NI 43-101 Technical Report
Cerro de Pasco Resources
Preliminary Economic Assessment
Santander Pipe Deposit, Huaral, Lima, Peru

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOS

1 SUMMARY

This Preliminary Economic Assessment (PEA) Technical Report (Report) relating to a proposal to reopen the Santander Pipe mine has been completed in compliance with the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines referred to in Companion Policy 43 101CP to the Canadian National Instrument, NI 43-101.

1.1 Introduction

On the 3rd of December 2021, Cerro de Pasco Resources Inc., ("CDPR", "the Issuer" or "the Company") took ownership of the Santander Mine assets of Trevali Peru (Trevali). CDPR management then mandated DRA Américas Perú (DRA) to undertake an independent review of the geological modelling processes and 2021 resource estimates for the Magistral and Santander Pipe deposits with an effective date of 31st December 2021.

Cerro de Pasco Resources Inc. is a Canadian-based resource management company incorporated in the Province of Quebec, Canada and headquartered at Unit 203, 22 Lafleur Ave, Saint-Sauveur, Quebec J0R 1R0. The Company's Peruvian office is located at Av. Santo Toribio, No. 115, Of. 702, San Isidro, Lima. The Company trades on the CSE (CDPR), OTCMKTS (GPPRF) and Frankfurt (N8HP).

CDPR is a silver and zinc-focused base metals mining company with one commercially producing operation and recently acquired Santander Mine in Perú. CDPR is also the owner of the El Metalurgista concession in Pasco, Peru which has an inferred mineral resource of 42.9 Moz Ag in the Excelsior Stockpile (NI 43-101 Technical Report, El Metalurgista Concession – Pasco, Peru, CSA Global, August 2020).

CDPR entered a share purchase agreement with Trevali Mining Corporation ("Trevali") (TSX: TV) (BVL: TV) (OTCQX: TREVF) (Frankfurt: 4TI) on the 8th of November 2021 to acquire the Santander Property in Peru by way of a sale of the shares held by Trevali in its Peruvian subsidiary Trevali Peru S.A.C. ("Trevali Peru"). Under the terms of the Agreement, Trevali received 10 million common shares of CDPR, C$1 million in cash, and a 1% Net Smelter Return Royalty on certain areas of the Santander Mine, except those on which there is currently a defined Mineral Resource.

The transaction was subject to customary closing conditions which were finalized on December 3rd, 2021. The full terms of the Agreement are provided in Section 4.3 of this Report.

This current technical report was commissioned on May 18th, 2022. The accompanying updated mineral resource for the Santander Pipe deposit has an effective date of June 30th, 2022, and the rest of the report has a final date of January 31st, 2023.

1.2 Reliance on Other Experts

With respect to claim tenure information, the authors and DRA have relied on an opinion letter from CDPR legal consultants, Rodrigo, Elias & Medrano Abogados of Lima Peru, who vetted the standing of 72 mining concessions and one beneficiation concession and other holdings before CDPR entered into the purchase agreement to acquire the Santander Project. Two additional concessions were granted during 2022.

The Qualified Persons and DRA have relied upon CDPR and its management for information related to underlying contracts and agreements pertaining to the acquisition of the mining claims and their status, and technical information not in the public domain. The Property description presented in this Report is not intended to represent a legal, or any other opinion as to title.

1.3 Property Description and Location

CDPR´s Santander Mine Property comprises an irregular, north and westerly-trending block of 74 mining concessions covering a granted area of 6,453.52 ha for a total effective area of 4,829.89 ha which encompasses one beneficiation (processing) concession occupying 133.11 ha.

Geographic coordinates for the centre of the property are 11º 11’ 28” south latitude and 76º 31’ 17” west longitude, and at an elevation between 4,400 a 4,750 masl.

1.4 Accessibility, Climate, Local Resources, Infrastructure and Physiography

The Santander Mine Property and associated infrastructure are located south to south-east of the town of Cerro de Pasco, and approximately 175 km north-east of the city of Lima. It is accessible from Lima by 3 main routes, via Canta (275 km), via Huaral (279 km), or via the “Carretera Central” and La Oroya (315 km).

The Property is located in the Puna Region (4,000 to 4,800 masl), where the climate is characterized by being cold and dry during the months of December to May, when the temperature ranges between 20°C during the day and less than 0°C at night. During the months of December to March, frequent precipitation occurs as snow or hail. Climate conditions are such that mining operations are possible throughout the year.

The mine is situated in a section of the superficial lands of the community of Santa Cruz de Andamarca (SCA), with whom the company has signed an easement agreement. Most of the goods and services required for the Project can be purchased locally or in the capital Lima. SCA through its communal company ECOSA, rents out machinery and equipment to the mine unit. The town closest to the operation comprises the community of San José de Baños (SJB), and both SCA and SJB have health posts and educational institutions.

Mine infrastructure is well-developed, with a fully equipped 500-person camp centrally located on a flat-bottomed valley site (see Figure 5-2). Several shallow lakes occupy the upper reaches of some of the glacial valleys and provide sufficient water for the mining/milling activities. Trevali, the previous owners, entered into long-term surface rights agreements with the local communities which CDPR has inherited with the purchase of the property on December 3rd, 2021.

1.5 History

The earliest recorded work at the Santander property was carried out in 1925, when the mineral rights to the district were acquired by Rosenshine and Associates. In 1928, the United Verde Copper Company optioned the property and carried out a program of exploration and core drilling in the Santander Pipe area, the results of which are unknown. In the 1940's, the National Lead Company explored the area and conducted further drilling. This work confirmed the existence of significant silver-lead-zinc mineralization at what was to become known as the Santander Pipe.

In 1957, St. Joe Minerals of New York (St. Joe) registered the Peruvian subsidiary Compañia Minerales Santander Inc. and built a 500 tonne per day (t/d) concentrator plant which was subsequently increased to between 850 t/d and 1,000 t/d. Following corporate restructuring in 1985, St. Joe divested its Latin American mining operations, including Santander which was acquired by a United States, West German and Peruvian Group called Docarb S.A. Docarb operated the mine under the name Compañia Minerales Santander S.A.C. (CMS) until a cessation of operations at the end of 1992 when the company´s finance failed as a result of social difficulties, low metal prices and hyper-inflation.

Over a 34-year time span, the total production from the Santander Pipe is estimated to be in the order of 8 million tonnes with a grade of approximately 7.0% zinc, and with significant silver-lead content, and minor copper credits. At the time of closure, CMS had started mining the Magistral deposits, had discovered the Puajanca deposit, and was undertaking an underground exploration program in the Santander Pipe whilst the lowermost proven reserves were reportedly being developed for exploitation.

The Santander Property then laid dormant until it was acquired by the TSX-listed Trevali Mining Corporation (Trevali) on December 11th, 2007. The acquisition was pursuant to an Assignment Agreement dated October 2nd, 2007, following which Trevali through its Peruvian subsidiary, effectively acquired all of the interest of CMS in the Property for a period of fifty (50) years with an automatic fifty (50) year extension. Trevali then carried out a series of successful exploration programs resulting with development of the Magistral underground mine (beginning in mid-2012) and commercial production commencing in September 2013. Trevali continued operations in the Magistral mine (Magistral North, Magistral Central and Magistral South) until December 3rd, 2021, when the mine was bought by Cerro de Pasco Resources Inc., (CDPR).

CDPR has continued mining the Magistral mine during 2022, and has started preliminary engineering studies considering the dewatering and reopening of the adjacent Santander Pipe mine (this current PEA).

1.6 Geological Setting and Mineralization

The Santander Pipe mine is located within what is referred to as the Miocene metallogenic belt of central and northern Perú. It extends for at least 900 km along the Andean Western Cordillera and adjacent Altiplano and is characterized by numerous hydrothermal mineral deposits that formed about 20 Ma ago. Mineralization is interpreted to have occurred during a pre-lower

Miocene Quechua I compressive event and spanned later Quechua II tectonism. Mineral deposits are predominantly hosted by shelf carbonates and other sedimentary rocks of Late Triassic, Jurassic, and Cretaceous age, and by volcanic and intrusive rocks mainly of Neogene age. Base metal and precious metal mineralization were intimately associated in time and space with the eruption of calc-alkali volcanic rocks of intermediate composition, and the emplacement of mineralogically and geochemically similar, dykes and stocks.

The property is underlain by a package of Cretaceous carbonate and clastic sedimentary rocks that were tightly folded into a series of northwest-trending anticlines and synclines. The lower, predominantly clastic part of the section was thrust over the mainly carbonate-rich upper portion (the favourable host rocks) along a regional, north to northwest-trending thrust fault, the Santander regional fault which is approximately parallel to the fold axes with a strike of 150º west, and dips moderately to the west. Based on regional stratigraphic reconstruction, it has an estimated minimum displacement of at least 1,000 metres, and clearly has a control over the mineralization of the adjacent Magistral mine deposits.

In the Santander Pipe mine, skarn alteration and associated sulphide mineralization were mined to a vertical depth of 480 metres below surface, with historical boreholes indicating mineralization continues to at least another 250 m depth. In detail, skarn mineralization forms a circular, massive, plug-like body in the massive-bedded Jumasha limestone formation to depths of approximately 250 m below surface prior to forming more discrete skarn hosted replacements in the underlying interbedded Chulec limestone formation to 730 m vertical depth. Exploration during 2022 has indicated that this mineralization continues at least 600 m northwards around a steep anticlinal fold and in alignment with the Puajanca deposit 1.5 km further north.

1.7 Deposit Types

The characteristics and setting of the mineralization at the Santander Property are consistent with intrusion related, carbonate-hosted zinc-lead (copper, silver) deposits (Megaw, Balton and Falce 1996; Megaw 1998; Meinert, Dippert, and Nicolescu 2005), also known as CRD or high-temperature carbonate (HTC) deposit types. Such deposits form a continuum between relatively lower-temperature replacement types as seen in the Magistral deposits, to higher-temperature skarn-hosted types as seen in the Santander Pipe deposit.

1.8 Exploration

Although the discovery of the Santander Pipe was the result of exploration activity started in the first half of the 20th Century, there is no surviving data other than old-style drill core logs covering the period 1976-93 together with incomplete mine plans and sections. It was only within the last few years of CMS mining activities, that exploration began to acquire adjacent concessions and look further afield for other sources of plant feed. This was when the Magistral and Puajanca deposits were found and added to the CMS portfolio.

Intermittent exploration campaigns were re-started by Trevali in 2007, first with structural mapping (2009-10), geochemical sampling (2013, 2018-19) and geophysics (2007-2012, 2015, and 2018-2020) all of which was extended out into the main 72 block of Santander concessions.

However, the main target remained with the Magistral deposits and the development of the Magistral mine until the property was sold to CDPR.

1.9 Drilling

There is drillhole data for the Santander Pipe recorded from 1976 through to 1993, and for the Puajanca deposit during the last years of CMS. Although the sampling and assaying procedures were not QA-QC supported, the quality of the drillhole logs is adequate for geological modelling and mineral resource estimation.

Trevali´s drilling (2008 – 2021) was mainly centred on the Magistral deposits, although some drilling was aimed at the Santander Pipe and Puajanca deposit, as well as a few early exploration targets.

Renewed exploration of the Santander Pipe was initiated by CDPR during 2022. This comprised inspection of the surviving mine plans, sections and drilling records, and re-logging of 31 of the old drill cores found on the property.

1.10 Sample Preparation, Analysis and Security

The database used to estimate mineral resources at the Santander Pipe deposit contains 347 core holes for 49,755 m. 306 of these holes containing 5,611 sample intervals, were drilled before 1993, when Compañía Minerales Santander S.A.C. (CMS) operated the now-abandoned mine. 41 holes (31,959 m) were drilled by Trevali between 2011 and 2020 and were focused mostly on extending the mineralization at depths below the mined levels.

The sampling and quality-control procedures of the CMS historical holes are not known. This is considered a weakness, and, in consequence, Mineral Resources estimated with mostly historical data can only be classified as Indicated at best.

Sample preparation, analyses, and security protocols were implemented during the Trevali period and, since acquiring the property in 2021, CDPR have maintained similar protocols with only minor changes for exploration holes drilled in 2022. DRA has reviewed the protocols and consider them to be of good standard.

Since the Trevali ownership, quality assurance and quality control protocols have been put in place to assure the reliability of the assay data. The procedures include industry standard check samples inserted during batch submissions. DRA has made recommendations to include further checks looking at improving and optimising the procedures.

In consideration of the lack of sampling and quality-control procedures of the historical data, during 2022, CDPR initiated work on re-logging and re-assaying core recovered from the historic drill holes. Preliminary results reviewed at the end of this study show consistent biases for Zn and other elements, with averages that are 9% lower for Zn, the primary commodity. DRA notes that these biases only affect the upper levels of the mineralization, representing some 35% of the reported Mineral Resource at Santander Pipe.

DRA strongly recommends continuing and completing the re-assaying of all the historic core that may be available. On completion, and assuming a reliable outcome, re-assayed values should replace the historic values, and if the biases are confirmed, factors will need to be applied to any remaining historic assays used to develop mineral resource models for future studies.

1.11 Data Verification

Since Trevali's acquisition of the Santander property in 2007, there have been six independent NI 43-101 compliant studies on the property: Golder in 2009, 2010 and 2012, SRK in 2017, DRA in 2022 and the current study. In most instances, site visits were conducted verifying the installations, geology, mineralisation, drilling, and sampling procedures related to exploration and to the mineral resource estimates. The databases were also verified by comparing against log sheets and laboratory-issued certificates. Only minor discrepancies were identified, and these have been corrected.

Assay data for the historic drill holes was originally compiled and catalogued by Trevali from historic reports, cross sections, and plans. For this and previous studies, the QP's have reviewed the data against historic sections and plans without noting any significant differences. However, DRA notes that the historic sections and plans are incomplete. A full set of sections and plans will need to be re-compiled to verify the full extent of the historic assay data.

The historic mine surveying used a local coordinate system. CDPR was not able to provide DRA with sufficient information to fully verify the coordinate transformation of historic data. Considering that the historic mine levels, where most of the data was collected, are not accessible, a field verification of the surveying is not possible. The coordinate transform from the historic local coordinate system to the current UTM WGS84 projection needs to be documented and verified based on the historic documentation.

1.12 Mineral Processing and Metallurgical Testing

The existing Santander concentrator facility comprises a three-stage crushing circuit, two (2) parallel milling circuits, each with a rod and ball mill, flash lead flotation within the milling circuit; lead rougher, scavenger, and cleaner flotation; zinc rougher, scavenger, and cleaner flotation with a regrind mill, lead-concentrate thickening and filtration, zinc-concentrate thickening and filtration, final-tailings thickening, and a tailings-storage facility (TSF). The Santander concentrator will be upgraded by adding minor equipment to its existing lead flotation circuit to produce either copper or lead concentrates.

In 2019, metallurgical tests were carried out to optimize the plant design and process flowsheet. These tests included the determination of comminution indices and analytical and mineralogical characterizations, in addition to flotation tests of lead and zinc ores to optimise the recovery and quality of the lead and zinc concentrates produced. For these tests, a blended head-sample composite was prepared with the following breakdown: 40% Magistral Centro, 20% Magistral Norte, 30% Magistral Sur, and 10% old tailings. The representative nature of this composite sample was not available in the Report.

In 2022, several metallurgical tests were conducted to evaluate the feasibility of upgrading or modifying the existing Santander Processing Plant to process mineralized material from the Santander Pipe Lower Zone. As previous metallurgical tests had only been conducted on samples from the Magistral Mine, it was necessary to conduct tests on samples from Santander Pipe Lower Zone to determine mineral recovery, required operating parameters and expected grades and recoveries.

The metallurgical tests conducted for the Santander Pipe Lower Zone include analytical assaying, mineralogy, abrasion indices, bond work indices, and bench scale flotation testwork. Testwork results showed successful production of copper concentrate at a 70% recovery and copper grade of 21% and zinc concentrate at a recovery of 89% and zinc grade of 51%.

Minor modifications are required to the Santander concentrator flotation circuit in order to process both the Magistral Mine ore and the Santander Pipe mineralized material.

1.13 Mineral Resource Estimates

The Mineral Resource model for the Santander Pipe has been updated following observations and recommendations made by DRA in January of 2022.

The current resource model for Santander Pipe was initially developed by CDPR. This model was reviewed and revised with DRA to ensure that all aspects relating to the Mineral Resource estimate comply with CIM reporting standards.

3D Geological interpretations of the mineralized domains were completed using Leapfrog GEO software. Metal grades were interpolated into blocks by ordinary kriging using Leapfrog's EDGE block modelling module.

The Mineral Resources were classified into Indicated or Inferred using CIM definition standards and guidelines.

Levels with historic mining at Santander Pipe, above 4020 m asl, are not included in the Mineral Resource.

Mineral Resources are reported above a Net Smelter Return (NSR) cut-off of US$40/t. The calculation of the NSR, factors in metal prices, recoveries, as well as treatment and refining charges and deductions, in accordance with current contracts. The numbers used are based on recent production and processing of the Magistral mine products, and CDPR corporate guidance. Metal prices are based on LME 2021 averages.

The updated Mineral Resource Statement for the Santander Pipe deposit is included in Table 1-1. Details of the parameters used in the NSR calculation are included in the footnotes.

Table 1-1: Mineral Resource Statement, Santander Pipe Deposit

Category	Tonnage (kt)	Zn (%)	Pb (%)	Ag (g/t)	Cu (%)
Indicated	**3,225**	**6.94**	**0.017**	**13.5**	**0.17**
Inferred	**1,779**	**5.95**	**0.013**	**7.9**	**0.15**

Footnotes:

- Mineral Resources are reported above a US$40 NSR cut-off.
- Metal prices used in the NSR calculations were US$3,000/tonne for Zn, US$2,200/tonne for Pb, US$9,300/tonne for Cu, and US$25/Oz for Ag.
- For Santander Pipe: NSR = (17.5 x %Zn) + (11.1 x %Pb) + (40.8 x %Cu) + (0.37 x g/t Ag), assuming recoveries of 90% for Zn, 70% for Pb, 60% for Cu and 50% for Ag.

DRA has included in this report a series of recommendations aimed at improving the geological and resource model for further studies.

1.14 Mineral Reserves

No mineral reserves have been estimated by CDPR for the Santander Pipe deposit to date.

1.15 Mining Methods

1.15.1 Geotechnical Parameters

The geotechnical criteria used in the evaluation of the Santander Pipe mining plan are supported by the CDPR internal report Geotechnical Assessment for Underground Mine Design (Palacio, 2022), which describes the methods developed by CDPR to prepare and analyse the drillhole data, evaluate ground support requirements, determine stable stope dimensions, and estimate external dilution.

Two mineralized zones have been identified within the Santander Pipe: (a) mineralized strata above 3,950 masl that has been largely mined down to level 4,020 m (the *upper zone*), and (2) mineralization below 3,885 m, outlined by more recent holes (*the lower zone*). The different morphology and depth of these zones require different geotechnical characterization.

Palacio (2022) carried out an empirical assessment of stope stability using the graphical stability criterion proposed by Mathews in 1981 and the criteria updated by Mawdesley (2002). Based on such an empirical assessment, stope support recommendations were proposed and estimates of potential dilution provided, as seen in Table 1-2.

Table 1-2: Recommended stope support

Excavation Type	Stope Face	N'	Ground Support
Upper Zone	Back	0.5	It is expected that over 20% dilution could be produced at the stope back, hence, cable bolts are required to support fractured, loose ground.
Upper Zone	Hanging wall 55°	2.3	It is expected that 10-20% dilution could be produced at the stope hanging wall, hence, reinforcement of the fair to good quality ground is recommended, preventing major unravelling
Upper Zone	Hanging wall 65°	2.7	
Upper Zone	Hanging wall 75°	3.2	
Lower Zone	Back	0.5	It is expected that over 20% dilution could be produced at the stope back, hence, cable bolts are required to support the fractured, loose ground.
Lower Zone	Hanging wall 50°	2.1	It is expected that 10-20% dilution could be produced at the stope hanging wall, hence, reinforcement of the fair to good quality ground is recommended, preventing major unravelling
Lower Zone	Hanging wall 55°	2.3	

Source: Palacio (2022); based on Hutchinson & Diederichs (1996).

Stope stability was determined according to the methodology described by Mawdesley et al.(2001). Table 1-3 shows the stope stability probability for three different stope configurations in the upper and lower zones. A excavation is considered stable if the stability probability is equal to or greater than 85%. It can be seen that in all scenarios the back of the stopes is marginally stable (85.3%). In both the upper and lower zones, the scenario with a 30-m stope height results in unstable footwalls.

Table 1-3: Stope stability probability – Upper and lower zones

Description		Stope dimensions			Hydraulic Radius (HR)			Stability Probability (%)		
Scenario	Depth (m)	Height (m)	Width (m)	Length (m)	Hanging Wall	Foot Wall	Back	Hanging Wall	Foot Wall	Back
U-01-SLS	424 - 504	15	7	15	3.78	3.78	2.39	91.7%	88.7%	85.3%
U-02-SLS	425 - 504	20	7	15	4.31	4.31	2.39	90.2%	86.7%	85.3%
U-03-SLS	426 - 504	30	7	15	5.03	5.03	2.39	88.0%	83.9%	85.3%
L-01-SLS	619 - 764	15	7	15	4.25	4.25	2.39	86.2%	86.9%	85.3%
L-02-SLS	619 - 764	20	7	15	4.76	4.76	2.39	84.1%	84.9%	85.3%
L-03-SLS	619 - 764	30	7	15	5.42	5.42	2.39	81.4%	82.4%	85.3%

The Empirical Ground Support Chart from the Q-system (Norwegian Geotechnical Institute, 2015), as well as the formula *Maximum Unsupported Span (MUS) = 2 x Q x 0.4* (Barton, Lien, & Lunde, 1974), were applied for the estimation of ground support requirements for waste and ore development including the evaluation of MUS (Palacio, 2022). The results are presented in Table 1-4.

Table 1-4: Summary of ground support recommendations for waste and ore development

Excavation Type	Rock Mass Class	Ground Condition Q	% Frequency	Q Min	Q Max	RMR Min	RMR Max	MUS	De	Ground Support
Waste Development	II	Fair to Good	13%	4.00	40.00	60	75	3.5	3.1	Spot bolting / 2.4 m long, Ø39 mm split sets @ 1.6 m + welded wire mesh
	IIIA	Poor	51%	1.00	4.00	50	60	2.0	3.1	2.4 m long, Ø19 mm grouted/resin bolts @ 1.5 m, 5 cm of reinforced shotcrete
	IIIB	Very Poor	21%	0.40	1.00	45	50	1.4	3.1	2.4 m long, Ø19 mm grouted/resin bolts @ 1.5 m 7.5 cm of reinforced shotcrete
	IV-A	Very Poor	12%	0.10	0.40	35	45	0.8	3.1	2.4 m long, Ø19 mm grouted/resin bolts @ 1.3 m 10 cm of reinforced shotcrete
	IV-B	Extremely Poor	3%	0.01	0.10	20	35	0.3	3.1	2.4 m long, Ø19 mm grouted/resin bolts @ 1 m 15 cm of reinforced shotcrete + lattice girders or RRS @ 2.3m
Ore Development	II	Fair to Good	21%	4.00	40.00	60	75	3.5	1.7	Spot bolting / 2.4 m long, Ø39 mm split sets @ 1.6 m + welded wire mesh
	IIIA	Poor	54%	1.00	4.00	50	60	2.0	1.7	2.4 m long, Ø39 mm split sets @ 1.5 m welded wire mesh
	IIIB	Very Poor	16%	0.40	1.00	45	50	1.4	1.7	2.4 m long, Ø39 mm split sets @ 1.5 m, 5 cm of reinforced shotcrete
	IV-A	Very Poor	6%	0.10	0.40	35	45	0.8	1.7	2.4 m long, Ø39 mm split sets @ 1.3 m, 7.5 cm of reinforced shotcrete
	IV-B	Extremely Poor	3%	0.01	0.10	20	35	0.3	1.7	2.4 m long, Ø39 mm split sets @1m, 10 cm of reinforced shotcrete systematic cable bolting

Source: Modified from Palacio (2022); based on Norwegian Geotechnical Institute (2015).

1.15.2 Mining

Using the UBC mining method selection methodology, developed by Miller and modified by Nicholas in 1981, it was determined that sublevel stoping (SLS) was the most suitable mining method for the Santander Pipe. Table 1-5 shows the minable resources that were estimated based on the optimum SLS scenarios for the upper and lower zones.

Table 1-5: Mineable Resources – Sublevel stoping scenarios selected

Scenario	Tonnes	Zn %	Pb %	Ag g/t	Cu %	NSR US$/t
Upper Zone	2,055,234	5.30	0.02	10.70	0.08	100.15
Lower Zone	2,312,974	4.10	0.00	6.26	0.13	79.36
TOTAL	**4,368,208**	**4.66**	**0.01**	**8.35**	**0.11**	**89.14**

A crown pillar and a small number of isolated/inaccessible blocks must be deducted from the minable resources. A mining plan was produced, taking into account the mine development and mining sequence, as well as the need to drain the flooded mine and rehabilitate the La Cuñada shaft. The resulting LOM mine production program can be seen in Table 1-6.

Table 1-6: LOM production plan

Description	Total	2024	2025	2026	2027	2028	2029
Stopes and Sublevels (t)	3,846,564	0.00	539,827	900,000	900,000	900,000	606,736
NSR ($/t)	89.25	0.00	97.99	94.72	98.70	78.21	75.72
Zn (%)	4.67	0.00	5.14	5.01	5.05	4.12	4.01
Pb (%)	0.01	0.00	0.02	0.01	0.01	0.00	0.00
Ag (g/t)	8.05	0.00	10.12	9.44	11.08	4.93	4.30
Cu (%)	0.11	0.00	0.10	0.08	0.15	0.11	0.09

1.16 Recovery Methods

The Santander concentrator was acquired from Glencore/Los Quenales' Rosaura concentrator, relocated, and upgraded with new equipment. Production rates increased from 1,250 t/d to 2,000 t/d, with an anticipated maximum capacity up to 2,500 t/d.

The plant began operations in 2013 and underwent continual optimization since that time. It operates 24/7, with a monthly short shutdown for planned maintenance. The plant is functioning well with minor operational issues. From 2017 to 2022, the plant has processed a total of 4.47 million metric tonnes of mineral.

The Santander Concentrator is currently processing Magistral ore and has two (2) separate flotation circuits, one for lead concentration and the other for zinc concentration.

Plant operational data indicates that in 2022 the average zinc recovery was 94.57% (highest for the last 5 years of production), and the average grade of Ag in the lead concentrate was 75.89 oz Ag/t. This is the second highest Ag grade achieved in the last 5 years of production, with 2021 being the highest. However, in 2022, the average lead grade was 50.56% and recovery was 67.55%, lower than in previous years.

To upgrade the Santander concentrator to enable it to also process Santander Pipe mineralized material and produce copper concentrates, the existing lead flotation circuit will need to be modified. These changes involve the addition of a horizontal regrind ball mill before the cleaner flotation stage for copper, as well as a horizontal vibrating screen prior to the rougher flotation stage.

CDPR has established a production plan that involves processing material from the Magistral Mine until early 2025, followed by processing mineralised material from the Santander Pipe until 2029.

1.17 Project Infrastructure

The Santander Pipe mine will share the infrastructure and associated services relating to the fully permitted and producing Magistral mine as listed in the 31st December 2021 NI 43-101 report. Although Magistral mine drainage is currently being discharged into the Santander Pipe open pit workings and drains via the 4380 drainage level, this will cease once the improvements to the mine water treatment system are completed, and the effluent is discharged to the Baños River, through the 24-inch HDPE diversion pipeline completed in 2022.

SRK Consulting has recently completed a feasibility study for the expansion of the TSF, with the dam expected to reach the 4,483.0 masl elevation (see SRK Consulting, 2022). This would add 2.98 Mm^3 of additional tailings storage capacity at the TSF.

Additional infrastructure and services connections will need to be designed as part of the next stage of engineering studies in relation to the proposed dewatering and rehabilitation of the La Cuñada shaft.

1.18 Market Studies and Contracts

The Magistral mining area is an operating unit with a concentrate sales contract in place with Glencore. All commercial terms and financial conditions under this off-take agreement are arms-length; including payment terms and penalties that were negotiated with the buyer. All commercial terms entered between the buyer and CDPR are regarded as confidential. On the other hand, it is expected that an eventual off-take agreement for the Santander Pipe mining area will include customary arms-length commercial terms and financial conditions similar to the ones currently in place with Glencore.

The Santander Pipe is expected to produce Zn and Cu-Ag concentrates. Based upon historical production from the upper zone and recent preliminary metallurgical testing with samples from the lower zone, those concentrates are expected to be clean.

1.19 Environmental Studies, Permitting and Social or Community Impact

All environmental studies and granted permits in relation to the operating Magistral mine were sourced by Trevali Peru, and are now owned by CDPR.

The Santander property complies with the terms of the Environmental Impact Assessment (EIA) and with each of the conditions provided in the resolutions of the environmental impact authorization issued by the National Environmental Certification Service (SENACE) through official communication R.D. N° 073-2019-SENACE-PE/DEAR dated May 2, 2019.

CDPR is currently in the process of obtaining the second modification of its detailed environmental impact assessment study (Second MEIA-d) for a tailings dam and mine expansion, including the deepening of the Magistral Mine and production expansion to include the Santander Pipe and its Pipe North Extension, with SENACE. This study was initiated in 2019, but due to the pandemic it was put on hold. The main objective of the study is to obtain the environmental certification of the aforementioned components that will allow for the extension of the LoM for the Santander property mines.

Additional permitting will be required in relation to the dewatering and re-opening of the La Cuñada shaft as well as bringing the Santander Pipe mine back into production, once new installations are defined within the next stage of engineering studies.

With reference to Social Responsibilities and Community Impact, CDPR maintains a good relationship with the population of the area of direct and indirect social influence, which is composed of the following three Rural Communities: CC Santa Cruz de Andamarca, CC Santa Catalina and CC San José de Baños respectively. CDPR undertakes to continue as a matter of priority the Sustainable Development Program, the Health and Nutrition Program, the Education and Culture, and the Communications and Dialogue initiatives set up by Trevali.

The mine closure plan has been designed to ensure the rehabilitation of the area where the mine is located.

1.20 Capital and Operating Costs

1.20.1 Capital Cost Estimate

The capital cost estimate was prepared with an expected accuracy range of +50% / -35% accuracy of actual costs (Class 5 AACE estimate). Base pricing is in the fourth quarter of 2022 US dollars with no allowances for inflation or escalation beyond that time. The estimate includes direct and indirect costs, as well as owner´s costs and contingency associated with mine, mine infrastructure, process facilities and on-site infrastructure. The capital costs are broken down into the following two timeframes:

- Initial capital costs: Includes accessing the Santander Pipe from the ongoing Magistral cross-cut, exploration development, in-fill drilling, PFS-level studies, drainage of the flooded mine, mine development, rehabilitation of the La Cuñada shaft, modifications to the process plant, and production start-up at 2,500 t/d; and

- Sustaining capital costs: include the expansion of the existing TSF, and production and underground mine development.

The initial capital costs are estimated at US$52.4 million and LoM capital costs are estimated at US$68.0 million (see Table 1-7).

Table 1-7: Capital Costs Summary

Capital Costs Summary	**MUSD**
Mine	34.6
Process Plant	0.6
Site Infrastructure	0.9
Indirect Costs	5.9
Owner's Costs	1.8
Contingency	8.5
Total Initial Capital	**52.4**
Mine	10.4
Tailings dam and tailings transport and disposal	2.9
Other sustaining CapEx	0.6
Contingency	1.7
Total CapEx (Initial+ Sustaining)	68.0

1.20.2 Operating Cost Estimate

The operating cost estimate was prepared with an expected accuracy range of +50% /- 35% accuracy of actual costs (Class 5 AACE estimate). Base pricing is in the fourth quarter of 2022 US dollars, with no allowances for inflation or escalation beyond that time.

The OpEx estimate is based on designed consumable rates, and received contractor quotations for mining and current process plant operating costs. Both process and mining personnel and salary requirements were estimated based on current operating practices at Magistral and DRA's experience on similar projects.

The OpEx is estimated at US$182.1 million over the life of mine or US$47.4/t of ore mined/processed during the five years of operation. The breakdown of the yearly and LoM unit costs per discipline is shown in Table 1-8.

Table 1-8: Unit Operating Cost Summary

	2025 (US$/t)	2026 (US$/t)	2027 (US$/t)	2028 (US$/t)	2029 (US$/t)	LOM (US$/t)
Mine	33.7	24.7	22.7	23.4	27.2	25.6
Process Plant	13.2	11.6	11.6	11.6	11.6	11.9
G&A	11.0	9.7	9.7	9.7	9.7	9.9
Total Unit Cost	**57.9**	**46.1**	**44.1**	**44.8**	**48.6**	**47.4**

1.21 Economic Analysis

The economic analysis contained in this report is based, in part, on Inferred Mineral Resources, and is preliminary in nature. Inferred Mineral Resources are considered too geologically speculative to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. There is no certainty that economic forecasts on which this PEA is based will be realized.

The financial analysis was carried out using a discounted cash flow (DCF) methodology. Net annual cash flows were estimated projecting yearly cash inflows (or revenues) and subtracting projected yearly cash outflows (such as capital and operating costs, royalties and taxes). These annual cash flows were discounted back to the date of the beginning of capital expenditure and totalled to determine the NPV of the project at selected discount rates. A discount rate of 6.0% was used as the base discounting rate. In addition, the IRR expressed as the discount rate that yields an NPV of zero, and the payback period expressed as the estimated time from the start of production until all initial capital expenditures have been recovered, were also estimated.

To assess the project value drivers, sensitivity analyses were performed for the NPV considering variations in total CapEx and OpEx, long-term metal prices, recoveries, and discount rate on the pre and after tax NPV. The project proved to be most sensitive to fluctuations in the Zn metal price. For the base case, using a discount rate of 6.0% and a Zn price of US$2,800.0/t, the project has a pre-tax NPV of US$71.3 million, and an after-tax NPV of US$31.2 million (see Table 1-9).

Table 1-9: Zinc Price Sensitivity

Zinc Price (US$/t)	Pre-Tax NPV			After-Tax NPV		
	@ 6.0% (MUS$)	@ 8.0% (MUS$)	@ 10.0% (MUS$)	@ 6.0% (MUS$)	@ 8.0% (MUS$)	@ 10.0% (MUS$)
2,240.0	9.9	6.5	3.5	-10.4	-12.5	-14.3
2,520.0	40.6	35.1	30.2	10.5	7.0	3.9
2,800.0	**71.3**	**63.7**	**56.9**	**31.2**	**26.3**	**21.9**
3,080.0	102.1	92.4	83.6	51.7	45.4	39.7
3,360.0	132.9	121.1	110.4	71.7	64.0	57.1

1.22 Adjacent Properties

The Chungar Antiguo deposit, located 7.5 km north of the Santander property, is an example of a contact developed endo-skarn and exo-skarn deposit surrounding an intrusive body which takes the form of a lacolith.

