter reports back to the process water tank.

Filtered lead concentrate is bagged for transport to the smelter, as is required by Bolivian law.

17.2.4.2 Zinc Concentrate Dewatering

The zinc concentrate reports to a 35' diameter thickener. The thickener underflow is pumped to a 12' diameter x 12' tall zinc filter feed tank stock tank. The zinc concentrate is filtered in a filtered in either a 1.2 m x 2.4 m x 2.4 m pressure filter or an 8 ft diameter x 5 disc filter.

17.2.5 Tailings

There are a total of 9 tailings dams at the Porco mine. Eight of the tailings dams have been decommissioned. The operational tailings dam received an increase in capacity in January. The current tailings pond capacity is designed to allow production to be stored until the end of 2023. All of the tailings dams are inspected regularly and maintained to the standards set out by the Canadian Dam Association guidelines. Both dams are under the supervision of engineers from AMEC (now Wood Engineering) and recently an external audit was conducted by Knight Piésold Consulting.

18 PROJECT INFRASTRUCTURE AND SERVICES

The infrastructure for the Porco operation is sufficient to meet the needs of the mine and processing plant.

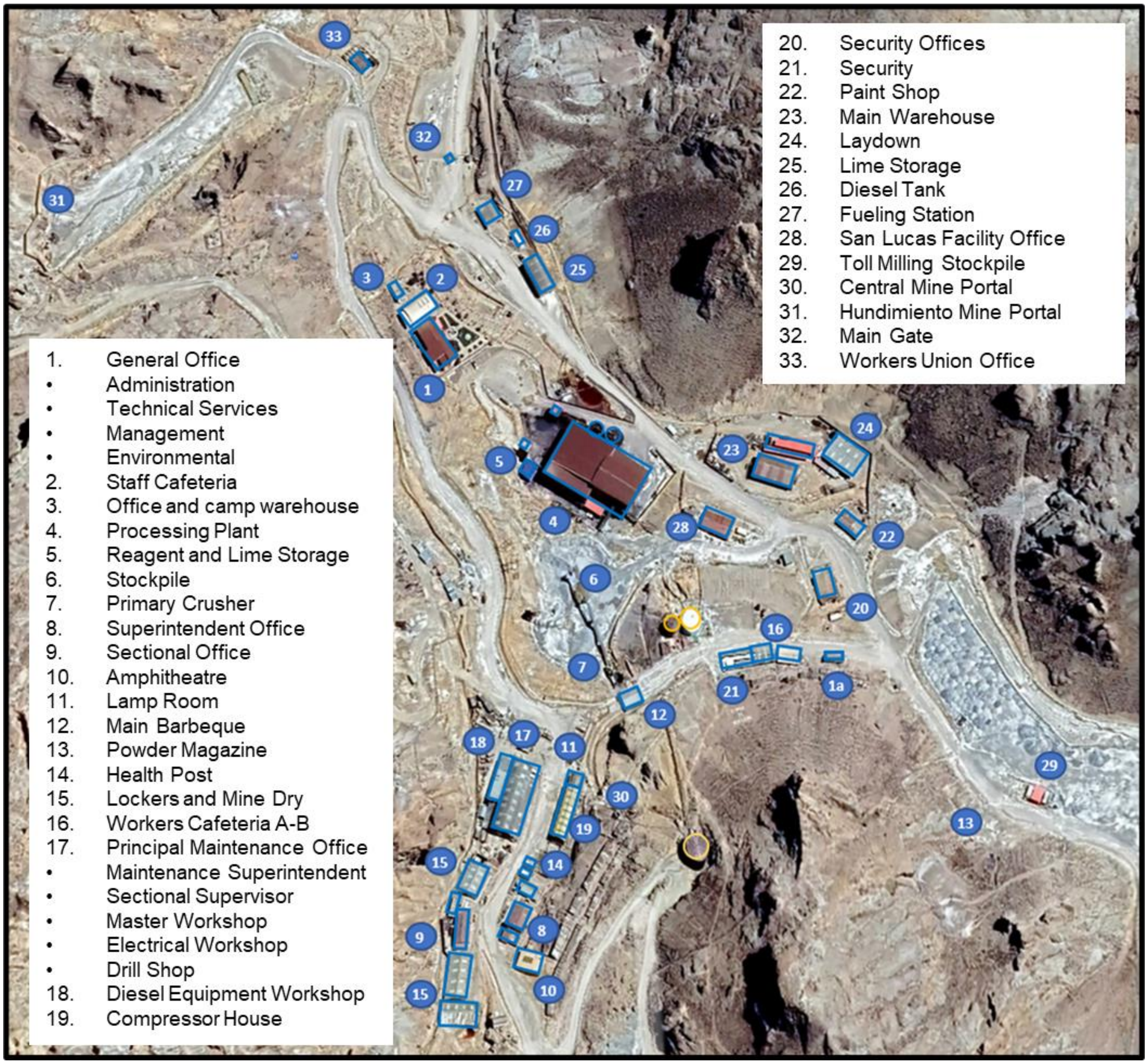
18.1 Industrial Complex

The industrial complex for the Porco operation comprises both mine portals, the processing plant, and all services to support mining and processing, as detailed on Figure 18-1. This includes:

- Various technical, administrative offices, and mine operations office;
- Maintenance facilities for all surface and underground equipment;
- Surface stockpiles;
- Warehousing facilities for mine and processing supplies, including reagents;
- A dining hall for technical and administrative staff;
- A first aid station;
- Fuel storage and a refilling station;
- A one million liter water storage tank;
- An explosives magazine;
- Water treatment; and
- Mine services, such as a mine dry, power, water supply, and compressed air.

The industrial site is gated and has a security force.

Figure 18-1: Industrial Complex of the Porco Mining Operation



Source: Santacruz (2023)

18.2 Yancaviri Camp, Porco, and Agua de Castillo Townsites

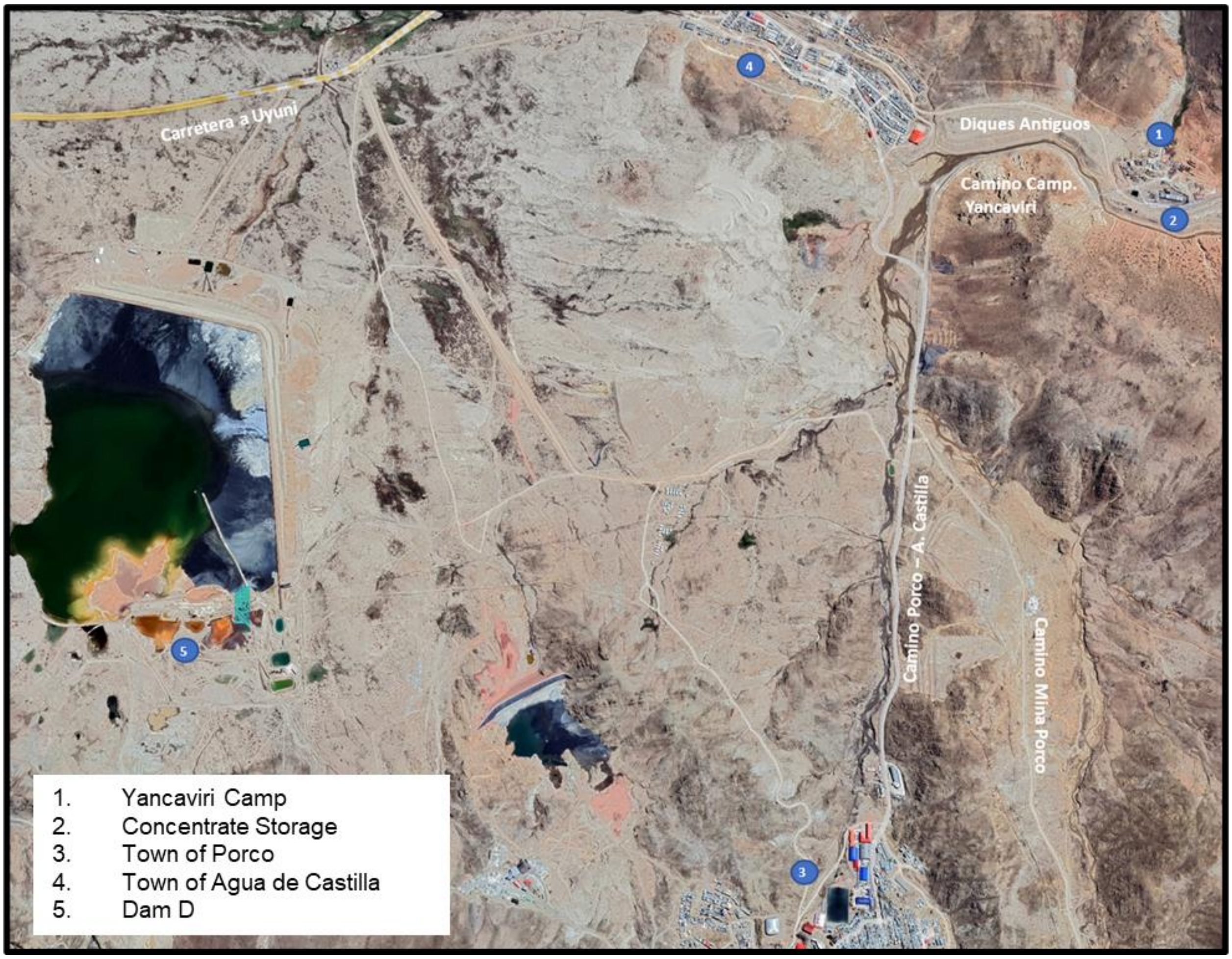
The Yancaviri camp area is located approximately 5 km from the industrial area of the Porco Mine operation and approximately 2 km from the town of Agua de Castilla (Figure 18-2).

The camp provides housing for technical staff of the operation and visitors. It is equipped with a cookhouse and dining hall, gymnasium and basketball court (Figure 18-3).

The camp site also houses the concentrate storage facility and the railway loadout for concentrate shipment.

The Yancaviri is also gated with a security force.

Figure 18-2: Yancaviri Camp Site, Porco, and Agua de Castilla Townsites.



Source: Santacruz (2023)

Figure 18-3: Details of Yancaviri Camp Facilities

Source: Santacruz (2023)

18.3 Power

Porco Operations uses power for mining and processing operations. Power is supplied by the National Grid. Approximately 21 million kWh of power was consumed in 2022, representing an average draw of approximately 2.6 MW. This equates to 126 kWh per tonne mined or 66 kWh per tonne processed (including toll milling).

19 MARKET STUDIES AND CONTRACTS

19.1 Contracts

19.1.1 Illapa JV

Porco operates under the management of Sinchi Wayra S.A. (formerly COMSUR S.A.), under a joint venture agreement with the Bolivian government (COMIBOL) named Illapa S.A. Sinchi Wayra S.A. and (COMIBOL) entered this Joint Venture Agreement (the Illapa JV) on December 4, 2014, by virtue of Public Deed N° 1356/2014. The duration of the Illapa JV is 15 years, with the possibility of extending the term for the same duration. Under the Illapa JV, ownership is 55% COMIBOL and 45% Illapa. In the event of any disagreement, the Illapa JV has an arbitration clause with seat in La Paz, Bolivia, under UNCITRAL Rules.

On October 11, 2021, Santacruz entered into the Definitive Agreement with Glencore whereby Santacruz agreed to acquire a portfolio of Bolivian silver assets from Glencore, including the following: (a) a 45% interest in the Bolivar Mine and the Porco Mine, held through an unincorporated joint venture between Glencore's wholly-owned subsidiary Contrato de Asociación Sociedad Minera Illapa S.A. (Illapa) and COMIBOL, a Bolivian state-owned entity; (b) a 100% interest in the Sinchi Wayra S.A. (Sinchi Wayra) business, which includes the producing Caballo Blanco mining complex; (c) the Soracaya exploration project; and (d) the San Lucas ore sourcing and trading business (the Assets).

On March 18, 2022, Santacruz completed the purchase of the Assets, including Glencore's interest in the Porco Mine.

On May 10, 2023, Santacruz and Glencore entered into a framework agreement to amend certain terms of the transaction documents pertaining to the acquisition of the Assets. On March 28, 2024, Santacruz and Glencore entered into the binding Term Sheet which amends the terms of certain deferred consideration and ancillary documents pertaining to the acquisition of the Assets.

19.1.2 Glencore Off-Take Agreement

Off-take Agreements with Glencore International are in place for the Porco Mine production: Contract No. 180-03-10309-P and Contract No. 062-03-10276-P, including all its addendums and amendments. These Off-Take Agreements are in effect through the life of the mine.

19.2 Market Studies

No market studies have been completed for the Project at this time. All commodities produced by the mine are regularly sold on vast international markets and the operation has an arrangement with a smelter to ensure continued product sales.

19.3 Smelting

The mine produces two saleable concentrates: lead, and zinc. Both are sent to Antafagasta, Chile for shipment overseas. Both are sold to Glencore. These include typical payment terms for all payable metals (Pb, Zn, Ag) and deductions for deleterious elements which potentially include Sb and As in the lead concentrate; and SiO_2 and Fe in the zinc concentrate.