Compañia Minera Chungar´s Romina project (also referred to as Nuevo Santander) is located 2 km to the north of Santander´s eastern-most concessions. This comprises a pipe-type deposit similar to the Santander Pipe, but with lower grades.

CDPR´s Santander concessions are mostly surrounded by other active exploration and mining companies. The measured and indicated resources as reported by operating mining companies within the surrounding area are summarized in Table 1-10.

Table 1-10: Adjacent properties - End-2021 declared Measured and Indicated Resources

Company	Deposit	Mt	Zn %	Pb %	Cu %	Ag oz/t	Location
Cia Minera Chungar	Romina project	10.6	4.8	2.6	0.1	1.2	2km North
Cia Minera Chungar	Animon mine	9.7	7.7	2.4	0.2	2.8	24 Km N-E
Cia Minera Chungar	Islay mine	2.8	1.8	0.8	0.0	4.8	16 km N-E
Cia Minera Chungar	Alpamarca mine	2.0	1.0	0.8	0.1	1.6	8 Km E-S-E
Pan American Silver	Huaron mine	4.4	2.9	1.6	0.5	5.1	25 Km N-E

1.23 Other Relevant Data and Information

1.23.1 Project Schedule

A conceptual project schedule developed for the Santander Pipe project indicates that it is expected to be commissioned at the end of the second quarter of 2025. The development of the Santander Pipe project depends on an interim resource estimate, to be completed at the end of 2023, that would allow CDPR to start working on mine dewatering and shaft rehabilitation prior to completing the proposed infill drilling campaign and the corresponding mineral resource estimate.

DRA considers the conceptual schedule feasible but challenging. There is very little slack, and unforeseen delays could affect the ability to meet the expected mine commissioning target date.

1.23.2 Risk and Opportunities

The main risks identified by DRA are related to the dewatering of the old Santander mine and the sourcing of the hoisting system.

On the other hand, the project has the potential to increase the mineral resource inventory by confirming the condition of areas in the upper zone that were not mined by CMS. Also, an appropriate mining sequence could liberate over 0.5 million tonnes of mineral resources tied up in the proposed crown pillar.

1.24 Interpretation and Conclusions

The following Interpretation and conclusions in relation to this PEA are summarised below.

1.24.1 Mine Tenure and Agreements

The CDPR mining concessions comprise an irregular, north to northwest-trending block of 74 mining concessions covering a granted area of 6,453.52 ha for a total effective area of 4,829.89 ha which which encompasses on processing concession occupying 133.11 ha. All 74 concessions are registered under the name of CDPR as recorded in INGEMMET´s website and their registry of concessions in Geocatmin.

Under the terms of the share purchase agreement with Trevali, CDPR agreed to pay Trevali a Net Smelter Royalty (NSR) equal to 1.0% on all new deposits outside an NSR exclusion zone. The NSR royalty does not included the Magistral, Santander Pipe and Puajanca deposits or any other mineral occurrences within the exclusion zone.

A Life of Mine (LoM) off-take agreement exists between CDPR and Glencore, on all mineral mined from the Magistral deposits or extensions considering within a defined area, normalised to an elevation of 4200 masl. The Santander Pipe and other areas of interest on the property are not subject to the off-take agreement.

1.24.2 Geology and Mineral Resources

An independent revision and update of the Mineral Resources for the Santander Pipe deposits, effective as of 30th June 2022 was completed. This estimate incorporated modifications to the interpreted mineralization, and an NSR cut-off of US $40/t. The NSR values were calculated from the block estimates using a Zn price of US $3,000/t, Pb price of US $2,200/t, and an Ag price of US $25/oz. Indicated mineral resources between the 4,020 and 3,885 levels comprises 2+ years of production at 2,500 t/d, with a further 2 + years below the 3,885 level. There is upside potential beyond this mineral resource.

DRA considers that the following geological work is essential to moving this project forward at a PFS level.

- The CDPR Geological team must be strengthen.
- All geological processes must be reviewed, updated, and improved as necessary.
- Re-logging and re-sampling of old Santander Pipe drill holes must continue.
- Due to the depth and position of old Santander Pipe workings, it is considered more efficient and cost-effective to drill all additional drill holes from underground as the Santander Pipe mine is being dewatered.
- The geological model must be used to plan:

    - The number and meterage of infill stope definition drill holes required to update the Indicated Mineral Resources to Measured Mineral Resources;
    - The number of and meterage of infill holes required to convert Inferred Mineral Resources to Indicated Mineral Resources; and,

- The number and meterage of step-out drill holes required to add further Inferred Mineral Resources to the current inventory. This should include further exploration of the *Pipe North* area, and targeting the geomorphological anomaly noted by DRA further north of this area.

1.24.3 Dewatering of the Santander Mine and Rehabilitation of the La Cuñada Shaft

Dewatering the old Santander mine includes the following:

- Hydrology and hydrogeology studies of the Magistral and Santander Pipe mines, and the exploration area in between.
- A mine dewatering trade-off study of the Santander Pipe mine.
- Engineering of the selected mine dewatering system and refurbishment of the shaft.

The rehabilitation of the La Cuñada shaft includes the following:

- A comprehensive survey of the La Cuñada shaft.
- A costed engineering design for rehabilitating the La Cuñada shaft.
- The acquisition and commissioning of a hoisting system, together with supporting infrastructure and services.

1.24.4 Mineral Processing

CDPR first identified the advantages in acquiring the Santander Property in March 2021, and closed the purchase on the 3rd December 2021, with a view to establishing CDPR´s first producing operation.

Metallurgical testwork was conducted to investigate the possibility of upgrading the Santander processing plant to process mineralized material from the Santander Pipe Lower Zone. Commercially saleable concentrates were achieved in the projected LCT balance: 70% recovery and 21% grade for the copper concentrate and 89% recovery and 51% grade for the zinc concentrate. Modifications are required to the current Santander concentrator flotation circuit which allows to concentrate consecutively material from both the Magistral Mine and the Santander Pipe.

1.25 Recommendations

DRA makes the following recommendations in relation to the interpretations and conclusions made in this report.

1.25.1 Geology and Geological Modelling

The following main items are considered essential to moving this project forwards:

- Improvements need to be made to Geology staffing levels and geological processes.
- All CMS core needs to be re-logged, re-sampled and assayed and the indicated assay biases (old vs new) needs further study, and the geological model may have to be adjusted accordingly.
- To use the current geological model to plan al infill, step-out, and exploration drilling in relation to upgrading and improving the Mineral Resource estimate for the Santander Pipe mine and any adjacent mineralization.

1.25.2 Mine Development and Mining

The development of the Santander Pipe mine require the following:

- To carry out the water management studies currently being proposed by CDPR.
- A detailed survey of the La Cuñada shaft.
- Costed engineering designs are required for selecting the most cost-effective (CapEx and OpEx) way of dewatering and rehabilitating the La Cuñada shaft.
  - The selected rehabilitation design will require a costed engineering design for a hoist, headframe, and supporting infrastructure and services.
  - Costing should include the clearing of the bottom levels and the rehabilitation of the old alternative ladder way and mine evacuation route.
- A consolidated development plan that considers the CapEx and OpEx requirements of both the Magistral and the Santander Pipe mines in the medium term.

1.25.3 Recovery Methods

Prior to the next phase of the Project, a detailed metallurgical testwork program is recommended to ensure that the existing lead/copper flotation circuit is capable of producing clean saleable copper concentrates from the Santander Pipe Deposit. This would also confirm the flowsheet and equipment sizing requirements according to the preliminary testwork program conducted.

Additional testing will be required, including variability testwork, to determine any differences throughout the Santander Pipe orebody with respect to recovery and reagent consumption, as well as confirming that the envisaged copper/lead and zinc flotation circuits are able to process mineralized material from the Santander Pipe over the LOM.

2 INTRODUCTION

This Technical Report is specific to the standards dictated by NI 43-101 for Disclosure of Mineral Projects (30 June 2011), Companion Policy 43-101CP, and Form 43-101F1. The Mineral resource estimates reported in this Technical Report have been prepared in accordance with CIM Definition Standards for Mineral Resources and Mineral Reserves (10 May 2014 and 2014 CIM Definition Standards) and CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (29 November 2019). Mineral Resources are provided on an estimated basis at this stage and as such Mineral Reserves are not specified.

2.1 Issuer

Cerro de Pasco Resources Inc. (“CDPR”, “the Issuer” or “the Company) is a Canadian-based resource management company incorporated in the province of Quebec, Canada and headquartered at Unit 203, 22 Lafleur Ave, Saint-Sauveur, Quebec J0R 1R0. The Company’s Peruvian office is located at Av. Santo Toribio, No. 115, Of. 702, San Isidro, Lima. The Company trades on the CSE (CDPR), OTCMKTS (GPPRF) and Frankfurt (N8HP).

CDPR is a silver and zinc-focused base metals mining company with one commercially producing operation, the Santander mine in Perú. It is also the owner of the El Metalurgista concession in Cerro de Pasco, Peru, which has an inferred mineral resource of 42.9 Moz Ag in the Excelsior Stockpile (NI 43-101 Technical Report, El Metalurgista Concession – Pasco, Peru, CSA Global, August 2020).

CDPR was formed in 2012, when it acquired mining rights related to tailings and stockpiles located at Cerro de Pasco (the El Metalurgista Concession**). Cerro de Pasco Resources Sucursal del Perú (“CDPRS”)** is a subsidiary fully owned by CDPR, constituted in Peru on June 8th, 2018. According to Peruvian regulations, CDPRS has its own legal status, through which the parent company CDPR develops its activities in Perú. In that sense, the CDPRS corporate body is the same as the parent company in Canada and CDPRS does not need to have independent General Shareholders or Directors. Notwithstanding this legal structure, CDPRS has permanent legal representation and management autonomy in Perú, related to the activities assigned by the parent company, and in accordance with the powers of attorney granted to CDPRS representatives.

CDPR entered a share purchase agreement with **Trevali Mining Corporation** (“Trevali”) (TSX: TV) (BVL: TV) (OTCQX: TREVF) (Frankfurt: 4TI) on the 8th of November 2021 to acquire the **Santander Mine in Perú**, by way of a sale of the shares held by Trevali in its Peruvian subsidiary **Trevali Peru S.A.C**. (“Trevali Peru”). Under the terms of the Agreement, Trevali received 10 million common shares of CDPR, CA$1 million in cash, and a 1% Net Smelter Return Royalty on certain areas of the Santander Mine site that excluded areas on which there is currently a defined Mineral Resource.

The transaction was subject to customary closing conditions which were finalised on December 3rd, 2021. The full terms of the Agreement are provided in Section 4.4.2 (NSR Royalty).

The Santander mine is an established producing polymetallic mining operation, located in west-central Perú, approximately 215 km east-northeast of Lima. CDPR wholly owns the Santander mine complex. The Santander mine complex comprises a historically mined open pit and underground workings. Active underground operations (the Magistral mine) currently producing a nominal volume of 2,000 t/d that feeds the Santander process plant, which produces approximately 130-160 t/d of zinc concentrate at a nominal grade of 47.5 – 48.2 % zinc, and 13-18 t/d of lead concentrate with nominal grades of 47 – 48 % lead and 67 – 77 oz/t silver. The Santander mine complex also includes a tailings storage facility (TSF), as well as a 500-person camp and a granted concession area of area of 6,453.52 ha considering a total effective concession area of 4,829.89 ha.

The Santander mine complex is being operated extensively using contractors through CDPR management supervision. Contractors on-site include Martínez Contratistas e Ingeniería S.A. (MCEISA, mining contractor), Tecnomin Data S.A.C. (process plant operator), Prosegur (Security), SGS del Peru S.A.C. (on-site laboratory services and concentrate sampling) and Industrias Metalicas Alyer S.R.L (concentrate transport) amongst others.

The Company's recent acquisition of the Santander mine complex, associated infrastructure and resources, positions CDPR as an operating company which has the potential to develop a long-term integrated Project with significant exploration upside potential.

2.2 Terms of Reference

The scope of work for this report was defined in a term sheet executed between CDPR and DRA on 18 May 2022. The scope included mobilizing a team of Qualified Persons to review the technical information relevant to supporting a PEA-level study, including:

- Magistral Mine Mineral resource estimate as depleted to 31/12/2021,
- Santander Pipe Mineral resource estimate as last estimated, March 2020,

The scope also included compiling a Technical Report pursuant to National Instrument 43-101 to support the disclosure of Mineral Resource statements.

The QP responsibilities for each report section are listed in Table 2-1.

CDPR reviewed draft copies of this report for factual errors. Any changes made as a result of these reviews did not include alterations to the interpretations and conclusions reached by DRA. Therefore, the statements and opinions expressed in this document are given in good faith and in the belief that such statements and opinions are not false or misleading as at the date of this Report.

Table 2-1: Qualified Persons – Report Responsibilities

Section	Qualified Person
Section 1: Summary	All Authors
Section 2: Introduction	All Authors
Section 3: Reliance on Other Experts	All Authors
Section 4: Property Description and Location	Martin Mount
Section 5: Accessibility, Climate, Local Resources, Infrastructure and Physiography	Martin Mount
Section 6: History	Martin Mount
Section 7: Geological Setting and Mineralization	Martin Mount
Section 8: Deposit Types	Martin Mount
Section 9: Exploration	Martin Mount
Section 10: Drilling	Martin Mount
Section 11: Sample Preparation, Analyses and Security	Graeme Lyall
Section 12: Data Verification	Graeme Lyall
Section 13: Mineral Processing and Metallurgical Testing	Dave Frost
Section 14: Mineral Resource Estimates	Graeme Lyall
Section 15: Mineral Reserve Estimates	Excluded
Section 16: Mining Methods	Pete Ferreira
Section 17: Recovery Methods	Dave Frost
Section 18: Project Infrastructure	Javier Aymachoque
Section 19: Market Studies and Contracts	Javier Aymachoque
Section 20: Environmental Studies, Permitting and Social or Community Impact	Javier Aymachoque
Section 21: Capital and Operating Costs	Javier Aymachoque
Section 22: Economic Analysis	Javier Aymachoque
Section 23: Adjacent Properties	Martin Mount
Section 24: Other Relevant Data and Information	All Authors
Section 25: Interpretation and Conclusions	All Authors
Section 26: Recommendations	All Authors
Section 27: References	All Authors

2.3 Sources of Information

This technical report is based on information made available to DRA by CDPR in electronic data form using SharePoint and emails, as well as information collected during the site visits. The QP´s have no reason to doubt the reliability of the information provided by CDPR. Other information was obtained from the public domain in addition to items listed in Section 27 (References) of this Technical Report.

Various studies and reports have been collated, reviewed, and integrated into this Technical Report by the authors, assisted by CDPR personnel. Reports, plans, sections, databases, and documents referred to in this report are securely stored on the CDPR and DRA servers. The QP´s have taken all reasonable steps to verify the information provided. The Mineral Resource estimates were reviewed, updated, and reported on by Mr. Graeme D. Lyall of Lyall Consult SpA, contracted by DRA.

This report is based on the following sources of information:

- Information provided by CDPR.
- A site visit conducted between 13th and 17th of December 2021.
- Discussions with CDPR management and technical personnel.
- Information stored in the virtual data room created for the preparation of this report.
- Previous and current on-going technical studies, technical memorandums, site visit notes (not publicly disclosed).
- The two (2) historic Resource Estimates described in Section 14 (Mineral Resource Estimate), prepared by previous project owners (Trevali and/or consultants), reviewed for adequacy by Mr. Graeme D. Lyall.
- Data, maps, drawings, and other project information provided by CDPR.
- 2020−2021 actual and preliminary 2022 budget cost information provided by CDPR.
- Magistral mine’s productivity data.
- Contributions from independent consultants listed in Section 2.4.
- Additional information from Governmental and public domain sources.

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

The Qualified Persons have reviewed such technical information and have no reasons to doubt the reliability of the information provided by CDPR. The authors do not disclaim any responsibility for the information provided and reviewed.

2.4 Qualified Persons

The QP's either work for or were subcontracted by DRA which is a diversified global engineering, project delivery and operations management group headquartered in Perth, Australia, with a track record spanning more than three decades. Known for its collaborative approach and extensive experience in project development and delivery, as well as turnkey operations and maintenance services, DRA delivers optimal solutions that are tailored to meet clients' needs.

Internationally, DRA comprises more than 4,500 professionals, offering expertise in a wide range of resource engineering disciplines. DRA has a proven track record in undertaking independent assessments of Mineral Resources and Mineral Reserves, project evaluations and audits, technical reports, and independent evaluations on behalf of exploration and mining companies, and financial institutions worldwide.

This Report was prepared by the QP's listed in Table 2-1. The authors are QP's as defined in NI 43-101, with the relevant experience, education, and professional standing for the sections of the Report for which they are responsible.

DRA conducted an internal check to confirm that there is no conflict of interest in relation to its engagement in this project or with CDPR, and that there is no circumstance that could interfere with the QP's judgement regarding the preparation of the Technical Report.

The following QP's participated in the writing of this Technical Report:

- Mr. Martin Mount (FGS Cgeol, FIMMM Ceng), the Principal Author in the preparation of the Report and independent consultant and geoscientist, is a professional geoscientist and engineer in the fields of geology, Mineral Resource and Mineral Reserve estimation and classification, geotechnical engineering, geometallurgy and mine planning.

- Mr. Javier Aymachoque Tincusi (MAusIMM CP (Min)), co-Author and consulting mine engineer and project infrastructure specialist, is a professional engineer in the fields of mine engineering, mine operations, site wide mine and infrastructure design, environmental permitting, capital and operating cost estimation, and mineral economics.

- Mr. Graeme Lyall (FAusIMM), co-author, is an independent consulting geologist with over 30 years professional experience in precious and base metals exploration, geological modelling, and mineral resource estimation.

- Mr. Pete Ferreira (FSAIMM), co-author, DRA South Africa Principal Mining Engineer, with nearly 40 years of international experience in the mining sector, including backfill design and installation, raise boring, mine management, flat raise boring, and classified backfill.

- Mr. Dave Frost (FAusIMM), co-author, DRA Americas VP Process Engineering, consulting metallurgical engineer with more than 27 years of technical and management experience in plant operations, process plant design, commissioning, due diligence review, laboratory supervision and consulting.

Each of the Authors, by virtue of their education, experience, and professional association, is a Qualified Person as that term is defined in NI 43-101, with the relevant experience, education and professional standing for the sections of the Report for which they are responsible.

The following list of professionals assisted the QP's in the development of the NI 43-101 Technical Report:

- Dr. Karina Tuesta, an independent consulting engineer with over 19 years of experience in environmental and social studies and projects in the mining, energy, oil, and gas industries.

2.5 Qualified Person Property Inspection

With respect to claim tenure information, the authors and DRA have relied on an opinion letter from CDPR legal consultants, Rodrigo, Elias & Medrano Abogados of Lima Peru, who vetted the standing of the 72 original mining concessions and one beneficiation concession and other holdings before CDPR entered into the purchase agreement to acquire the Santander Project

Qualified Persons Messrs. Graeme Lyall and Javier Aymachoque conducted a five-day property visit to the Santander mine site between the 13th and the 17th of December 2021, as detailed in Sub-Section 12.1 (Site Inspections). The data verification activities conducted by the author during the site inspection included:

- Observation of the mineralization in surface outcrops and underground workings.
- Observation of the on-site analytical laboratory, and sample storage facilities.
- Verification of random drill collar surveys.
- Inspection of drill hole core from the Magistral and Santander Pipe deposits.
- Visit to underground mine and production faces.
- Review of supporting documentation of the historical data.
- Review of documents, reports, procedures and standards.
- Observation of execution capability.
- Visit to Project Infrastructure.

During the site visit, DRA's QP's held discussions with the site geology team and CDPR's management including:

- Mr. Shane Whitty, CDPR Vice-President Exploration & Technical Services, regarding the geology and tenure of the property.
- Mr. Diederik Duvenage, Vice-President Operations & Project, on project operational issues
- Mr. John Grewar, Vice-President Processing Operations (video conference meeting), on metallurgy, testwork and process plant layout and condition.
- Mr. Paul Camacho, Technical Services Manager, regarding mine planning and the underground operation at Magistral.

- Mr. Omar Saavedra, Senior Mine Geology Supervisor, regarding the mining method, underground geology and sampling protocols, grade control, stock piling and blending, mine to mill reconciliations, and drilling and development requirements.
- Mr. Edinson Rosell, Senior Exploration Geology Supervisor, regarding the property geology, geological controls on the mineralization, geological interpretation and the development of 3D models, and evidence supporting historical data.
- Mr. Víctor Loayza, Mine Superintendent, regarding underground mine operation management, extraction system, production rate, bottleneck in operations, geomechanics, mining method, mine dewatering system, dilution and recovery reconciliation and mining cost.
- Mr. Juan Poma, Ventilation Supervisor, regarding mine ventilation system and mine dewatering system.
- Mr. Manuel Lizandro Rodríguez Mariátegui Canny (Lima office meeting), Managing Director, on legal issues, legal due diligence, and concession status.
- Mr. Edwin Mitchell, Vice-President Safety, Health, Environment & Community, on environmental, community and health and safety requirements.
- Mrs. Yessica Juárez, Environment Lead on environmental and historical and ongoing permits.
- Mr. Julio Bazán, Senior Environment Supervisor, on environment issues of the project infrastructure.
- Mr. Frank Zambrano, Metallurgist, on the concentrator plant.
- Mr. Roberto Gago, Maintenance Superintendent, on mine and plant maintenance.

2.6 Effective Date

The Effective Date of this Technical Report is January 31st, 2023. This date reflects the day upon which all technical estimates are based, other than the Mineral Resource Estimate carried out previously to the date of June 30th, 2022.

DRA opinion contained herein, unless otherwise stated, is based on information collected by DRA throughout the course of its investigations. The information in turn reflects various technical and economic conditions at the time of writing the Report. Given the nature of the mining business, these conditions can change significantly over relatively short periods of time. Consequently, actual results may be significantly more or less favourable.

2.7 Units, Abbreviations and Currency

The Metric or SI System is the primary system of measure and length used in this Report and is generally expressed in kilometres (km), metres (m) and centimetres (cm); volume is expressed as cubic metres (m^3), mass expressed as metric tonnes (t), area as hectares (ha), and zinc, copper and lead grades as percent (%) or parts per million (ppm). The precious metal grades are generally expressed as gram/tonne (g/t) but may also be in parts per billion (ppb) or parts per million (ppm). Conversions from the SI or Metric System to the Imperial System are provided below and quoted where practical. Metals and minerals acronyms in this report conform to mineral industry accepted usage.

For the purpose of reporting the mineral resource estimates, silver is reported in grams per tonne (Ag g/t). Base metals, zinc (Zn %), lead (Pb %) and copper (Cu %), are reported in percentage (%). Conversion factors utilised in this report include:

- 1 troy ounce/tonne = 31.1035 grams/tonne,
- 1 gram/tonne = 0.0322 troy ounces/tonne,
- 1 troy ounce = 31.1035 grams,
- 1 gram = 0.0322 troy ounces.

The term gram/tonne or g/t is expressed as "gram per tonne" where 1 gram/tonne = 1 ppm (part per million) = 1,000 ppb (part per billion). Other abbreviations include ppb = parts per billion; ppm = parts per million; oz/t = ounce per tonne; oz/st = ounce per short ton; Moz = million ounces; Mt = million tonne; t = tonne (1,000 kilograms); st = short ton (2,000 pounds) and, SG = specific gravity.

Table 2-2 lists the abbreviations that may be used in this Report

Unless otherwise mentioned, all coordinates in this Report are provided in UTM Zone 18 South projection, WGS84 datum.

All currencies are expressed in U.S.A. Dollars (US$), unless otherwise stated. As of the Effective Date of this Report (31/01/2023), the Bank of Canada exchange rate between the US$ and Canadian dollar (CA$) and the US$ and Peruvian Sol (PEN) was approximately US$ 1.00 = CA$ 1.34 = PEN 3.84.

Table 2-2: Acronyms and Abbreviations

Abbreviation	Meaning or Units
'	Feet
"	Inch
$	Dollar Sign
$/m²	Dollar per Square Metre
$/m³	Dollar per Cubic Metre
$/t	Dollar per Tonne
%	Percent
% w/w	Percent Solid by Weight
¢/kWh	Cent per Kilowatt hour
°	Degree
°C	Degree Celsius
2D	Two Dimensions
3D	Three Dimensions
µm	Microns, Micrometre
µg	Microgram(s)
µg/m³	Micrograms per cubic metre
µPa	Micropascal
ADR	Adsorption, Desorption, Recovery
Ag	Silver
AP	Acid Potential
ARD	Acid Rock Drainage
As	Arsenic
AISC	All-In-Sustaining Costs
As	Arsenic
ASL	Above Sea Level
Au	Gold
AuEq	Equivalent Gold
AWG	American Wire Gauge
Az	Azimuth
bcm	Bank Cubic Metre
BFA	Bench Face Angle
Bi	Bismuth
BoQ	Bill of Quantities
BSG	Bulk Specify Gravity
BTU	British Thermal Unit
BWI	Bond Ball Mill Work Index
Ca	Calcium
$CaCO_3$	Calcium Carbonate
CAD	Canadian Dollar
CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditure or Capital Cost Estimate
Cd	Cadmium

Abbreviation	Meaning or Units
cfm	Cubic Feet per Minute
CFR	Cost and Freight
CIF	Cost Insurance and Freight
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
cm	Centimetre
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COG	Cut-Off Grade
COV	Coefficient of Variation
Cu	Copper
CWI	Crusher Work Index
dB	Decibel
dBA	Decibel with an A Filter
DEM	Digital Elevation Model
DCF	Discounted Cash Flow
DRA	DRA Américas Perú
DWI	Drop Weight Index
DMT	Dry Metric Tonne
DWT	Drop Weight Test
DXF	Drawing Interchange Format
E	East
EA	Environmental Assessment
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
ELVs	Emission Limit Values
EP	Engineering and Procurement
EPCM	Engineering, Procurement and Construction Management
Fe	Iron
FEED	Front End Engineering Design
FEL	Front End Loader
FeS_2 or Py	Pyrite
FOB	Free on Board
FS	Feasibility Study
ft	Feet
g	Gram
FW	Foot Wall
G&A	General and Administration
g/L	Grams per Litre
g/t	Grams per Tonne
gal	Gallons

Abbreviation	Meaning or Units
GCW	Gross Combined Weight
GDP	Gross Domestic Product
GPS	Global Positioning System
h	Hour
h/d	Hours per Day
h/a	Hour per Annum
H_2	Hydrogen
H_2O	Water
H_2SO_4	Sulphuric Acid
ha	Hectare
HDPE	High Density Polyethylene
HFO	Heavy Fuel Oil
Hg	Mercury
HVAC	Heating Ventilation and Air Conditioning
HW	Hanging Wall
Hz	Hertz
I/O	Input / Output
in	Inches
IRR	Internal Rate of Return
ISO	International Standards Organisation
IT	Information Technology
JORC	Joint Ore Reserves Committee
JV	Joint Venture
K	Kelvin
kg	Kilogram
kg/L	Kilogram per Litre
kg/t	Kilogram per Tonne
kL	Kilolitre
km	Kilometre
km/h	Kilometre per Hour
koz	Kilo ounce (troy)
kPa	Kilopascal
kt	Kilotonne
kV	Kilovolt
kVA	Kilovolt Ampere
kW	Kilowatt
kWh	Kilowatt-Hour
kWh/m^2	Kilowatt-Hour per Square Metre
kWh/t	Kilowatt-Hour per Tonne
L	Litre
L/h	Litre per Hour
lbs	Pounds
LCT	Locked Cycle Test
LG	Low Grade

Abbreviation	Meaning or Units
LOM	Life of Mine
Ltd	Limited
LV	Low Voltage
m	Metre
m/h	Metre per Hour
m/s	Metre per Second
m^2	Square Metre
m^3	Cubic Metre
m^3/d	Cubic Metre per Day
m^3/h	Cubic Metre per Hour
m^3/y	Cubic Metre per Year
mA	Milliampere
masl	Meters Above Sea Level
mg	Milligram(s)
Mg	Magnesium
mg/kg	Milligram per Kilogram
mg/L	Milligram per Litre
$mg/m^2/day$	Milligram per Square Metre per Day
min	Minute
min/shift	Minute per Shift
mL	Millilitre
ML	Metal Leaching
mm	Millimetre
mm/d	Millimetre per Day
Mm^3	Million Cubic Metres
MINEM	Ministry of Energy and Mines of Peru
Mn	Manganese
Mt	Million Tonnes
Mtpa or Mt/a	Million Tonne per Annum
M USD	Million United States Dollars
MV	Medium Voltage
MVA	Mega Volt-Ampere
MW	Megawatts
MWh/d	Megawatt Hour per Day
My and Ma	Million Years
N	Nitrogen
N	North
NAAQS	National Air Quality Standards
NaCN	Sodium Cyanide
NAG	Non-Acid Generating
NaHS	Sodium Hydrosulfide
NE	Northeast
NGO	Non-Governmental Organisation

Abbreviation	Meaning or Units
NGR	Neutral Grounding Resistor
NI 43-101	National Instrument 43-101
Nm³/h	Normal Cubic Metre per Hour
NNE	North - Northeast
NNP	Net Neutralisation Potential
NP	Neutralisation Potential
NPV	Net Present Value
NSR	Net Smelter Return
NTP	Normal Temperature and Pressure
NW	North West
O/F	Overflow
OPEX	Operating expenditure / Operating cost estimate
oz	Troy ounce (31.1034768 grams)
p	Pressure
P&ID	Piping and Instrumentation Diagram
Pa	Pascal
PAG	Potential Acid Generating
Pb	Lead
PF	Power Factor
PFC	Power Factor Correction
pH	Potential of Hydrogen
PLC	Programmable Logic Controller
ppm	Parts per Million
psi	Pounds per Square Inch
PSAD56	Provisional South American Datum of 1956
Pt	Platinum
Py	Pyrite
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance / Quality Control
QP	Qualified Person
RF	Revenue Factor
RFQ	Request for Quotation
ROM	Run of Mine
rpm	Revolutions per Minute
S	South
S	Sulphur
S/R or SR	Stripping Ratio
SABC	SAG and Ball (Milling) Circuit
SAG	Semi Autogenous Grinding
Sb	Antimony
scfm	Standard Cubic Feet per Minute

Abbreviation	Meaning or Units
SE	South East
s	Second
SG	Specific Gravity
SO_2	Sulphur Dioxide
SoW	Scope of Work
SPI	SAG Power Index
SW	South West
t	Tonnes
t/d or tpd	Tonne per Day
t/h or tph	Tonne per Hour
t/h/m	Tonne per Hour per Metre
t/h/m²	Tonne per Hour per Square Metre
t/m or tpm	Tonne per Month
t/m²	Tonne per Square Metre
t/m³	Tonne per Cubic Metre
ton	Short Ton
tonne or t	Metric Tonne
ToR	Terms of Reference
TOS	Trade-Off Study
tpa or t/a	Tonne per Annum
TSF	Tailings Storage Facility
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
TSX	Toronto Stock Exchange
U/F	Under Flow
U/S	Undersize
US, USA	United States (of America)
USD, $ USD, US$	United States Dollar
USGPM	US Gallons per Minute
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
V	Volt
W	Watt
W	West
WGS	World Geodetic System
w/o	Waste / Ore
X	X Coordinate (E-W)
XRD	X-Ray Diffraction
XRF	X-Ray Fluorescence
Y	Year
Y	Y coordinate (N-S)
Z	Z coordinate (depth or elevation)
Zn	Zinc

3 RELIANCE ON OTHER EXPERTS

This report has been prepared by DRA. The information, conclusions, opinions, and estimates contained herein are based on:

- Information made available to DRA at the time of preparation of this report.
- Assumptions, conditions, and qualifications as set forth in this report, and
- Data, reports, and other supporting information supplied by CDPR and other sign-off parties.

DRA and the QP's contracted to prepare this current report, have relied upon CDPR and its management for information related to underlying contracts and agreements pertaining to the acquisition of the mining claims and their status, together with technical information not in the public domain. The Property description (Section 4) presented in this Report is not intended to represent a legal, or any other opinion as to title.

With respect to claim tenure information in Section 4, DRA and the Qualified Persons have relied on an opinion letter from CDPR's legal consultants, Rodrigo, Elias & Medrano Abogados of Lima Peru, who vetted the standing of the original 72 Santander concessions and other holdings before CDPR entered into the agreement to acquire Santander Mine in Peru by way of the purchase of shares held by Trevali in its Peruvian subsidiary Trevali Peru S.A.C. ("Trevali Peru") ("R.A.") (Rodrigo et al., Memorandum Santander Concessions), which can be seen in Appendix A of the previous NI 43-101 Technical Report prepared by DRA and dated 31/12/2021.

DRA and the QP's have relied upon CDPR for the metal market analysis as summarized in Section 19.

DRA was informed by CDPR that there are no known litigations potentially affecting the Santander Pipe Project or Properties.

4 PROPERTY DESCRIPTION AND LOCATION

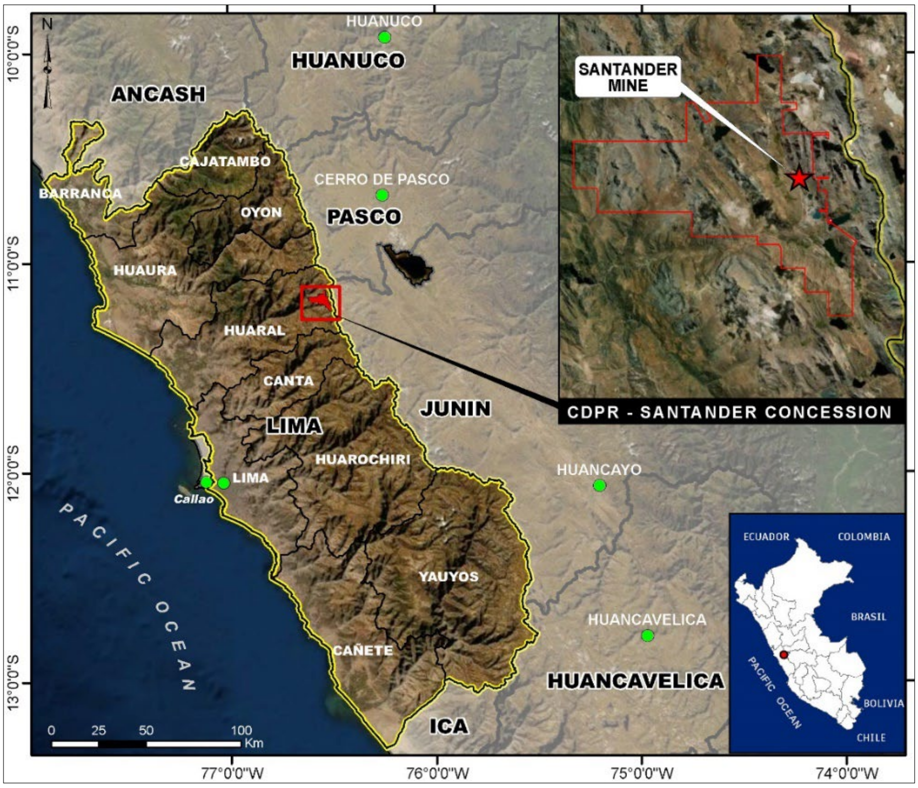
4.1 Property Location

The CDPR mining concessions specified in this report (hereinafter referred to as the Property) are located approximately 215 km north-east of the capital city of Lima in the district of Santa Cruz de Andamarca, province of Huaral, Department of Lima. Geographic coordinates for the centre of the property are 11º 11' 28" south latitude and 76º 31' 17" west longitude, and at an elevation between 4,400 a 4,750 masl (Figure 4-1). The entire property covers an area of 4,829.89 ha. The Santander Mine is located within this property.

4.2 Property Ownership

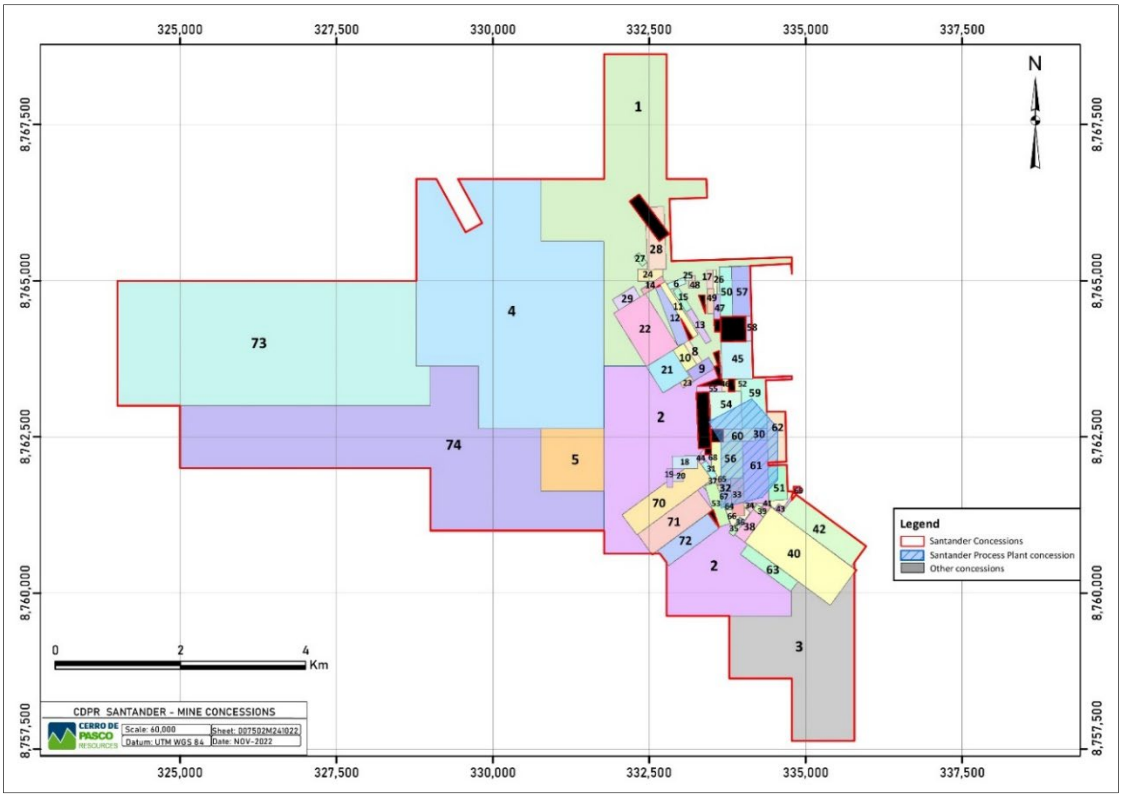
The Property comprises an irregular, north to northwest-trending block of 74 mining concessions (Figure 4-2 and Table 4-1) covering a granted area of 6,453.52 ha for a total effective area of 4,829.89 ha which encompasses one beneficiation (processing) concession occupying 133.11 ha. The reason for the variance in hectares, is that the five largest (Atoj 1 to 5) of the 72 concessions are older, irregularly orientated concessions and their hectarage has not been deducted by MINEM from the larger overlying concessions. The older concessions include some small concessions pertaining to Compañia Minera Chungar S.A.C. which have preference over Atoj 1 and Atoj 2 (Figure 4-2). However, these do not affect CDPR´s production areas and currently known exploration potential.

Figure 4-1: Map of Lima Department showing the Location of the CDPR Concessions and Santander Mine



Source: CDPR (2022).

Figure 4-2: Image Distribution of Santander Property Mining and Beneficiation concession



Source: CDPR (2022).

The Property concessions grant the titleholder the right to conduct exploration activities and exploitation of metallic and non-metallic materials within a determined area for an indefinite term (subject to compliance with applicable obligations), and the ownership of extracted minerals is vested in the holders of the mining concessions. A beneficiation concession grants the right to concentrate, smelt or refine minerals already mined. To exercise such mining and beneficiation rights, it is necessary to obtain permits and authorizations as required by law, from the respective authorities. An overview of the Peruvian Mining Law and regulations is presented in Appendix B of the previous NI 43-101 Technical Report prepared by DRA and dated 31/12/2021.

CDPR legal consultants (Rodrigo, Elias and Medrano) performed due diligence on the original 72 mining and one beneficiation concessions before CDPR entered into a share purchase agreement to acquire said company (Rodrigo Elias and Medrano, October 2021): (Appendix A of the previous NI 43-101 Technical Report prepared by DRA and dated 31/12/2021). Two additional concessions were granted during 2022, to the west of the original group.

All holders of mining concessions are required to pay good standing fees, called validity fees. These fees are calculated based on the concession extension and paid on an annual basis to

INGEMMET[1]. Failure to pay validity fees for two years results in the cancellation of the mining concession. Validity fees paid in 2022 on the Property mining concessions total US$16,418.60 and annual fees paid in 2022 for the beneficiation total US$2,069.61 (Table 4-1).

In addition to the annual validity fees, holders of mining concessions must achieve a minimum production level of one Tax Unit per hectare per year[2] within a 10-year term following the year in which the respective mining concession title was granted. If such minimum production is not reached within the referred term, the mining titleholders are required to pay a penalty equivalent to: 2% of the minimum production (between year 11 and 15), 5% of the minimum production (between year 16 and 20), and 10% of the minimum production (between year 21 and 30). Titleholders of mining concessions have a 30-year term to achieve the minimum production levels set by law. If minimum production is not reached within this term, the respective mining concession is cancelled. In principle, the 30-year term is counted from the year following the granting of a mining concession title. However, for those concessions granted before December 31, 2008, the term is counted as from January 2009. Penalty fees paid in 2021 on the projects mining concessions totalled US$1,121.21.41 (Table 4-1).

4.3 Property Description

The Property consists of 74 mining concessions (Figure 4-2) and one beneficiation concession (Figure 4-2 and Figure 4-3). All 74 concessions are registered under the name of CDPR as reorded in INGEMMET´s website and their registry of concenssions in Geocatmin.

The registry records the concession name, code, date issued, the granted and effective areas, validitiy fees, and any penalties arising as summarised in Table 4-1.

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1 The Instituto Geológico, Minero y Metalúrgico: the current validity fee is US$ 3 per hectare per year.

2 Reduced minimum production requirements are applicable for non-metallic concessions and for artisanal and small mining producers

Table 4-1: Mining and Beneficiation Concessions – Santander Property

N°	Concession	Code	Date Issued	Granted Area	Effective Area-Total (ha)	Registered Titleholder	Public Registry file	Validity fees (US$) 2022	Production Penalties (US$) 2021
1	ATOJ 1	010226707	26/05/2008	1000	584.5316	001485-2008-INGEMMET/PCD/PM	12279041	$1,753.60	
2	ATOJ 2	010226807	14/12/2007	1000	515.9589	002881-2007-INGEMMET/PCD/PM	12280565	$1,547.88	
3	ATOJ 3	010226907	14/08/2007	400	340.5506	000437-2007-INGEMMET/PCD/PM	12281129	$1,021.65	
4	ATOJ 4	010227007	14/08/2007	1000	973.2428	000449-2007-INGEMMET/PCD/PM	12281101	$2,919.73	
5	ATOJ 5	010227107	9/07/2007	100	100	000934-2007-INGEMMET/PCD/PM	12281060	$300.00	
6	ATOJ 6	010406407	12/12/2007	2.8117	2.8117	002607-2007-INGEMMET/PCD/PM	12280495	$8.44	
7	MAGISTRAL	11000091Y02	10/02/1928	4	3.9932	77-RM	2009275	$11.98	
8	MAGISTRAL N° 2	11000098Y02	3/05/1929	20	19.9689	RM Nº 102	2006746	$59.91	
13	MAGISTRAL N° 4	11000102Y01	3/05/1929	8	7.9875	RM Nº 101-29	2009274	$23.96	
12	MAGISTRAL N° 5	11002704X01	3/05/1929	8	7.9873	RM Nº 100	2006748	$23.96	
14	MAGISTRAL N° 6	11002818X01	31/01/1931	10	9.9841	RM Nº 56	2006777	$29.95	
9	MAGISTRAL N° 7	11002819X01	28/02/1931	6	5.9906	RM Nº 106-31	2006752	$17.97	
10	MAGISTRAL N° 8	11002823X02	4/01/1931	4	3.9938	RM Nº 172	2006749	$11.98	
11	MAGISTRAL N° 9	11002823X01	20/12/1943	4	3.9936	RM-2439	2006754	$11.98	
23	SAN JOSE N° 1	11014192X01	22/08/1966	45	44.9457	328-RD	2010890	$134.84	$952.19
24	SAN JOSE N° 11	11021055X01	29/09/1988	1	1	RD.419-88-EM-DGM-DCM	02029441	$3.00	

N°	Concession	Code	Date Issued	Granted Area	Effective Area-Total (ha)	Registered Titleholder	Public Registry file	Validity fees (US$) 2022	Production Penalties (US$) 2021
15	SAN JOSE N° 14	11021158X01	27/10/1977	3	2.9954	236-77-DGM-DCM	2017753	$8.99	
25	SAN JOSE N° 15	11021159X01	5/10/1988	4	3.9999	RD.453-88-EM-DGM-DCM	2029450	$12.00	
26	SAN JOSE N° 17	11021161X01	10/05/1988	2	2.0001	RD.431-88-EM-DGM-DCM	2029449	$6.00	
27	SAN JOSE N° 18	11021162X01	9/09/1988	30	30.0002	RD.383-88-EM-DGM-DCM	2029415	$90.00	
16	SAN JOSE N° 2	11014193X01	11/02/1966	8	7.9875	RD Nº 468-66	2010891	$23.96	
17	SAN JOSE N° 3	11014194X01	17/08/1966	3	2.9954	RD Nº 301-66	2010893	$8.99	
18	SAN JOSE N° 4	11014195X01	22/08/1966	2	1.9969	RD Nº 329-66	2010894	$5.99	
19	SAN JOSE N° 5	11016047X01	29/08/1966	25	24.9606	RD Nº 343-66	2015290	$74.88	
20	SAN JOSE N° 6	11016048X01	31/12/1965	60	59.9051	RD 1131-65	2015215	$179.72	
21	SAN JOSE N° 7	11016049X01	31/12/1965	2	1.9968	1107-RD	2015214	$5.99	
28	SAN JOSE N° 7	11021141X01	10/11/1982	8	7.9874	RD Nº 144-82-DCM	02029451	$23.96	$169.22
22	SAN JOSE N° 9	11021153X01	27/10/1977	8	7.9891	RD 235-77-DGM-DCM	2017740	$23.97	
29	SANTANDER	11002528X01	30/10/1922	4	3.9938	S/N	2002789	$11.98	
30	SANTANDER A	11008190X01	31/12/1959	3	2.9953	RD Nº 2905-59	2010991	$8.99	
31	SANTANDER B	11008191X01	16/05/1960	4	5.9907	RD Nº 643-60	2010865	$17.97	
32	SANTANDER C	11008192X01	25/04/1960	12	12.0003	468-RD	2010867	$36.00	
33	SANTANDER C.C.	11013296X01	31/12/1959	1	0.9985	RD Nº 2904-59	2010854	$3.00	
34	SANTANDER D	11008193X01	5/04/1960	2	1.9971	RD Nº 537-60	2010866	$5.99	

N°	Concession	Code	Date Issued	Granted Area	Effective Area-Total (ha)	Registered Titleholder	Public Registry file	Validity fees (US$) 2022	Production Penalties (US$) 2021
35	SANTANDER D.D.	11013282X01	31/12/1959	1	1.009	3032-RD	2010855	$3.03	
36	SANTANDER DEMASIA C.	11008749X01	18/12/1961	2.56	1.2099	RD Nº 1206-61	2011672	$3.63	
37	SANTANDER E	11008194X01	31/12/1959	10	9.9846	RD Nº 3028-59	2010853	$29.95	
38	SANTANDER EE	11013283X01	31/12/1959	2	1.9969	RD Nº 3031-59	2010858	$5.99	
39	SANTANDER F	11008195X01	16/05/1960	119	118.8198	RD Nº 644-60	2010863	$356.46	
40	SANTANDER F.F.	11013284X01	31/12/1959	1	0.9985	RD Nº 2885-59	2010856	$3.00	
41	SANTANDER G	11008196X01	16/05/1960	56	55.9144	614-RD	2010864	$167.74	
42	SANTANDER H	11008197X01	31/12/1959	1	0.9985	RD Nº 3030-59	2010852	$3.00	
43	SANTANDER M	11008961X01	28/11/1960	1	0.9985	RD Nº 1984-60	2011531	$3.00	
55	SANTANDER N° 10	11002784X01	28/02/1931	18	17.9717	RM Nº 105-31	2002788	$53.92	
59	SANTANDER N° 11	11002790X01	17/03/1931	4	3.9936	RM Nº 125	2006745	$11.98	
56	SANTANDER N° 12	11002791X01	4/01/1931	2	7.4884	RM Nº 171	2006750	$22.47	
61	SANTANDER N° 13	11002792X01	4/01/1931	24	23.9627	170-RM	2009270	$71.89	
49	SANTANDER N° 14	11002783X01	1/08/1944	30	29.9537	RM Nº 1325	2006747	$89.86	
50	SANTANDER N° 15	11002813X01	17/06/1931	2	1.9968	339-RM	2006753	$5.99	
54	SANTANDER N° 16	11002814X01	4/01/1931	16	15.975	RM Nº 169	2009271	$47.93	
51	SANTANDER N° 17	11002815X01	30/06/1931	4	3.9934	RM Nº 354-31	2009272	$11.98	
53	SANTANDER N° 18	11002816X01	7/03/1931	4	3.9938	RM 380-31	2006778	$11.98	

N°	Concession	Code	Date Issued	Granted Area	Effective Area-Total (ha)	Registered Titleholder	Public Registry file	Validity fees (US$) 2022	Production Penalties (US$) 2021
52	SANTANDER N° 19	11002817X01	3/07/1931	2	1.9969	RM Nº 379-31	2006779	$5.99	
44	SANTANDER N° 2	11002623X01	30/03/1929	32	31.9496	RM Nº 186	2002819	$95.85	
62	SANTANDER N° 21	11005565X01	10/05/1931	4	4.0157	RM Nº 546-31	2009273	$12.05	
45	SANTANDER N° 3	11000094Y02	13/08/1928	10	9.9846	RM Nº 384-28	2002812	$29.95	
46	SANTANDER N° 4	11000095Y01	13/08/1928	40	39.9372	RM Nº 385-28	2002816	$119.81	
47	SANTANDER N° 5	11000096Y02	8/08/1928	24	23.9621	RM Nº 377-28	2002821	$71.89	
48	SANTANDER N° 6	11002631X01	8/08/1928	20	19.9698	RM. 368	2004946	$59.91	
60	SANTANDER N° 7	11002650X01	5/03/1929	30	29.9531	RM Nº 103-29	2002820	$89.86	
58	SANTANDER N° 8	11000099Y01	5/05/1929	30	29.9529	RM Nº 98-29	2002822	$89.86	
57	SANTANDER N° 9	11000103Y02	3/05/1929	14	13.978	104-RM	2004947	$41.93	
63	SANTANDER Y	11011253X01	9/01/1960	1	1	RD Nº 1536-60	2010875	$3.00	
64	SANTANDER Z	11011254X01	9/01/1960	1	0.9999	RD Nº 1537-60	2010874	$3.00	
65	SANTANDERINA	11015169X01	31/12/1966	0.7875	0.7899	RD Nº 605-66	2015295	$2.37	
66	SANTANDERINA I	11015292X01	26/11/1973	9.6813	9.8372	RD Nº 365-73-DGM-DCM	2016451	$29.51	
67	SANTANDERINA II	11016022X01	2/07/1968	2.4875	2.4835	RD 199-68	2015639	$7.45	
68	SANTANDERINA III	11015637X01	31/12/1966	2.1908	2.2688	RD Nº 615-66	2015296	$6.81	
69	SANTANDERINA IV	11015638X01	23/05/1967	1	0.9983	RD Nº 136-67	2015223	$2.99	
70	SOCAVON BAÑOS	11005967X01	10/05/1931	60	59.9068	RM Nº 545-31	2004398	$179.72	

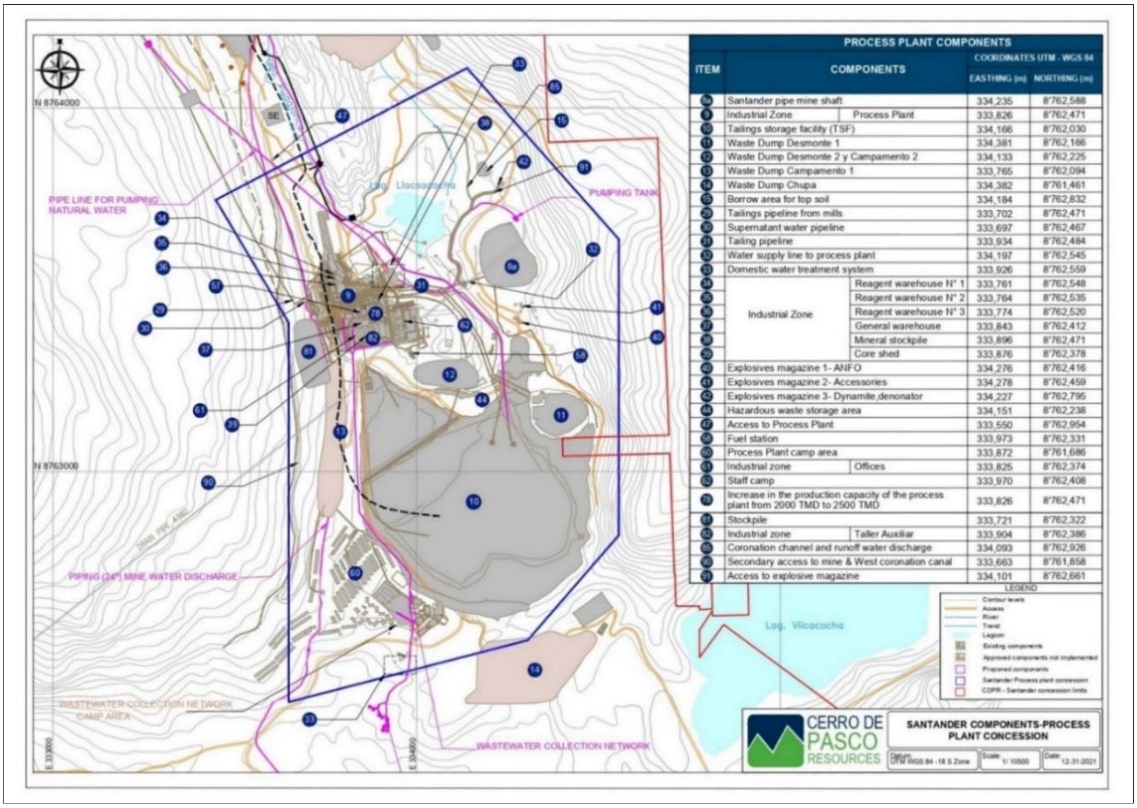
N°	Concession	Code	Date Issued	Granted Area	Effective Area-Total (ha)	Registered Titleholder	Public Registry file	Validity fees (US$) 2022	Production Penalties (US$) 2021
71	SOCAVON N° 1	11005968X01	12/01/1946	48	47.9256	112-RM	2004396	$143.78	
72	SOCAVON N° 2	11005969X01	1/08/1946	30	29.9532	46-RM	2004397	$89.86	
73	SANTANDER BLOCK 4	010077622	6/10/2022	1,000	603.86	3897-2022-INGEMMET/PE/PM	in process	$3,000.00	
74	SANTANDER BLOCK 2	010077822	6/10/2022	1,000	753.18	3898-2022-INGEMMET/PE/PM	in process	$3,000.00	
				6,453.52	**4,829.89**			**$16,418.60**	**$1,121.41**

Source: CDPR (2022).

N°	Concession	Code	Date Issued	Granted Area	Effective Area Total (ha)	Registered Titleholder	Public Registry file	Validity fees (US$) 2022	Production Penalties (US$) 2021
1	Planta Concentradora Santander	P000041511	7/5/2012	**133.11**	**133.11**	Resolución N° 145-2012-MEM-DGM/V	1329622	$2,069.61	

Source: CDPR (2022).

Figure 4-3: Area of beneficiation concession with associated infrastructure plotted.



Source: CDPR (2021).

Taxes, Royalties and Other Agreements

As of 2011, producing mining companies are required to contribute in accordance with the following fiscal regimes: Corporation Income Tax (CIT), Modified Mining Royalty (MMR) levy on the quarterly sales revenues from metallic and non-metallic mineral resources (Law No. 29788), Special Mining Tax (SMT) levies on the operating profit of metallic resources (Law No. 29789) and the Special Mining Contribution (SMC) applicable to entities that have entered into tax stability agreements with the government. (Law No. 29790). Table 4-2 shows the tax rates as indicated by SUNAT (Superintendencia Nacional de Administración Tributaria - National Superintendency of Tax Administration).

All payments of mining royalties, SMT and SMC contributions are deductible expenses for income tax purposes. Further, as an incentive for mining investment, an early recovery regime of Value Added Tax applies for mining entities in the exploration stage, as well as special tax depreciation for all mining companies with a stability agreement for mining equipment and machinery.

CDPR's acquisition of Santander Mine in Peru was by way of a sale of the shares held by Trevali in its Peruvian subsidiary Trevali Peru S.A.C. ("Trevali Peru") including all their permits, licenses and concessions located at the Santander mining complex. Under the terms of the Agreement, CDPR agreed to pay Trevali the following consideration:

- CAD1 million cash to be paid at closing.

- 10 million shares of CDPR, to be issued to Trevali, which will be released from escrow and freely tradable according to the following schedule: (i) 10% at closing of the transaction, and (ii) 15% every six months thereafter.
- A Net Smelter Royalty (NSR) equal to 1% on all new deposits outside the NSR exclusion zone.
- A contingent payment of up to USD2.5 million if the LME average zinc price for 2022 is equal to or greater than USD1.30/lb.

An existing off-take agreement with Glencore (Zinc and Lead concentrates) will be restricted to mineral from the Magistral deposits (Figure 4-4), and all other areas of the property exempt from such commitment.

Table 4-2: Applicable Taxes

Name	Tax Base	Tax Rate	Authority
Corporation Income Tax (CIT)	Profit before tax	28%	SUNAT
Modified Mining Royalty Tax (MMR)	Operating Income	1-12% depending on operating margin (minimum 1% of sales; deductible from CIT)	SUNAT
Special Mining Tax (SMT)	Operating Income	2-8.4% depending on operating margin (deductible from CIT)	SUNAT
Special Mining Contribution Tax (SMC)	Operating Income	4-13.12% depending on operating margin (deductible from CIT)	SUNAT

Source: SUNAT (2021).

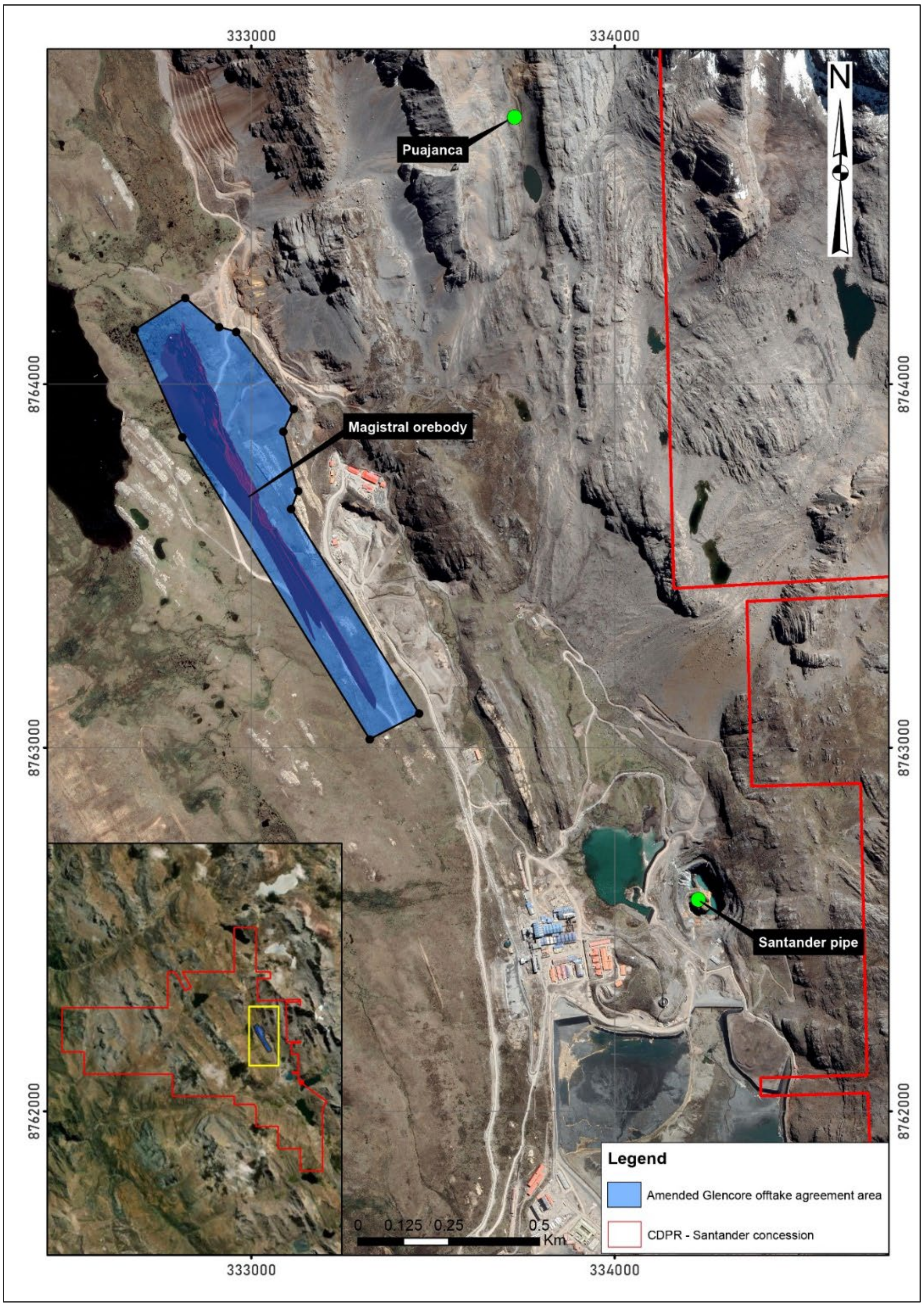
4.3.1 *Glencore Off-Take Agreement*

A Life of Mine (LoM) off-take agreement exists between CDPR and Glencore, a large, diversified resource conglomerate and commodity trader, on all mineral mined from the Magistral deposits or extensions considering the area shown in Figure 4-4. The boundary showing the off-take area in Figure 4-4 has been normalised to an elevation of 4200 masl. Previously the off-take agreement applied to the entire Santander property, however, an agreement was made with Trevali and Glencore to limit the off-take agreement to the Magistral orebodies alone. As such, the Santander Pipe and other areas of interest on the property are not subject to the off-take.

The off-take agreements are governed by Contract No. 062-15-33356-P dated December 1, 2015, providing for the sale of zinc concentrates from the Santander Mine, and Contract No. 180-15-33358-P dated December 1, 2015, providing for the sale of lead concentrates from the Santander Mine.

The concentrate off-take agreements apply standard benchmark treatment.

Figure 4-4: Modified Glencore off-take agreement area

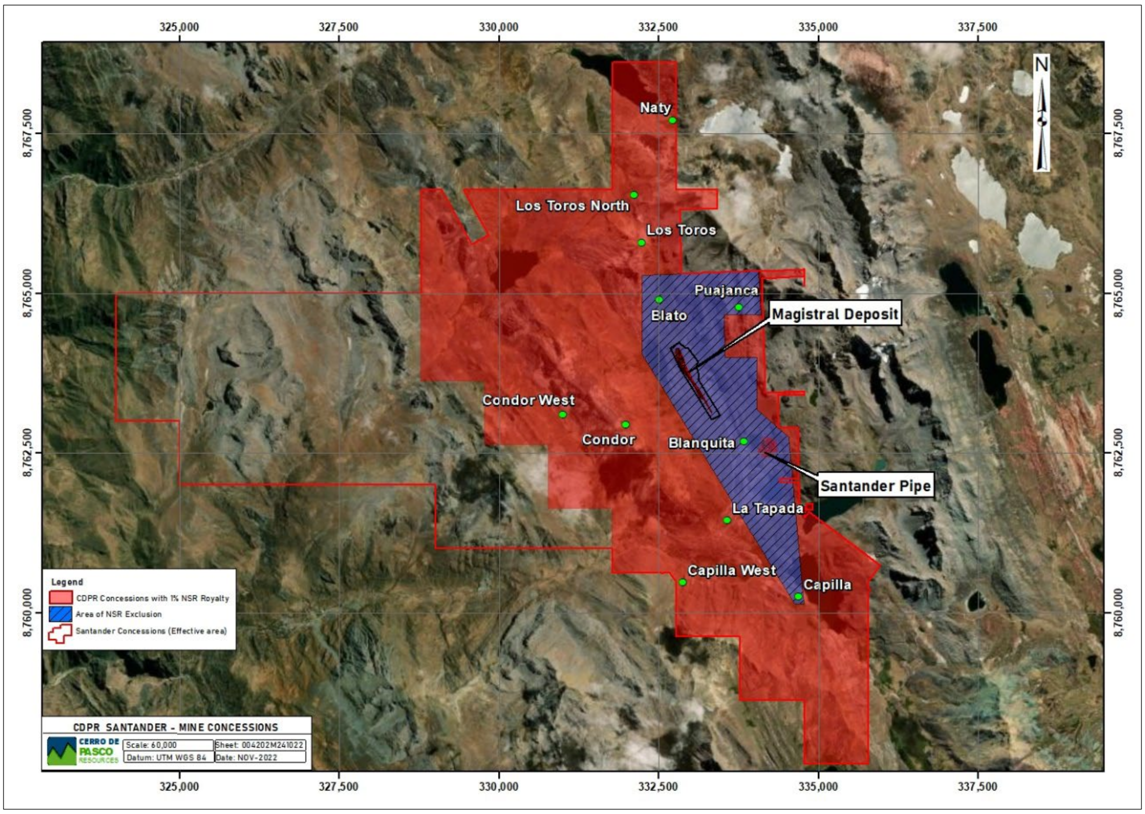


Source: CDPR (2022).

4.3.2 *NSR Royalty*

A 1% NSR Royalty was agreed with respect to any mineral found and mined outside of the exclusion zone shown in Figure 4-5. The NSR royalty does not include the Magistral, Santander Pipe and Puajanca deposits or any other mineral occurrences within the exclusion zone.

Figure 4-5: NSR exclusion Zone.



Source: CDPR (2022).

4.3.3 Surface Rights and Land Usage Agreements

Mining rights are independent from surface rights. Hence, the holders of mining rights may be different parties to those holders or owners of the coinciding lands. The holder of a mining concession must respect the landowner's property or rights of an occupier. A holder of mining rights cannot trespass such property or use surface lands without the landowner's or occupier's consent.

Mining concession holders may acquire or purchase lands, real estate properties, easements, rights of way, and/or other surface rights owned or held by third parties. If the owner or holder of such properties or rights is a local community, then such community's approval is required and, generally, an agreement must be negotiated with the community addressing their expectations in respect of the mining development.

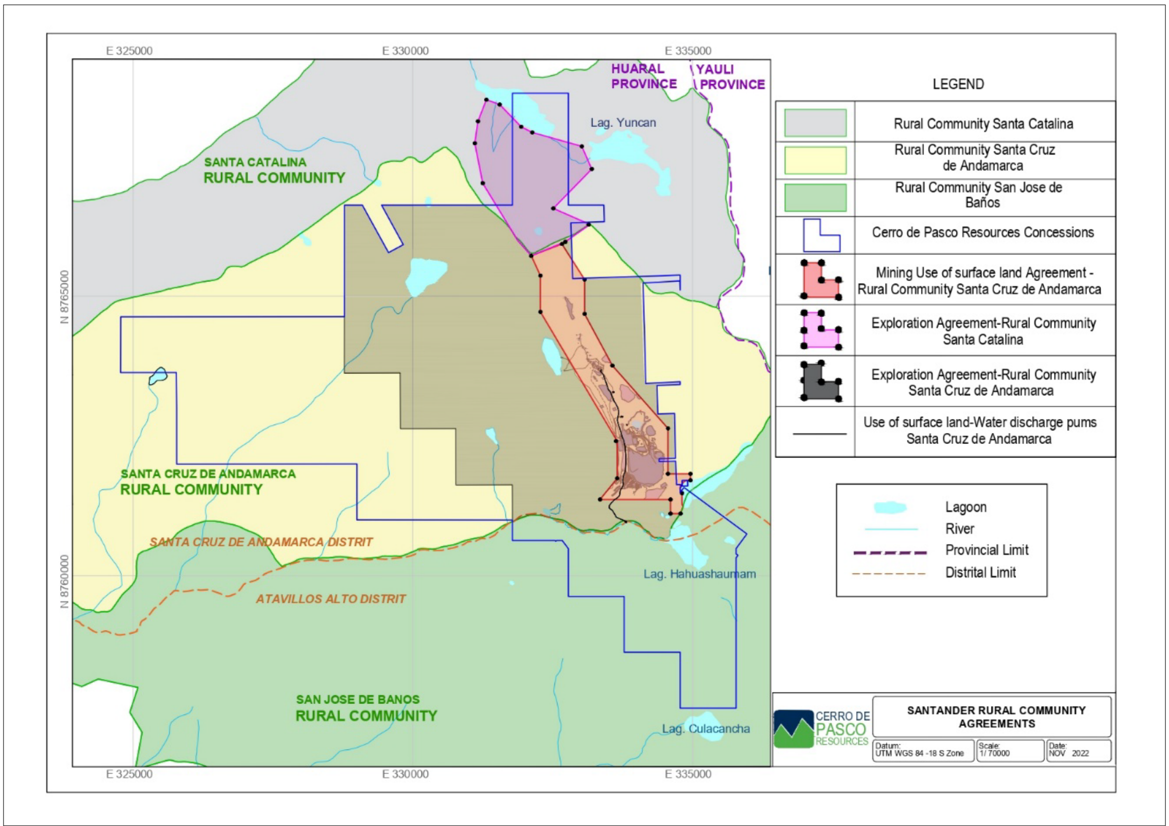
Neither CDPR nor its subsidiaries hold title to any of the land within or surrounding the Santander concessions. It does, however own surface rights for areas encompassing the mine and associated infrastructure, previously negotiated by Trevali. See Table 4-3.