The approximate percentage net revenue by concentrate is ranked as follows:

- Zn Concentrate: 59%
- Pb Concentrate: 41%

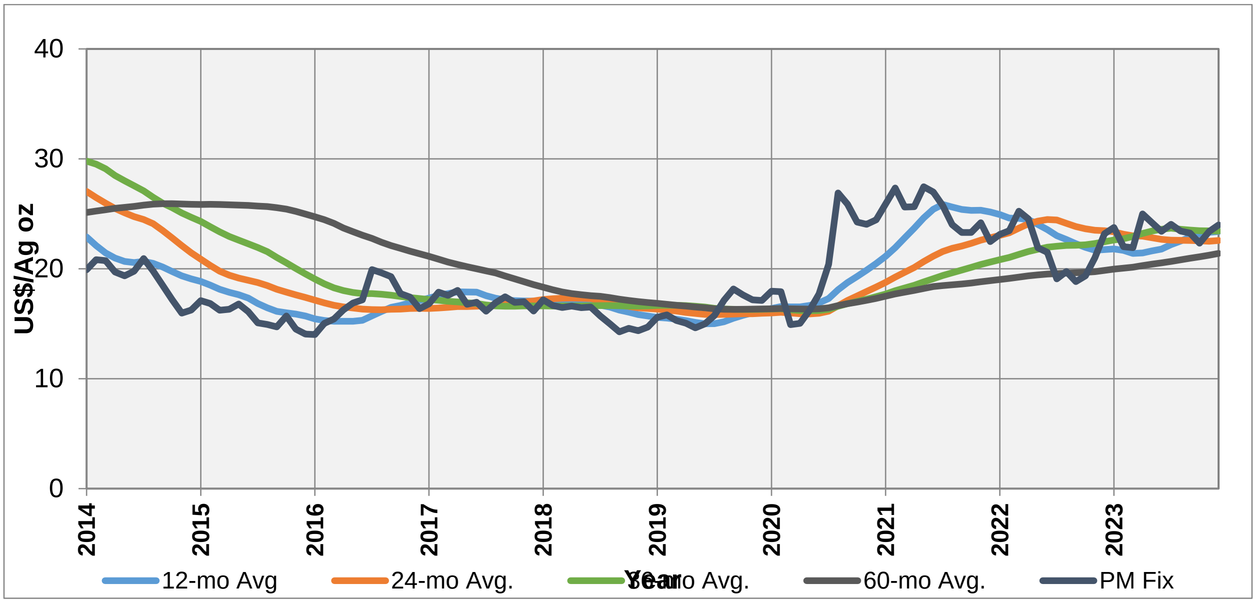
The approximate percentage revenue by metal is ranked as follows:

- Ag: 58%
- Zn: 39%
- Pb: 3%

19.4 Metal Prices

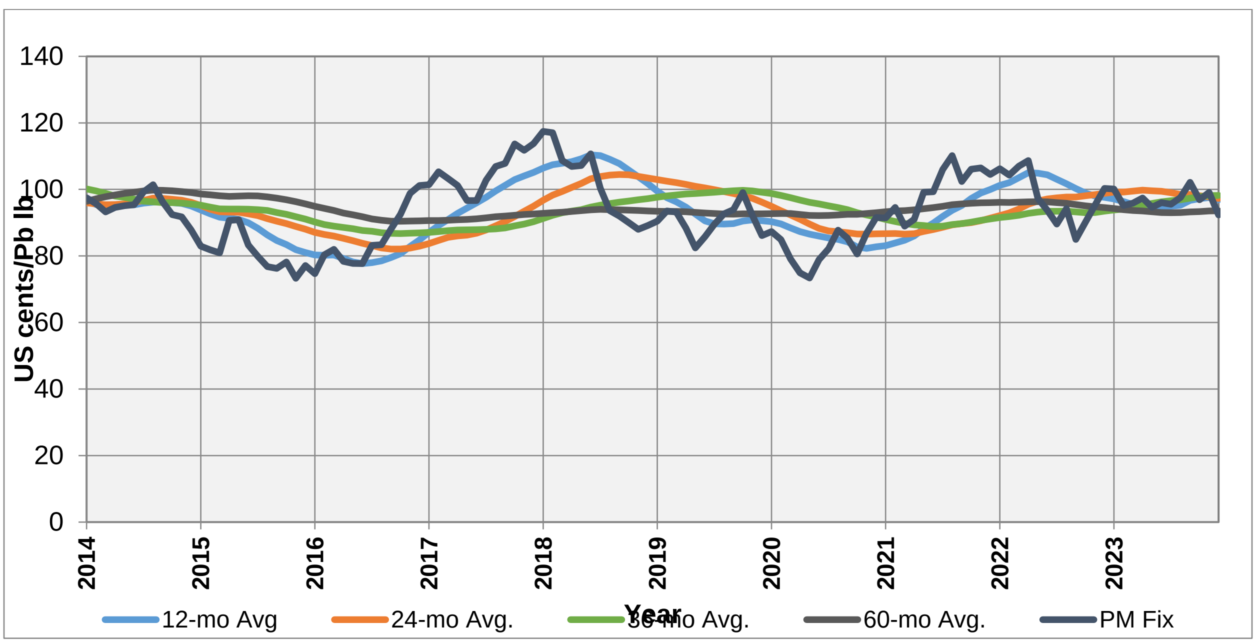
Historical silver, lead, and zinc prices are shown in Figure 19-1 through Figure 19-3.

Figure 19-1: Historical Silver Price



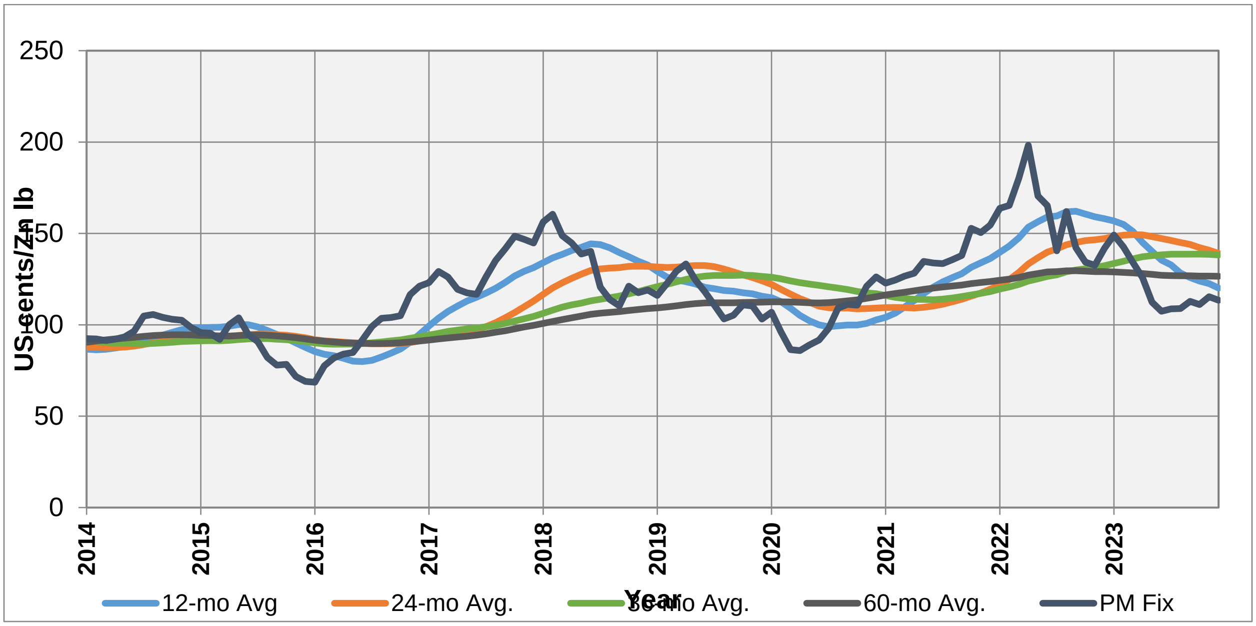
Source: London Metals Exchange (2023)

Figure 19-2: Historical Lead Price



Source: London Metals Exchange (2023)

Figure 19-3: Historical Zinc Price



Source: London Metal Exchange (2023

The zinc, silver and lead prices used in this Technical Report were selected based on the average of three years past and forward projections by CIBC and Consensus Economics, as shown in Table 19-1. These parameters are in line with other recently released comparable Technical Reports. These prices were used as the basis for the resource estimate, reserve estimate, and economic model.

Table 19-1: Metal Price and Exchange Rate

Metal	Three Year Average	CIBC (Long Term)	Consensus Economics Forecast (Log Term)	Assumed Value
Silver	23.39	22.96	20.48	21.00
Zinc	1.20	1.27	1.14	1.15
Lead	0.97	0.94	0.88	1.00

It must be noted that metal prices are highly variable and are driven by complex market forces and are difficult to predict.

Current (May 3, 2024) spot prices are as follows:

- Ag: $26.50/oz
- Zn: $1.32/lb
- Pb: $1.00/lb

The QPs do not consider the difference between metal current prices and those assumed in this study to be material with regard to the estimation of the mineral resources, reserves, or financial model.

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACTS

20.1 Environmental Considerations

Responsible environmental management is a critical part of Santacruz's license to operate and our responsible, compliant operation of Bolivian assets has continued for the last 30 years. Control of potential environmental impacts that can affect Santacruz's performance and the interests of internal and external stakeholders is paramount. Santacruz' environmental management approach is divided into three major areas; Water Management, Tailings Management, and Climate Change. However, other environmental issues are addressed as needed outside of these major management areas such as Waste Management, Land Use, Environmental Closure, and Biodiversity.

Environmental Compliance with national laws and regulations is the basis of Santacruz's environmental management system and is governed by a framework of oversight by the relevant Environmental Authority. However, the company's environmental management system allows it to identify and assess all effects of its operations in order to establish controls and improvement targets guided by best environmental practices and its responsibility to the communities in which it operates. Its environmental commitments are reported to the authorities annually in an Environmental Monitoring Report, which summarizes environmental management of its operations under applicable laws and regulations.

Santacruz is part of the Environmental Working Table within the Bolivia Network of the United Nations Global Compact, where it supports initiatives for raising awareness and environmental care, while also sharing experience from the field.

Based on comparison to the Baseline Environmental Audit Studies (ALBAs), mining activities in Santacruz's operations have not had a significant impact on the area's biodiversity. However, Santacruz actively manage risks related to land use by analyzing impacts on water resources and agriculture, adhering to national regulatory requirements, and applying relevant best practices from the ICMM for environmental closure. In the context of continuous improvement, Santacruz carried out partial remediation and rehabilitation tasks in industrial areas in accordance with the Progressive Closure Plan, in compliance with the Environmental Regulation for Mining Activities (RAAM) of Law No. 1333. None of Santacruz's mining operations are in direct proximity to a sensitive biodiversity area, and no species listed on the IUCN Red List or national conservation lists are identified as threatened by Santacruz's activities. However, Reserva Mine in Caballo Blanco is located near a Municipal protected area.

20.1.1 Climate Change

The impacts and costs of addressing climate change is driven by global commitments, such as the Paris Agreement in 2015, which was signed by 193 countries, including Bolivia. The Agreement proposes, through international action, the reduction of global emissions to prevent the increase of 2° C in the planet's temperature. In this regard, the Bolivian government, through Law No. 835 of 2016, committed to preserving the integrity of Mother Earth, and private industry is expected to join global initiatives on climate change. Climate change has been identified as a material topic due to its potential negative impacts in the medium and long term, particularly in terms of water use and the energy limitations that the mining sector must face. This has been evaluated in Santacruz's corporate risk matrix, and Santacruz is taking actions to address this risk. Santacruz recognize the importance of the required actions in response to Climate Change and strive to ensure mining operations with the least possible environmental impact. focus its efforts mainly on efficient water management and energy efficiency. The cost of energy is one of the largest components of Santacruz's operating expenditures. Ninety percent of the electricity consumed in Santacruz's operations is purchased from the national power grid which relies mostly on fossil fuels (73%). One of Santacruz's direct actions is the management of two power plants that supply electricity to Colquechaquita Mine (Caballo Blanco):

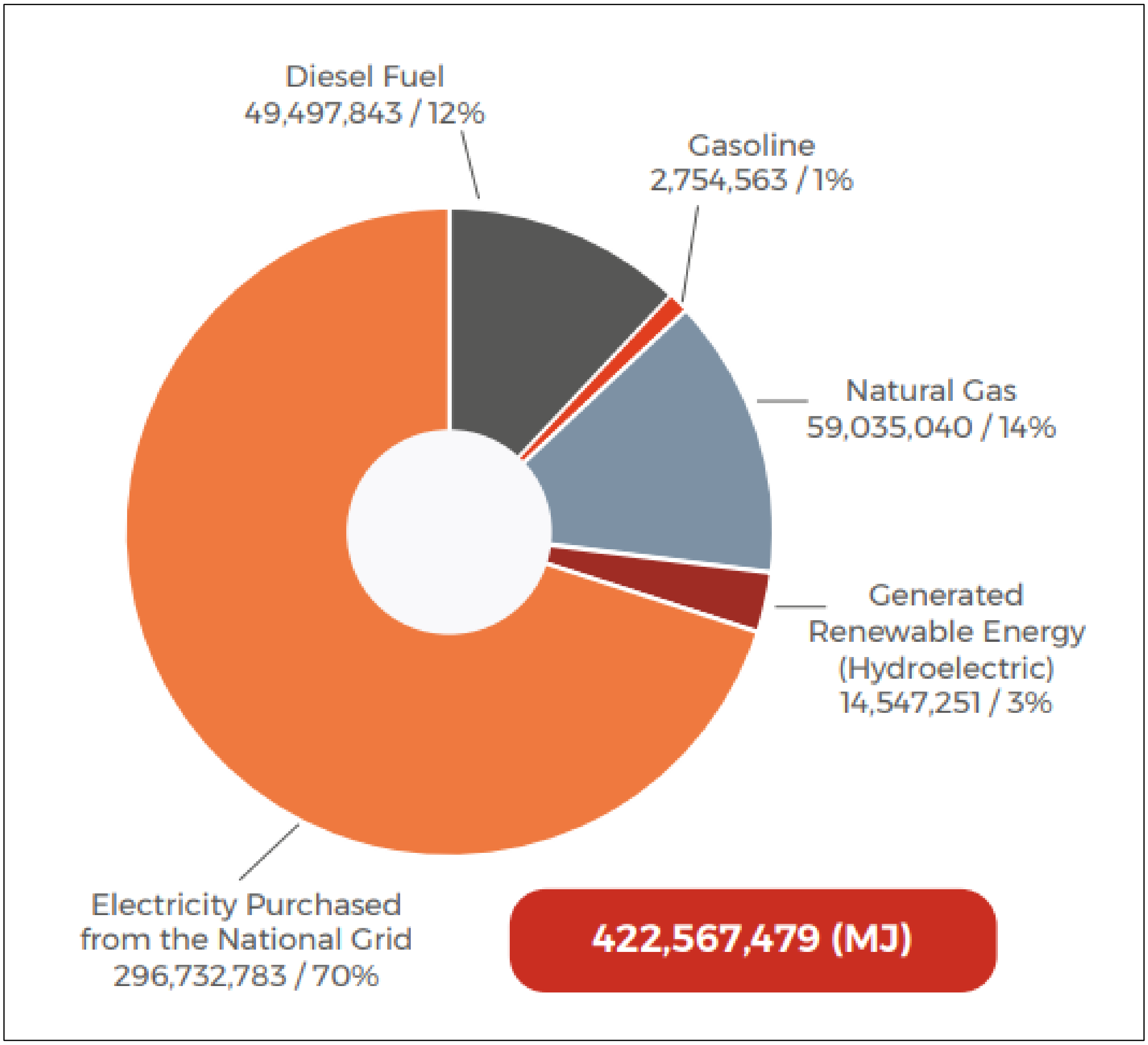
- Hydropower Plant - Renewable energy from Yocalla, which generates 870 CVA s a generation facility that converts the potential energy from falling water into electricity, with a generation capacity of 870 CV; and

- Aroifilla Thermoelectric Plant, which operates on natural gas and has a generation capacity of 200 KW.

Santacruz's operations consumed a total of 91,500 M Watt-hours from the national grid and Santacruz's own power plants, representing a 3% increase compared with the previous year's consumption against a 7% growth in production. 90% of the electricity consumed is purchased from the National Grid, while the remaining electricity is generated by Santacruz's Aroifilla thermoelectric power plant (5%) and Yocalla Renewable hydroelectric power plant (4%).

Electric energy and natural gas are measured via dedicated meters installed for this purpose. Gasoline and diesel fuel consumption is tracked through the records of outgoing supplies managed by warehouses, which are solely for the company's equipment and vehicles. Energy intensity can then be calculated to allow monitoring of overall energy efficiency. In 2022, Santacruz's energy intensity per tonne of concentrate was 2,544 MJ/t, a 10% reduction compared with the previous year, and 30.5% decrease since 2018. This reduction is attributed to more efficient production processes and increases in production that allow energy to be used more effectively.

Figure 20-1: Santacruz Bolivia Operations Energy Consumption



Source: Sustainability Report, Sinchi Wayra (2022)

Atmospheric Emissions are associated with the transportation of materials and personnel to and between the mines, resulting from dust and particulate matter generated by truck transport on unpaved roads. To prevent dust and particulate material dispersion in the air, Santacruz has implemented controls, such as frequent watering of gravel roads. In 2022, Santacruz continued to perform ambient air quality monitoring at specific points designated in Santacruz's environmental permits. These monitoring activities assess the levels of PM-10 and metallic contents in the air, and the results are well below the permissible limits. Santacruz also reports the emissions of SOx and NOx resulting from the combustion of natural gas in Santacruz's

Aroifilla thermoelectric plant in Potosí. These emissions are also below the permissible limits established by law. The calculation of these emissions is based on measurements conducted by an independent certified environmental laboratory.

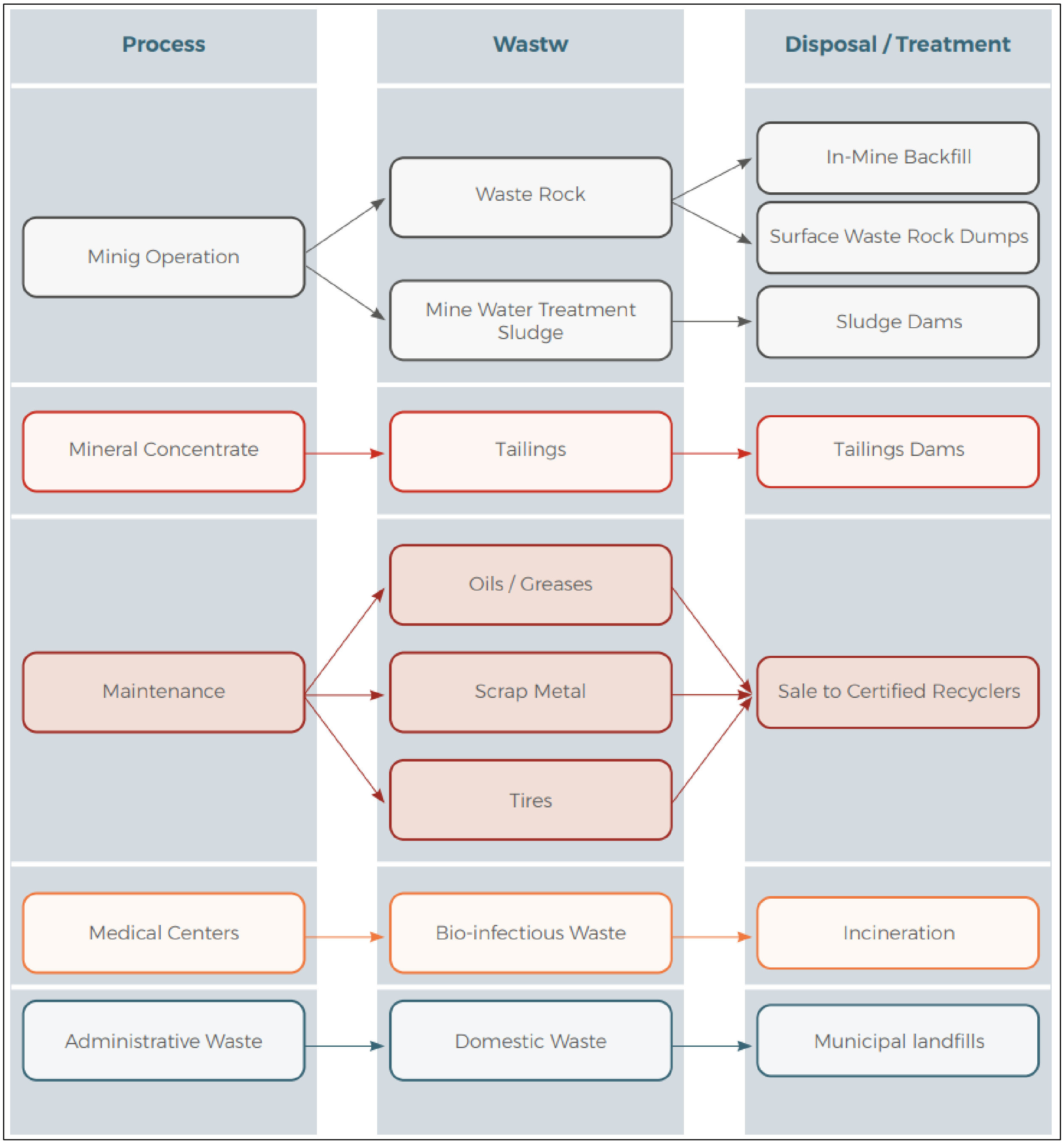
20.2 Waste and Water Management

Waste management is an important part of Santacruz's Comprehensive Environmental Management, which includes a waste management plan to classify, handle, and store waste separately for proper disposal or treatment. Waste management complies with Environmental Law No. 1333, its Regulations on Solid Waste Management, and its supplementary regulations, focusing primarily on the sectoral requirements of the Environmental Regulation for Mining Activities for waste rock and tailings.

Waste management extends beyond Santacruz's production operations and includes administrative activities and healthcare facilities managed by Santacruz. Santacruz has begun initiatives for recycling and reuse of domestic waste at several of Santacruz's operations, including plastic recycling campaigns, paper reuse, and compost generation from food waste. Industrial wastes such as oils, greases, scrap, and tires, are sold to recognized recyclers. It ensures that these recyclers are regulated and certified by the environmental authorities to ensure compliant reuse and recycling.

Santacruz classifies waste based on its source of generation. Waste Management then addresses separation by kind of waste, collection, temporary storage and final disposal.

Figure 20-2: Waste Classification by Process Source



Source: Sustainability Report, Sinchi Wayra (2022)

Table 20-1: Total Waste Quantification and Treatment/Disposal

Classification	Subclassification	Type of Waste	Description of Measures and Risks	Treatment / Disposal	2022
Hazardous Waste	Mineral Waste	Waste Sterile Rock or Wall Rock (Tn.)	Excavated material resulting from mining operations. Our environmental and safety management ensures that this waste is confined to fill blasted galleries, maintaining the stability of the deposit. The excess sterile rock is transported to the surface and stored in Waste Rock Deposits with all the necessary environmental measures to prevent pollution. Its hazard level is high due to the potential for Acid Rock Drainage (ARD) generation, which is why we have a drainage system that collects and redirects rainwater to avoid contact with the sterile material accumulations.	Transport to a Landfill On-site	17,266
		Tailings (Tn.)	Tailings are the residues generated from the metallurgical concentration process, and they are confined in constructed tailings dams specifically designed for this purpose. They are transported through a pipeline system from the Concentrator Plants. Due to their high content of metals and chemicals, their hazard level is high. The tailings dams are equipped with a drainage system that captures and diverts rainwater, as well as another system to capture infiltrations.	Transport to a Landfill On-site	851,725
	Non-Mineral Waste	Bio-infectious Waste (Tn.)	This waste is generated by our health centers in the operations. It undergoes incineration treatment in Bolívar and Porco, while in Caballo Blanco, it is transported to Potosí for disposal by the specialized municipal service. Its hazardous nature is based on the potential for disease transmission and infection, including transmission of Covid-19.	Disposal by Incineration (without energy recovery) On-site (Bolívar and Porco) / Off-site (Caballo Blanco)	0.7
Non-Hazardous Waste	Mineral Waste	Sludge (Tn.)	Sludge is the waste generated by the Treatment of Water. It is composed mainly of Calcium Hydroxide and solids decanted from the mine water. Sludge is stored in pools specifically designed for this purpose or in the Tailings Dams.	Transport to a Landfill On-site	18,597
	Non-Mineral Waste	Domestic and Industrial Waste	Non-hazardous non-mining waste is common waste that is collected separately, including domestic garbage, paper and cardboard, and plastic. In the operational area, oils, greases, worn-out tires, and scrap materials are separated. These waste items are temporarily stored and, as part of circularity measures, sold to specialized external companies for their respective reuse, recycling, or proper disposal. As a prerequisite for verifying these companies, their environmental license for handling this waste is requested. Contracts and shipping documents are also available and validated by the Environmental Authority.	Disposal - Transfer to Municipal Landfill (domestic waste) Off-site Industrial Waste - Transfer for Recycling/Reuse (Not disposed of) Off-site	1,318

Source: Sustainability Report, Sinchi Wayra (2022)

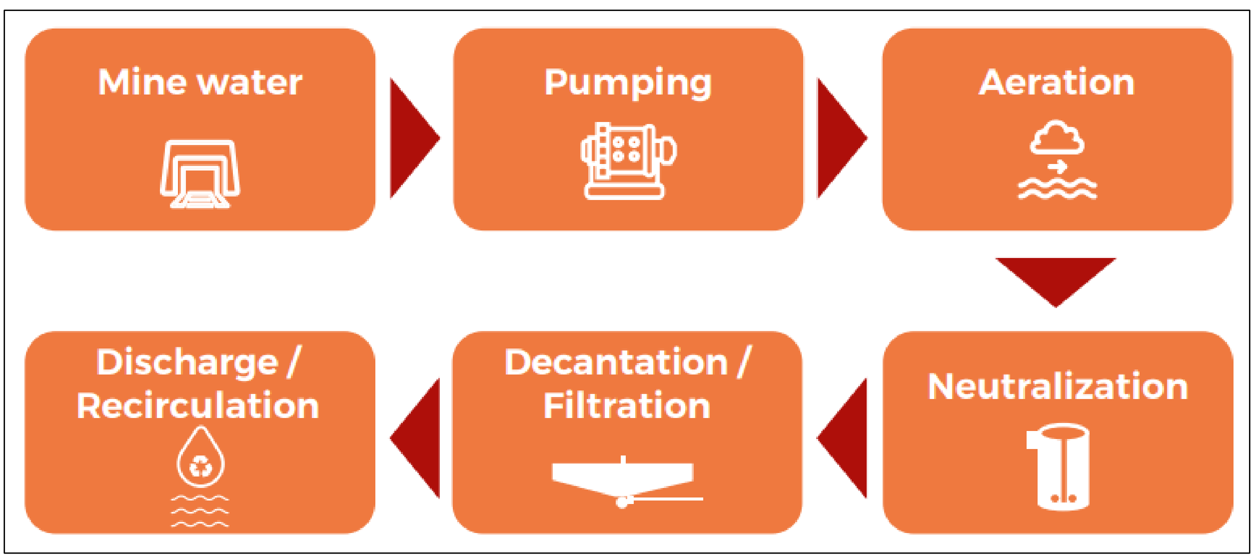
Water management has been identified as the most critical environmental area. Water is a shared resource of high social, environmental, and economic value, which is also a critical component of Santacruz's mining and metallurgical activities. Mining operations are located in the Bolivian Highlands, in areas with low precipitation, high evapotranspiration, and threats of drought.