Figure 4-6 shows the location of the surface rights that are currently active with the different communities within the Santander concession package.

Table 4-3: CDPR Surface Land Holdings

N°	Community	Agreement	Initial Date	Expiry Date
1	Rural Community of Santa Cruz de Andamarca	Authorization for Mining Use of surface land	27/09/2015	26/09/2030
			27/09/2015	21-Feb
2	Rural Community of Santa Cruz de Andamarca	Mining Exploration Authorization	1/1/2020	31/12/2024
3	Rural Community of Santa Cruz de Andamarca	Authorization to use of surface land - water discharge pipeline	The usage agreement is granted for the time that the pipeline will be required which would be end of mine closure or as long as the authorities request the installation to function.	
4	Rural Community of Santa Catalina	Mining Exploration Authorization	06 months validity from Trevali´s communication on the activities commence	

Figure 4-6: Location of land usage agreements



Source: CDPR (2022).

4.4 Water Rights

Water rights cannot be purchased in Peru, but they are commonly granted by the National Water Authority for industrial or mining purposes. Obtaining water permits is a prerequisite in Peru prior to any drilling or development being undertaken.

Water collection and discharge permits in use at the project are discussed in Section 20 Environmental and Permitting Considerations

Environmental and permitting considerations are discussed in Section 20. There is an expectation of environmental liabilities associated with historical mining and exploration activity. Under Law No. 28271, the responsibility for the remediation of environmental liabilities lies with the person or company that generated the liability. In the case of historical liabilities where the entity or person who generated the liability is unknown or no longer exists, the state-owned company AMSAC is charged with remediation on behalf of the government.

Environmental liabilities for mining projects are normally listed in the Ministry of Energy and Mines' (MINEM) Environmental Mining Liabilities registry (Spanish acronym PAM). No historic environmental liabilities are listed in the PAM for the Santander Property.

4.5 Social License Considerations

Social licence considerations are discussed in Section 20.

4.6 Other Risks

Mining rights are independent of surface rights. CDPR currently has adequate surface access to complete the work planned or recommended in this Technical Report, however as the Project advances, CDPR may need to increase the area of the beneficiation concession to include a larger TSF footprint.

It has been noted that some mines have temporarily closed in Peru due to community unrest under the current political regime. Given the good relationship that the Santander mine has with the local community this is not seen as a large risk in this particular case.

The Qualified Persons are unaware of any other significant risks which could affect access, title, or the right or ability to perform work planned or recommended in this Report for CDPR's mining and beneficiation concessions.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

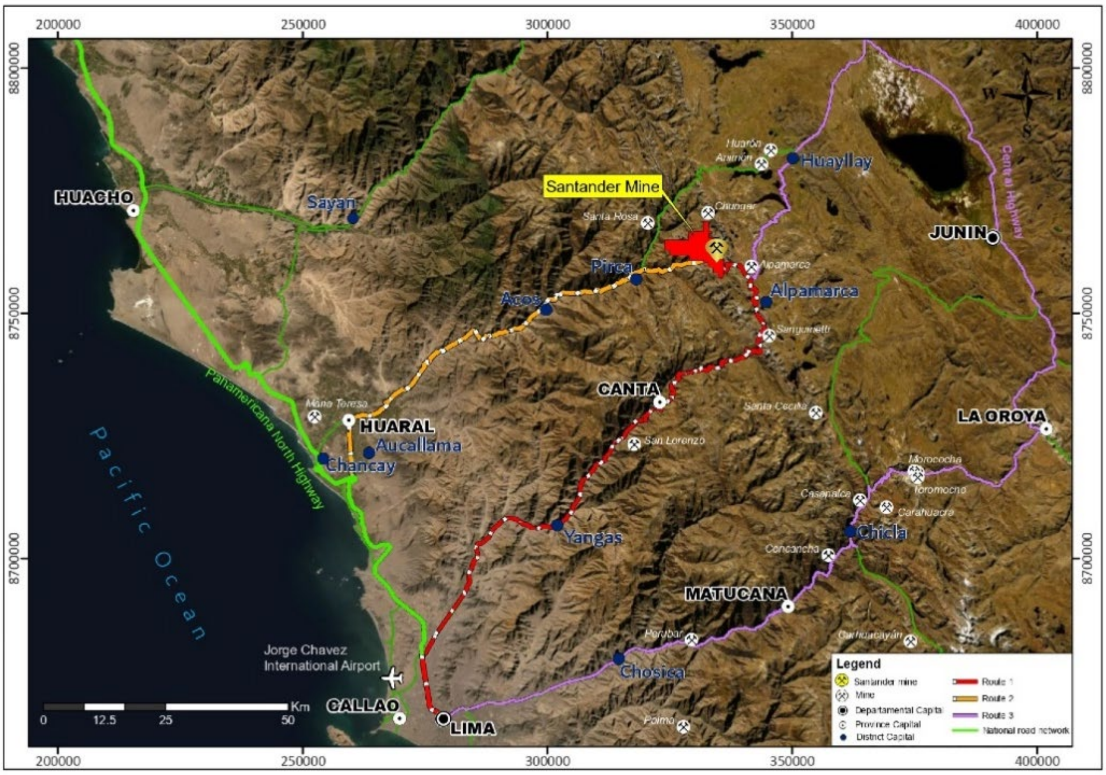
5.1 Access to Property

The Santander mine and associated infrastructure are located 55 km southeast of the town of Cerro de Pasco, approximately 175 km north northeast of the city of Lima. The property can be reached by one of two principal routes and one alternative route (Figure 5-1):

- Route 1 – Auxiliary Pan-American North highway from Lima followed by the 20A road to Canta. At the Alpamarca mine, left towards Santander Mine. The total distance is 275.4 km, and the driving time is approximately 4 hr 40 mins. This route is currently being upgraded by the Peruvian national government.
- Route 2 – Auxiliary Pan-American North highway from Lima followed by the 1N road to Huaral, then towards San Jose de Baños, Total distance is 279 km and driving time is approximately the same (4 hr 40 mins).
- Route 3 – Highway 22 from Lima to La Oroya, then by the 3N road from La Oroya to just before Villa Pasco. Left on the 101, Left on the 20A. The total distance is 315 km, and the driving time is approximately 7 hr 20 mins.

Route 1 is the principal access route used by CDPR to move people and material up to the mine. CDPR uses Route 2 if problems are reported with Route 1 (delays due to road maintenance etc.). Route 3 is used in the unlikely case that an event closes parts of Routes 1 and 2 and for concentrate transport in case of closing of sections of route 1, as route 2 is not suitable for concentrate hauling.

Figure 5-1: Location and access to the Santander Project



Source: CDPR (2022).

5.2 Climate, Physiography & Fauna and Flora

5.2.1 Climate

The Project area is located in the Puna Region (4,000 at 4,800 masl.), also called Jalca. The climate is characteristically cold and dry with temperature ranging between 20 ° C during the day and below zero at night between the months of December to May. During the months of December to March it presents frequent precipitations that appear in solid form as snow or hail.

According to the Thornthwaite Climate Classification, the climate of the Project area is within a semi-arid, rainy climate zone, with deficient rainfall in winter and with humidity classified as humid (B (i) D'H3).

The average annual rainfall assigned to the Project is 794.74 mm, the maximum rainfall was 1,269.09 mm and the minimum rainfall was 431.48 mm. The months with the highest intensity of precipitation in the surroundings of the Project extend from November to March and the months with the lowest intensity extend from April to October.

For the analysis of the direction and speed of the wind, the data recorded in the Picoy near-site station has been taken as a reference, with records from the year 2000 to 2015 (15 years), finding that the predominant wind direction is southwest (SW), which means that the winds come from the southwest (SW) and are directed towards the northeast (NE), with an average speed of 1.25 m/sec. According to the Beauford scale, they are classified as Ventolina and with 0.00% calm.

Since SENAMHI does not have Solar Radiation records at stations near the Project area, referential information on this parameter was obtained from the web page of NASA's Atmospheric Science Data Center (ASDC), where it was possible to obtain referential satellite data of solar radiation between the years 1983 to 2005 (23 years) in the Project area, taking into consideration a reference point, in geographical coordinates, to obtain the requested data, determining that the average multi-year solar radiation in the period 1983-2005 was 5.80 kWh/m2, with a maximum value of 7.48 kWh/m2 and a minimum of 3.91 kWh/m2.

Also based on the records of average, maximum and minimum relative humidity reported by the ASDC, the behavior of relative humidity was determined where the average wettest months are from December to April, which register values greater than 70%, decreasing moderately between the months of May to November.

Mining operations are possible throughout the year.

5.2.2 Physiography

The property is located along the western edge of the Peruvian Altiplano, with the main valley being at elevations of between 4,200 masl and 4,500 masl. Local ridges are quite steep, with peaks at elevations exceeding 5,200 masl. The highly dissected topography is typical of mountain glaciation, with many cirques and cols. A few remnant glaciers are present, but retreat has been quite extensive over the last 20 years, exposing more bedrock.

5.2.3 Fauna and Flora

The area is located in the Life Zone called Subtropical Alpine Pluvial Tundra, between 4,300 and 5,000 masl, corresponding to the Puna Ecoregion. The species that make up the life zone have adapted to withstand environmental conditions of intense cold and winds, generally developing habitats ranging from hilly grasses at ground level, padded or padded grass clusters, shrubs, subshrubs, and bunches of short to medium grasses.

Fauna species include birds such as the “mountain partridge”, the “Andean woodpecker” and mammals such as vicuñas, mice, and bats. In the Baños River there is presence of "rainbow trout" which is a species native to the northern hemisphere and introduced decades ago in Peruvian territory.

Environmental baseline studies completed by previous operators document the fauna and flora within the Project footprint (EIA 2009, MEIA 2012, MEIA 2019). This baseline work has been updated for different Technical Supportive Reports (ITS) and permit applications, and documents the fauna and flora of the project area in detail.

5.3 Local Resources and Infrastructure

5.3.1 Local Resources

The Project is located in the district of Santa Cruz de Andamarca and Atavillos Alto, in the province of Huaral and the Lima region. The operation is situated in a section of the superficial lands of the rural community of Santa Cruz de Andamarca, with whom the company has signed an easement agreement. However, the town closest to the operation is the rural community of San José de Baños, which is part of the area of indirect social influence and located in the district of Atavillos Alto.

All the superficial components of the operation are located between 4,400 and 4,750 masl, where, due to the altitude and geographical location, no agricultural activities or high Andean livestock farming is practiced.

The main access road from Lima to the mine unit is through an affirmed highway of the national road network that is currently being paved and runs through the town of Canta.

Most of the settlers in the area are subsistence farmers, while others work for mining companies or are engaged in commerce.

Both Santa Cruz de Andamarca and San José de Baños have medical centres, categories I-2 and I-1 respectively. In Santa Cruz de Andamarca, there is an educational institution that offers initial, primary and secondary education, and in San José de Baños there is an educational institution for initial and primary education.

Most of the goods and services required for the Project can be purchased locally or in the capital Lima. The community of Santa Cruz de Andamarca, through its communal company ECOSA, rents out machinery such as a front-end loader and dump trucks to the Project. There are no other local suppliers of machinery or equipment in the area.

5.3.2 Infrastructure

Infrastructure is well-developed, with a fully equipped 500-person camp centrally located on the flat-bottom valley site (Figure 5-2). Several shallow lakes occupy the upper reaches of some of the glacial valleys and provide sufficient water for the mining/milling activities. Trevali, the previous owners, entered into long-term surface rights agreements with the local communities which CDPR has inherited with the purchase of the Property.

The Ministry of Transport and Communications has commenced significant infrastructure upgrades on the roads that provide access to the mine site, some of which have been completed. Upgrade, optimization, and maintenance contracts span a 15-year period.

The Project infrastructure (Figure 5-2) consists of:

- The Santander base and precious metals concentrator, permitted at 2,500 tpd;
- Pumping and water treatment, separate underground pumping systems for acidic (approximately 15% of total) and neutral waters (approximately 85% of total), surface drainage and pumping network, acid neutralization facility and industrial water treatment facility.
- Tailings Storage Facility (TSF);

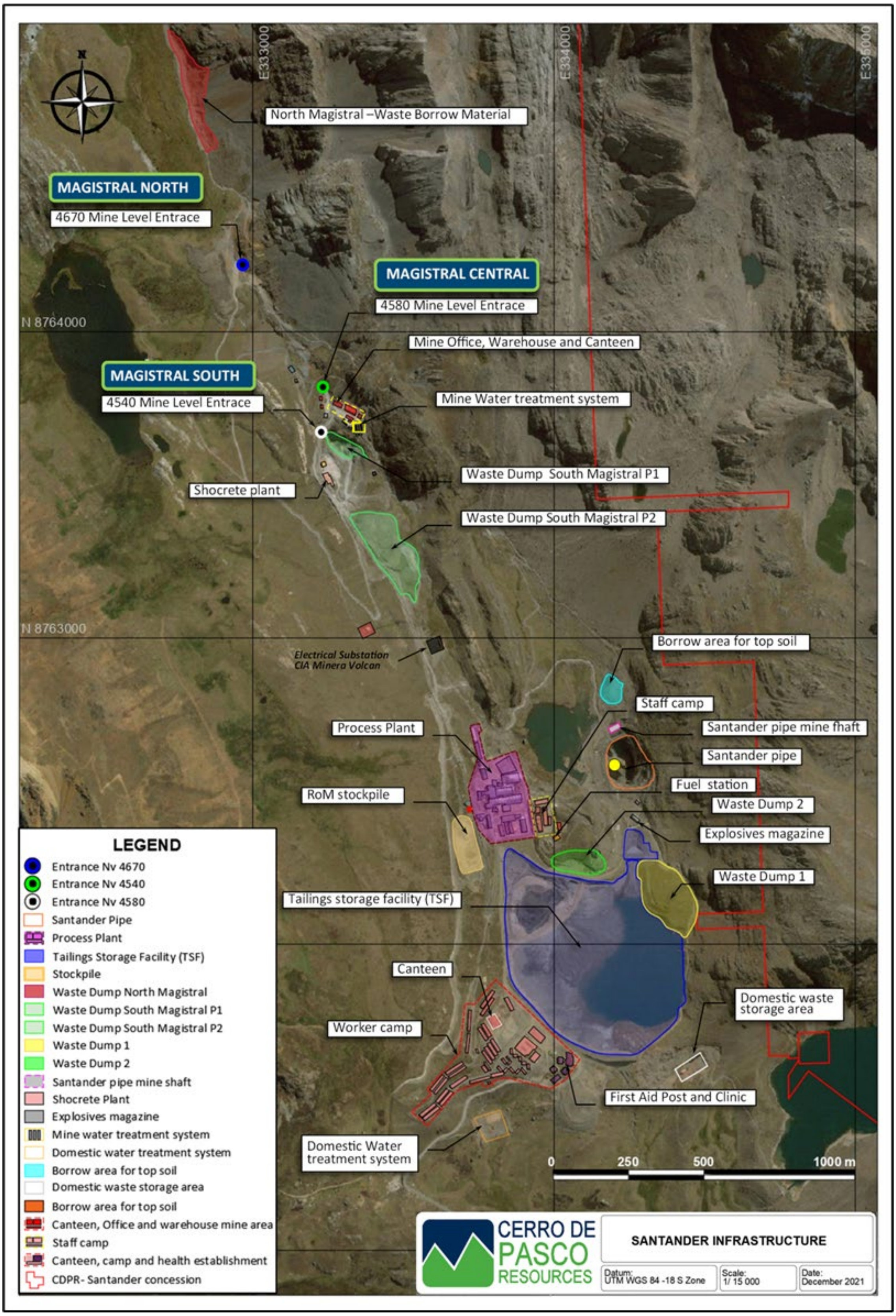
- On-site facilities including safety/security/first aid/emergency response buildings, core sheds, assay laboratory, plant guard house, dining facilities, offices, etc.
- Mine services facilities including truck shop, shotcrete plant, truck wash facilities, warehouse, fuel storage and distribution facilities, reagent storage and distribution facilities, explosives magazine and staff accommodation.
- Electrical substations: the principal central substation, substation No 6 (mine level 4370 MC), No 7 (mine level 4300 MN), No 08 (mine level 4300 MC), No 09 (mine level 4230 MC), No 10 (mine level 4370 MC), and No 11 (mine level 4160 MC).
- Network communications include telephone connections (Telefónica del Peru), limited cellular network coverage, radios, internet via Wi-Fi and cable and an on-site server with a link to the Lima office.

A complete description of the project infrastructure is provided in Section 18.

5.3.3 Adequacy of Project Size

At this time, the Project holds sufficient concessions necessary for ongoing mining operations (including tailings storage areas, waste disposal areas, and processing plant sites) and proposed exploration activities at the Property. The adequacy of the current concessions' area for potential future expansion of mining and processing infrastructure will be further assessed by subsequent engineering studies as the Project advances (Figure 5-2).

Figure 5-2: Location of infrastructure



Source: CDPR (2021).

6 HISTORY

There has been a long history of exploration and mining of the Santander Pipe deposit, with some of the existing mining concessions dating back to the early 1900s. There are extensive, but incomplete records relating to the last period of working (1979-1991). The most relevant documents are referred to in the following subsections.

6.1 Ownership and Exploration History

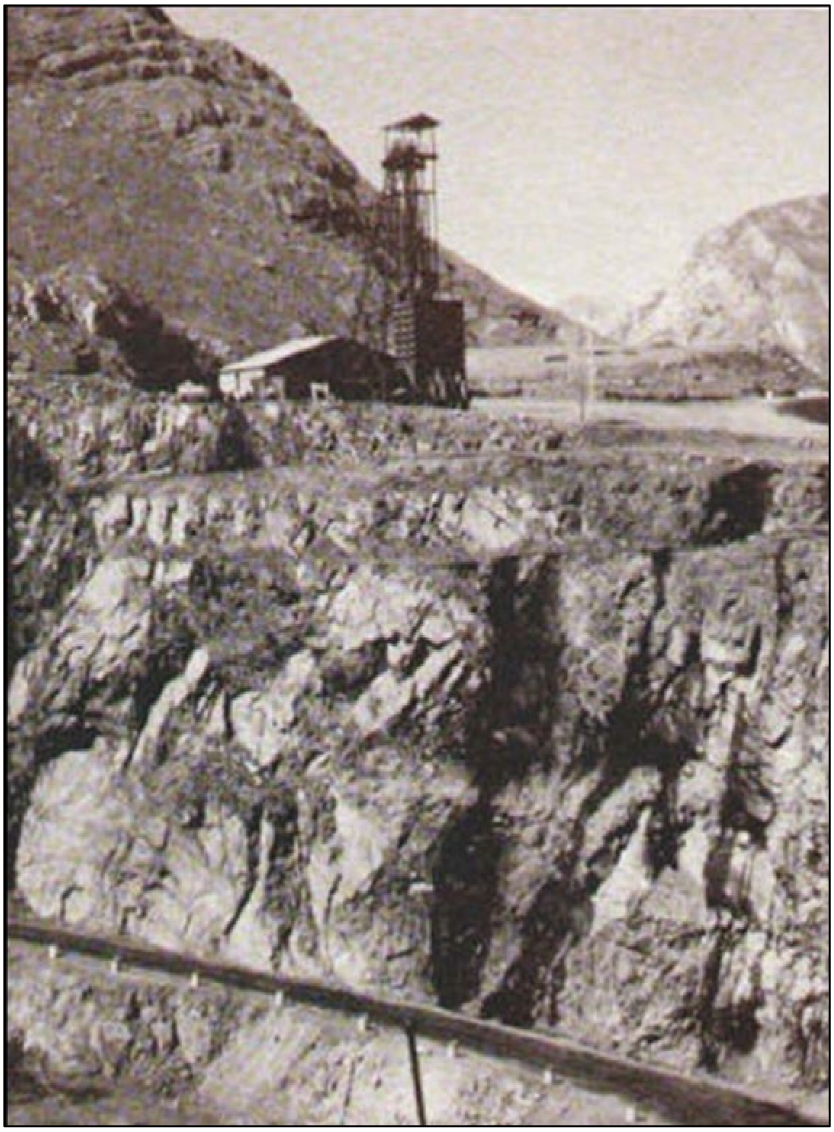
The earliest recorded work at the Santander property was carried out in 1925, when the mineral rights to the district were acquired by Rosenshine and Associates. In 1928, the United Verde Copper Company optioned the property and carried out a program of exploration and core drilling in the Santander Pipe area, the results of which are unknown. In the 1940s, the National Lead Company explored the area and conducted further drilling. This work confirmed the existence of significant silver-lead-zinc mineralization at what was to become known as the Santander Pipe.

In 1957, St. Joe Minerals of New York, USA (St. Joe) registered the Peruvian subsidiary Compañia Minerales Santander Inc and completed a detailed evaluation of the Santander Pipe, and estimated a near-surface resource of approximately 2.5 Mt of high-grade lead-zinc mineralization with associated silver values that could be exploited by open pit methods. St. Joe also estimated that a further 2 Mt of resources could be exploited by underground mining methods. Compañia Minerales Santander, Sucursal de Perú, was formed on 9 April 1957 as a Peruvian subsidiary of St. Joe to exploit the identified resources, primarily lead and silver. The company built a 500 t/d concentrator plant which was subsequently increased to between 850 t/d and 1,000 t/d. At the same time, a run-of-river hydroelectric plant was built at Tingo to provide a portion of the electrical power requirements for the operation. Photo 6-1 shows the Santander open pit and headframe for the shaft circa 1963. Figure 6-1 shows a block diagram of the mine circa 1983.

Following corporate restructuring in 1985, St. Joe divested its Latin American mining operations, including Santander, which was acquired by a United States, West German, and Peruvian Group called Docarb S.A. (Docarb Group) for a cost of US$ 3M. The Docarb Group was a holding company for Minera Katanga S.A. which had a 51% interest in the Santander property. The Docarb Group operated the mine under the name Compañia Minerales Santander S.A.C. (CMS) and planned to spend US$ 2M for exploration and development at the Santander operation (Figure 6-1).

Cavanagh (ND) records that the mine required constant pumping to drain water from the mine workings and prevent flooding. About 2,500 gallons were extracted every minute, twenty-four hours a day, by three 600-hp electric pumps that consumed about 8% of the mine´s total energy requirements. According to Cavanagh, the first Ballón (principal owner of Docarb Group) improvement was to get rid of the costly petrol-fuelled generators that Saint Joe had installed to pump water. Instead, Ballón rented four hydroelectric plants from the neighbouring Rio Pallanga operation. Next, the Docarb Group commenced exploration outside the immediate area of the mine, buying in 1989 a nearby concession known as “Magistral”. By 1990, Magistral, an open pit, and underground zinc and lead operation, were becoming increasingly important in compensating for the declining production from the Santander Pipe.

Photo 6-1: The Santander Shaft on the South Side of the Open Pit, circa 1963.

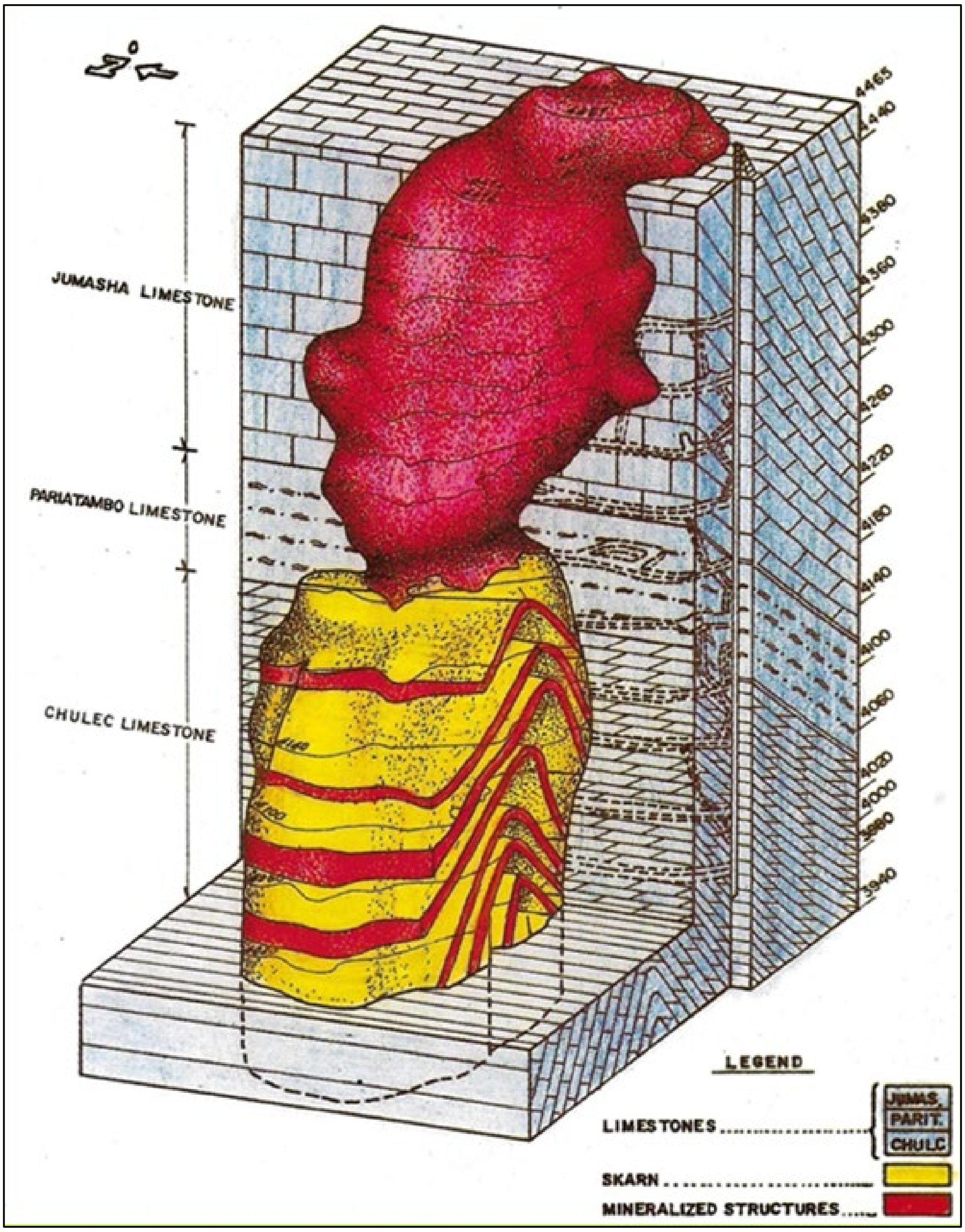


Source: Trevali (2016).

Amado Yataco (CMS General Manager) said that between July 1989 and January 1990, the company invested US$3.7 M in Santander, most of it going on the acquisition of equipment, some repairs to the Santander shaft and the hydroelectric plants, and as working capital. Part of the financing (some US$1.5 M) came from Santander´s buyer Pechiney, advanced against future sales. The mine was at that time planning to mine a second shaft to facilitate the operation of the mine to greater depth and increasing production.

Cavanagh says that a strike from the 20th, June through to the 20th, August 1990, proved “almost fatal” to the mine, but Santander “hung on by the skin of its teeth”. Exploration was continued in late 1990 with another potentially attractive deposit, “Puajanca”, discovered only two years earlier. By May 1991, Santander´s first drillings here had revealed orebodies at a depth of 200 m, containing zinc, lead, and silver, and the company was reportedly planning to devote the year to further drilling and improving the access road.

Figure 6-1: The Santander Pipe - Block Diagram by J. Villanueva (1983), looking East in relation to the shaft.

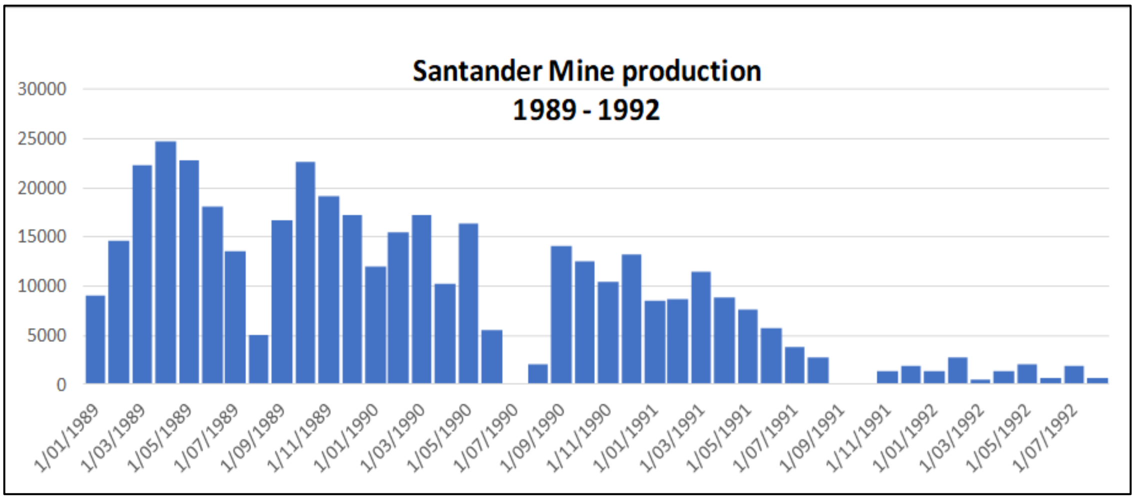


Source: Cavanagh (ND).

Figure 6-2 shows the production interruption as a result of the 1990 strike together with the final decline in production brought about by Peru´s political problems with the Shining Path movement, and the resultant hyperinflation (1988 to 1989) and adverse economic conditions, which brought closure to many mining operations throughout Peru.

The Santander Property then laid dormant until it was acquired by the TSX-listed Trevali Mining Corporation (Trevali) on December 11th, 2007. The acquisition was pursuant to an Assignment Agreement dated October 2nd, 2007, following which Trevali through its Peruvian subsidiary, Trevali Peru S.A.C. effectively acquired all of the interest of CMS of Lima, Peru in the Property for a period of fifty (50) years with an automatic fifty (50) year extension.

Figure 6-2: Santander Bi-monthly Production Record 1989-1992



The consideration payable by Trevali to Santander comprised a 3.5% Net Smelter Return (the “Royalty”) and commencing on January 1st, 2008, the Company was obligated to pay CMS US$100,000 per month on account of the Royalty.

Trevali Peru S.A.C. carried out a series of successful exploration programs resulting in the development of the Magistral underground mine (beginning in mid-2012) and commercial production commencing in September 2013.

Although Trevali carried out further diamond-drilling of the Santander Pipe together with the digitization of old drill-hole logs, their reinterpretation, and upgrading the mineral resource estimate, there has been no actual mining work carried out on the Santander Pipe deposit, although the Santander Shaft appears to remain in potentially re-usable condition (Photo 6-2 and Photo 6-3). At present, both the Santander Pipe open pit (Photo 6-4) and the underground mine remain flooded.

Photo 6-2: The Santander Shaft at Surface

Source: CDPR (2021).

Photo 6-3: Looking down the three-compartment Santander Shaft

Source: CDPR (2021).

Photo 6-4: The Santander Pipe open pit

Source: CDPR (2021).

Trevali continued operations in the Magistral mine (Magistral North, Magistral Central, and Magistral South) until December 3, 2021, when the Santander property was bought by Cerro de Pasco Resources Inc. (CDPR), who amongst other opportunities, had recognised the opportunity of dewatering and bringing the Santander Pipe deposit back into production.

6.2 Historic Mineral Resource Estimates

There have been a number of mineral resource estimations made for the Santander Pipe deposit over the years. Results are summarized in the following subsection.

DRA cautions some estimates were made prior to implementation of NI 43-101 and are considered “historical” as defined by NI 43-101 guidelines. The historic estimates do not apply the estimation and classification of mineral resources and mineral reserves as set out in NI 43-101, and therefore they should not be relied upon.

The historic estimates are only relevant in so far as they provide a range of grades and tonnages declared and used by the previous operators.

At the time of closure in August 1992, the old Santander Mine had historical reserves in the order of 650,000 tonnes with an average grade of 9.74% zinc and 0.66 oz/t silver (Espinosa and Flores 1993). This indicates that mining would have kept going had it not been for the political and economic difficulties at that time.

Compliance with NI 43-101 reporting only began when Trevali took an interest in restarting mining operations. Table 6-1 summarises the historic NI 43-101-compliant and AIF-issued Resource Estimates completed on the Santander Pipe by Trevali.

Table 6-1: Historic NI 43-101 Compliant and AIF issued mineral resource estimates completed on the Santander Pipe

Year	Source	Cut-off	Classification	Tonnage (Mt)	Zn (%)	Pb (%)	Cu (%)	Ag (g/t)
2010	Golder, NI 43-101	3% Zn Eqv	Measured	NA	NA	NA	NA	NA
			Indicated	NA	NA	NA	NA	NA
			Inferred	3.32	5.78	0.01	NR	16
2012	Golder, NI 43-101	3% Zn Eqv	Measured	NA	NA	NA	NA	NA
			Indicated	NA	NA	NA	NA	NA
			Inferred	8.40	4.75	0.34	0.14	20
2016	SRK, NI 43-101	mining cut-off of US$40	Measured	NA	NA	NA	NA	NA
			Indicated	NA	NA	NA	NA	NA
			Inferred	10.10	4.09	0.18	0.10	15
2018	Trevali, AIF	$40 NSR	Measured	NA	NA	NA	NA	NA
			Indicated	2.77	6.81	0.09	NA	13.39
			Inferred	0.82	4.6	0.21	NA	22.19
2019	Trevali, AIF	$40 NSR	Measured	0.54	8.09	0.03	NA	16.31
			Indicated	3.23	6.43	0.01	NA	11.37
			Inferred	1.31	5.37	0.02	NA	7.42
2020	Trevali, AIF	$40 NSR	Measured	0.53	7.78	0.03	NA	16.76
			Indicated	2.95	6.38	0.01	NA	11.62
			Inferred	0.93	5.15	0.01	NA	7.54

Following takeover of the Santander Property on December 3, 2021, CDPR commissioned DRA to review the geological models and provide updated NI 43-101 compliant mineral resource estimates, which included the Santander Pipe deposit (Table 6-2).

Table 6-2: CDPR 31/12/21 Mineral Resource Statement, Santander Pipe Deposit

Category	Tonnage (kt)	Zn (%)	Cu (%)	Pb (%)	Ag (g/t)
Indicated	1,791	7.18	0.10	0.03	14.8
Inferred	3,189	5.07	0.15	0.004	7.9

Footnotes:

- Mineral Resources are reported above a US$40 NSR cut-off.
- Metal prices used in the NSR calculations were US$3,000/t for Zn, US$2,200/t for Pb, US$9,300/t for Cu, and US$25/oz for Ag.

- For Santander Pipe: NSR = (17.5 x %Zn) + (11.1 x %Pb) + (40.8 x %Cu) + (0.37 x g/t Ag), assuming recoveries of 90% for Zn, 70% for Pb, 60% for Cu and 50% for Ag.

DRA noted deficiencies in the Santander Pipe geological model and recommended that CDPR makes improvements to the model and Mineral Resource Estimate, as well as the associated preliminary studies (metallurgy, geomechanics, hydrogeology, etc.) with the objective of designing an infill drilling program to be carried out either from surface, or from within the old underground mine.

6.3 Santander Pipe Production (Mid-1950s to 1992)

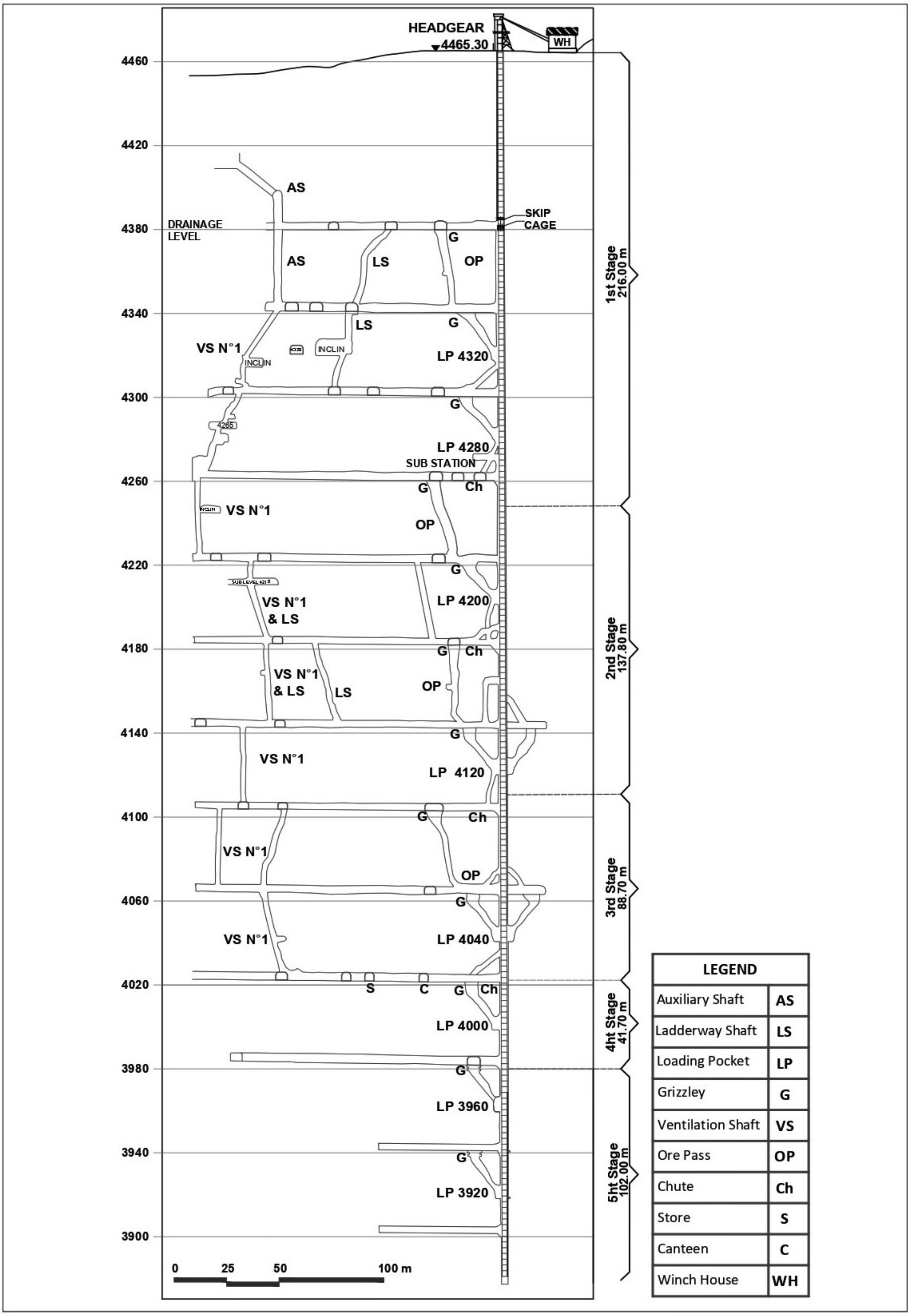
This section describes the mining methods used at the historic Santander Pipe. The total production from the Santander Pipe over a 34-year time span (1958-1992) is estimated to have been in the order of 8.0 million tonnes with a grade of approximately 7% zinc, with significant silver-lead content, and minor copper credits.

High-grade mineral within the perimeters of the pipe was mined by open pit (Photo 6-4) until 1968 (BISA, 1993) to a depth of around 85 m and then by underground mining which was accessed by a vertical shaft (La Cuñada Shaft) located to the south of the open pit.

This shaft has a cross-section of approximately 4.8 m by 2.4 m (Photo 6-3). It has three equally dimensioned compartments, two for hoisting, men and materials, and a third compartment equipped with a pumping column, ladderway, and services. Old sections of the shaft record a depth of 510 m (Figure 6-3, CMS Map 0202) and indicate main level intervals at 40 m vertical spacing.

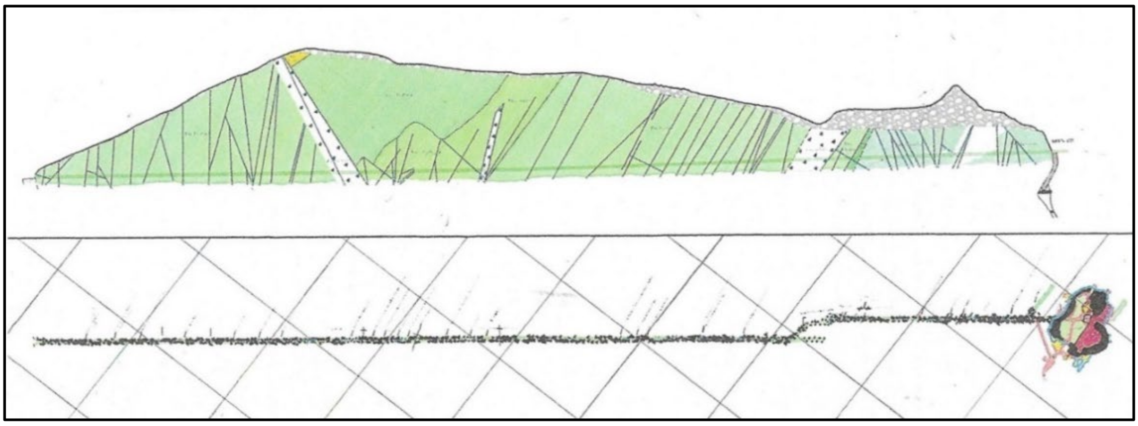
Water was pumped up to an adit outflow level at 4380 m (85 m depth) which discharged at a location called “Los Baños”, 2.05 km SW of the shaft (Figure 6-4, CMS Map 0078). This adit level drains surface water currently being discharged into the open pit, although the water level in the open pit is slightly higher than the adit level, which indicates that outflow at the adit level may be partially blocked (Figure 6-5).

Figure 6-3: La Cuñada Shaft section and summarised level intervals and depths.



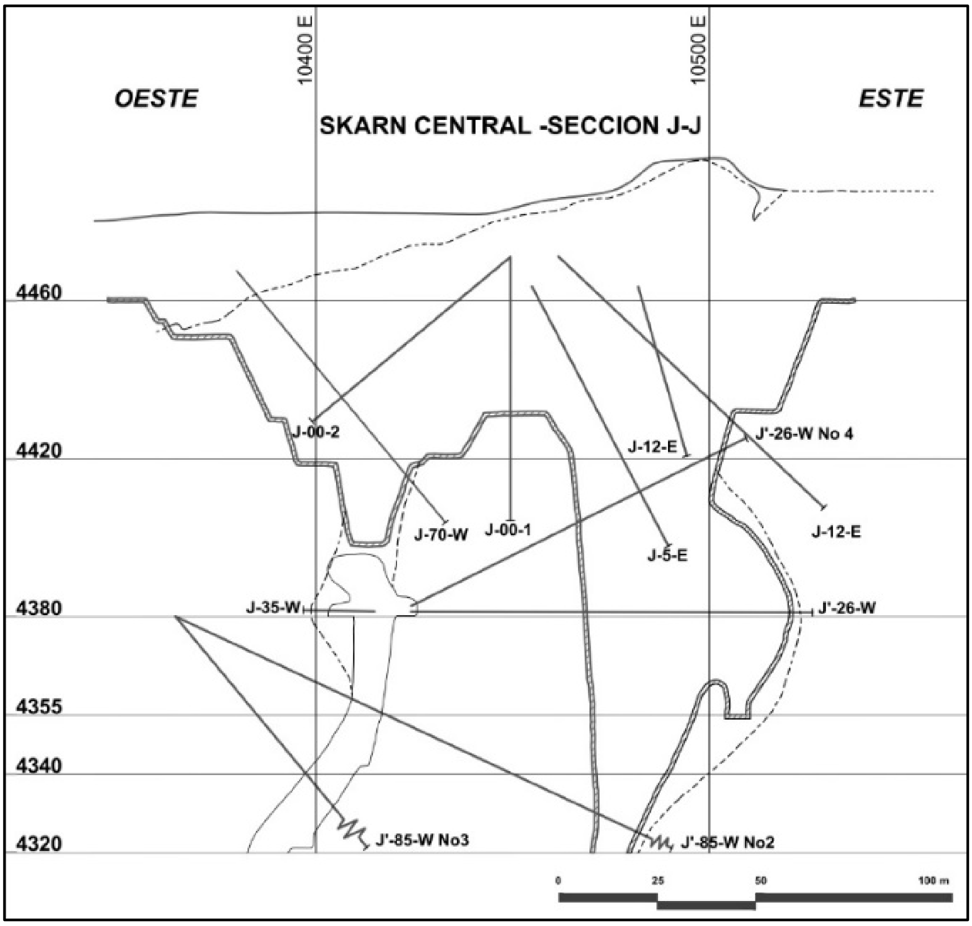
Source: CDPR (2022) – Old CMS Records, Map 0202.

Figure 6-4: Plan and Section of the Drainage Level from the Open Pit down to "Los Baños".



Source: CDPR (2022) – Old CMS Records, Map 0078.

Figure 6-5: Section showing the relationship between the Open Pit and Underground Mine.



Source: CDPR (2022), Old CMS Records, Map 0140.

The depth of mining within the open pit is highly irregular because an off-centre plug of low-grade mineral that was left unmined. A cross-section (Figure 6-5; CMS Map 0140) shows the unmined low-grade zone, but it does not give any details regarding a possible crown pillar left between the open pit and underground.

We learn from various plans and sections that the shaft was sunk in five sinking phases to its current recorded bottom, a process that must have got more and more difficult with depth whilst maintaining production. The rate of sinking is summarised from dated shaft sectional drawings as shown in Table 6-3.

Table 6-3: La Cuñada Shaft - Summary of Phased Sinking from CMS records

CMS Map/Section		La Cuñada Shaft		
No.	Dated	Shaft bottom at (masl)	Shaft depth (m)	Planned
0015	Oct. 1967	4,247.0	218.0	
0024	Aug. 1972	4,247.0	218.0	Projected to 4,147 masl
0026	May 1975	4,110.9	345.1	
0042	Sept.1975	4,110.9	345.1	Projected to 3,990 masl
0040	June 1976	4,110.9	345.1	Projected to 3,900 masl
0051	Feb.1977	4,095.0	370.0	
0056	Jan. 1978	4,065.0	400.0	
0069	Sept. 1978	4,022.0	443.0	
0079	Apr. 1980	3,990.0	475.0	
0088	Dec. 1981	3,950.0	515.0	Projected to 3,950 masl
0096	Dec. 1982	4,000.0	465.0	
0100	Aug. 1984	3,954.59.	510.41	Projected to 3,880 masl

Source: CDPR (2022).

Compiled production records (CDPR) for the years 1988 to 1991 show that there were interruptions to production, and this may have been due to the requirement of staged sinking and catch-up development, and there was an interruption at the end of 1990 possibly due to repairs required within the shaft.

Table 6-4 summarizes recorded production for the years 1977 to 1991, although it should be noted that the last three years were supplemented by lower grade production from the start-up of the Magistral open pits. These numbers indicate that annual production varied between averages of 120 t/d to 840 t/d, probably depending upon the availability of the shaft for hoisting.

Within this scenario, CMS was obviously looking at alternatives, and in March 1979 they were considering a second shaft (CMS Map 0140) with a design capacity of 5,000 t/d and a projected depth of 1,500 m. By October 1979 (Figure 6-6: CMS Map 0140) they were siting this proposal on the northeast side of the open pit. Clearly, no decision was made and by December 1981 they were considering increasing the dimensions of the La Cuñada Shaft (CMS Map 0087, December

1981) to add two more hoisting compartments. Finally, in 1984 they were planning a sixth phase of sinking the La Cuñada Shaft to 3875 (590 m depth). Although these schemes indicate some degree of confidence in mineral resources at depth, they never got around to starting any of these proposals during the last seven years of mine life.

Nevertheless, a previous employee of CMS has informed CDPR that at the time of closure the mine was preparing stopes between the 4,060 m and 4,020 m levels, and that the 3,980 m and deepest level was still being developed. He also stated that the rock was very hard and stable and very little support was needed in developing advances.

With reference to the shaft, he stated that the shaft was furnished with steel sets and wooden guides and that the shaft was left open to its bottom after abandonment.

Table 6-4: Summary of Recorded Santander Mine Production 1977-1991

Year >	1977	1978	1979	1980	1981	1982	1983	1984
Months production	12	12	12	2	6	12	12	12
T treated	246,819	288,921	270,848	41,144	136,202	266,221	292,385	255,527
% Zn	7.67	8.16	9.65	10.6	10.6	11.65	12.1	11.28
% Pb	0.53	0.51	0.17	0.13	0.10	0.07	0.05	0.05
% Cu	0.26	0.28	0.32	0.4	0.37	0.26	0.31	0.29
oz Ag/t	2.35	1.26	1.1	0.84	0.82	0.53	0.54	0.54
% Fe	8.64	11.75	9.56					
Shaft depth >	4,095 m.	4,020 m.		3,990 m.	3,950 m.	4,000 m.		3,954 m.

Year >	1985	1986	1987	1988	1989	1990	1991
Months production	12	12	11	10	10	11	9
T treated	293,550	238,157	219,409	159,129	204,537	182,763	202,786
% Zn	10.95	9.30	8.30	7.40	6.52	7.24	6.28
% Pb	0.06	0.06	NR	NR	0.38	0.72	0.56
% Cu	0.25	0.23	0.20	0.23	0.23	0.16	0.1
oz Ag/t	0.59	0.50	0.52	0.65	0.95	1.06	0.62
% Fe							
Shaft depth >	3,954 m.						

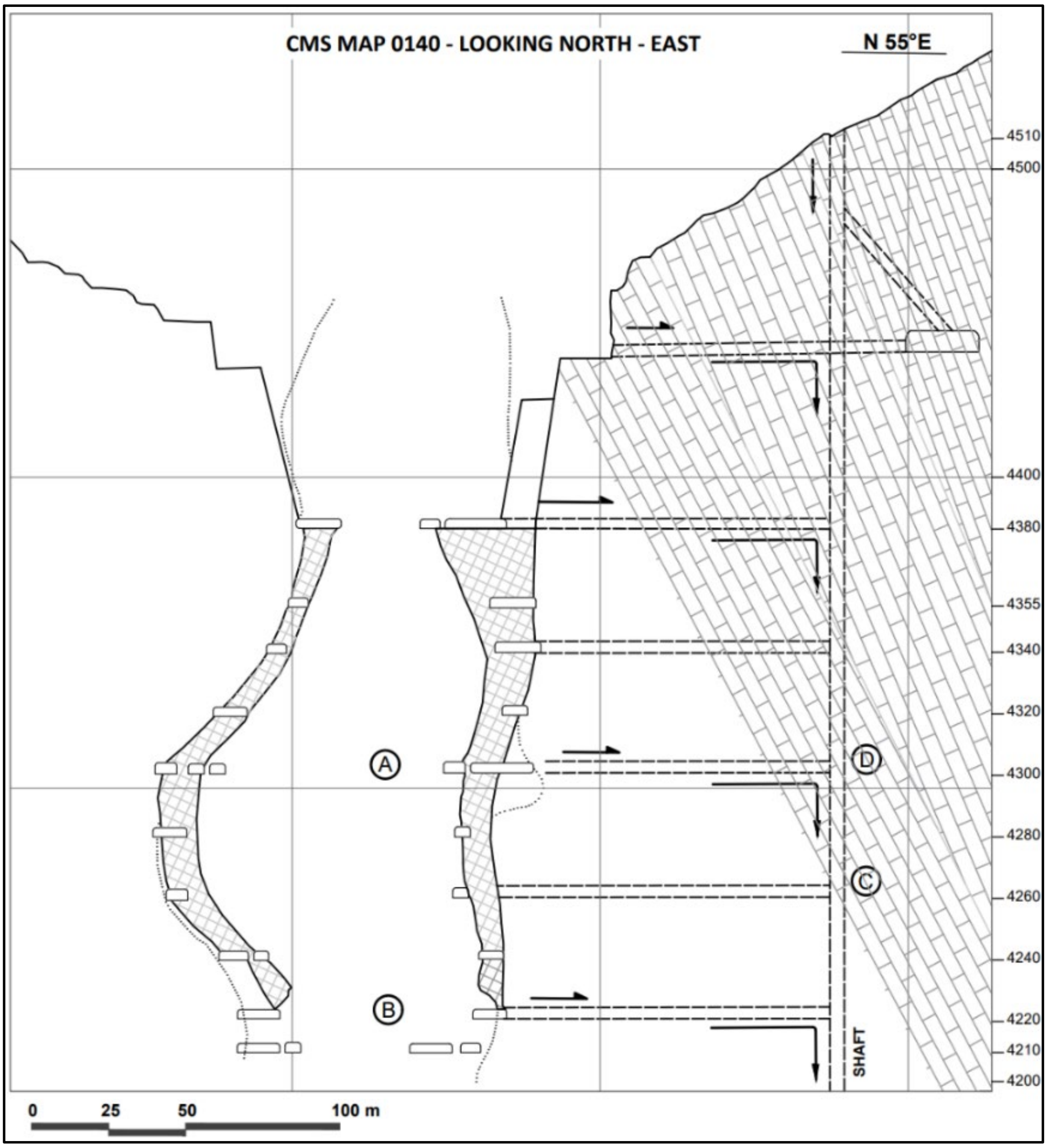
Source: CDPR (2022).

The underground mining method adopted is recorded by BISA (1993), as shown in Figure 6-7. This method comprised the mining of drawpoints at 10 m intervals from a hanging-wall access drive. From a near footwall position, a short raise was mined and then coned out to the full mineral width at an overall height of 10m. The mineral was then extracted in retreat by long-hole open stoping from the level above. The sill pillars provided the cover required for mining the next panel below.

Internal working access was provided by stope access ramps. BISA (1993) record that tramming was carried out with 2.2 yd^3 scoop trams or low-profile trucks with a capacity of 12 t to 15 t, maintenance of which took place underground. Another source stated that all large equipment had to be lowered into the mine dismantled and was then reassembled underground.

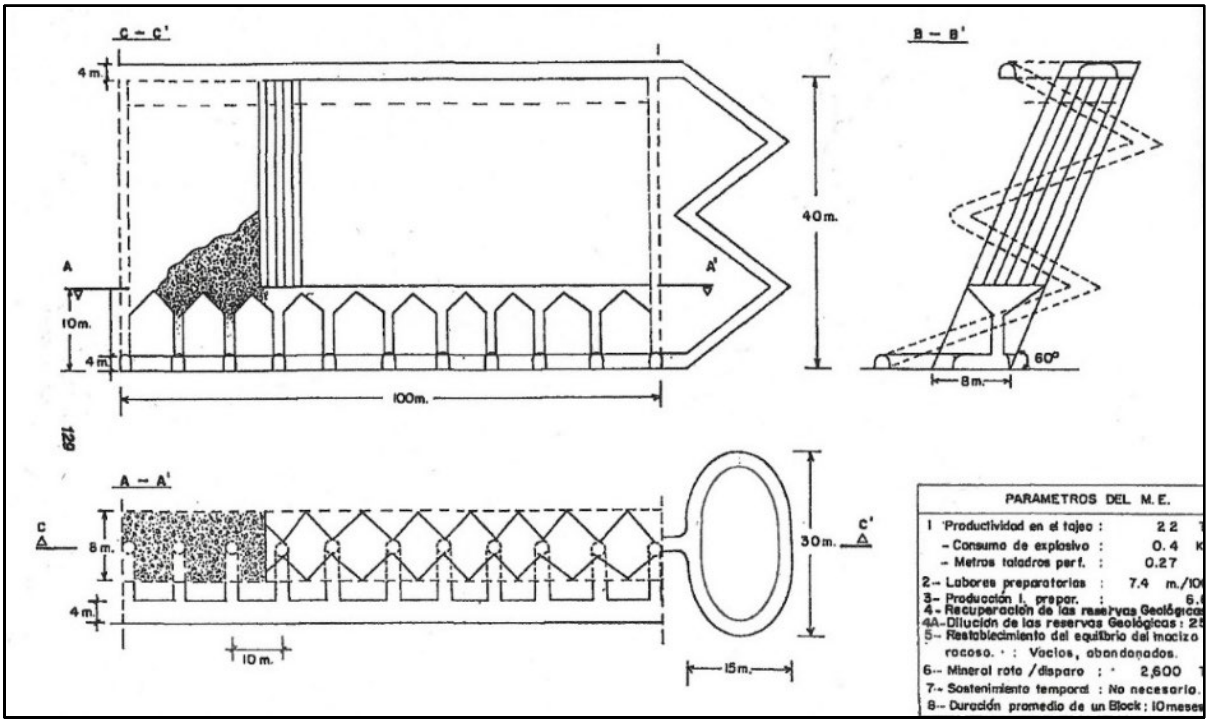
There was no information found that indicated that stopes had been backfilled.

Figure 6-6: Cross-section of the Open Pit, the top of the Underground Mine, and a proposed Second Vertical Shaft on the other side of the Open Pit



Source: CDPR (2022) – Old CMS Records, Map 0140.

Figure 6-7: Santander Pipe Underground Mining Method



Source: BISA (1993)

6.4 Ground-Water Inflows and Pumping Records

A CMS shaft section dated 27-09-1975 shows a stage pumping system using 4” pipe columns. The information is summarized in Table 6-5. However, another drawing (not dated) indicates that this may have been replaced with a 10” pipe column when the mine went deeper. A note on the drawing states that the inflow rates increased during the rainy season.

Dr. Lucio Pareja (PEA Project Manager for DRA) recalls working for a short period at the mine prior to the lower levels being allowed to flood. He says (pers. comm.) that the mine was very wet, and the pumping rate was around 160 litres per second. He also says that it was not unusual for drill rods to be pushed out of a hole during drilling because of the in-situ water pressures being encountered at depth.

This rate of pumping is confirmed by both BISA (1993) and Cavenagh (1991), and Cavenagh states that “about 2,500 gal are extracted every minute twenty-four hours per day, by three 600 hp electric pumps that consume about 8% of the mine´s total energy requirements”.

Trevali currently discharges excess surface water into the open pit, but it is noted that the outflow at the 4,380 m drainage level discharges at Los Baños at a lower rate than that being discharged into the open pit. Hydrogeologically, this indicates an open-fracture system at depth and where the current 425 m high static head of water at the shaft bottom is probably feeding water back into the deep underground aquifers.

In comparison, the water inflow in the Magistral mine is much higher due to the larger footprint of the mineworkings (Table 6-6). The 1.5 km area between the two mines has an even greater footprint in similar geology.

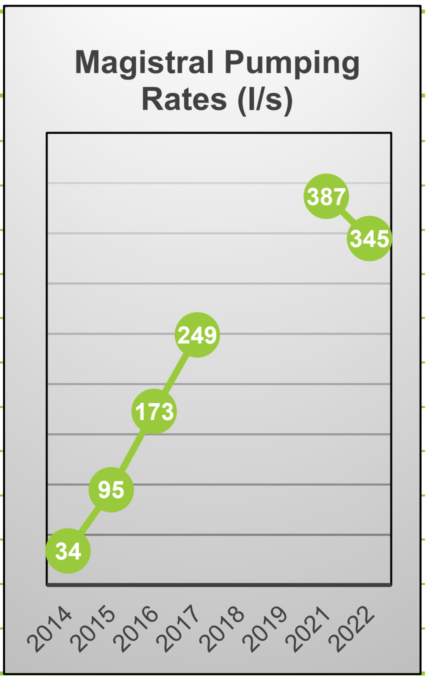
Table 6-5: Santander Mine installed pumping system

Pump	Pumping	Pumping	Pump	Length of	Pumping	Pumping rates	
Elevation	To	location	rating	4" pipes	Height	Gal/Min	Lit/Sec
4300	4380	Auxiliary shaft	120 HP	80.8	121.9	400	105.8
4260	4300	Auxiliary shaft	70 HP	100.6	91.4	400	105.8
4260	4380	Main shaft	320 HP	120.4	243.8	700	185.2
4220	4380	Main shaft	120 HP	160.0	213.4	300	79.4
4140	4260	Main shaft	300 HP	120.4	228.6	300	79.4
4100	4140	Main shaft	70 HP	39.6	91.4	400	105.8
4072	4100	Shaft bottom	12 HP	32.0	61.0	100	26.5

Map reference 0042 states that the flow rates increase during the rainy season
Source: CDPR (2022), CMS Map 0042, 27/09/1975.

Table 6-6: Summarises Monthly and Annual Average Pumping Rates, Magistral Mine

YEAR >>	2014	2015	2016	2017	2021	2022
Jan		57	137	222		328
Feb		71	118	221		343
Mar		48	137	304	387	351
Apr		39	143		386	352
May		113	164		386	351
Jun		95	163		381	
Jul		159	226		345	
Aug		144	223		336	
Sep		80	138		238	
Oct		119	216		452	
Nov	23	61	189		472	
Dec	44	155	220		488	
Averages	34	95	173	249	387	345



Source: CDPR (2022).

6.5 Mineral Processing Records 1979 - 1991

With reference to Table 6-7, it is concluded that in 1979 the process plant was failing to produce a saleable lead concentrate and that in the following eight years only copper and zinc concentrates were produced.

Table 6-7: Summarized plant production and recoveries for the years 1979-1991

Year	Concs	Tonnes	%Zn	%Pb	%Cu	ozAg/t	%Rec.	%rec Ag
1979	Cu	2,394.7	13.4	3.01	19.93	35.4	55.0	26.8
	Pb	570.9	29.3	24.0	1.12	48.08	29.3	9.2
	Zn	48,110.6	90.4	0.18	0.57	1.82	90.4	31.8
	Tails		0.96	0.08	0.05	0.47		
1980	Cu	565.9	11.29	2.26	17.28	36.67	59.4	59.75
	Zn	7,949.6	49.9	0.184	0.599	0.78	90.95	29.59
	Tails		1.02	0.08	0.06	0.24		
1981	Cu	1,534.3	12.34	4.21	18.14	39.26	54.6	54.66
	Zn	26,812.8	49.34	0.09	0.66	0.95	91.62	23.05
	Tails		0.95	0.04	0.05	0.24		
1982	Cu	1,669.5	11.42	4.83	16.03	35.43	40.7	43.58
	Zn	57,631.9	48.77	0.06	0.55	0.76	90.68	31.40
	Tails		1.31	0.03	0.04	0.18		
1983	Cu	2,541.3	12.51	1.88	17.6	29.25	50.0	47.0
	Zn	65,505.4	48.64	0.05	0.51	0.71	90.1	29.5
	Tails		1.42	0.02	0.05	0.17		
1984	Cu	2,008.0	11.47	2.05	15.82	29.88	42.9	43.4
	Zn	51,675.4	50.35	0.05	0.59	0.82	90.3	30.7
	Tails		1.26	0.03	0.05	0.18		
1985	Cu	1,949.6	10.27	4.75	16.37	38.82	43.1	43.8
	Zn	57,130.5	51.09	0.05	0.51	0.84	90.8	27.9
	Tails		1.16	0.02	0.06	0.20		
1986	Cu	1,238.0	11.10	0.53	17.06	41.66	45.63	44.99
	Zn	41,757.9	49.37	NR	0.54	0.91	89.5	31.84
	Tails		1.01	NR	0.03	0.12		
1987	Cu	1,198.3	11.94	NR	16.15	43.6	51.94	55.55
	Zn	32,833.2	19.37	NR	0.62	1.22	95.9	39.65
	Tails		0.83	NR	0.02	0.10		
1988	Cu	990.4	8.65	NR	18.93	39.50	53.56	39.71
	Pb	93.5	9.30	NR	3.75	63.73	NR	9.03
	Zn	21,540.1	49.35	NR	0.59	1.49	90.25	32.06
	Tails		0.77	NR	0.03	0.20		
1989	Cu	1,163.2	1.45	5.92	20.22	35.05	50.14	20.91
	Pb	868.4	6.25	44.08	9.48	65.42	58.61	29.23
	Zn	22,756.4	41.9	0.31	0.14	2.10	88.9	21.53
	Tails		0.69	0.05	0.03	0.28		
1990	Cu	197.1	7.98	7.97	21.59	36.99	14.68	3.75
	Pb	1,971.4	5.25	54.01	3.88	49.77	81.27	50.5
	Zn	24,575.2	48.61	0.46	0.57	1.72	90.0	21.8
	Tails		0.74	0.08	0.02	0.30		
1991	Cu	194.8	NR	NR	NR	NR	NR	NR
	Pb	1,138.2	4.66	55.08	3.21	42.8	74.53	47.44
	Zn	12,729.4	48.42	0.43	0.49	1.22	89.7	18.96
	Tails		0.70	0.10	0.02	0.18		

Source: CDPR (2022).

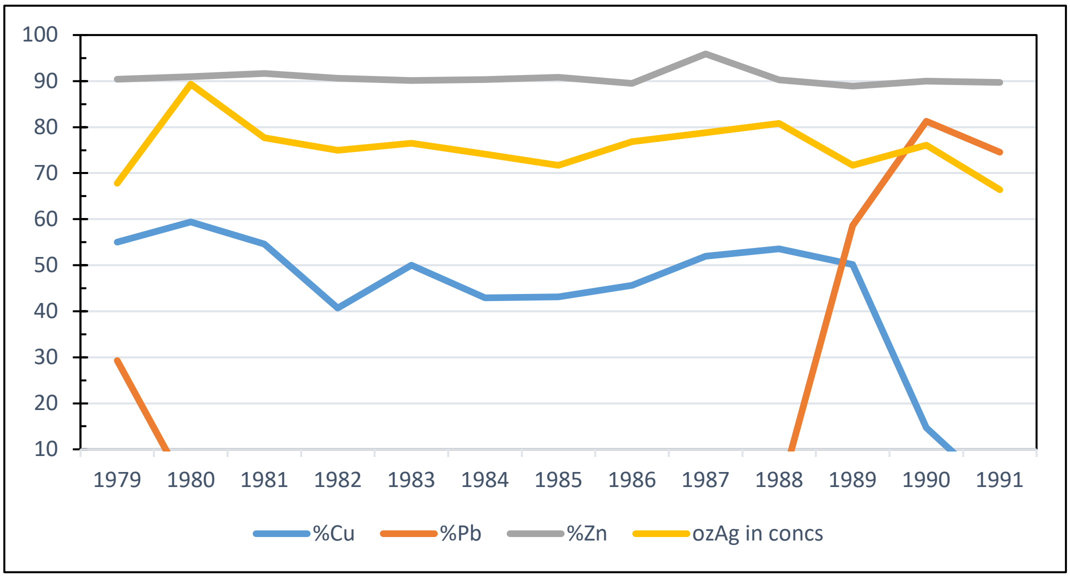
The production of a lead concentrate was re-introduced in 1988 for the last four years of production. During the last year of production, it would appear that there may have been no copper concentrates produced and that the tonnage number recorded was carried over from 1990.

During the years 1980 to 1990 inclusive the average plant recoveries were as follows:

- Copper in copper concentrates = 47.19%.
- Zinc in zinc concentrates = 91.16%.
- Silver in all concentrates = 78.6%.

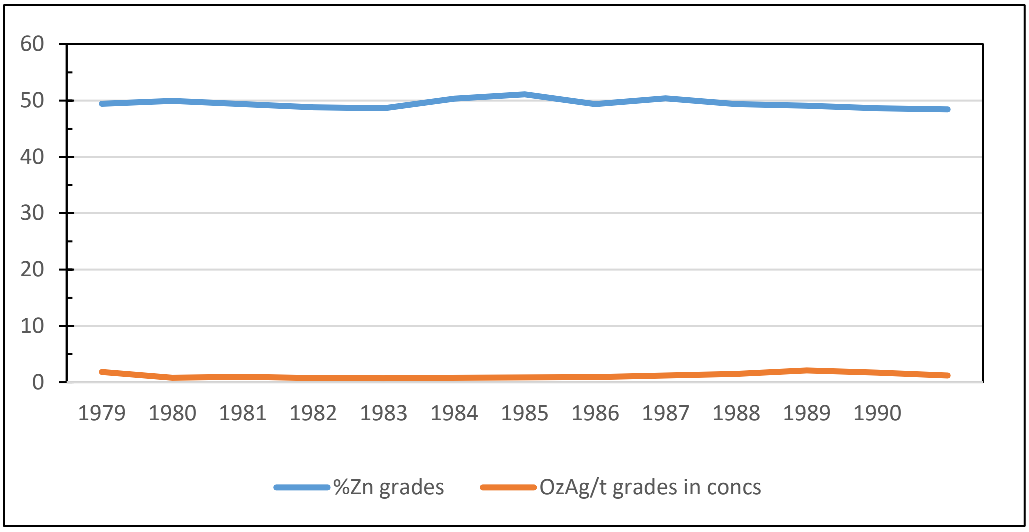
The 1979-1991 annual average plant recoveries were as shown in Figure 6-8, and the annual Zn and Cu concentrate grades were as shown in Figure 6-9 and Figure 6-10 respectively.