According to data presented in the “Ecological Threat Register”, which ranks countries and watersheds worldwide based on their exposure to water-related risks, Bolivia has a low country risk (10- 20%) of water vulnerability and is not considered a water-stressed country. However, in accordance with the “Aqueduct Water Risk Atlas” by the World Resources Institute, the highland areas where Santacruz operates are considered as Medium Risk (Bolívar) and High Risk (Caballo Blanco and Porco). According to these recognized international public tools, Santacruz deems the care and preservation of water critical aspects of Santacruz’s management system and strives to ensure access to water for communities and operational needs.

During the mining production process, water comes into contact with heavy metals, so it must be treated before being use or discharge. Monitoring water quality and quantity and the use of water balance monitoring, Santacruz is able to comply with the criteria required by the Regulations on Water Pollution (RMCH) of Environmental Law No. 1333. Santacruz is also subject to periodic inspections by applicable environmental authorities and community representatives. Water balances for each operation are verified using flow meters and reservoir level bathymetry to ensure accurate and validated information for assessing, proposing, and identifying opportunities for improving water management.

Water Treatment - The underground mining activities produce an excess of water which must be pumped from the mine. This water may contain suspended solids and chemical contaminants (such as pyrite and heavy metals), which would require treatment for reuse of discharge. Water treatment includes the following steps:

Figure 20-3: Water Treatment Process



Source: Sustainability Report, Sinchi Wayra (2022)

Table 20-2: Santacruz Bolivia Water Volumes

Water Sources	Description	2022
Underground Water (m^3)	Given the nature of mining operations, the required deposits are located adjacent to underground water sources that are pumped to the surface for mining development and treatment, as it contains high levels of metals and solids. (Produced water)	118,960
Fresh Surface Water (m^3)	Fresh surface water is obtained from rivers or springs in the area. We minimize the need for fresh surface or springs. It is used to supply drinking water to the camps or to supplement the operational needs of the concentrating plants.	7,003,987
Rainwater (m^3)	Rainwater is the water collected in our tailings ponds, and it is calculated based on rainfall data and the surface area of the pond. This water is added to the water that goes through recirculation.	298,055
Other Sources of Water (m^3)	These include small amounts of potable water (third parties) supplied by local municipal operators.	9,032
	Total Extracted Water	**6,697,431**

Notes:

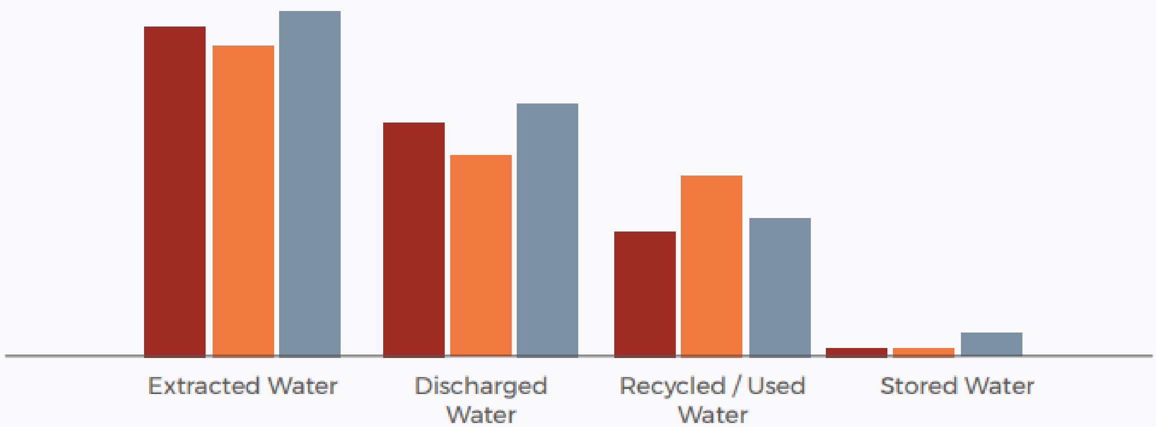
1. Marine water sources are not considered as the country is landlocked.
2. The underground water sources refer to the extraction of produced water, and there is no extraction from other natural underground sources.
3. All extracted waters [fresh surface water, rainwater, other sources water, and even underground (produced) water] are considered freshwater (total dissolved solids ≤ 1000 mg/l).
4. This data is consolidated from all our operations. For detailed information on each operation and water stress zones, please refer to the operation-specific information.

Source: Sustainability Report, Sinchi Wayra (2022)

Operational consumption is used for drilling, mine services, irrigation, and process water sourced by reclaim from the Tailings Dam. The actual water consumption is the difference between "extracted" water and "discharged water", resulting in 1.9 Mm^3 consumed in 2022 for all mines.

Santacruz treats excess water to meet applicable required standards and discharge it to surface water at authorized points specified in Santacruz's environmental permits. The discharge parameters as set out in Water Pollution Regulations Law No. 1333, include pH, iron, zinc, lead, and suspended solids, which are typical in the water treated from the mine.

Figure 20-4: Santacruz Bolivia Water Balance



	Extracted Water	Discharged Water	Recycled / Used Water	Stored Water
2020	7,178,981	5,131,719	2,701,583	214,464
2021	6,697,431	4,412,548	3,873,349	232,526
2022	7,494,504	5,505,821	3,023,718	530,463

Source: Sustainability Report, Sinchi Wayra (2022)

20.2.1 Solid Waste - Porco

There are a total of 9 tailings dams at the Porco mine. Eight of the tailings dams have been decommissioned. All of the tailings facilities are inspected regularly and maintained to the standards set out by the Canadian Dam Association guidelines. Dams are under the supervision of engineers from AMEC (now Wood Engineering) and regular external audits are conducted by a third-party engineering firm.

The active Tailings Storage Facility (dam “D”) began operations on March 3, 1998. Initially designed by AGRA Earth & Environmental Ltda. For the first two phases., and AMEC for the current active expansion. The facility meets current international standards. The impoundment is of downstream construction and the dam lined with 60 mil HDPE. A system of well and piezometers are in place to monitor the facility’s performance. Construction of Phase VI begun in 2018 was completed in 2019 and included recommended work to reinforce areas of the foundation. Another expansion was completed in 2021, and construction of the next expansion is planned for Q3 2024.

Tailings are discharged along the inside face of the dam at 25-29% solids, forming a tailings beach for additional support, and keeping the water away from the dam. The water reclaim system consists of a barge mounted pump system to form a closed loop with the process plant. The site is zero discharge.

Figure 20-5: Volume Profile of Dam "D" by Stage Height

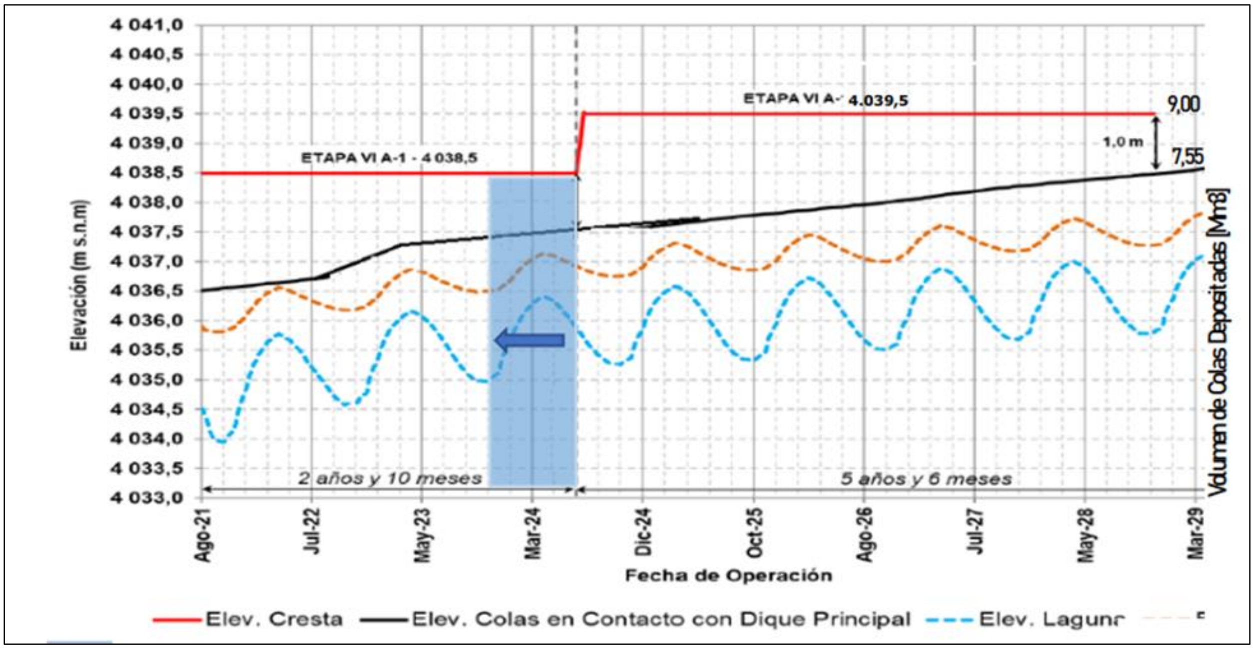


Figure 20-6: Aerial Photography of the Dam "D" TSF

Source: Glencore (2021)

Porco currently disposes of all waste rock underground; thus, surface management is not required. Process tailing and sludge from the water treatment plant are both stored in the Tailing Storage Facility (dam "D"). Domestic waste is collected by the Porco cleaning company, who is supported by Illapa with equipment and a front-end loader, to move the waste in Porco's sanitary landfill. Hospitals in Agua de Castilla and Porco generate a considerable amount of biological hospital waste, which is classified and carefully stored for subsequent incineration.

Table 20-3: Stored Solid Waste Tonnages

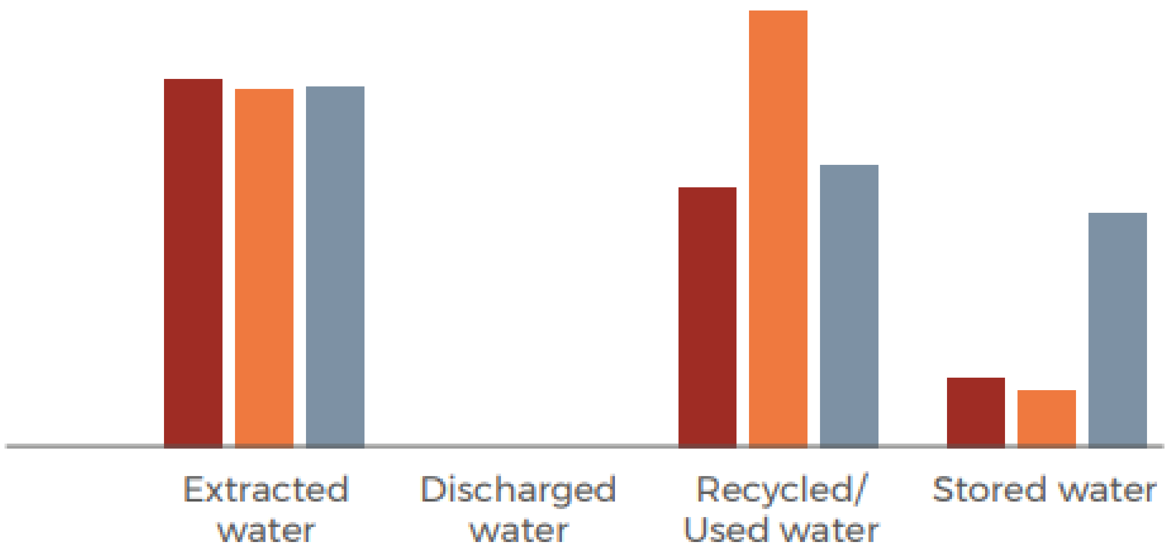
Classification	Subclassification	Solid Waste	2022
Hazardous Waste	Mineral Waste	Waste Sterile Rock or Wall Rock (Tn.)	221
		Tailings (Tn.)	287,899
	Non-Hazardous Waste	Biohazardous Waste (Tn.)	0.49
Non-Hazardous Waste	Mineral Waste	Sludge (Tn.)	3,388
	Non-Mineral Waste	Domestic and Industrial Waste (Tn.)	480

Source: Sustainability Report, Sinchi Wayra (2022)

20.2.2 Water Management - Porco

Porco Mine is a zero-discharge operation. The mine produces about 35 liters/s excess water, which combined with that precipitation captured in the Tailings Storage Facility makes up 85% of the fresh water supply and is the major source for Industrial make-up water. Treated discharge is reused for drilling and dust suppression water underground and the process plant uses mine water combined with reclaim from the Tailings Storage Facility. Porco Mine has permits in place for maximum water needed, however limits the use of fresh makeup water from the Jalsuri spring to potable needs at campsite and offices, and to prepare certain reagents.