Figure 6-8: Average Santander Plant Recoveries 1979-1991



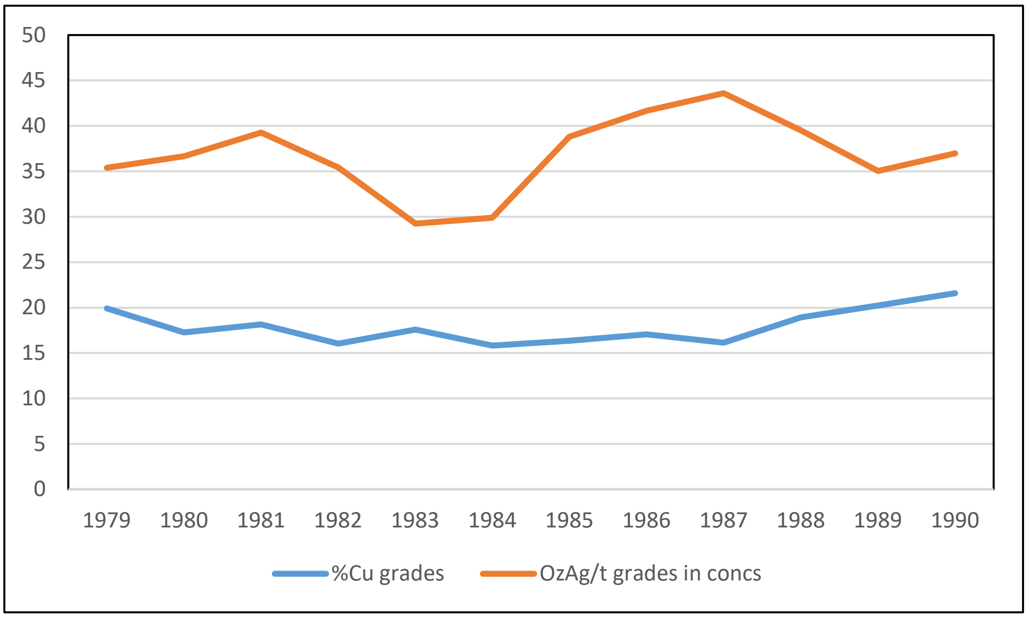
Source: CDPR (2022).

Figure 6-9: Average Santander Plant Zn Concentrate Grades 1979-1991



Source: CDPR (2022).

Figure 6-10: Average Santander Plant Cu Concentrate Grades 1979-1991



Source: CDPR (2022).

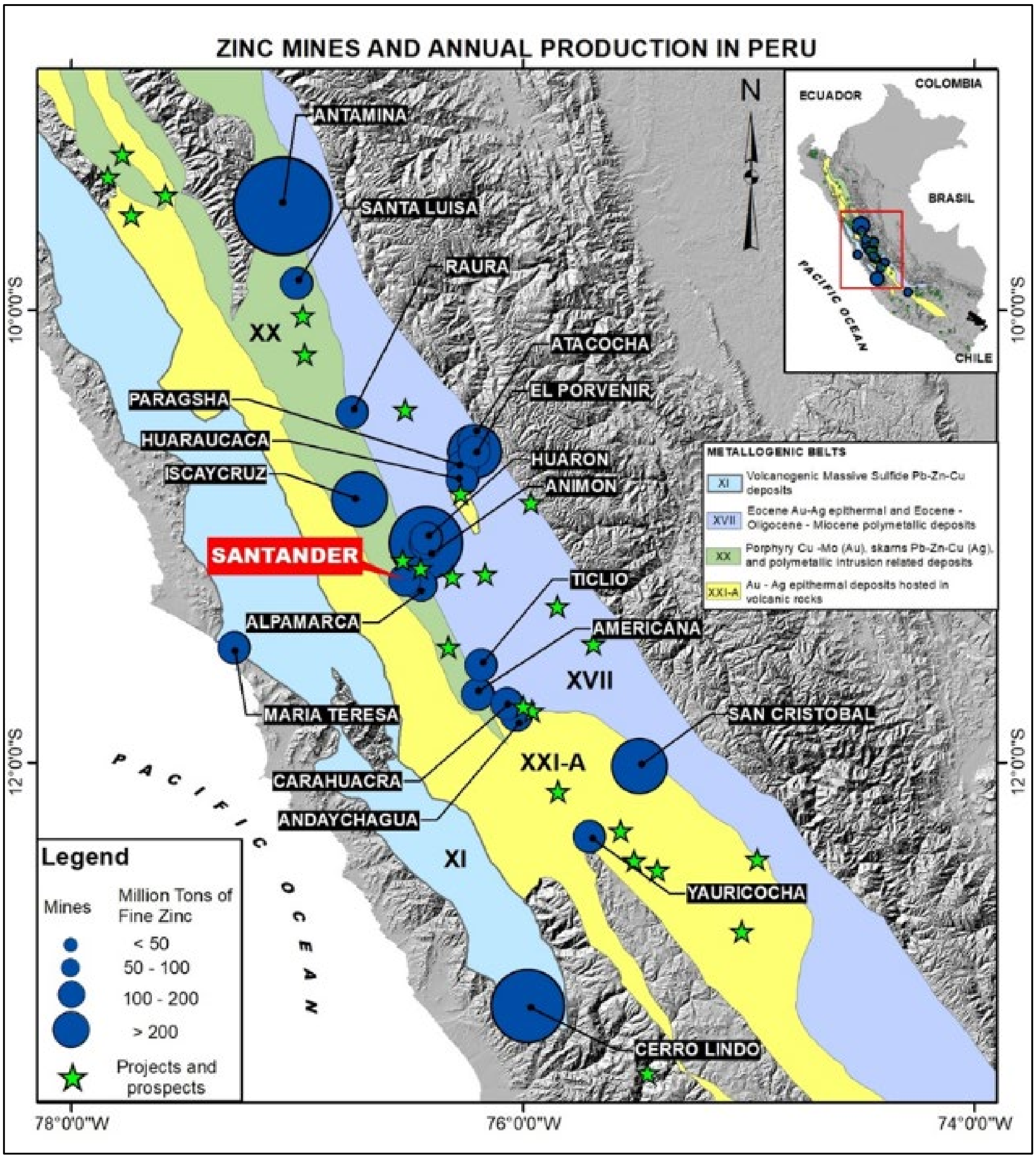
In conclusion, although the mineralogy is noted to change in depth, this has not had a significant effect on zinc and silver recoveries.

Although copper recoveries are low, recovering copper appears to greatly improve the recovery of silver and helps result in a saleable concentrate. This may be due to silver being locked within copper sulphides like tetrahedrite, a common association within central Peruvian polymetallic mines.

7 GEOLOGICAL SETTING AND MINERALISATION

The Santander Pipe deposit is located within what is referred to as the Central Peruvian Metallogenic Belt and where the zinc mines (Figure 7-1) and their associated Pb-Ag production have produced 12%, 7%, and around 10% of the World´s zinc, lead, and silver production, respectively, over the last two decades (USGS, 2001-2020).

Figure 7-1: Map showing the location of Peru´s producing Zn (+Pb-Ag) mines and deposits



Source: Acosta (2015)

The Instituto Geológico Minero y Metalúrgico (INGEMMET), part of the Peruvian Ministry of Energy and Mines, has conducted extensive geological work in the region since the 1980s. Geological maps are available for download on the INGEMMET website (www.ingemmet.gob.pe). The Santander Project is covered in regional geological map sheet 23-j at 1:100,000 scale, as well as more detailed geological map sheets 23-j to I-II at 1:50,000 scale. The 23-j map sheet is accompanied by the following INGEMMET geological reports:

- “Geology of the Barranca, Ambar, Oyon, Huacho, Huaral y Canta quadrangle” Boletin N°26, Series A (Cobbing, Edwin John et al., 1973).
- “Memorandum of the revision and update of the Canta quadrangle 23-j) to I-II- (de la Cruz, Jaimes et.al., 2003).

In addition, the Mine Geology and Exploration Departments of the Santander Project hold detailed maps for the current mining of the Magistral Deposits, with historic mining activity of the Santander Pipe and exploration targets.

The author has drawn extensively on the MSc thesis of Jean-Paul Bergoeing Rubilar (June 2020), University of Geneva, entitled “Distal Zn-Pb(-Ag) skarn mineralization at Santander, Central Peru” in writing this section to describe the project geology along with information provided by CDPR and geological descriptions in Golder (2012) and SRK (2017).

7.1 Regional Geology

The Project lies within the Western Cordillera (11°11' S, 76°31' W), at an elevation of approximately 4,490 masl within the Santander - (Old) Chungar district, in the southern zone of the Peruvian flat slab region in the western central Peruvian Andes. This tectonic segment of the Andean Cordillera hosts numerous world-class ore deposits (Petersen, 1965; Soler, 1986): a 120-km-wide, 800-km-long belt located between 7° and 14° S.

This cluster of deposits in the Polymetallic Belt of Central Peru includes high-sulfidation epithermal Au-Ag deposits (e.g., Yanacocha), polymetallic porphyry-skarn systems (e.g., Antamina), quartz-Mo veins (e.g. Janchiscocha), Cordilleran base-metal lodes (e.g. Cerro de Pasco, Morococha) and Zn-Pb skarns and carbonate-replacement bodies (e.g. Huanzalá), among others (Petersen, 1965; Einaudi, 1977; Baumgartner, 2007; Bendezú et al., 2008; Frenzel et al., 2016; Suzuki and Hayashi, 2019). Geochronology studies indicate that they formed during at least two distinct periods of polymetallic mineralization throughout the Oligocene and Miocene epochs (Soler and Bonhomme, 1988; Bissig et al., 2008). Their genesis has been attributed to magmatic activity associated with the subduction of the Nazca aseismic ridge within the subducting oceanic Nazca plate into the subduction zone during this time span (Rosenbaum et al., 2005).

Plate reconstruction models predict the onset of the subduction of the Nazca ridge during the Miocene (between 11.2 Ma and 15 Ma) at the latitude of Cerro de Pasco, which coincides with an important metallogenic activity in the zone (Hampel, 2002; Rosenbaum et al., 2005). The relatively rare occurrence and smaller size of late Oligocene deposits within the Central Peruvian Polymetallic Belt (e.g., Uchucchacua; Soler and Bonhomme, 1988) results from a limited magmatic activity, possibly also associated with a flat subduction configuration but with a stronger upper-plate metallogenic control (Bissig et al., 2008).

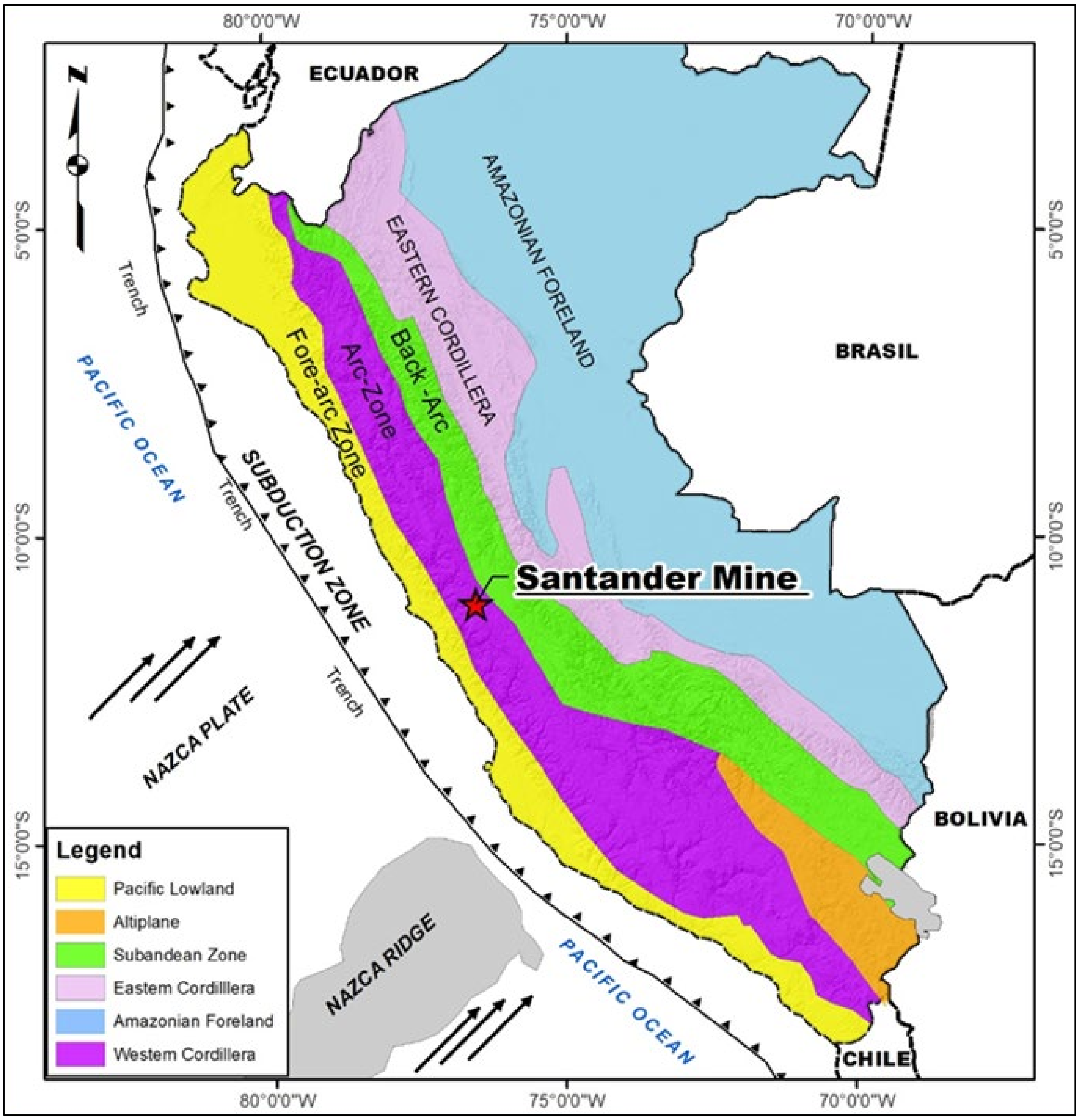
The structure of the Andean Cordillera at this latitude consists of two parallel ranges: the Western Cordillera and Eastern Cordillera (Figure 7-2) separated by a high-elevation flat zone that extends across a large part of the central and southern Peruvian Andes, the Altiplano. At the latitude of the Santander-(Old) Chungar district, the Western Cordillera mainly corresponds to the Mesozoic and early Paleocene ensialic magmatic arc represented by the 160 Ma to 60 Ma Coastal Batholith, and Paleogene to Neogene volcano-sedimentary cover rocks of the "Calipuy volcanics" – locally named Yantac Formation - and Colqui Group (Cobbing, 1973; Atherton et al., 1979). The geology of the Altiplano and Eastern Cordillera includes a Precambrian to Cambrian metamorphic basement (Marañón Complex) overlain by Paleozoic and Mesozoic back-arc sedimentary sequences which record at least two marine transgressions related to early tectonism in the Andes (Mégard, 1979; Cardozo and Cedillo, 1990; Love et al., 2004).

At the latitude of the Santander – (Old) Chungar district (Figure 7-3), the stratigraphy includes the Paleozoic slates, schists, and quartzites of the Excelsior Group, and the carbonate-rich Mesozoic units including the Triassic Chambara Formation, the Triassic-Lower Jurassic Pucara Group, the Jurassic Condorsinga, and Aramachay Formations; and the Cretaceous Oyón Formation, Goyllarisquizga Group, Pariahuanca Formation, Pariatambo Formation, Casma Group, Jumasha Formation and Casapalca Formation (Cobbing, 1973; Einaudi et al., 1981).

Expressions of Cenozoic volcanism are widespread also in the Altiplano where volcano-sedimentary sequences of the Calipuy, Pacococha Formation, and Rumillana Formation appear discordantly overlying the Mesozoic sequences. During the Tertiary, the Mesozoic sequences suffered a strong deformation due to successive major compressive events occurring in this section of the Central Andes since the Eocene (Noble et al.,1979: Mégard, 1984).

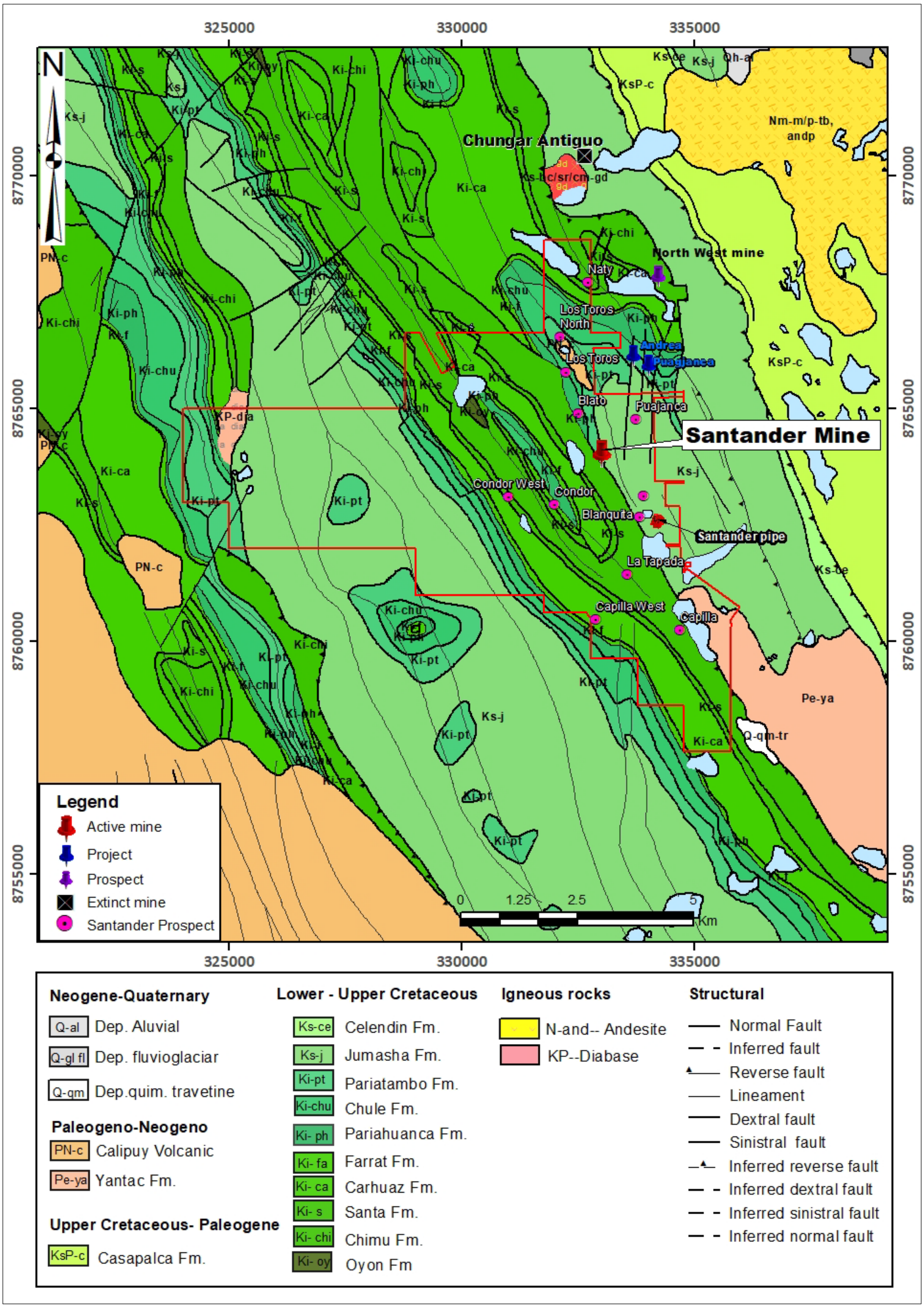
In the boundary between the Western Cordillera and Altiplano, numerous isolated shallow syn-tectonic intrusive stocks and volcanic domes of late Eocene to early Oligocene (39 – 31 Ma) and Miocene (18 – 5 Ma) age intruded the deformed Mesozoic sedimentary sequences, where they are commonly associated with the development of polymetallic mineralization typical of the Central Peruvian Polymetallic Belt (Bissig et al., 2008), Figure 7-4.

Figure 7-2: Morpho-structural map of Peru



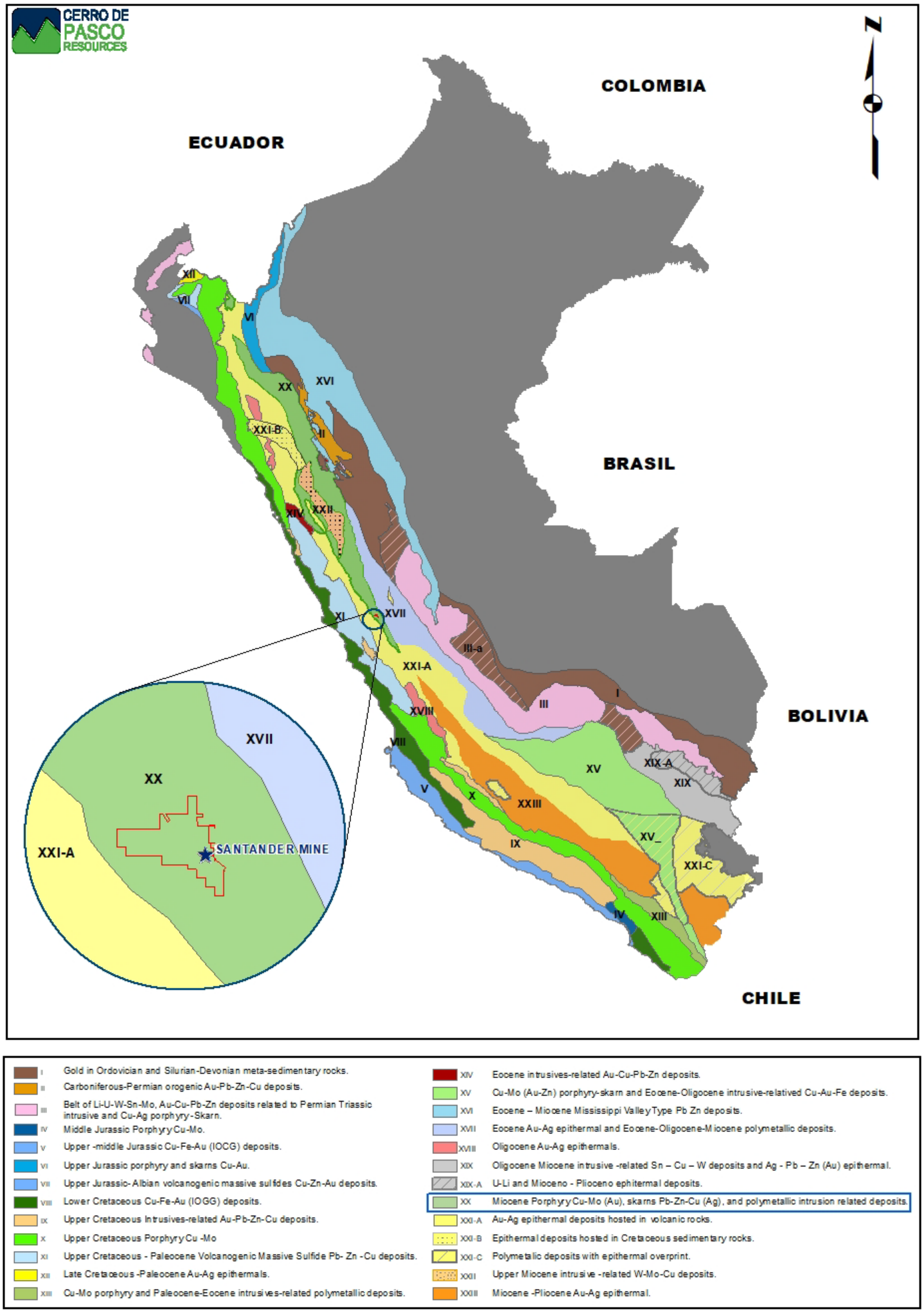
Source: Jaillard et al. (2000) in Wipf (2006), PGS Pacific Geological Services

Figure 7-3: Regional Geology Map



Source: Metadata set of GEOCATMIN - INGEMMET, Integrated Geological Maps 100 K (1973, modified in 2003)

Figure 7-4: Metallogenic belts of Peru with location of Santander Property



Source: Metallogenic Map of Peru, INGEMMET (2020)

7.2 Local Geology

The property is underlain by a package of Cretaceous carbonate and clastic sedimentary rocks that were tightly folded into a series of northerly-trending anticlines and synclines. The lower, predominantly clastic part of the section was thrust over the mainly carbonate-rich upper portion (the favourable host rocks) along a regional, north northwest-trending fault, the Santander regional fault (Figure 7-5).

Several northeast-to-east-west trending, high-angle, oblique wrench faults cut the entire section. Tertiary volcanic rocks unconformably overlay the folded carbonate and clastic sedimentary units. These are interpreted to be broadly contemporaneous with Miocene-age stocks considered to be the heat, and possibly fluid, sources that produced the base metal mineralization. Pre- and post-mineralization diabase dykes and sills are locally present within the section.

Syn-mineralization intrusive activity has not been recognized on the property; however, such bodies are inferred to be present at depth and are seen in intimate contact with similar skarn and carbon replacement deposits (CRDs) immediately along the strike to the north and within the Cerro de Pasco district. At the Volcan Compañía Minera Chungar deposit and the North West Mine, located approximately 10 km and 3 km to the north of the Santander Pipe deposit, respectively, skarn mineralization associated with a granodiorite stock dated at 13.6 Ma old is present.

7.2.1 Stratigraphy & Magmatism

Lower Cretaceous Succession

At the base of the stratigraphic section is the Oyon formation (Figure 7-7). This unit has limited exposure on the property and generally consists of 15 m to 40 m of shale and quartzite units with intercalated beds of anthracitic coal. Small workings in the west and northwest parts of the property are located on coal beds.

Lying conformably above the Oyon formation is the Chimú formation. This unit consists of an approximately 480-m-thick succession of massive to thickly bedded orthoquartzites that grade into slatey quartzite near the top of the section. The unit outcrops primarily to the west of the Santander fault and, because of its resistant nature, produces steep slopes and escarpments.

The Chimú formation is overlain by the Santa formation. This unit has a thickness of approximately 105 m and consists of thin-bedded, blue to grey limestones with local cherty nodules. The unit outcrops principally to the west of the Santander fault (Figure 7-5). Figure 7-6 shows the over-thrust displacement under which the Magistral deposits were discovered, NE-SW oriented blue lines in the geological map represent high angle strike-slip faults that cut the entire section.

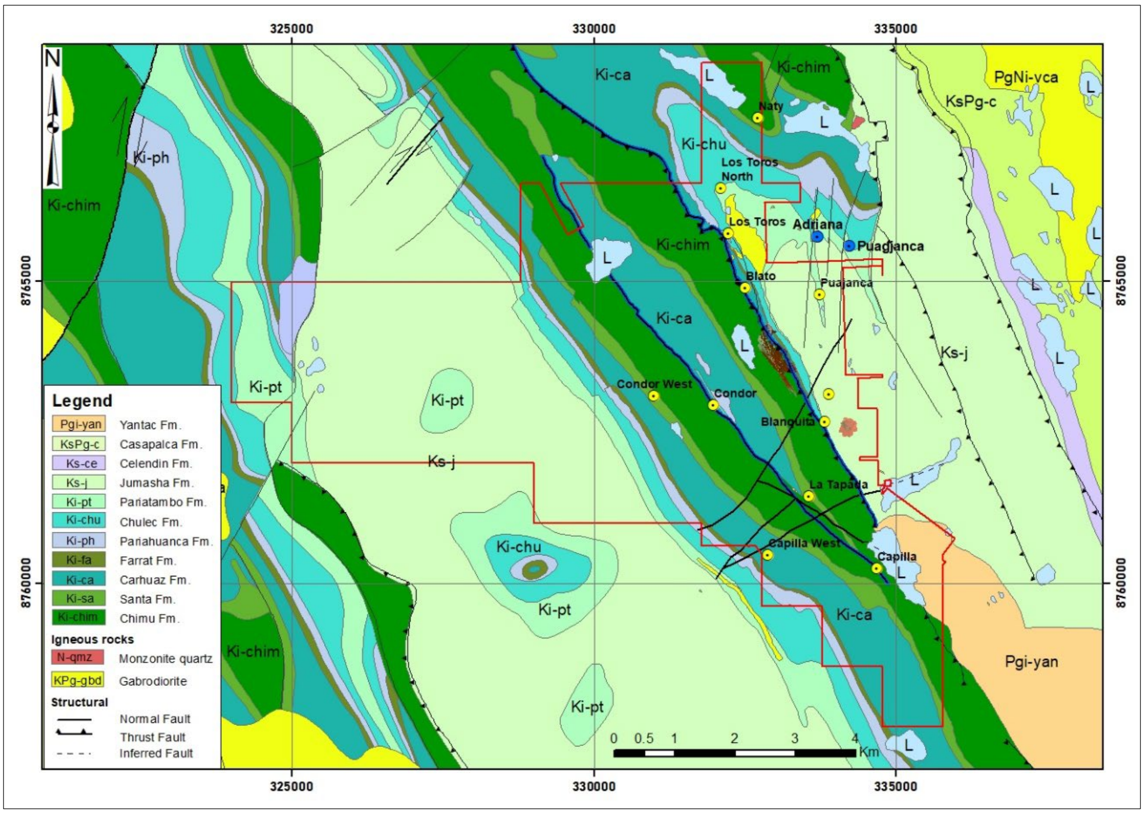
Lying above the Santa formation is a 630-m-thick section of intercalated shales and sandstones known as the Carhuaz formation. This unit is mostly thin-bedded with colours ranging from grey through brown and yellow-brown, with the sandstones occasionally displaying ripple marks.

The Carhuaz formation is overlain by the Farrat formation (Figure 7-7). This unit consists of roughly 60 m of fine-grained quartzites and sandstones. The beds average 1 m thick, are light grey in colour, and occasionally display cross-bedding. The Farrat Formation marks a change from predominantly clastic sedimentation to carbonate deposits.

The Farrat formation is overlain by the Pariahuanca formation (Figure 7-7). This 280-m-thick unit consists primarily of grey massive limestone with occasionally fossiliferous and more siliceous beds. It is locally cut by diabase sills and dykes and is a favourable mineralization host rock at other base metal districts in the mineral belt.

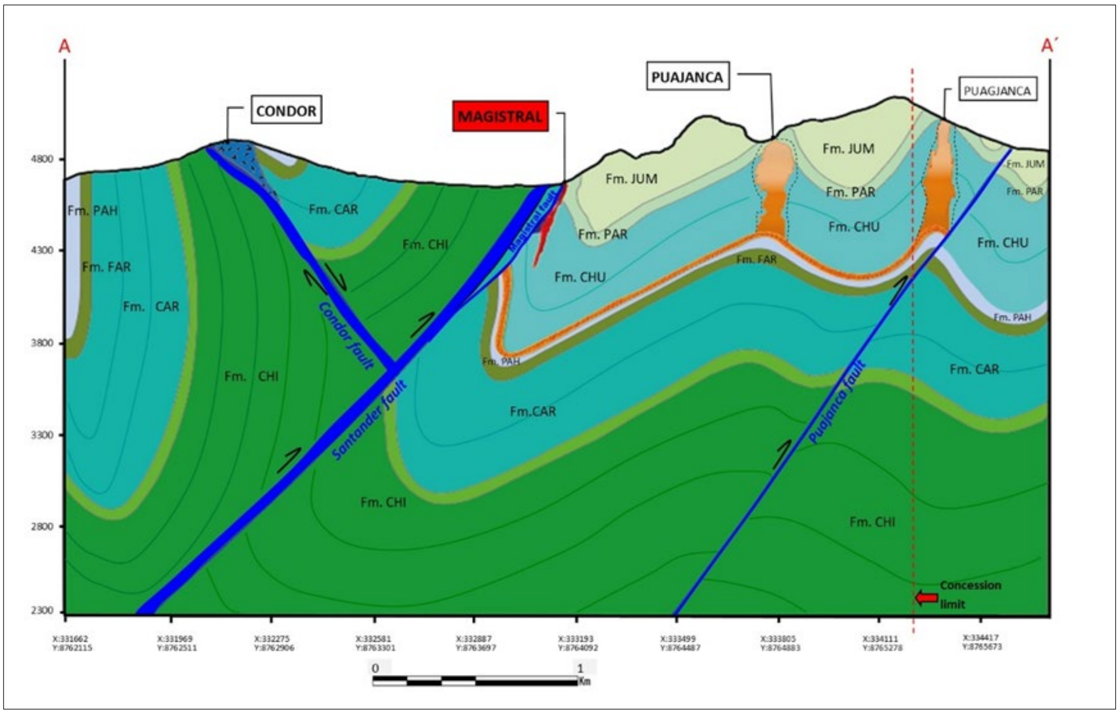
Overlying the Pariahuanca formation is the Chulec formation (Figure 7-7). This 180-m-thick unit consists of an alternating succession of marls and dark grey limestone, although in some areas it is pure limestone. This formation is the most fossiliferous of all the Cretaceous formations and is an important host rock for “manto-type” or replacement mineralization. The Chulec formation hosts all three Magistral deposits as well as the Rosa and Fátima Zones and the lower portions of the Santander Pipe (Figure 7-7).

Figure 7-5: Simplified geological map of the Santander Property



Source: CDPR (2022).

Figure 7-6: Section of the southern part of the Santander-Old Chungar district



Source: Modified from Jean-Paul Bergoeing Rubilar (June 2020).

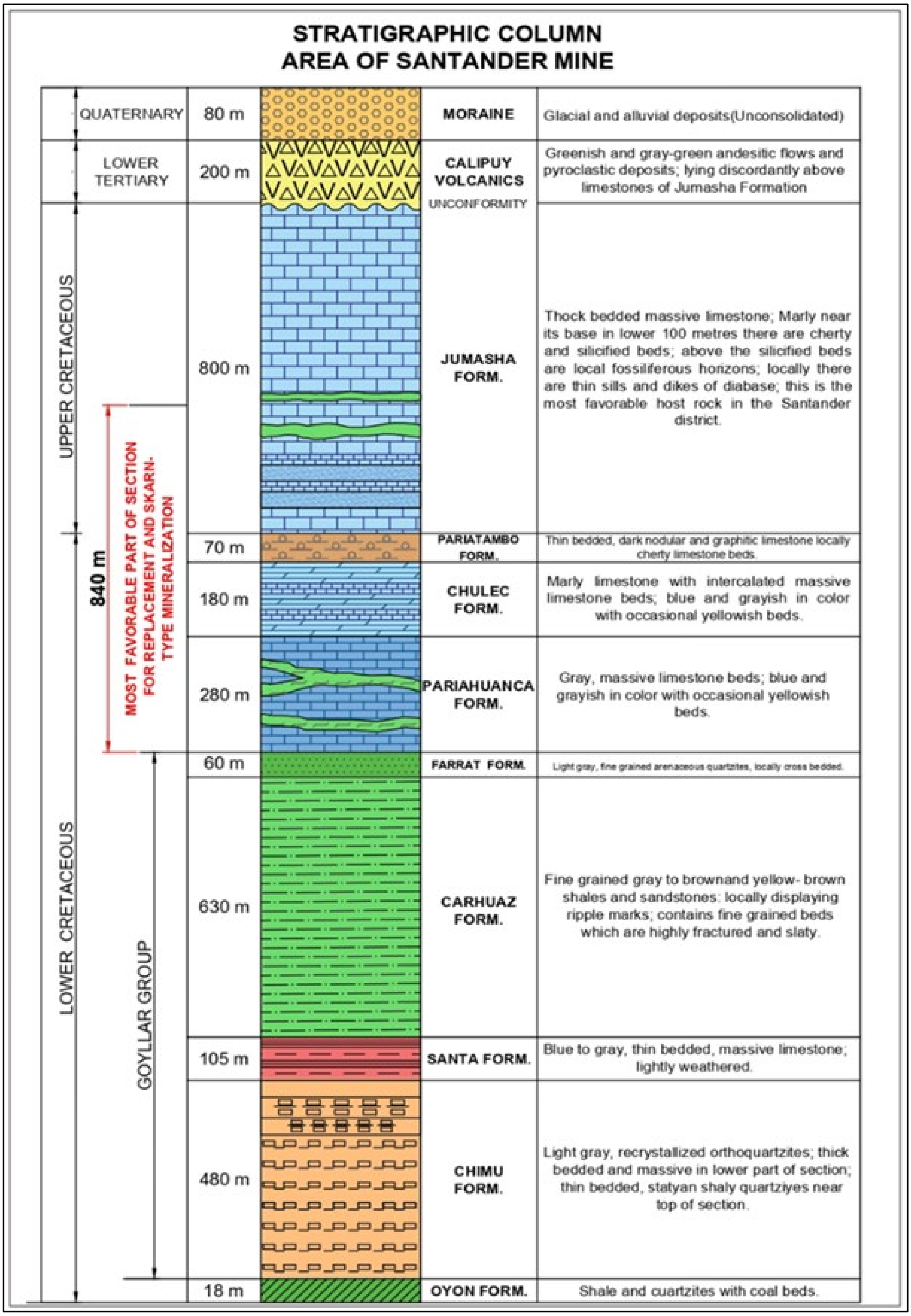
The Chulec formation is overlain by the 70-m-thick Pariatambo formation (Figure 7-7). This unit consists of a succession of thin-bedded limestone, marl, and slate that occasionally contain chert nodules as well as graphitic and pyritic horizons. Outcropping mineralization at the Puajanca prospect is hosted within this unit.