Figure 20-7: Porco Mine Water Balance



	Extracted water	Discharged water	Recycled/ Used water	Stored water
2020	639,948	0	448,974	115,000
2021	620,088	0	765,493	101,236
2022	625,517	0	493,906	402,341

Source: Sustainability Report, Sinchi Wayra (2022)

20.3 Permitting

Santacruz Silver operates the Porco Mine as a joint venture with the Bolivian Government (COMIBOL) The structure of the contract with COMIBOL is a "Partnership Contract governing Bolivar and Porco Mines (CA-MBP), and its purpose is to develop and implement a mining operation for the treatment of the existing mineralogical reserves and resources in the Bolívar and Porco Mines, by the exploitation, preparation, beneficiation and sale of mineral concentrates. Contrato de Asociación Sociedad Minera Illapa S.A. is authorized as operator and responsible of executing on behalf of COMIBOL, all the operations and activities of the association contract. The shares of CA-MBP are 55% for COMIBOL and 45% for Contrato de Asociación Sociedad Minera Illapa S.A." This renewable agreement expires in 2028.

Mining Contracts that grant the right to the subsoil mining resource, is granted by the Mining Administrative Jurisdictional Authority (AJAM) over the ATE mining areas, and a contract is granted for each area or contiguous group of areas. Recent changes to the laws and government personnel have pushed Santacruz contract updates into a transitionary period waiting for final signatures and approvals. Santacruz holds Special Transitory Authorizations for each contract area which are officially designated “Mining Administrative Contracts for Adaptation”. As of the effective date, approximately half of the applications have been transitioned, and the remainder fall under Article 187 of Law No. 535 on Mining and Metallurgy, which states:

> *ARTICLE 187. (CONTINUITY OF MINING ACTIVITIES). Holders of Special Transitory Authorizations to be adapted or in the process of adaptation will continue their mining activities, with all the effects of their acquired or pre-constituted rights until the conclusion of the adaptation procedure.*

Santacruz has fully complied with this administrative procedure and is waiting for the Mining Administrative Authority to issue the relevant documents. It should be noted that this public entity has a considerable delay in the issuance of these documents.

Environmental Licenses have been formally granted to allow operation for all mining activity, by

Table 20-4: Environmental Licenses Held by Santacruz

Operation	License
Bolívar	040603-02-da-0324/14
Porco	051203-02-da-0031/14
Caballo Blanco – Colquechaquita Mine	050101-02-da-131/11
Caballo Blanco – Mina Reserva and Tres Amigos	050101-02-da-561/11
Caballo Blanco – Don Diego Concentrator Plant	050302-02-da-003/2024
Caballo Blanco – San Lorenzo Mine	050101-02-da-005/06
Comco	050101-02-da-006/09
Soracaya	050801-02-CD-C3-002/2017
Aroifilla Thermoelectric Plant	050101-04-da-007/2023
Yocalla Hydroelectric Plant	050103-05-da-006/2023

20.4 Community Relations

Santacruz mining projects are mostly well-established operations with a long history and a developed infrastructure, which provide direct benefits to employees and supporting businesses. However, the mines are located in rural to semirural areas in which the surrounding mostly agricultural communities can benefit from each operation only indirectly or through company outreach. Santacruz supports these communities by addressing services that are lacking, and helping to create value with economic development programs, and other forms of support.

Mining represents a significant portion of the Bolivian economy and is especially critical to local economies through employment, tax revenue and local procurement or supply. The high dependency on mining of areas influenced by Santacruz operations obliges responsible action and support for the health of these communities, as well as its employees and their families. Santacruz is interested in fostering an environment of social peace, respect, and mutual progress. The Social Management team for each operation consists of a dedicated Superintendent along with supporting personnel who ensure the fulfillment of its commitment to the communities.

To be most effective local Social Management groups have established communication channels to learn about the perceptions, concerns, requests, or complaints from within stakeholder communities. The communities can communicate their inquiries, complaints, concerns, and issues through letters addressed to the company, formal meetings, or the Santacruz "Ethics Hotline" channel. The local Social Management team routinely conducts community and area visits inspections and, in the case of a complaint, conducts the necessary verifications. The main channel of communication is through in-person meetings involving community leaders where minutes are recorded. As such, all parties can move cooperatively forward with acceptable initiatives and mitigations.

Prior to action, Santacruz must take into consideration social challenges faced by the country and the communities, as well as each initiative's possible impacts on the life of people. Its actions are aimed at identifying vulnerable groups and obtaining their participation. It identifies impacts and assess risks associated with each initiative, as well as changes in Santacruz's operations that may have repercussions on the community.

Table 20-5: Communities and Population Proximal to Santacruz Operations

Operation	Communities	Approximate number of people
Bolívar	9	4,440
Porco	10	15,810
Caballo Blanco	13	5,120

Source: Santacruz (2023)

Common concerns addressed during the meetings with community leaders focus on job opportunities within the company and monitoring medium- to long-term commitments. The change of shareholders that occurred with the Santacruz purchase in March 2022 generated uncertainty in several communities, and a process of communication and meetings was necessary to assure and demonstrate that the company will maintain normal operations and fulfill its commitments to the fullest extent. The major concerns of the proximal communities put forth in 2022 are outlined in Table 20-6.

Table 20-6: Concerns put forth by Proximal Communities in 2022

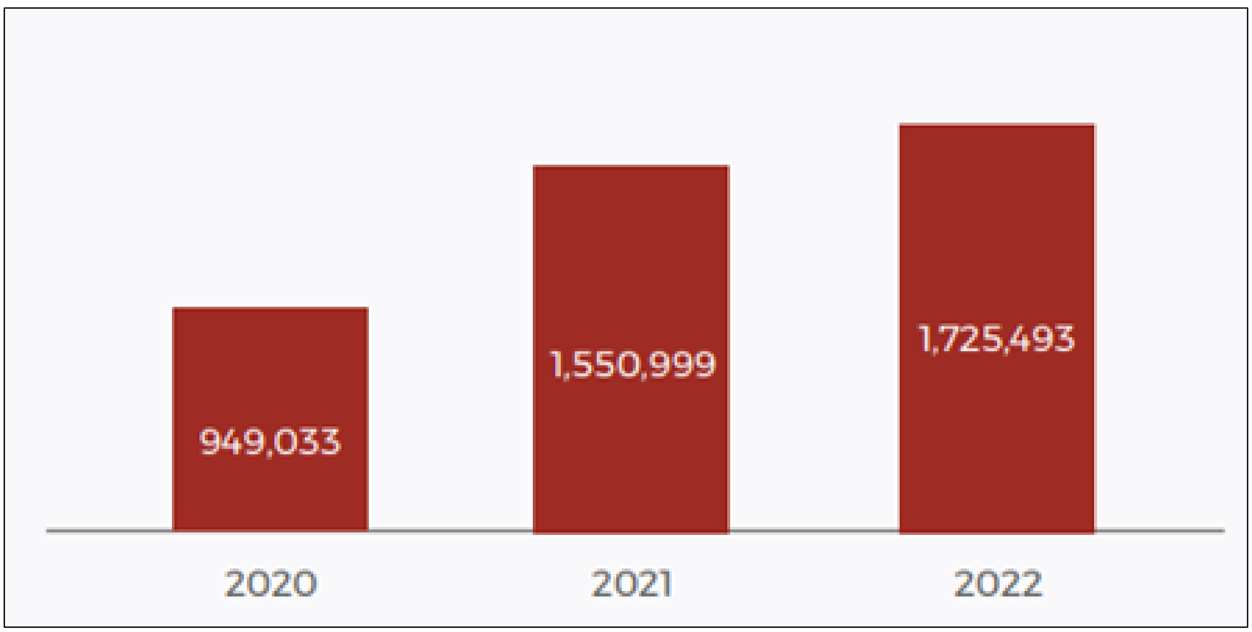
Operation / Month	Community	Concern	Description and Approach to the solution
Porco – September/2022	Porco	Concern about the visual appearance of stagnant rainwater in areas adjacent to the tailings dam	Description and Approach to the solution Diversion works were carried out to prevent the stagnation of rainwater. This action was verified by the indigenous authorities.
Bolívar May/2022	Queaqueani Grande	Community demands for new hires, issues related to water and the environment	Despite several attempts at dialogue initiated by the company, the community carried out a road blockade demanding the closure of the tailings dam in order to draw the attention of regional and national authorities to negotiate community issues with the company. With the mediation of the Governor of Oruro, several meetings were held, which concluded with the signing of an agreement with the community. To this date, direct dialogue has been reestablished with the community to address their demands.
Bolívar April/2022	Charcajara	Concerns regarding the maintenance and replacement of pipelines passing through the community. Request for new job positions and environmental issues.	After nearly 6 months of negotiations, an agreement was signed with the community, establishing a land lease for the passage of the pipelines. A separate agreement was included to address the remaining demands of the community.
Bolívar May/2022	Antequera	Uncertainty regarding the continuity of pending commitments.	Meetings were held with the community to reaffirm the fulfillment of pending commitments, which are currently being carried out. Additionally, a negotiation process was initiated to install an alternative pipeline route that bypasses the community of Charcajara.

Source: Sustainability Report, Sinchi Wayra (2022)

Santacruz's investments focus on donation of assets, goods, products, and in-kind services, minimizing cash disbursements to directly benefit the communities. As part of Santacruz's support, Santacruz has invested over $300,000 in infrastructure, including housing, pedestrian bridges, electrification, water diversion systems for irrigation, and basic sanitation, among other infrastructure projects. As a company, Santacruz encourages the communities to manage and prioritize long-term projects with a greater impact. At all times, and particularly during implementation, the communities are heavily involved in each project.

A rigorous company due diligence policy governs the contributions and investments made to community projects, so that they are made in accordance with the company's values and ethics codes. The process begins with the requests proposed by the communities through their leaders, followed by meetings held between the Community leaders and the company during which, formal agreements are executed, which approve mutually accepted projects to be implemented.

Figure 20-8: Total Investment in Communities



Source: Sustainability Report, Sinchi Wayra (2022)

A key player connected with all Bolivian Mines and surrounding areas are the mining cooperatives which are organized independent mining entities, some quite capable and organized with their own equipment. Recognized by the government as a valid economic activity for local development, they conduct their activities in abandoned mines or expropriating active mines, which can pose risks to business. The relationship is not completely one-sided as the Cooperatives sell mineralized material to process their product, thus mechanisms are in place to face possible subjugations, protect mine employees and the communities.

More importantly, proactive solutions and agreements to avoid conflict and coexist peacefully with the different cooperatives are in place. As much as possible, with cooperatives as toll processors at Santacruz Process Plants, compliance with occupational health and safety, human rights, and good work practice is sought.

To incorporate a new supplier, an assessment is required, including:

- Submission of legal documents proving that they are up to date with regard to any rules in force;
- The mineral supplier's background is verified; for this purpose, we have access to the Thomson Reuters and Info center systems, which report their background globally. This system informs us whether the supplier has any negative local or international background; in that case, Santacruz would not deal with them;
- Commercial visit to the supplier's operations, to directly verify the standards such as the 132 company's Code of Ethics; In particular, whether or not child labor is employed in the operations, and any other Human Rights violations, and observations of the use of safety equipment and personal protective equipment; and
- Machinery is assessed to ensure good condition safe operation.

Once all these steps are completed and upon the in-situ verification of legal documents, the relationship with the cooperative is authorized. A pilot support program was launched in 2019 to supply advisors and technical assistance on environment, human rights, occupational health & safety, and administrative management. The goal being to help mineral suppliers improve their internal systems and processes to ensure sustainability and compliance with Santacruz sustainability standards.

Santacruz's community investment programs are aimed mostly at communities directly influenced by the operations. Community investments are designed to maximize positive impact, recognizing that each community has unique requirements and living conditions; therefore, Santacruz prioritizes based on number of beneficiaries, vulnerability, long-term sustainability, and urgency of need.

The Porco operation is located 50 km southwest of the city of Potosí, at an average elevation of 4,147 masl, in the province of Antonio Quijarro, Porco Canton of the Department of Potosí. Road access exists from Potosi via paved National Route #5 connecting Potosi to Uyuni, and a short stretch of gravel road that leads to Porco. Concentrate is shipped via rail from a warehouse proximal to the plant site in the town of Agua de Castilla.

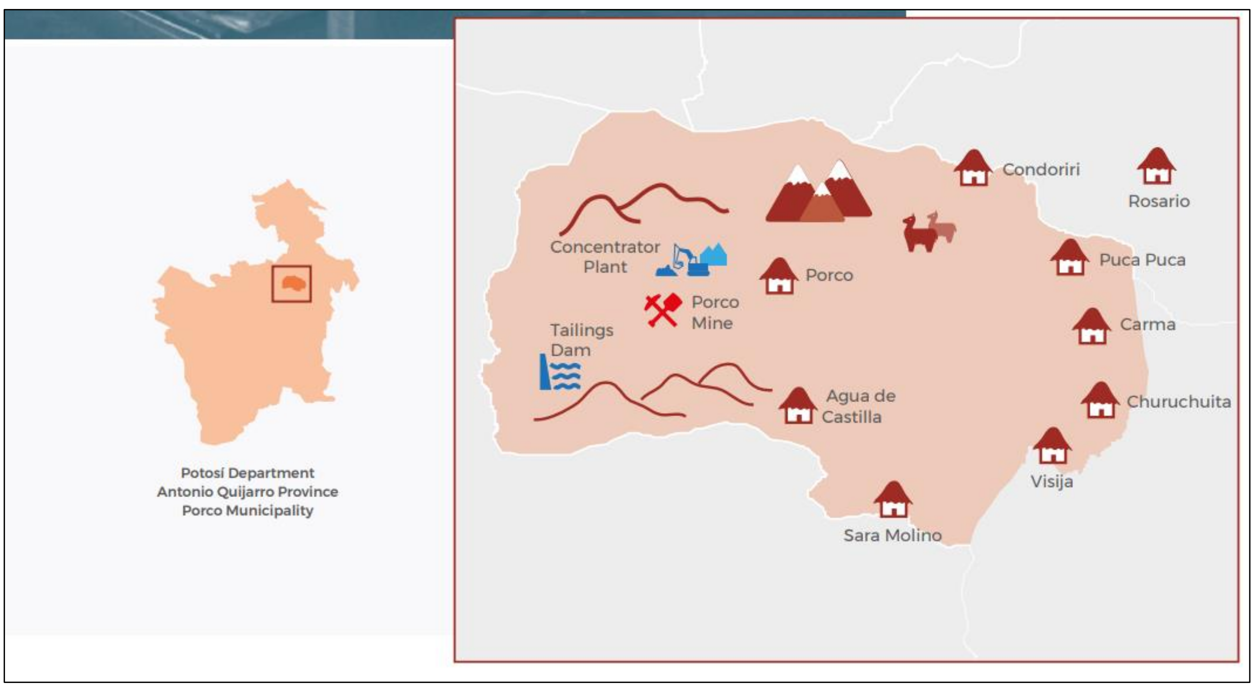
Porco is a completely self-contained industrial center which supports the two main processes of mineral exploitation and concentration. There also exist on site, management, maintenance, transportation and sales support. Porco has been a mining area since colonial times, and mining is its main source of income. It is inhabited by civilians with outside sources of income, cooperative miners, and Santacruz workers with their families. The company works closely with the local populations, the most important being Porco and Agua de Castilla, as well as other smaller, satellite communities. Two cooperatives also work at, and adjacent to, Santacruz operations.

Table 20-7: Porco Local Populations

Communities	People
Porco	9,000
Agua de Castilla	5,500
Condoriri	200
Puca Puca	100
Carma	300
Churcuita	300
Sara Molino	120
Rosario	150
Visijsa	100
Yungaviri	40
Porco Total	**15,810**

Source: Sustainability Report, Sinchi Wayra (2022)

Figure 20-9: Porco Surrounding Communities



Source: Sustainability Report, Sinchi Wayra (2022)

20.4.1 Education

Santacruz has engaged in the following activities to support education in the region:

- Provided meals for students, paying salaries of “Desayuneras” (personnel that prepare meals), and providing the principals of the local schools J. M. Linares and Agua Castilla;

- Established a scholarship program for outstanding students who are children of employees. In 2022, 10 scholarships were awarded; and

- Supported the educational units in Porco and Agua de Castilla by paying the salaries of 15 teachers.

20.4.2 Community and Economic Development

Santacruz has encouraged community and economic development in the region following ways:

- Constructed infrastructure, including both structural and finishing works, for the COSAP’s (Porco Water Cooperative) offices, including meeting rooms, the accountant’s office, and sponsorship for water supply. This project directly benefits 60 individuals and indirectly supports the entire population of Porco;

- Provided technical training in Cooking in Porco and “Machine Knitting” in Agua de Castilla, each lasting for 6 months. These programs were implemented in 7 women’s centers, benefiting a total of 520 women; and

- Supported the delivery of 5 houses with finishing works to the educational board, intended to be given to teachers in need. Approximately 5 families, and indirectly around 500 individuals, will benefit from this initiative.

20.4.3 Local Needs

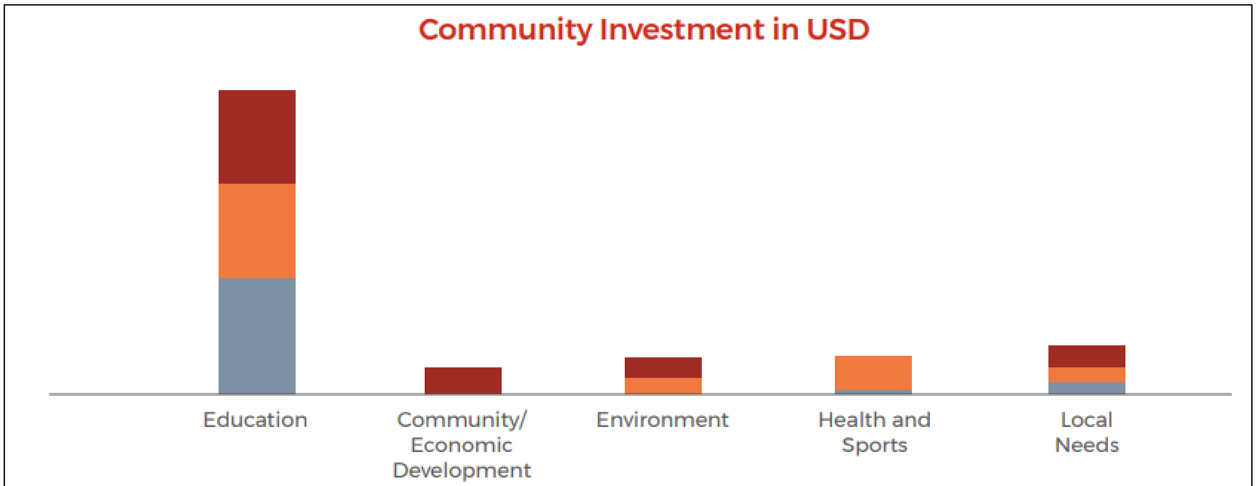
Santacruz has responded to local needs in several ways including the following:

- Constructed the pedestrian bridge in Puca Puca, spanning 24 m, which has benefited 90 families;

- Supported traditional local activities, including City and National anniversaries, and local sports ad recreational activities; and

- Donated to the downstream communities in accordance with their irrigation needs and provided uniforms for one school in these communities.

Figure 20-10: Porco Community Investment



	Education	Community/ Economic Development	Environment	Health and Sports	Local Needs
2022	282,452	74,211	60,053	0	71,087
2021	291,206	0	52,718	105,747	43,407
2020	342,732	0	0	5,812	33,474

Source: Sustainability Report, Sinchi Wayra (2022)

One important characteristic of the Porco Operation is the presence of mining cooperatives, particularly those working in and around the Santacruz operation. Some of these cooperatives are legitimate entities under agreement with Santacruz to exploit the near surface areas of the same deposit being mined by Santacruz. Therefore, cooperatives share mine access with Santacruz workers. From 2013, it was agreed that Contrato de Asociación Sociedad Minera Illapa S.A. would exploit the levels lower than levels 4,213 and 4,225, in the central area and Hundimiento, respectively. However, members of the cooperatives regularly violate the agreement and access active Santacruz areas, which at times can endanger the safety of Santacruz personnel and infrastructure.

Much effort has been spent to successfully control this risk, with agreements put in place with large cooperatives to purchase their mineral. However, the influx of illegal miners who are less likely to negotiate is a constant risk to safe and productive operations.

20.5 Mine Closure

Closure Planning for Operations has social, economic, workforce, and environmental impacts, so conceptual closure plans are shared with communities. Santacruz's goal is to recover areas by establishing a healthy ecosystem capable of sustaining productive land use, ensuring the best possible environmental conditions, including physical, chemical, biological, and ecosystem aspects, at closure. Environmental superintendents are responsible for monitoring the environmental closure planning, and periodic reviews of these plans are conducted, including surveys of areas and activities to adjust financial provisions for closure.

Land Use and Rehabilitation - environmental challenges related to biodiversity protection, soil restoration, and land use, are addressed through dialogue with stakeholders, including local communities and relevant authorities. Our comprehensive environmental management focuses on minimizing disturbed areas. In 2022, Santacruz managed a total of 6,600 hectares of land covered by Temporary Special Authorizations (ATEs) granted by the Mining Administrative Jurisdiction Authority (AJAM), under leasing contracts with the Government through COMIBOL. However, Santacruz’s processing activities, services, and related infrastructure (industrial area) currently occupy only 400.5 hectares of land, including areas of previous mining operations and other areas with environmental closure located within the properties Santacruz manage.

In 2022, Santacruz continued with the reforestation plan in the Queaqueani Dam area, in accordance with an agreement with the community of the same name, and significant progress was made in the progressive closure of the old tailings facilities at the Don Diego Concentrator Plant.

21 CAPITAL AND OPERATING COST ESTIMATES

21.1 Capital Costs

The Porco Mine has been in continuous operation for many years. There will be, as the reserve is expanded and developed, the need for step changes in mine access, production or haulage methods, that may require large capital outlays. These will be financially justified as needed. However, the capital needs for continued operation to exploit the remaining reserves is limited to Primary mine development, Capital equipment rebuilds and replacements, and Tailing Storage Facility expansions. Average annual capital has been and is projected to be in the 4 to 5 million USD range. The historic total capital requirement for all the Bolivian operations is shown in Table 21-1. Porco's projected capital requirements for 2023 to 2027 is shown on Table 21-2.

Table 21-1: Actual Combined Capital Requirement for All Bolivian Operations, 2017 to 2022 ($M)

	2017	2018	2019	2020	2021	2022
Bolivar	8.8	13.7	13.7	6.3	11.3	10.2
Porco	**3.0**	**8.8**	**8.4**	**3.6**	**5.3**	**3.1**
Reserva	1.3	2.4	2.1	2.0	4.3	3.5
Tres Amigos	2.1	2.6	1.5	1.8	2.2	3.0
Don Diego	0.9	6.9	1.4	0.9	1.1	1.2
Colquechaquita	1.2	2.0	1.4	1.0	3.0	2.5
La Paz	3.3	0.6	0.3	0.4	0.2	0.7
Soracaya	0.5	2.1	0.2	0.1		
San Lucas	0.8	0.0	0.0	0.1	0.4	
Total	**21.8**	**39.0**	**28.5**	**16.3**	**27.8**	**24.3**

Table 21-2: Projected Capital Requirement for Porco Operations, 2021 to 2027 ($M)

	2023	2024	2025	2026	2027
Engineering/Admin			0.1	0.0	
Safety/Environmental			0.2	2.0	
Mobile Equipment/Maint			0.9	1.8	1.2
Plant	0.3	0.5	0.3	0.3	0.2
Exploration		0.0	0.4	0.2	0.2
Primary development			1.4	1.7	2.4
Total		**2.9**	**6.4**	**4.1**	**2.5**

Recurring exploration and primary development costs have been included in the COG calculations to better anticipate and account for total costs and make the COG more meaningful for reserve estimation and mine planning.

21.2 Operating Costs

Costs used for Cut-Off-Grade analysis were taken from actual costs from the last 6 months of 2022, and the first three months of 2023. This most recent cost history was deemed the most accurate and stable period, and which best represented the true costs of the operation. Sinchi Wayra was acquired by Santacruz Silver in March of 2022, so it was decided to use actual costs incurred while the mines were under current ownership. The actual cost of corporate G&A was allocated to each of the businesses.

Table 21-3: Unit Operating Costs ($/t)

Mine	**94.68**
Mine operations	16.06
Mine maintenance	58.85
Indirect	19.78
Plant	15.04
Warehouse	1.94
G&A	13.36
Total	**125.02**

Mine operations include direct costs of mining, including labor, energy, materials, and services.

Mine Equipment Maintenance Costs includes maintenance to all equipment related to direct development, exploitation and haulage, as well as service equipment such as pumping, ventilation, winches, etc.

Indirect costs would include Site Management, Technical services, Site Administration, Environmental and Social, Safety and Security.

Plant costs include direct Beneficiation costs as well as plant maintenance, and indirect costs.

Warehouse costs refer to Concentrate handling and storage.

General and Administration includes allocated Bolivian corporate costs.

22 ECONOMIC ANALYSIS

22.1 Result

The Reserve Estimate was generated using actual costs experienced during a stable production period following the change in management after the purchase of the mine by Santacruz Silver (2022 and beginning of 2023). Actual costs were used for mine operating, concentrate overland transport, port costs, and shipping as well as smelting fees, payment terms, and penalty charges in effect during that period. A simplified Cash flow model was built to model the costs and conditions used to generate the Reserve estimates stated in this report.

The Porco Mine is part of a multi-operation business. However, the Economic model treats it as a separate financial entity with Bolivian corporate costs allocated for the analysis. As well, the operation is subject to a partnership with the Bolivian Government (COMIBOL), but the financial modelling examines the value of the operation on a 100% basis to support the Reserve statement.

The Porco Mine has been in continuous operation for over 500 years and the deposit is a network of relatively narrow veins. These two aspects drive the normal exploitation process of the mine, where inferred resources are converted and exploited in the same budget year. Resources are generally proven-up by drifting and sampling instead of drilling. Therefor normal budgeting and mine planning includes resources outside of the Reserve estimate.

For the current exercise in this report, only Proven and Probable reserves are included in financial evaluation, so the production schedule represents the depletion of these reserves at average grade and current production rates. The context of the production schedule exploits the Proven and Probable reserves as part of a continuous operation and as such does not include the closure activities.

Table 22-1: Production Forecast – Mining and Processing

	Unit	2023	2024
Mine Production			
Tonnes Mined	(DMT)	197,400	121,772
Tonnes Processed	(DMT)	197,400	121,772
Head Grades			
Zinc	(%)	12.71	12.71
Lead	(%)	0.72	0.72
Silver	gr/t	162	162

Metallurgical recoveries and concentrate qualities are actual for the times and head grades that were actually mined. These parameters will necessarily be conservative considering the higher grades in the production schedule.