Upper Cretaceous Succession

The Pariatambo formation is overlain by the Jumasha formation, which is the thickest calcareous unit of the section, at an estimated 800 m (Figure 7-7). It consists primarily of massive light grey to grey limestone. Immediately about its base, the limestone units are marly for approximately 100 m of section, followed by about 130 m of alternating cherty and fossiliferous limestone with beds ranging between 0.5 m and 2 m in thickness. Sills and dykes of the diabase are occasionally seen in the lower half of the formation. The Jumasha and Pariatambo formations host the upper portions of the Santander Pipe.

Lying unconformably above the Jumasha limestone are erosional remnants of the Calipuy volcanic rocks. These consist primarily of green-grey andesitic flows and fragmental rocks up to 200 m thick.

Figure 7-7: Stratigraphy at the Santander Property



Source: modified from Golder (2009)

Tertiary

Tertiary rocks are minor in volume within the Santander area and correspond to green, grey, beige and reddish andesitic volcanic and volcanoclastic rocks of the Callipuy volcanics, which lie discordantly on top of the Mezosoic units. South of the Santander area, these rocks can reach important thickness of up to 1,000 m (Zimmernink, 1985; Jacay, 2011). Within the limits of the property, intrusive rocks are limited to discrete occurrences of microdioritic rocks emplaced as sills and dykes mainly in the lower half of the Upper Cretaceous formations, which have been informally called “the diabase unit”.

No geochronology study has been carried out so far in this unit, but field observations indicate that these rocks appear to be pre-mineralization (Golder, 2012;). To date, syn-mineralization intrusive activity has not been recognized in the Santander area. However, 10 km to the north-northwest of the Santander – (Old) Chungar district, a granodiorite stock dated at 13.3 Ma ± 0.3 Ma and 13.6 Ma ± 0.36 Ma is directly associated with the development of skarn mineralization at the Volcan Compañía Minera Chungar mine (Soler and Bonhomme, 1988; Bissig et al., 2008).

7.3 Structural Geology and Mineralization

An initial pre-mineralization, northwest-trending fold, and thrust belt formed during Incaic orogenic cycle (late Palaeocene to Eocene). A second phase of contractional deformation in the mid-Miocene is thought to be contemporaneous with mineralization, resulting in a series of north-northwest trending anticlines and synclines occasionally disrupted by high-angle thrust faults that parallel the regional structural grain of the Western Cordillera of the Andes. The most prominent of these thrust faults is the Santander fault, a regional-scale deformation zone. It is approximately parallel to the fold axes with a strike of 150º and dips moderately to the west. Based on regional stratigraphic reconstruction, it has an estimated minimum displacement of at least 1,000 m. There is also a subordinate system of north-east to east-west-trending transverse oblique wrench faults, some of which are interpreted to cut the Santander fault at a high angle.

Interplay between the various deformation styles has resulted in zones of enhanced fracturing and permeability, ultimately leading to zones of preferential fluid flow and mineralization. The age of mineralization was previously thought to be between 12 Ma and 14 Ma old, based on two potassium-argon age determinations of biotite from a granitic intrusion at nearby skarn-hosted Chungar Mine located approximately 10 km to the north-northwest of the Santander Property.

However, geochronology carried out on garnet samples by Jean-Paul Bergoeing Rubilar (June 2020) for his MSc thesis, University of Geneva, entitled “Distal Zn-Pb(-Ag) skarn mineralization at Santander, Central Peru, yielded U-Pb ages of 10.72 ± 0.56 Ma, 10.72 ± 0.56 Ma and 9.53 ± 0.56 Ma for the Santander Pipe and 9.60 Ma ± 0.33 Ma in Blato for the prograde skarn formation. Titanite associated to the porphyry-style Qz-Moly veins yielded U-Pb ages of 10.89 Ma ± 0.47 Ma in the Santander Pipe and 11.07 Ma ± 0.45 Ma and 11.69 Ma ± 0.35 Ma in the Blato prospect which are younger than the skarn hosted Chungar mine.

The work undertaken by Jean-Paul Bergoeing Rubilar identified three different alteration/mineralization events in relation to the Santander Pipe. These events have been defined based on a study of representative samples from four of the mineralised centres in the area:

- A prograde skarn assemblage was identified in all of the studied zones and is characterized by an early massive garnet-clinopyroxene-magnetite-apatite-vesuvianite assemblage and a late formation of garnets and clinopyroxene occurring as veins and disseminations.
- A retrograde skarn assemblage was also identified in the four studied zones and is characterized by epidote-chlorite-actinolite-magnetite-sericite-K-feldspar-plagioclase-quartz and calcite. The retrograde skarn assemblage is superposed onto the prograde skarn and is genetically associated to two stages of polymetallic mineralization, defined in terms of sulphidation state of the ore mineral assemblages. The early stage is characterized by an early pyrite precipitation followed by a low-sulfidation assemblage dominated by Fe-rich sphalerite, pyrrhotite, arsenopyrite, chalcopyrite, and minor galena. The late stage is characterized by an intermediate-sulfidation ore assemblage that includes the replacement of former pyrrhotite by late pyrite and the generation of two different Fe-poor sphalerites together with galena and minor As-Sb-Ag tellurides and sulphides. The two mineralization stages occur superimposed in a single sample and even within a single vein. Textural evidence suggests that the transition between them was a continuous process and reflects the evolution of a single mineralizing fluid. The polymetallic mineralization at Santander can be correlated to an early low to intermediate-sulfidation mineralization stage reported in various polymetallic deposits associated to the intrusion of Miocene porphyry stocks in the Central Peruvian Polymetallic Belt. Major and minor element geochemistry of skarn silicates associated to the mineralization show systematic variations resulting from different temperature conditions during the ore deposition in the four studied areas.
- Porphyry-style quartz-molybdenite-pyrite veins have been observed in the deep sections of the Santander Pipe. These are characterized by multiple vein formations with variable amounts of sulphide and gangue minerals. Alteration associated to this event shares characteristics of potassic alteration in porphyry systems, dominated by K-feldspar, biotite, quartz, and titanite with minor amounts of sericite and chlorite. In the Santander Pipe, the veins appear cross cutting the prograde skarn mineralogy and are in turn cross-cut by the polymetallic mineralization associated with the retrograde skarn formation. These occurrences suggest a protracted deep porphyry-style activity during the formation of the skarn alteration and polymetallic mineralization at Santander.

7.3.1 The Santander Pipe

The Santander Pipe was in operation between 1958 and 1992, both as open-pit and underground workings that reached a depth of up to 480 m below the surface. Past production from the Santander Pipe reached approximately 8.0 Mt averaging 7.0% Zn with significant Ag-Pb and minor Cu credits (SRK, 2017). During its operation lifetime, it produced an estimated 1.45 Mt of

Zn, Pb-Ag and Cu concentrates associated to sphalerite-galena-hessite and chalcopyrite respectively.

Mining ceased at 480 m depth in mineralization, due to adverse metal prices and underlying hyperinflation. The last drill program indicates that mineralization (Zn-(Cu-Pb-Ag)) continues at least 400 m further below the lowest working and at depth, the Qtz-Moly mineralization reaches 700 m further and is still open at depth. The geometry of the Santander Pipe is modelled as manto replacement in favourable rocks of the Chulec Formation in depth and as a vertical pipe-like geometry in the shallower parts where it cuts through the Jumasha limestones using the axial plane of a north-south trending regional anticline (Figure 7-8). In the upper cylindrical part of the Santander Pipe, mineralization is seen as massive sulphides concentrated along the borders of a massive garnet-pyroxene skarn core, forming an annular outer layer of sulphide-rich material with a diameter between 6 and 20 m. Below this ring zone, the ore minerals appear as sulphide-rich manto-like bodies, alternating with the occurrence of skarn-rich levels (Photo 7-1). Their strike and dip coincide with the surrounding Cretaceous sediments where they reach a thickness between 5 and 25 m. The contact between the limestones and the skarn body is extremely sharp and it is usually characterized by a 4 to 8 mm chlorite-rich part which is followed by a zone of diopside (some 1 - 3 cm, but not always clearly developed) and then by a zone which contains garnets (Zimmernink, 1985).

The gangue minerals consist mainly of garnets (andradite and grossular), calcite, quartz, diopside, epidote, chlorite, vesuvianite, orthoclase, clinozoisite, and zoisite (Zimmernink, 1985). Ore minerals include mainly Fe-rich sphalerite, with variable amounts of chalcopyrite, argentiferous galena, pyrrhotite, pyrite, and minor amounts of mackinawite, marcasite, bornite, hessite, and various bismuth tellurides (Zimmernink, 1985). Complex textures of dissolution and replacement suggest a complex evolution of the mineralizing fluids where different stages of alteration and mineralization were superimposed on a single-hand specimen (Zimmernink, 1985). Of special interest is the great variety of up to 5 different garnet types described by Zimmernick (1985) in terms of optical characteristics. The distribution of both gangue and ore minerals within the vertical profile of the Santander Pipe indicates mineralogical zoning. For example, a change in composition of garnets from andraditic to grossularitic towards depth was observed by Zimmernink (1985), who also points out that vesuvianite, orthoclase, and clinozoisite are found in minor amounts only in the lower parts of the mine.

The mineralization drilled below the bottom of the mine shows further changes, with thinner skarn horizons and shallower dips with distance from the deposit axis, and a tendency to indicate that the skarn horizons may be spreading beyond the pipe confines and into horizons relating to a possible larger skarn front.

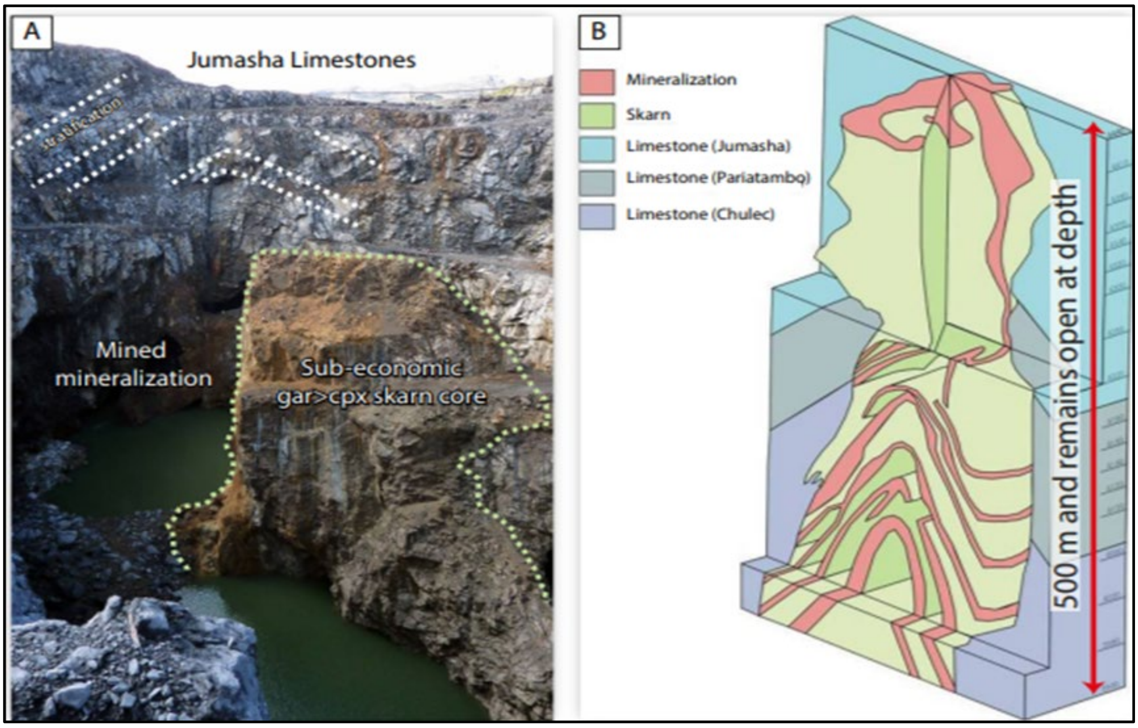
The following Figure 7-8 shows:

A. Open pit of the Santander Pipe (old mining operation, now inactive). In this segment of the profile, the host rocks are the massive limestones of the Jumasha Formation, which are folded in an anticline. Orange colour corresponds to the massive barren skarn body (gar>px) that formed in the axial trace of the anticline. Mineralization was mainly focused in the margins of the skarn body, forming a ring-like geometry that was mined between

1958 and 1992. Underground workings extend for more than 300 m depth. The inactive mine is currently flooded as all the water pumped from the actual Magistral mine goes directly to the old Santander Pipe open pit. Source: Bergoeing (2020).

B. Schematic representation of the geometry of mineralization and alteration in the Santander Pipe. Note the “manto-like” geometry of the skarn and mineralization at depth, contrasting to the “pipe-like” geometry in the uppermost part of the profile. Mineralization extends for more than 500 m and remains open at depth.

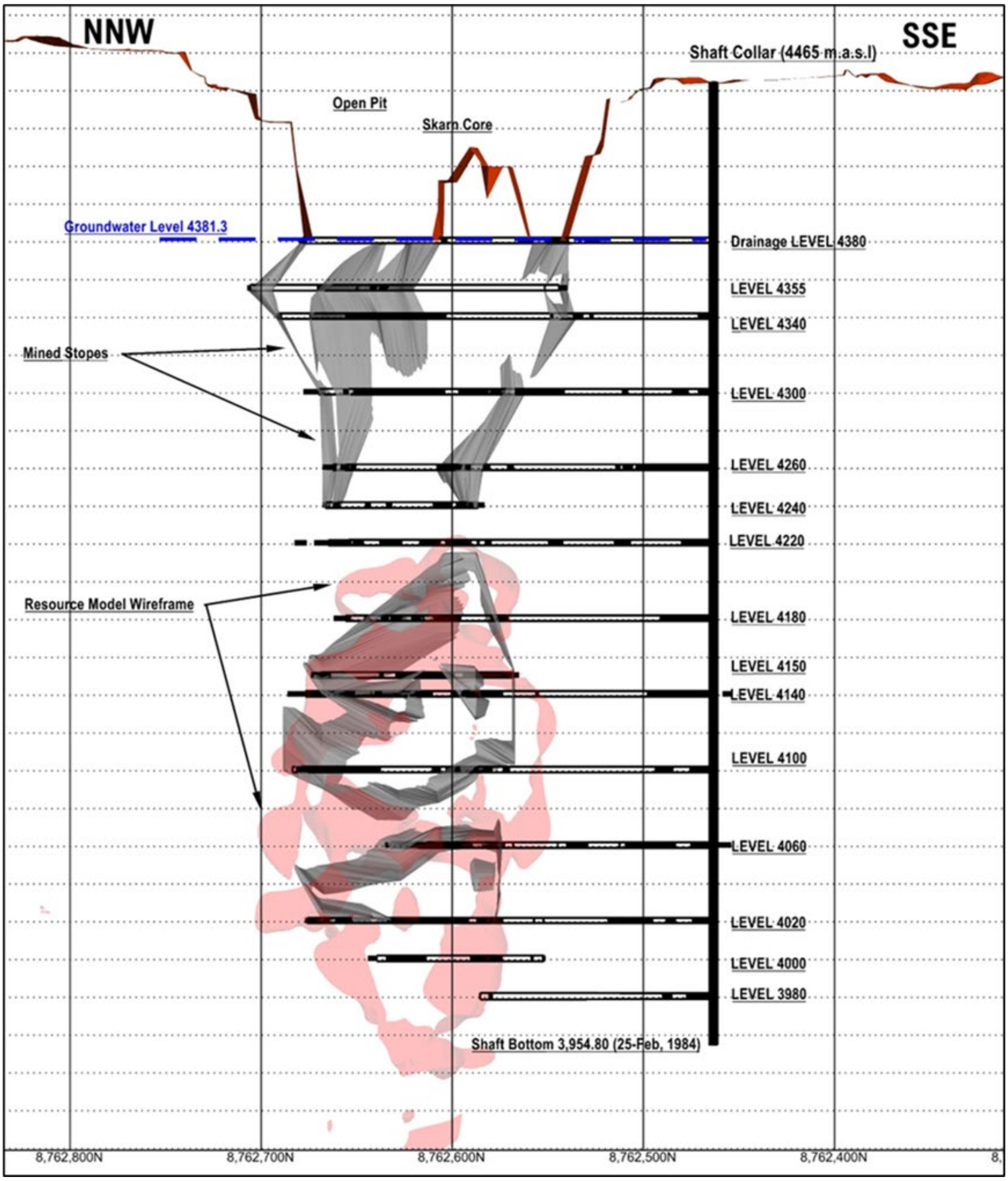
Figure 7-8: (A) Santander Pipe Open Pit; (B) Geometry of the Mineralization



Source: Bergoeing (2020).

Figure 7-9 shows the open pit, mineral worked out down to the 4,020 m level (in grey), and the mineralization remaining (pink), both within and below the underground mine.

Figure 7-9: Open Pit, Worked Out areas and Remaining Mineralization



Source: CDPR (2022).

Photo 7-1 displays a sulphide-rich manto zone in drillhole 0242B-19 showing a sharp contact with grey footwall limestone to the right.

Photo 7-1: Sulphide-rich Manto Zone in Drillhole 0242B-19

Source: Trevali drill hole (CDPR, 2022).

Photo 7-2 shows a zoisite (pale green), grossularite (pale pink), and feldspar (white) manto zone carrying irregular medium-grade sulphide mineralization in drillhole SAN-0225-19, showing a sharp contact with grey-red limestone.

Photo 7-2: Sulphide Mineralization in Drillhole SAN-0225-19

Source: Trevali drill hole (CDPR, 2022).

Photo 7-3 shows a variably mineralized manto zone carrying irregular lower grade sulphide mineralization in Drillhole SAN-0242B-19. This intersection shows a gradual contact with chloritic unmineralized skarn and limestone wall rocks.

Photo 7-3: Sulphide Mineralization in Drillhole SAN-0242B-19

Source: Trevali drill hole (CDPR, 2022).

Zimmernink (1985) also reports that the occurrence of zoisite (Photo 7-2) appears to be more abundant towards the deepest parts of the Santander Pipe, where it usually forms small prisms and needles or appears as a rim in clinozoisite. Chlorite shows variable colours that range from nearly transparent to greenish to brownish and forms very fine-grained masses usually associated with quartz and sulphides (Photo 7-3). In parts of the old Santander Pipe mine, it appears to form a transition zone between the skarn body and host rock (limestone), where it can make up 70 % of the rock (Zimmernink, 1985). Exploration drilling campaigns carried out by Trevali since 2017 have revealed the occurrence of a magnetite-rich skarn zone and an intense Qz-Moly-Py stockwork in the deep levels of the Chulec Formation. This stockwork extends to deeper levels into the siliciclastic rocks of the Chimu Formation. Other than a narrow diabase dyke, no intrusive bodies spatially and genetically associated with the skarn or the Qz-Moly-Py stockwork, have been discovered so far.

The changing in-depth dimensions and zoning characteristics of the Santander Pipe deposit are summarised in Table 7-1.

Table 7-1: Main Characteristics of the Santander Pipe Deposit, (Zimmernink, 1985)

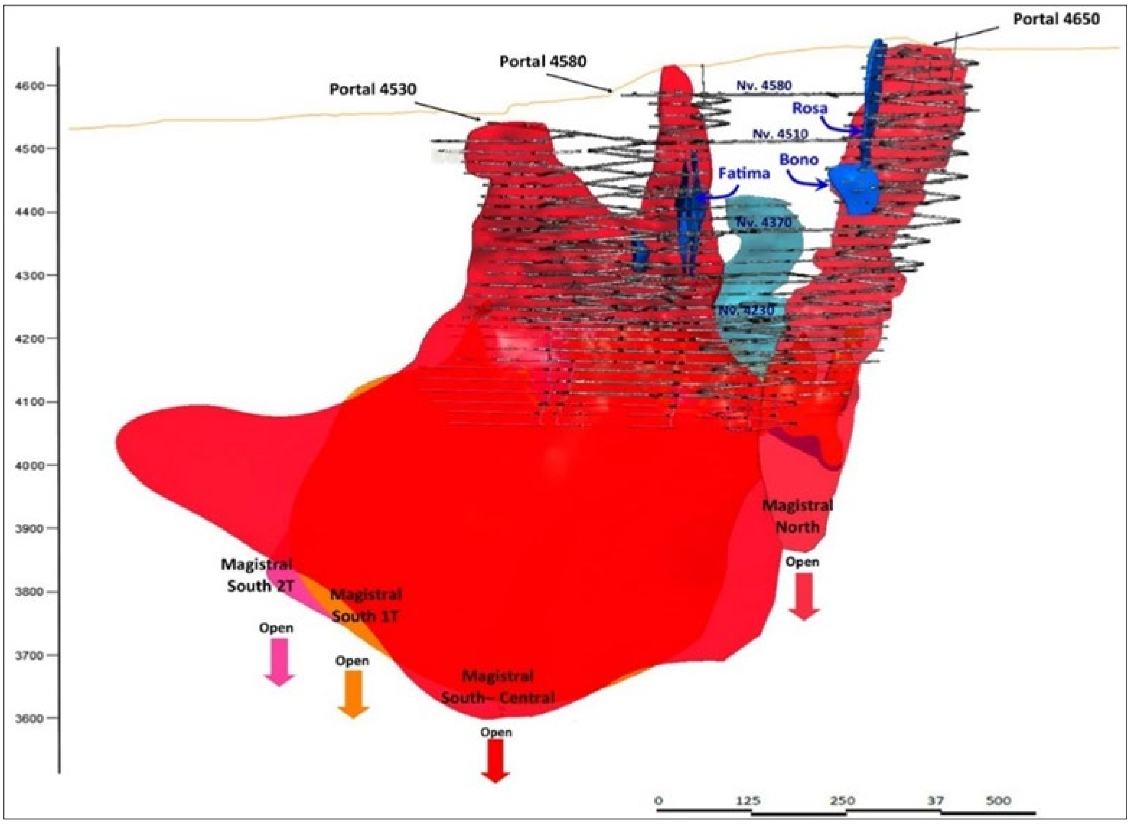
CDPR Map ref.	LEVEL	Dimensions		AREA m²	MINERAL ZONING CHARACTERISTICS	Host Rock
		N-S metres	E-W metres			
178	4410	156	110	12,038	Massive sulphides surrounding a central low grade skarn core.	Jumasha Formation limestones
177	4380	141	118	12,245		
176	4355	177	110	11,637	Mainly Fe-rich Sphalerite plus variable low amounts of Galena, Chalcopyrite, Pyrrhotite & Pyrite.	
175	4340	156	90	10,925		
174	4260	100	117	7,975		
173	4240	117	108	7,622	---------------------------------	-----------------------
172	4220	151	95	7,931	Both gangue and ore minerals change with depth indicating mineral zoning, as seen in the garnets which change from Andradite to Grossular in depth.	Central dolomitic zone
171	4180	160	97	9,705		
170	4150	93	93	11,155		
169	4140	168	102	14,231		
168	4100	156	120	15,295		
167	4060	151	152	17,652	---------------------------------	-----------------------
166	4020	149	158	16,932	Increasing amounts of Zoisite with depth, particularly on mineral / limestone contacts.	Chulec Formation limestones
165	4000	152	167	16,783		
164	3980	140	152	14,760		
	From Trevali drillholes below the bottom levels:				Magnetite-rich Skarn at greater depth & Quartz-Molybdenite-Pyrite veining	
	Zimmernink (1985)					

Source: CDPR (2022).

7.3.2 Deposits within the Adjacent Magistral Mine

Magistral is the only actual mining operation at Santander, situated 1.5 km NW of the Santander Pipe (Figure 7-5). It consists of three main mineralised bodies Magistral North, Magistral Central, and Magistral South, and six minor bodies —Rosa, Bono, Fátima North, Fátima South, Magistral Central-North, and Oyon. The three main bodies strike approximately N 330° and dip between - 55° and - 67° to the southwest. Figure 7-10 shows a 3D combined graphical representation of the Magistral deposits (Magistral North, Magistral Central, Magistral South, Magistral Central-South, Oyón, Rosa, Bono, Fátima North, and South Zones), together with current mining and exploration depths. Pb-Zn-Ag Mineralisation is at variance to that recorded within the Santander Pipe deposit, and principally comprises fault-controlled replacement within the Chulec formation, located along the footwall side of the Santander fault, and where only local skarn development is seen.

Figure 7-10: Longitudinal 3-D View of the Magistral Deposits



Source: CDPR (2021).

7.3.3 *Evidence of Mineralization Close to the Santander Pipe and the Magistral Mine*

A number of prospects are situated close to the Santander Pipe deposit, and these include Puajanca, a similar pipe-like deposit that is located 2.5 km to the north to NNW of the Santander Pipe deposit on what is referred to as the Santander trend (Figure 7-11). This has been partly drilled and is prioritised for further exploration drilling.

The Blanquita prospect is a CRD target located 0.7 km SE of Magistral South and 0.5 km NW of Santander Pipe on what is referred to as the Magistral trend (Figure 7-11). In 2017, Trevali drilled one hole (SAN-0227-17) aimed to test the Blanquita target without any significant results but with interesting alteration, which shows moderate to strong recrystallization from 392 m to hole end at 485 m, with traces of sphalerite-galena-pyrite towards the end of the hole.

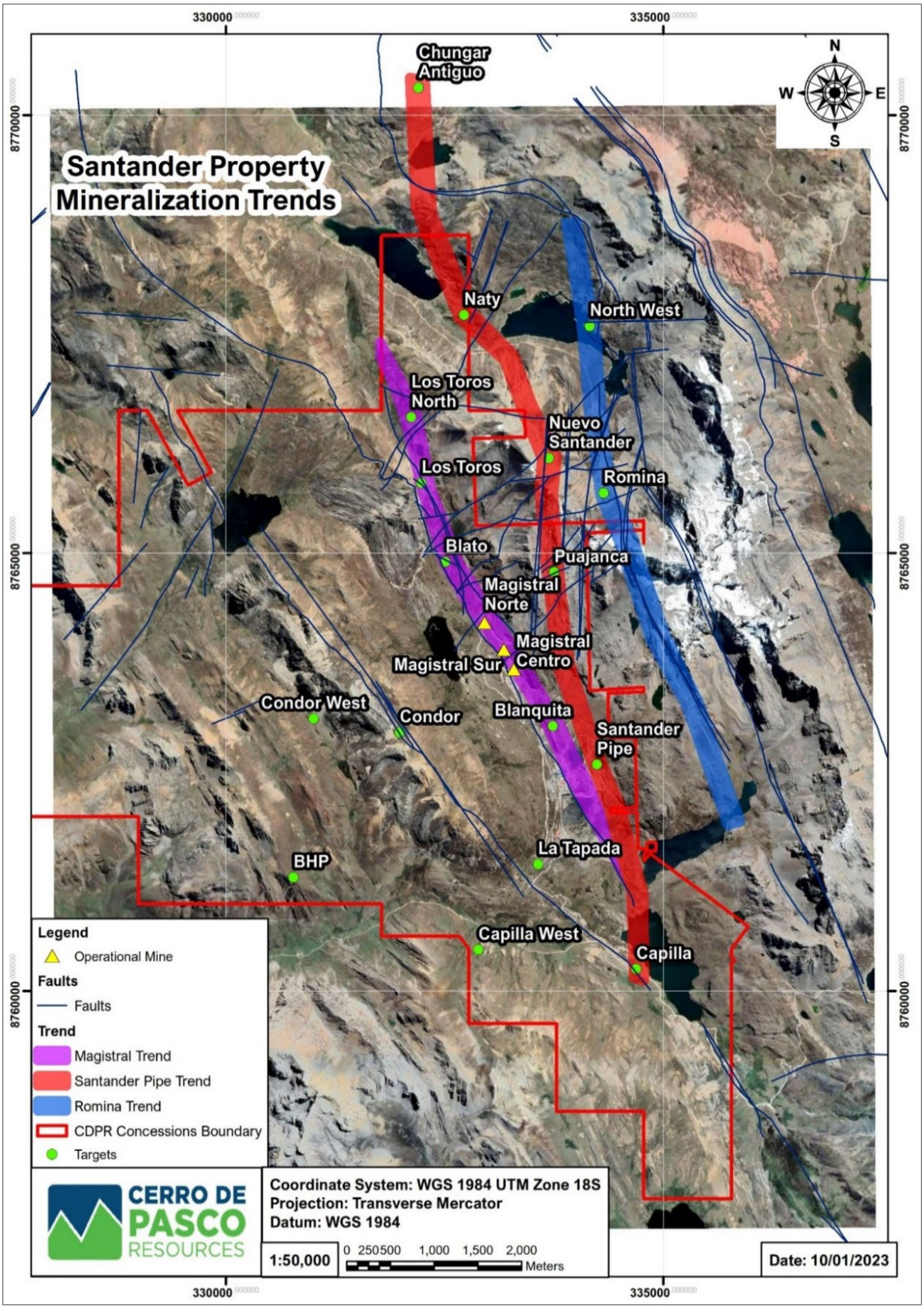
7.4 Local Prospects

Figure 7-11 shows three north to north north-west trending mineralization trends now being interpreted within this mining area. These include :

- The Magistral trend to the west along which various other exploration targets (Blato, Los Toros, and Los Toros Norte) have been idientified in recent years to the north of the Magistral mine.

- The Santander Pipe trend, a central trend which continues northwards from the Santander Pipe to Puajanca, Nuevo Santander (not within CDPR´s concessions), and Naty which is within CDPR´s concessions.
- An east trend, which parallels the Santander Pipe trend and hosts amongst other deposits, Chungar´s Romina project and other exploration projects.

Figure 7-11: The Magistral, Santander Pipe, and adjacent Romina Trends showing the location of other prospective targets within these trends and within the Property boundaries

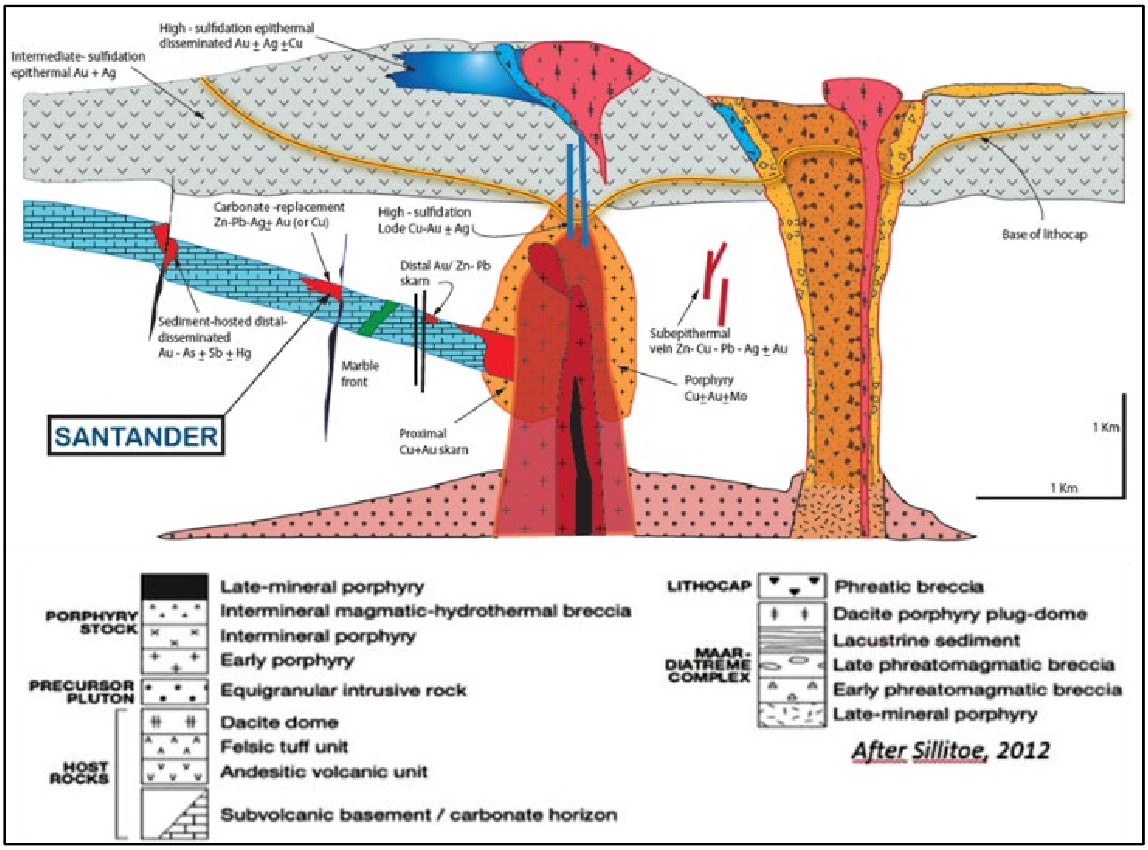


Source: CDPR (2023)

8 DEPOSIT TYPES

The characteristics and setting of the mineralization within CDPR´s Santander properties are consistent with intrusion-related, carbonate-hosted zinc-lead (copper, silver) deposits (Megaw, Balton and Falce 1996; Megaw 1998; Meinert, Dippert, and Nicolescu 2005), also known as CRD or high-temperature carbonate (HTC) deposit types. Such deposits form a continuum between relatively lower-temperature replacement types to higher-temperature skarn-hosted types (Figure 8-1).

Figure 8-1: Santander Carbonate Replacement Deposit Model in Relation with the Intrusive-related system



Source: Sillitoe (2012).