Table 22-2: Production Forecast - Concentrate

	Unit	2023	2024
Concentrates			
Zinc	(DMT)	46,279	28,548
Zn Conc. Grade	(%)	51	51
Ag (in Zinc)	gr/t	266	266
Zn Recovery	(%)	94	94
Ag (in Zinc)	(%)	38	38
Lead	(DMT)	1,984	2,444
Pb Conc. Grade	(%)	54	27
Ag (in lead)	gr/t	8,069	4,049
Pb Recovery	(%)	76	76
Ag (in Lead)	(%)	50	50
Metal Recovery			
Zinc	(FMT)	24,000	15,000
Silver (in Zinc)	(FOT)	395,000	244,000
Lead	(FMT)	1,000	1,000
Silver (in Lead)	(FOT)	515,000	318,000
Silver (Total)	(FOT)	910,000	562,000

Notes:
FMT = Fine Metric Tonnes; DMT = Dry Metric Tonnes; FOT = Fine Ounces Troy

That same logic follows to the net revenue generation (Table 22-3) which includes smelter charges and penalty fees.

Table 22-3: Revenue and Cost Projection ($M)

	Unit	2023	2024
Payable Metal Revenue			
Zinc		60	37
Metallurgical Deduction		9	6

	Unit	2023	2024
Gross Payable Zinc		50	31
Lead		2	1
Metallurgical Deduction		0	0
Gross Payable Lead		2	1
Silver		19	12
Metallurgical Deduction in Zinc		5	4
Metallurgical Deduction in Lead		1	0
Gross Payable Silver		14	8
Gross Revenue (Total)		67	40
Smelter Charges and Penalties			
Treatment charges Zn	(USD/t)	230	277
Treatment charges Zn		11	8
Treatment charges Pb	(USD/t)	130	133
Treatment charges Pb		0	0
Penalties in Zn	(USD/t)	3	7
Penalties in Zn		0	0
Penalties in Lead	(USD/t)	0	13
Penalties in Lead		0	0
Refining Charges in Pb	(USD/FOZ)	1	1
Refining Charges in Pb		1	0
Smelter Fees and Penalties		12	9
Net Revenue		55	31
Operating Costs			
Production Costs		22	14
Cost of Sales			
Rail Freight Zn			3
Rail Freight Pb			0
Port Expenses Zn		2	1
Port Expenses Pb			0
Rollback Fee Zn		4	2
Rollback Fee Pb		0	0
Concentrate Freight and Port Costs		7	7
Mine Royalty		4	3
Communities and Unions		1	2
Total Cost of Sales		**34**	**25**

The mine royalty shown in Table 22-3 is paid to the state government, comprising 6% for precious metals (silver and gold) and 5% for base metals (zinc and lead).

Depreciation is a product of previous operation and annual capital expenditure incurred for the exploitation of the reserve tonnage. Capital is limited to that required to support mining, processing, and tailing storage for the reserve. Corporate G&A is that part of the in-country costs allocated to the Porco mine.

Table 22-4: Cashflow Projection ($M)

	2023	2024
Income Statement		
Net Revenue	55	31
Production Costs	(22)	(14)
Selling Costs	(12)	(12)
Depreciation	(2)	(3)
Gross Profit	20	3
Corporate G&A	(2)	(1)
Corporate Administrative Expenses	(2)	(1)
Operating profit	18	2
EBIT	18	2
Income Tax Expense (CIT)	(6.6)	(0.7)
Net Gain/(Loss) for the Year	11	1
Cashflow Statement		
Cash from Operations Activities		
Net Income	11	1
Depreciation	2	3
Subtotal	13	4
Cash from Investing Activities		
Sustaining Capital Expenditure	(2)	-
Subtotal	(2)	-
Cash Balance		
Beginning	-	10
Change in Cash	10	4
Ending	**10**	**14**

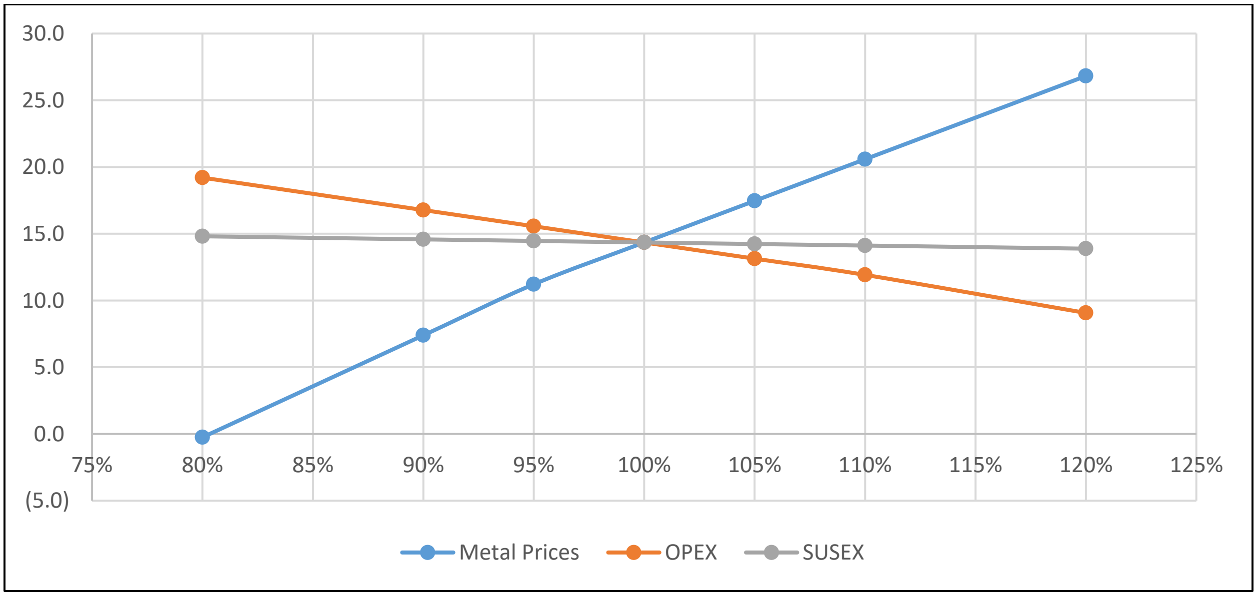
Income Tax is 37.5% of the EBIT. As seen, the operations generate a positive cash flow after tax upon exploitation of the stated reserve at the metal prices used to generate the reserve.

22.2 Sensitivities

A univariate sensitivity analysis was performed to examine which factors most affect the Project economics when acting independently of all other cost and revenue factors. Each variable evaluated was tested using the same percentage range of variation, from -20% to +20%, although some variables may experience significantly larger or smaller percentage fluctuations over the LOM. For instance, the metal prices were evaluated at a ±20% range to the base case, while the capex and all other variables remained constant. This may not be truly representative of market scenarios, as metal prices may not fluctuate in a similar trend. The variables examined in this analysis are those commonly considered in similar studies – their selection for examination does not reflect any particular uncertainty.

Notwithstanding the above noted limitations to the sensitivity analysis, which are common to studies of this sort, the analysis revealed that the Project is most sensitive to metal pricing. The Project showed the least sensitivity to capital costs. Figure 22-1 shows the results of the sensitivity analysis.

Figure 22-1: Univariate Sensitivities



23 ADJACENT PROPERTIES

There are no relevant adjacent properties to the Porco Project.

24 OTHER RELEVANT DATA AND INFORMATION

Mining has been ongoing since the effective date of this report through 2023 and into 2024. Total mining in 2023 was 190,837 t at a grade of 126 g/t Ag, 0.54% Pb, and 6.61 % Zn, resulting in the production of 665 koz of Ag, 777 t of Pb, and 11,901 t of Zn.

This production cannot simply be subtracted from the January 1, 2023, resource or reserve estimates contained in this report, however. As described previously, reserves and resources are adjusted as the mining progresses based on development along vein and associated sampling. These adjustments can be significant, and the geologic block model is updated to account for this new information. The operations team at Porco uses the considerable modelling tools and methods at their disposal to incorporate these operational updates to guide their mine planning.

The January 1, 2023 Reserves statement is based on a fixed model. However, block model updates are generated for annual budgeting and forecasting. These updates incorporate projected operating costs, updated block grades and NSR factors as applicable.

A significant amount of the 2023 production came from blocks that were not included in the stated January 1, 2023 reserves.

However, actual dilution was 15%, slightly higher than the 12.5% estimated in the January 1, 2023 reserves.

This ongoing estimation process provides a good mine planning guide as well as an accurate empirical tool for reconciliation. A direct reconciliation with the January 1, 2023 Reserve and Resource blocks stated in this report shows that:

- 27% of the mined mineralized production for 2023 originated from the Proven and Probable reserves;
- 22% of mined mineralized production for 2023 originated from Measured, Indicated, and inferred Resources outside of the reserve base, which were converted into reserves as mining progressed; and
- 51% of mined mineralized production for 2023 originated from the increased external dilution and, more significantly, from extraction outside of either the 2023 resources or the reserves.

This analysis provides a good indication of the reserve drawdown and continuous level of replenishment resulting from normal operations in identified and active mineralized veins.

Details of the 2023 production and economic results are included in Santacruz's MD&A filing.

25 INTERPRETATIONS AND CONCLUSIONS

25.1 Observations

The Porco Project is located in the Cordillera de los Azanaques, forming the western edge of the Cordillera Oriental, which is detached from the Cordillera de los Frailes, belonging to the group of central mountain ranges. Characterized by the essence of undulating plateaus, outstanding mountains parallel to the course of the Andes, with elevations that vary between 3,400 and 4,600 masl. The area is part of the polymetallic belt of the altiplano and the Cordillera Occidental.

The most important ore deposits of the Eastern Cordillera are polymetallic hydrothermal deposits mined principally for Sn, W, Ag and Zn, with sub-product Pb, Cu, Bi, Au and Sb. They are related to stocks, domes and volcanic rocks of Middle and Late Miocene age (22 to 4 Ma). Mineralization occurs in veins, fracture swarms, disseminations and breccias. The deposits of the Eastern Cordillera are epithermal vein and disseminated systems of Au, Ag, Pb, Sb, as that have been telescoped on to higher temperature mesothermal Sn-W veins and, in some cases, porphyry Sn deposits. The telescoping is a characteristic of these deposits and is the result of collapse of the hydrothermal systems, with lower temperature fluids overprinting higher temperature mineralization. The systems show a fluid evolution from a high temperature, low sulphidation state to intermediate sulphidation epithermal and high sulphidation epithermal.

The Porco Project is an “advanced property” and has been in continuous production since 1993. Glencore and subsequently Santacruz Silver has performed exploration and resource expansion drilling consisting of surface and underground drillholes at the Caballo Blanco since 2010 totalling 39,562.55 m. The 128 drillholes and 19,644 underground channels in the database were supplied in electronic format by Santacruz. This included collars, downhole surveys, lithology data and assay data (i.e., Ag g/t, Pb%, Zn%, Fe%, Sn%).

The Porco Mine Project consists of two separate mining zones that essentially function as separate mines, the Hundimiento and Central, that feed ore to a single processing plant on site to produce zinc and lead concentrates. Sinchi Wayra S.A. owns and operates all facets of the Porco business, which is in turn owned by Santacruz.

Verification of the Porco drillhole and underground sample assay databases are primarily focused on silver, lead and zinc in addition to iron, arsenic, sulphur and tin. Sample databases were supplied in Excel™ format and in LeapFrog™. Checks against source data and assay certificates showed agreement. Statistical analyses used to investigate and identify errors were performed and resulted in minor issues. These have been corrected and it is recommended that a continued program of random “spot checking” the database against assay certificates be employed.

During the 2023 site visit, an extensive independent sampling verification plan was implemented with a total of 80 samples collected across from the Bolivar, Porco and Caballo Blanco operations. The Don Diego laboratory is an NB/ISO/IEC 17025:2018 accredited laboratory which performs all assay analyses for the mining and processing operations for Sinchi Wayra including Caballo Blanco. The Don Diego laboratory in owned and operated by the Issuer, Santacruz.

Results of the verification samples indicates that the regression predictions perfectly fit the data meaning that the check sampling program successfully verified and validated the data and although, these results are not a complete audit of the laboratory, they do verify that the assay results are suitable for resource estimation purposes.

The geological and lithological solid domain models were supplied by Santacruz in both Datamine™ and LeapFrog™ which are both industry-leading software systems. The QP imported the multiple vein domains into a similar system called MineSight™ to verify solids volumes and ensure matching of the solids domains against the drillhole and sample database. Results confirmed location and extent of volumes are appropriate to resource estimation purposes.

Resource block models were supplied in Datamine™ format which is an industry recognized software system used for resource estimation. These models were then imported to MineSight™ for verification of the resource estimation. In addition, independent estimations were run using the verified sample data and vein domains employing inverse distance estimations to ensure reasonableness and verify the resources independently. Results illustrated good agreement between the original and verification models. Verification of the SG regression analysis was also performed by comparing measured versus calculated density values.

The mineral resources were estimated in conformity with CIM's "Estimation of Mineral Resources and Mineral Reserves Best Practices Guidelines" (December 2019) and are reported in accordance with NI 43-101 guidelines. The Qualified Person evaluated the resource in order to ensure that it meets the condition of "reasonable prospects of eventual economic extraction" as suggested under NI 43-101. The criteria considered were confidence, continuity and economic cut-off. The resource listed below is considered to have "reasonable prospects of eventual economic extraction".

Using a cut-off grade of 11.2% ZnEq, the Porco operations resources are presented in Table 25-1.

Table 25-1: Base-Case Total Mineral Resources at 11.2% ZnEq Cut-off

Total Porco 2023 Mineral Resources					
Mine	**Category**	**Tonnes ('000)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**
Porco	Measured	566	17.17	0.88	202
	Indicated	253	16.38	1.02	166
	Total M+I	819	16.92	0.92	191
	Inferred	1,007	15.16	0.92	117

Notes:

1) The current Resource Estimate was prepared by Garth Kirkham, P.Geo., of Kirkham Geosystems Ltd.
2) All mineral resources have been estimated in accordance with CIM definitions, as required under NI43-101.
3) The Mineral Resource Estimate was prepared using a 11.2% zinc equivalent cut-off grade. Cut-off grades were derived from $25.20/oz silver, $1.38/lb zinc and $1.20/lb lead, and process recoveries of 91% for zinc, 70% for lead, and 89.7% for silver. This cut-off grade was based on current smelter agreements and total OPEX costs of $120.22/t based on 2022 actual costs plus capital costs of $48.68/t, with process recoveries of 91.0% for zinc, 70.0% for lead, and 89.7% for silver. All prices are stated in $USD.

4) An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.
5) Mineral resources are not mineral reserves until they have demonstrated economic viability. Mineral resource estimates do not account for a resource's mineability, selectivity, mining loss, or dilution. All figures are rounded to reflect the relative accuracy of the estimate and therefore numbers may not appear to add precisely.

The QPs found that Porco is a well-managed operation that should be capable of sustaining profitable operations for many years to come in the same fashion as it has operated for the past several years.

The reserves were found to be estimated correctly using industry-standard techniques and procedures and industry-standard software by diligent and competent professionals.

The mine has an ample provision of skilled workers. Typical and reasonable ore control systems were in place, but it is possible that the results could be improved with a closer attention to appropriate mining widths, minimizing them wherever possible to minimize dilution.

The single greatest challenge to the operation is the incessant trespassing of illegal miners into the active mining operations. This results in damage of mine equipment (often disrupting the ventilation system), disruption to scheduling, loss of revenue, and poses a real threat to the safety of the workers. How this situation can be ameliorated or prevented is beyond the scope of this document and the cultural awareness of the authors. However, it should be noted that this situation is ongoing and, as such, all production and economic results contained in this report are inclusive of this threat and impediment.

This threat also forces the mine to minimize its resources and reserves. Both require development for expansion, and while a typical mine provides adequate development ahead of production. A typical mine provides adequate development ahead of production for ore definition and proper scheduling. However, the Porco Mine minimizes open development to provide less opportunity for the illegal miners to access and illegally extract its ore. As a result, the operation runs very "hand to mouth" with respect to both access development and resources / reserves. This is demonstrated by the forward planning; 37% of the 2023 schedule was based on inferred resources.

It is difficult to estimate the ability of the mining fleet to execute the mine plan, as industry-standard availability and utilization factors are not tracked by unit or even unit type.

The processing facility at the Porco Mine appears to be well run and in good condition.

25.2 Risks

Many risks exist which are common to most mining projects including operating and capital cost escalation, permitting and environmental compliance, unforeseen schedule delays, changes in regulatory requirements, ability to raise financing and metal price. Many of these ever-present risks can be mitigated with adequate engineering, planning and pro-active management. The most significant risks to this project and its continued development are related socio-economic and geo-political factors.

The following Risks were identified for the Project:

- Geological interpretations may be subjective and may result in the location and extent of some of the mineralized structure although as the Porco mine is comprised of well constrained veins, this risk is minimal;
- As vein thicknesses are narrow, resources may be sensitive to dilution although the relative high grades that exist at the Porco mine are successful mitigating such risks to date;
- Varying resource classification methods and criteria may vary as more data is considered;
- There is no guarantee that further drilling will result in additional resources or increased classification;
- Lower commodity prices could change size and grade of the potential targets;
- Further work may disprove previous models and therefore result in condemnation of targets and potential negative economic outcomes;
- The single greatest risk to the Project is the activity that is prevalent throughout the region related to Cooperativas and artisanal miners may cause issues for access and for reasonable prospects of eventual economic extraction and may condemn or reduce resources and reserves in those areas and can drastically impact mine planning and scheduling;
- The current political and socio-economic climate in Bolivia poses risks and uncertainties that could delay or even stop development as reported within the Fraser Institute Annual Report 2022 where Bolivia ranks very low in many non-technical metrics. Bolivia has been ranked consistently low for the past five years and ranks in the lower quartile on all metrics that gauge risk and uncertainty. It is difficult to gauge or qualify the level or extents of the risks however, all companies working in Bolivia must continue to be aware of the potential risks and develop mitigation strategies. A significant risk related to the Santacruz Bolivian mineral assets and in particular the mineral resources and mineral reserves is the significant artisanal activity that continues to exist. This activity is not only a socio-economic risk but also affects access to resources and reserves along with potential sterilization of mineral resources;
- Lower commodity pricing will change the size and grade of potential targets;
- Ability to replace mined reserves on an annual basis; and
- Maintenance of permitting.

Figure 22-1The greatest risk to the economic results in this study is from changes to metal prices.

As the mines continues to expand to depth, the following aspects of mine operations will be challenged:

- Worker travel time (reduced time at the face);
- Dewatering inflow quantities, infrastructure and costs; and

- Ventilation system needs and costs.

As the ore is conveyed by shaft for both mines, and most of the remaining reserve at depth, this could be very impactful on future operations. The shaft will ultimately require extension to depth or trackless equipment will be required to haul the ore to the shaft bottom.

25.3 Opportunities

Project opportunities include:

- A systematic exploration program could provide an excellent opportunity for successfully uncovering new discoveries;
- An increased understanding and derivation of alternative theories may result in further discovery and expansion for the Project;
- A hydrogeological study could help the operation to better characterize and understand water inflows, aiding design work and planning to reduce the impact of major seasonal inflows;
- Higher commodity prices will change size and grade of the potential targets; and
- Potential for expansion and classification upgrade of resources as mining activities progress.

The primary opportunity to the mine is to somehow contain or eliminate the illegal miner situation. This would allow for more predictable scheduling and operations, the ability to expand the resources and reserves, reduce operating costs, and improve the safety of all personnel.

The grade to the mill could be improved the grade to the mill by incorporating a mine dilution control program. As is typical with all narrow width mining, dilution is very sensitive to the mined widths of veins, which must be kept at minimum to accommodate equipment widths. Often, however, veins are over-mined to ensure complete recovery of the ore. This practice significantly increases dilution due to overbreak of the hangingwall and footwall.

26 RECOMMENDATIONS

To advance the Porco Mine and further evaluate the potential additional veins and increase resources thereby displacing depletion due to ongoing mining activities, the following is recommended:

- Regional exploration for identification of new veins;
- Incorporate structural interpretations to assist regional understanding;
- Analysis of thickness and grade-thickness profiles for resource targeting and predictive dilution study;
- Review and further documentation of QA/QC programs;
- Investigate geo-metallurgical characteristics; and
- Hydrogeological study and modelling should be done to better understand water inflows and minimize their impact on production.

Some surface or near surface targets along with underground drilling for resource delineation and extension. As is typical with all narrow width mining, dilution is very sensitive to the mined widths of veins. Often veins are over-mined to ensure complete recovery, but this practice comes with significantly increased dilution due to overbreak of the hangingwall and footwall. The operation should conduct a thorough test stoping experiment to ensure the most economic balance between incomplete recovery and excessive dilution:

- As is typical with all narrow width mining, dilution is very sensitive to the mined widths of veins. Good work is being done on identifying and qualifying specific stope dilution. Analysis and incorporation of findings into the stope planning and mine operations is an opportunity to increase project value; Often veins are over-mined to ensure complete recovery, but this practice comes with significantly increased dilution due to overbreak of the hangingwall and footwall. The operation should conduct a thorough test stoping experiment to ensure the most economic balance between incomplete recovery and excessive dilution;
- The possibility for ore sorting or should be evaluated. As the mines each have a considerable haulage distance for run-of-mine ore, reducing the quantity to reduce haulage costs could be economically beneficial. On site crushing may be required to conduct sorting, however, offsetting or exceeding the savings it would provide to the trucking costs;
- Metallurgical testwork to investigate opportunities to increase recoveries, through grinding, reagent dosage or newer flotation technologies;
- Investigate geo-metallurgical characteristics of the feed; and
- The operation should continue to maintain diligent accounting centers to determine each mine’s profitability and, if necessary, shift resources or assets to maximize profits.

Availability and utilization factors should be tracked, calculated, and reported for all mining equipment. This information should be used as a management tool to determine which units should be rebuilt or replaced and to avoid or minimize usage of the units with the highest operating costs.

The activities of both Cooperativas and illegal miners must continue to be monitored and action taken to understand and, to whatever extent is possible, control their activities to mitigate safety concerns for the workers reduction to the resources and/or reserves, to avoid disruption of the mine plan.

These recommendations have not been costed, as they represent changes to current practices that can be funded by existing operating budgets.

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28 UNITS OF MEASURE, ABBREVIATIONS, ACRONYMS, AND GLOSSARY OF SPANISH TERMS

Symbol / Abbreviation	Description
°	degree
$	United States Dollars
$M	One Million United States Dollars
°C	degrees Celsius
µm	micrometres
3D	three-dimensions
a	annum (year)
ACAD	AutoCAD™, a commercially produced design software by Autodesk
Ag	silver
amsl	above mean sea level
Au	gold
Bi	bismuth
Ca	calcium
CAPEX	Capital expense
cfm	cubic feet per minute
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
cm	centimetre
cm^2	square centimetre
cm^3	cubic centimetre
CIBC	Canadian Imperial Bank of Commerce
CIT	Corporate income tax
COMIBOL	Bolivian Government owned mining company; joint venture partner to Santacruz through the Illapa JV
CQA	Quality Assurance (for tailings disposal)
CQC	Quality control management (for tailings disposal)
Cu	copper
CV	Coefficient of Variation
DAA	Declaration of Environmental Adequacy
DMT	Dry metric tonnes
E	East
EBIT	Earnings before interest and taxes
EIA	Environmental Impact Assessment
ENDE	National Electricity Company (Bolivia)

Symbol / Abbreviation	Description
ft^3	cubic foot
g	gram
G&A	general and administrative
g/t	grams per tonne
hp	horsepower
HSEC	health, safety, environment and community
IDW	Inverse distance weighting
JDS	JDS Energy & Mining Inc.
JORC	Australasian Joint Ore Reserves Committee
JV	Joint venture
kg	kilogram
km	kilometre
km/h	kilometres per hour
kPa	kilopascal
kt	kilotonne
kV	kilovolt
kVA	kilovolt-ampere
kW	kilowatt
L	litre
L/min	litres per minute
L/s	litres per second
LOM	life of mine
m	metre
M	million
Ma	million years
masl	metres above sea level
mm	millimetre
Mm^3	Millions of cubic metres
MPa	megapascal
Mt	million metric tonnes
MW	megawatt
N	north
NI 43-101	National Instrument 43-101
NSR	net smelter return
OPEX	Operating cost
oz	troy ounce
OK	Ordinary kriging

Symbol / Abbreviation	Description
P.Eng.	Professional engineer (a Canadian designation)
P.Geo.	Professional Geologist (a Canadian designation)
Pb	lead
ppm	parts per million
PVC	Polymerization of vinyl chloride (a plastic)
QA/QC	quality assurance/quality control
QP	qualified person
RMR	rock mass rating
S	South
SAG	Semi-autogenous grinding
SAMREC	South African Code for the Reporting of Exploration Results
Sb	Antimony
SDG	Sustainable development goals
SG	specific gravity
Sn	selenium
t	metric tonne
t/d	tonnes per day
t/m^3	Tonnes per cubic metre
TSF	tailings storage facility
UTM	universal transverse mercator
V	volt
W	west
Zn	zinc
ZnEq	Zinc equivalent (other payable metal values have been converted to the same value of zinc metal)

Glossary	
Spanish Term	**English Translation**
1er	primary
2do	secondary
Acceso	Sublevel access
Aire limpio	Fresh air
Aire viciado	Exhaust
Altura de banco	Bench height
Ancho	Width

Glossary	
Spanish Term	**English Translation**
Ángulo	Dip
Bomba estacionaria	Stationary pump
Bomba sumergible	Submersible pump
Bombeo	pumping
Buzon	Ore bin
Cara libre	Free face
Chimenea	Raise
Chimenea de ventilacion	Ventilation raise
Circuito	circuit
Desarollos	Development
Dique de colas	TSF
Direccion de tumbe	Ore mining direction
Etapa	Stage
Exploración	Exploration
Filtracion	filtration
Flotacion	flotation
Flujograma	Flowsheet
Galería	Drift (gallery), classified as Superior (main) and Inferior (secondary)
Ingeniera	Engineering
Ingreso rampa	Portal
Mantenimiento	Maintenance
Media ambiente	environment
Mina	mine
Nivel	Level
Perforación	drilling
Planta Concentradora	Processing Plant
Plomo	lead
Puente	Pillar
Red de bombeo	Pumping system
Relleno	Backfill
Seccion longitudinal	Long section
Seccion transversal	Cross section
Seguridad	Security
Sistema	System

Glossary	
Spanish Term	**English Translation**
Subnivel	Sublevel
Subnivel de relleno	Backfill drift
Taladros	Drillholes
Taza de bombeo	Water storage pond
Ventilador	Fan
Veta	Vein
Zonas explotadas	Mined zones