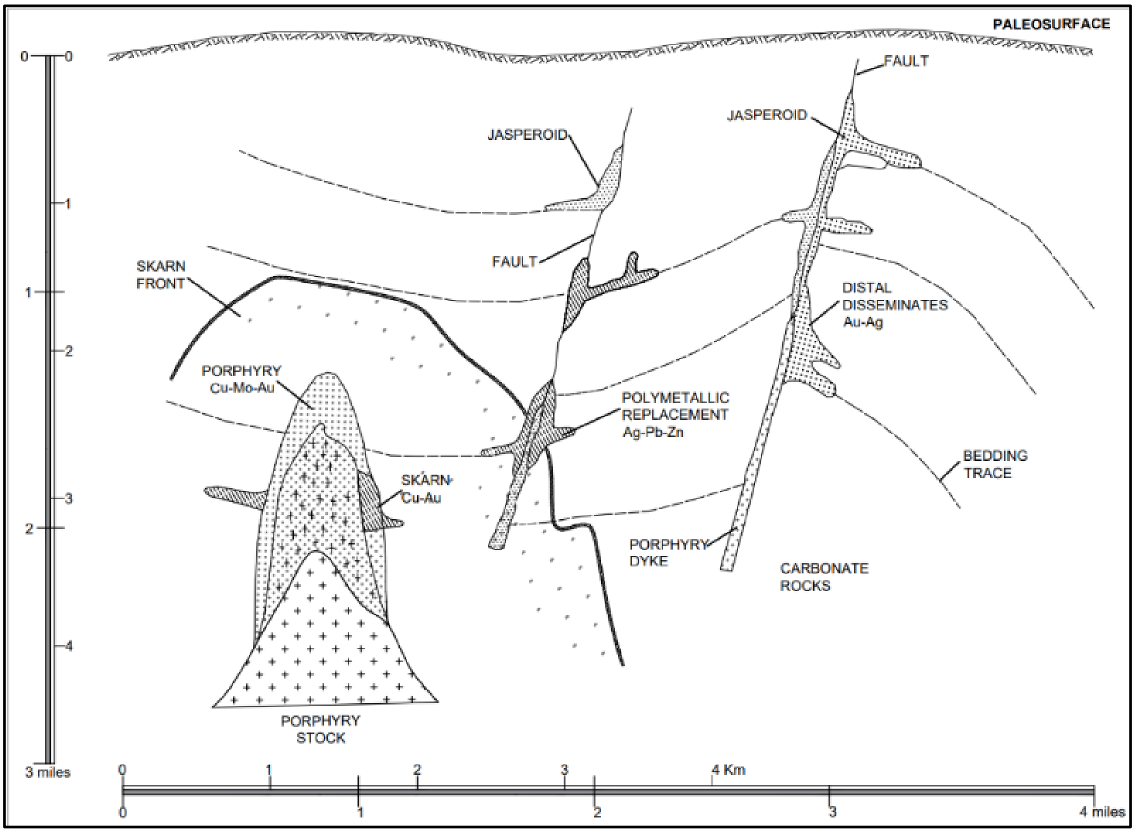
The mineralization occurring at the Santander property is typical of productive CRD silver-lead-zinc districts, such as those found in the Central Mineral Belt of Perú. Deposition of acidic metalliferous brines is considered to have been caused by a variety of physio-chemical triggers, such as rapid pressure drop, temperature gradients, and/or reactions with neutralizing host rocks. Such deposits may display a variety of geometries from irregular, tabular types to extensive "manto and chimney" or pipe systems.

Zoning of metals is common from the central part of the systems outward to the less-altered host rocks. A typical classic gradational zonation (vertical or horizontal) from proximal to distal is as follows: copper ± gold to zinc to lead-silver to iron-manganese in the uppermost or outermost portions of the systems.

Rocks of the Magistral Deposits indicate a high to intermediate position in the system with the Magistral North, Oyon, Magistral Central-North and Magistral Central deposits as well as the Puajanca Prospect falling within the lead-silver-rich zones and the Magistral South and Santander Pipe within the intermediate to lower-level zinc-rich zones. All zones remain open for expansion.

The Blanquita target between the two mines is of particular interest for its outcrop description fits one of Sillitoe´s more detailed models, as illustrated in Figure 8-2, which shows the general setting of polymetallic replacement deposits and jasperoidal outcrops in relation to porphyry stock.

Figure 8-2: General Setting of Polymetallic Replacement Deposits and Jasperoidal Outcrops



Source: Modified from Sillitoe and Bonham (1990).

The overall deposit model Santander Pipe to Magistral Mine is developed further in Section 9 of this report.

9 EXPLORATION

It was only following the 2007 Trevali acquisition of the Santander property, that an auditable and systematic approach was introduced into exploration, starting with the exploration drilling and sampling of the known Magistral deposits, and then extending out into the area covered in the concessions where mapping, geochemical sampling, and different geophysics studies have been undertaken to explore for new possible sources of economic mineralization.

The various exploration campaigns carried out together with the findings are already summarized in the previous NI 43-101 report (DRA, 2022) in the following referred to report Sections:

- Regional geological mapping and structural interpretation (Section 9.1).
- Systematic rock-chip and soil-sampling campaigns and their interpretation (Section 9.2).
- Geophysical surveys (Section 9.3).

9.1 The Santander Pipe

Diamond drilling carried out by CMS and Trevali (Section 10) comprises the principal exploration carried out in direct relation to the Santander Pipe deposit.

CDPR continues the process of reviewing all available information that, in relation to the Santander Pipe, comprises old CMS geology and mining maps, plans, sections, and reports, as well as CMS and Trevali drill cores stored on site.

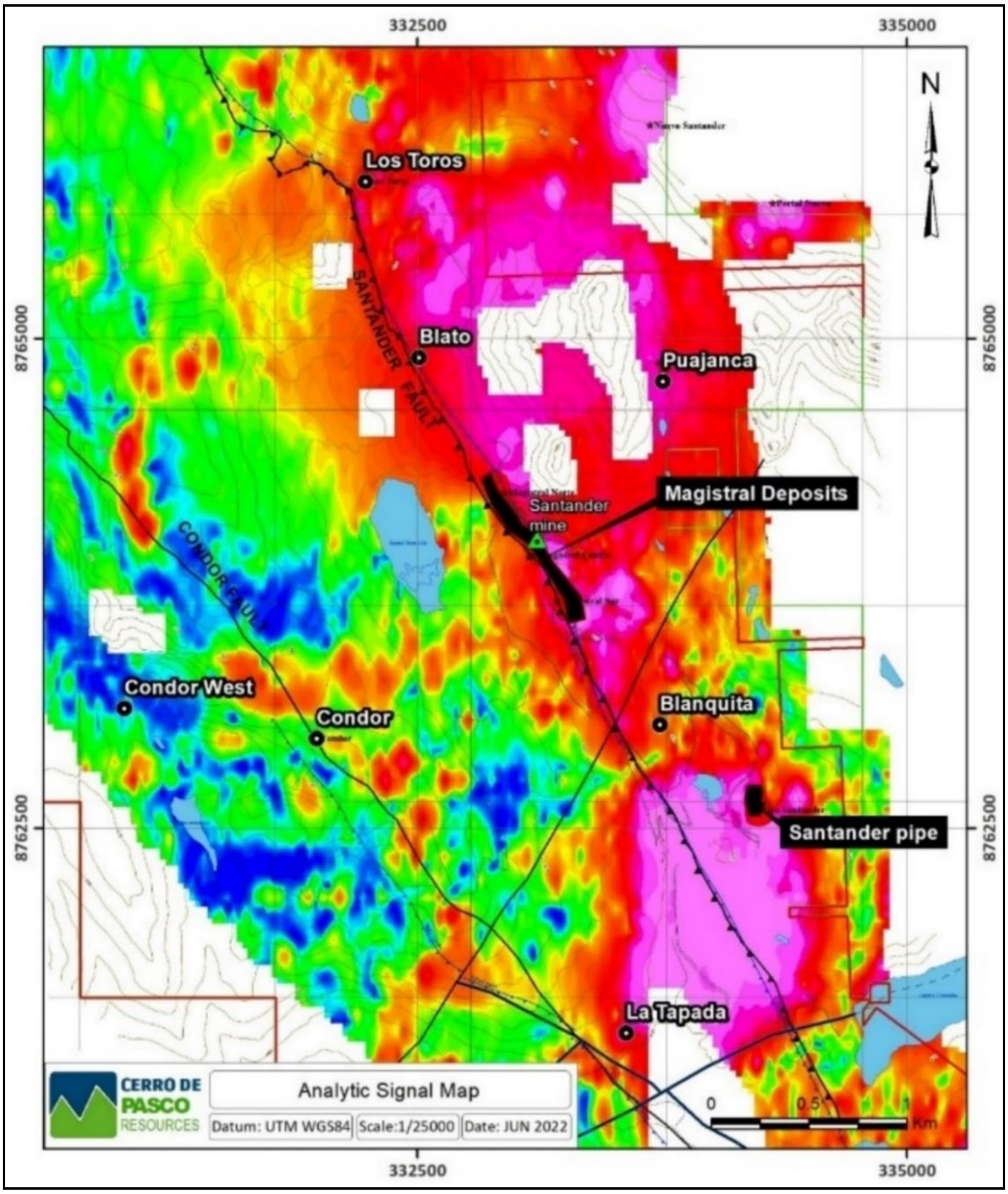
The principal magnetic anomalies in the combined 2007, 2009, and 2011 surveys can be seen in Figure 9-1, which shows the combined magnetic analytic signal map survey results and targets (2007 and 2011 by Val d'Or Geophysics, and 2009 by Quantec Geoscience), and the deep MT anomaly (possible in-depth intrusion) in Figure 9-2. The cumulative ground magnetic data has most recently been re-interpreted and enhanced by Silver Bow Geophysics (Todd, 2022), and shows an anomaly to the south of the Santander open pit, which warrants further exploration in the future (Figure 9-3).

Both infill and exploration drilling have been re-started by CDPR, mainly in relation to ongoing operations in the Magistral Mine. However, some drill holes have been carried out in the area between the Magistral mine and the Santander Pipe, in relation to what is being referred to as the "Pipe North" area, and the Blanquita prospect.

9.2 The "Pipe North" Area

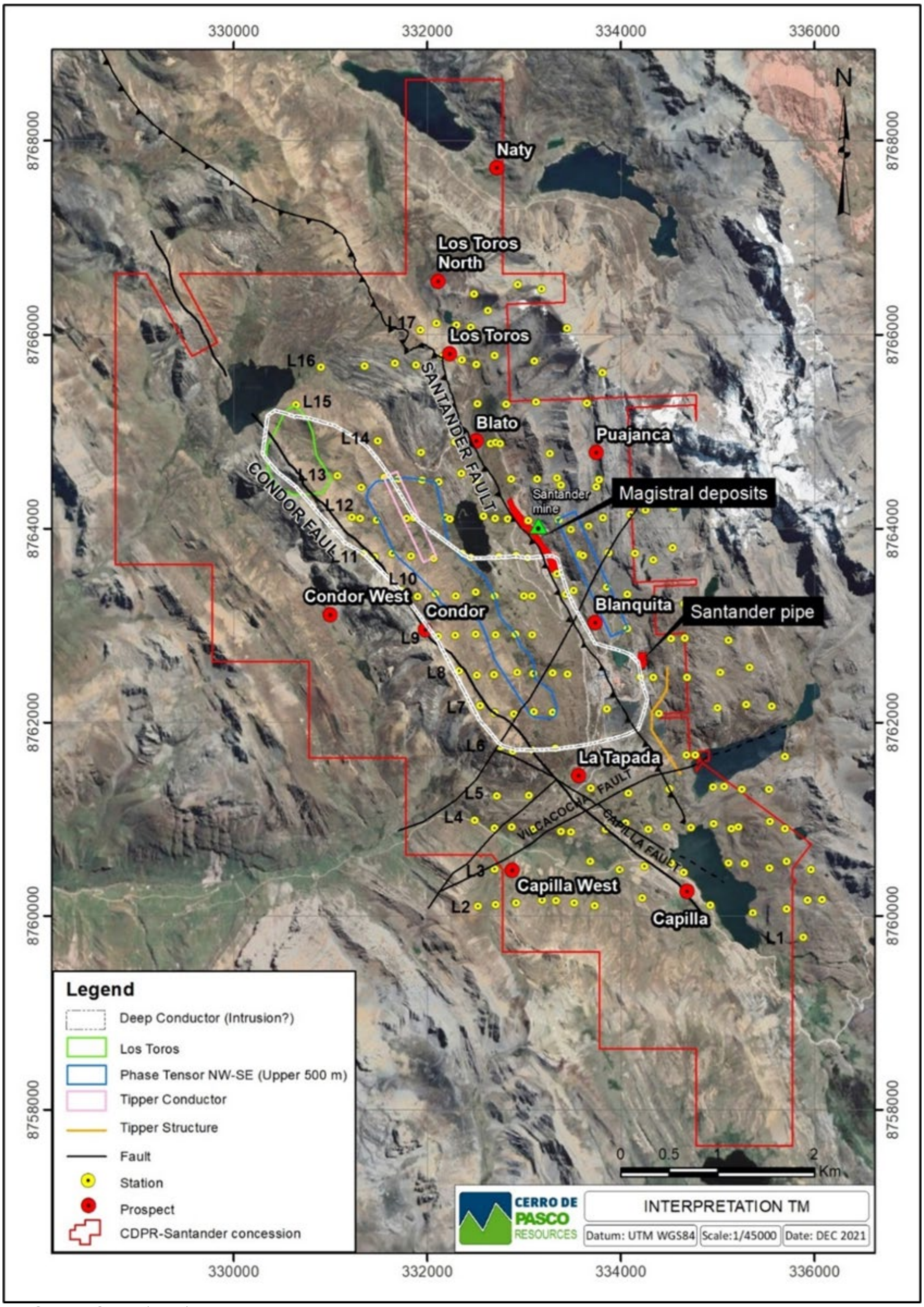
No further drilling of the Santander Pipe was carried out by CDPR. However, a number of exploration drill holes were carried out during 2022, which were designed to explore the deep skarn front surrounding the steep fold within the Pariatambo and Chulec formations that trend northwards from the pipe and in the direction of the Puajanca deposit approximately 2 km to the north of the pipe. The zone between 200 m and 800 m north of the pipe was explored indicating variable thicknesses of skarn-type mineralization the results and tenor of which are summarised in Section 10 of this report.

Figure 9-1: Combined Magnetic Analytic Signal Map Survey Results and Targets



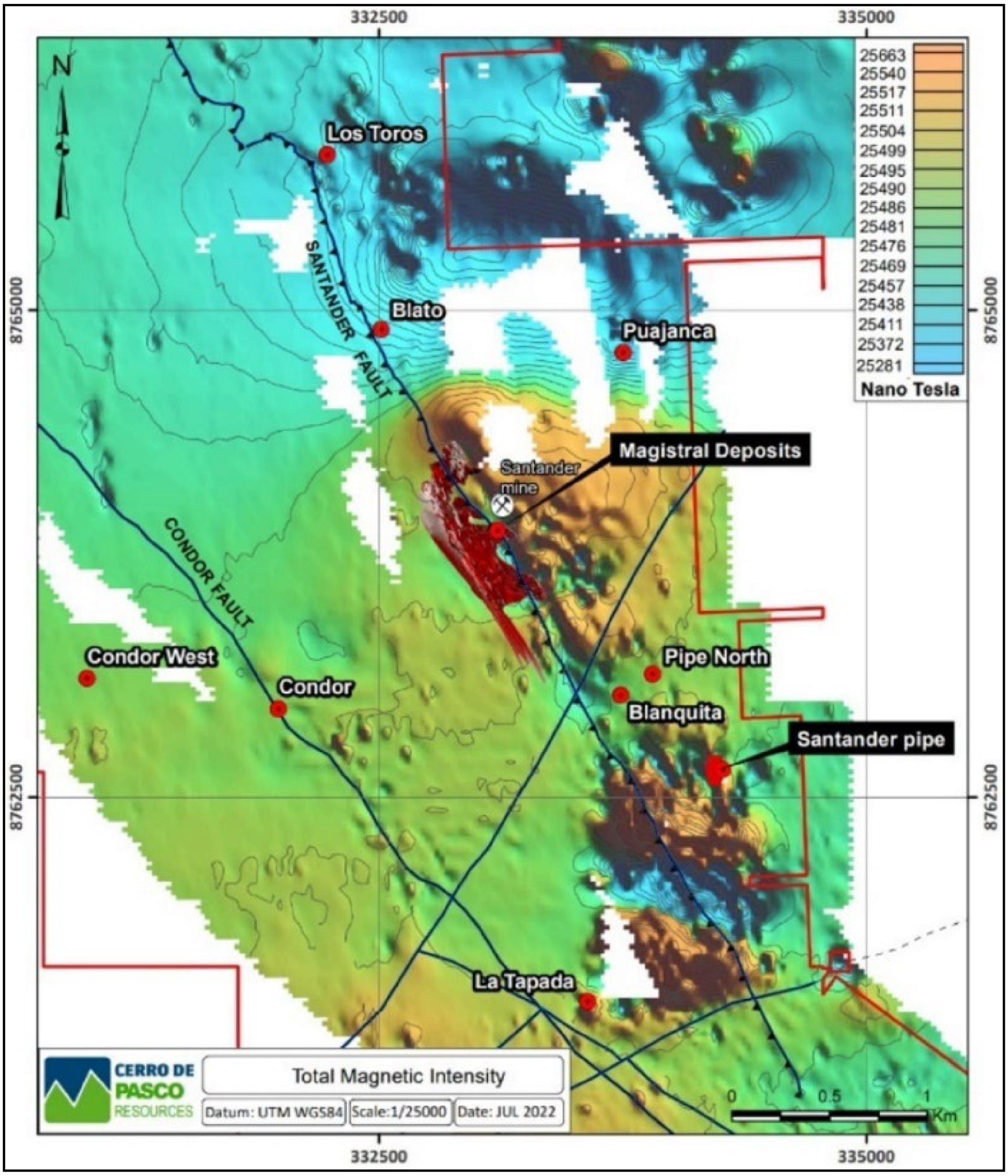
Source: CDPR (2021).

Figure 9-2: MT Anomalies and Station Points



Source: CDPR (2021).

Figure 9-3: Reinterpretation and enhancement of Ground Magnetic data showing an anomaly to the south of the Santander Pipe deposit



Source: CDPR and Todd (2022).

9.3 Blanquita Prospect

Blanquita is a CDPR target located in the same Magistral structural corridor, 0.7 km SE of Magistral South and 0.5 km NW of Santander Pipe. It has some interesting IP geophysical anomalies along with mapping and sampling, which have indicated a pervasive jasperoid silica alteration area (470 m x 20 m) and As, Mn, Sb, Mo, Tl, Cs, and Sr geochemical anomalies. E-W and NE-SW trending comb quartz and calcite-MnOx veinlets cut the jasperoid silica alteration and the Jumasha´s limestones, respectively.

In 2017, Trevali drilled one hole (SAN-0227-17) aimed to test the Blanquita target, without any significant results but with interesting alteration, which shows moderate to strong recrystallization from 392 m to hole end at 485 m, with traces of sphalerite-galena-pyrite towards the end of the hole.

This exploration target is located from 0.4 km to 0.5 km to the west of the Santander Pipe and considered more accessible from the Santander Pipe mine if economic mineralization is discovered. CDPR therefore drilled 6 more drill holes totalling 3,428.8 m probing this target, but results remain inconclusive.

Further geological interpretation work is required to understand the structural and lithological controls in this area prior to recommending any further drilling.

9.4 Summary

The main advances in exploration understanding are summarized as follows:

- The combined Magnetic Analytic Signal map (Figure 9-1) indicates that further exploration along the line of the Santander fault should be continued. This over-thrusting fault may be obscuring further mineralization, in particular to the north and south of the Magistral deposits, and therefore, more local EM and IP geophysics and scout drilling is required.

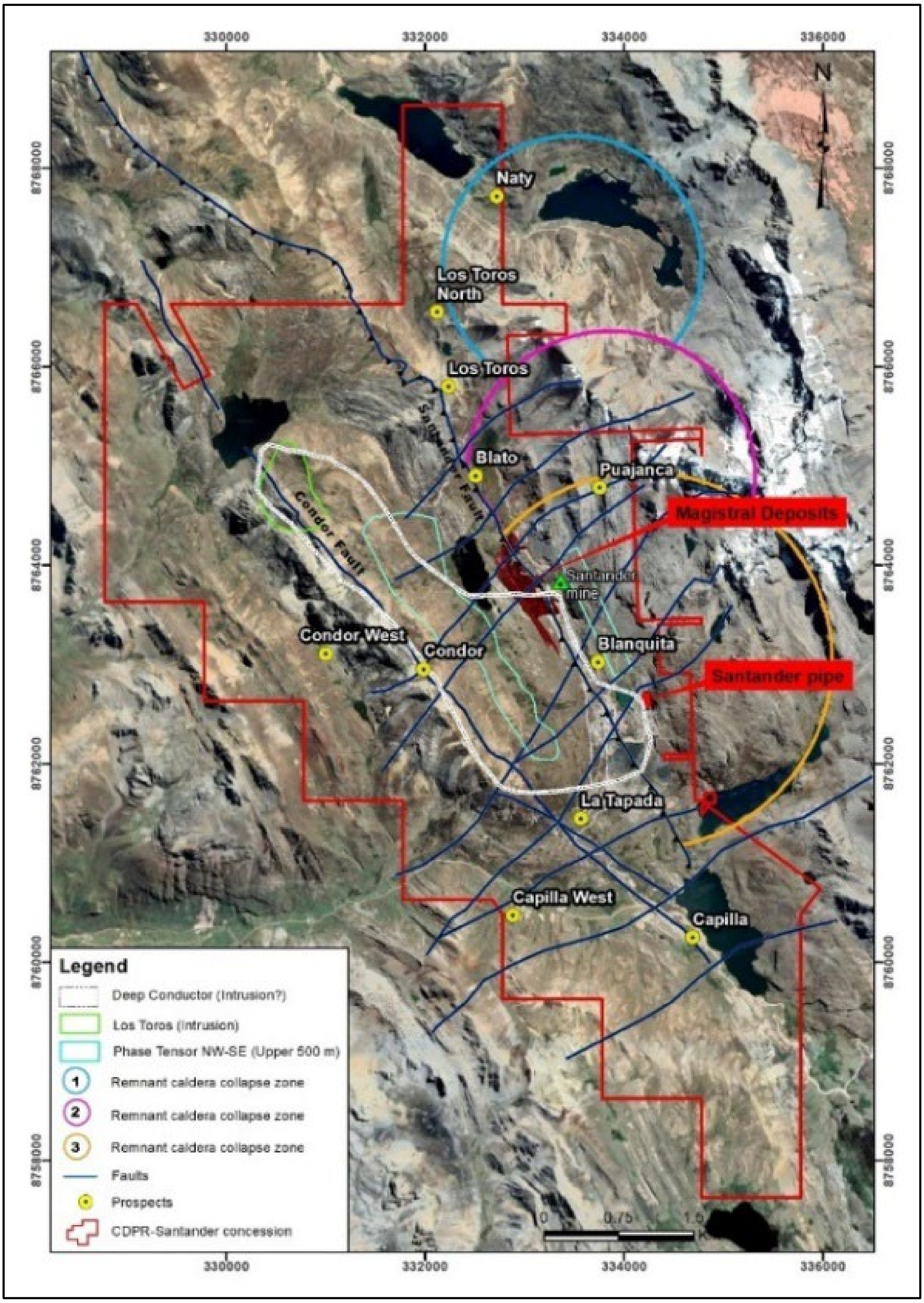
The EM Pulse (2018-19) Magnetoteluric (MT) Survey (Figure 9-2) indicates a deep low-resistivity anomaly to the immediate west of the Magistral and Santander mineralization.

- The reinterpreted and enhanced cumulative Ground Magnetic data (Todd, 2022) has indicated further anomalies within the Santander concessions, including an anomaly to the south of the Santander Pipe deposit.

- A new observation made whilst compiling the current report comes from annotations made from the surface topography (Figure 9-4) from which satellite imagery indicates that the Santander Pipe and the Magistral deposits occur within what is interpreted as a collapsed caldera and that the deep low-resistivity MT anomaly is indicating a diapiric or porphyry-type structure at depth (see the model modified from Sillitoe, and Bonham (1990).

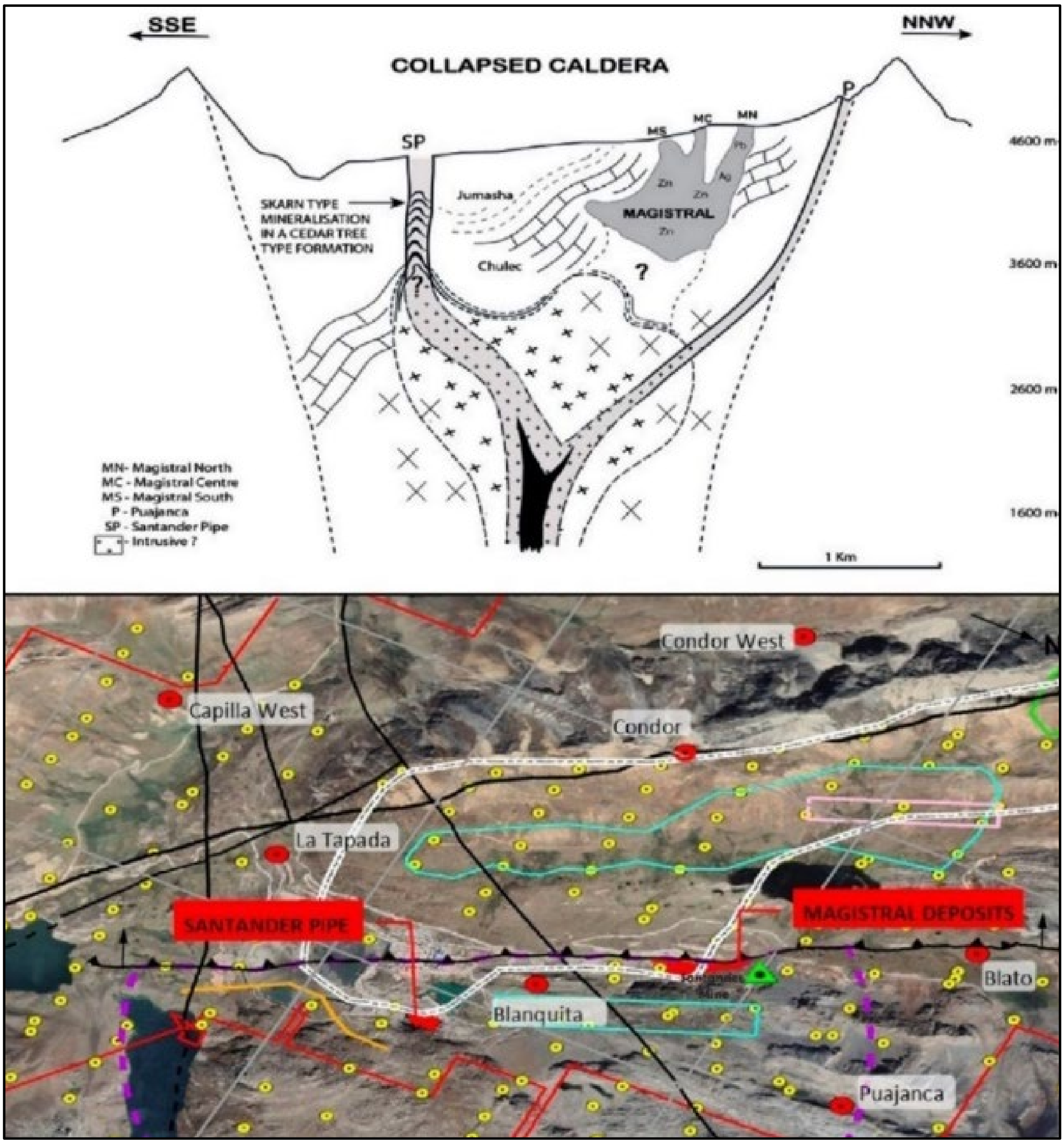
- The high walls of the collapsed caldera can only be seen surrounding the eastern half of the interpreted feature, because the western half has been denuded and obscured by the over-thrusting Santander fault. Furthermore, another part-caldera circle can be seen immediately to the north of the interpreted “Santander caldera”, within which lies Volcan’s Romina pipe deposit, and further north of that lies another part-caldera circle, within which lies the Cerro Chungar laccolith and associated skarn-type mineralization. These three part-caldera circles are added to the exploration map (Figure 9-4). A proposed model for the Santander mineralization occurrences is shown in Figure 9 5.

Figure 9-4: Interpreted Collapsed Caldera



Source: CDPR, Mount (2021).

Figure 9-5: Proposed Model for the Santander Mineralisation Occurrence



Source: Mount (2022).

10 DRILLING

Diamond Drilling specifically aimed at the Santander Pipe mineralization and its extensions in depth comprised two main periods of drilling carried out by CMS and Trevali.

More recent drilling (Trevali and CDPR) has started to explore the area to the north-west and north of the Santander Pipe.

10.1 Santander Pipe Drilling by CMS

Recorded drilling was carried by CMS during the years 1973 to 1993 (Table 10-1), and drilling carried out by Trevali during the years 2009 to 2020 (Table 10-2). Most of this was either carried out underground, or from the open pit.

Table 10-1: Summary of Santander Pipe Drilling by CMS

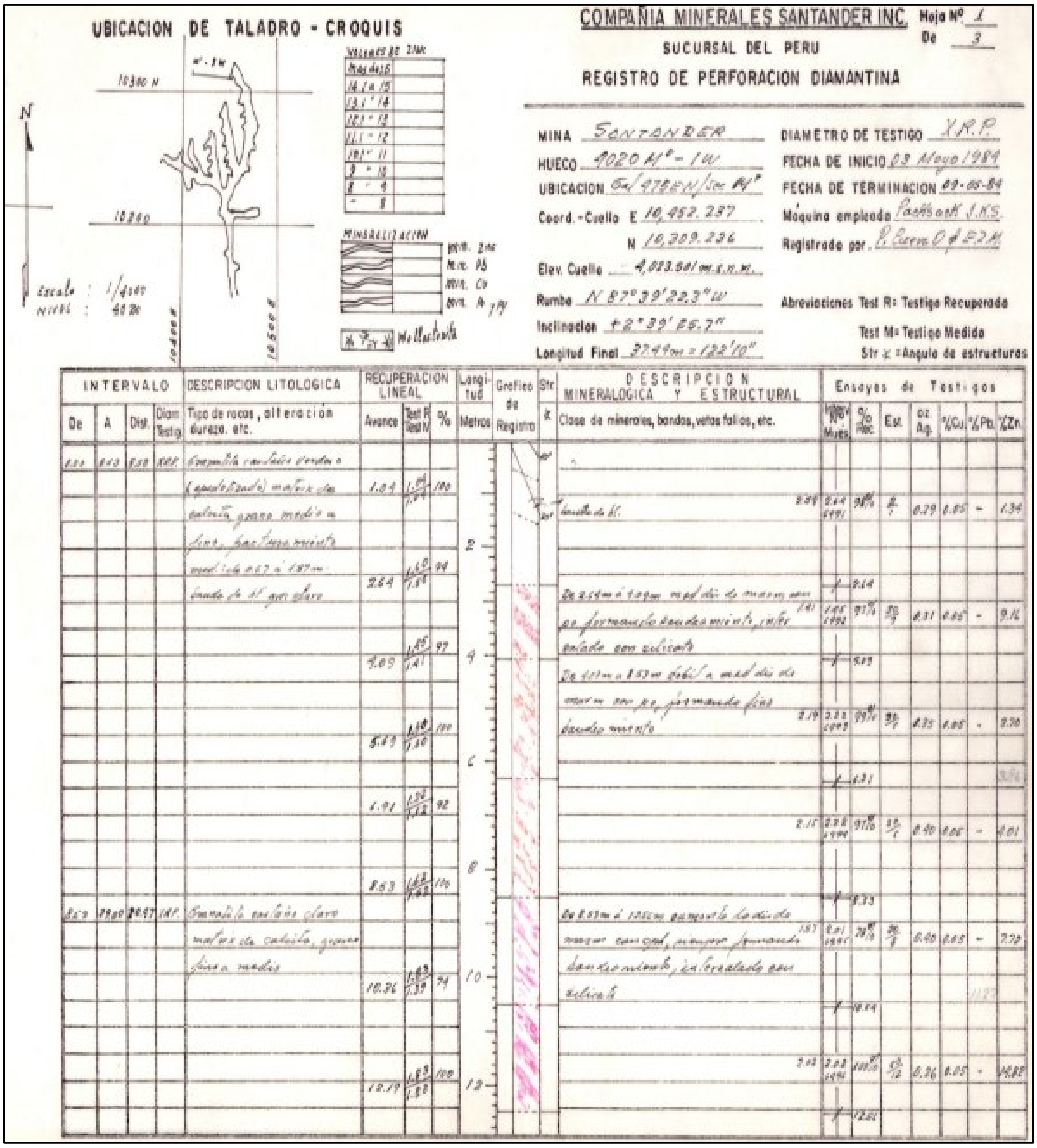
YEAR	No. Drillholes	Total Metres
1973	2	540.41
1976	11	630.02
1977	68	3,787.10
1978	71	4,652.51
1979	37	1,723.60
1980	30	1,401.51
1981	18	833.26
1982	16	1,272.83
1983	15	922.39
1984	24	1,078.06
1985	23	1,412.82
1986	4	275.10
1990	1	35.36
1993	4	154.34
Summary	**324**	**18,719.31**

Location details of all 324 drill holes are summarised in Appendix A.

Drill hole data recovered from CMS archives comprises good quality hand written core logs (Figure 10-1, example) which record much detail as summarised in Section 10 of the previous NI 43-101 Report (DRA, 2022), but with the exception that the sampling, sample preparation and assay data is not supported by QA-QC procedures, because this requirement did not come into established use until after 1997.

Figure 10-1 shows an example of a typical drill core log carried out by CMS geologists.

Figure 10-1: Shows a typical logging sheet made by CMS (1984)



Source: CDPR (2021).

Much of the old CMS core has been found on site and following the recommendations of DRA, CDPR has started the process of re-logging these holes and carrying out duplicate assays to verify the recorded assay data. 31 drill holes have been re-logged to date, and the results of the comparative assays are included in Section 11 and 12 of this Report.

10.2 Geotechnical

The geotechnical criteria used in the evaluation of the Santander Pipe mining plan are supported by the report *Geotechnical Assessment for Underground Mine Design* (Palacio, 2022), which describes the methods developed by CDPR to prepare and analyse the drillhole data, evaluate ground support requirements, determine stable stope dimentions, and estimate external dilution. The available drillhole database contains geotechnical data in terms of the RMR system.

10.3 Santander Pipe Drilling carried out by Trevali

Exploration drilling by Trevali was carried out only from surface and adopting established geological procedures and QA-QC as reported in Section 10 of the previous NI 43-101 Report (DRA, 2022).

Table 10-2: Summary of Santander Pipe Drilling by Trevali

Year	No. Drillholes.	Total Metresl
2009	1	625.95
2011	4	1,489.20
2017	9	6,749.10
2018	9	7,620.30
2019	12	11,488.40
2020	6	3,985.70
Summary	**41**	**31,958.65**

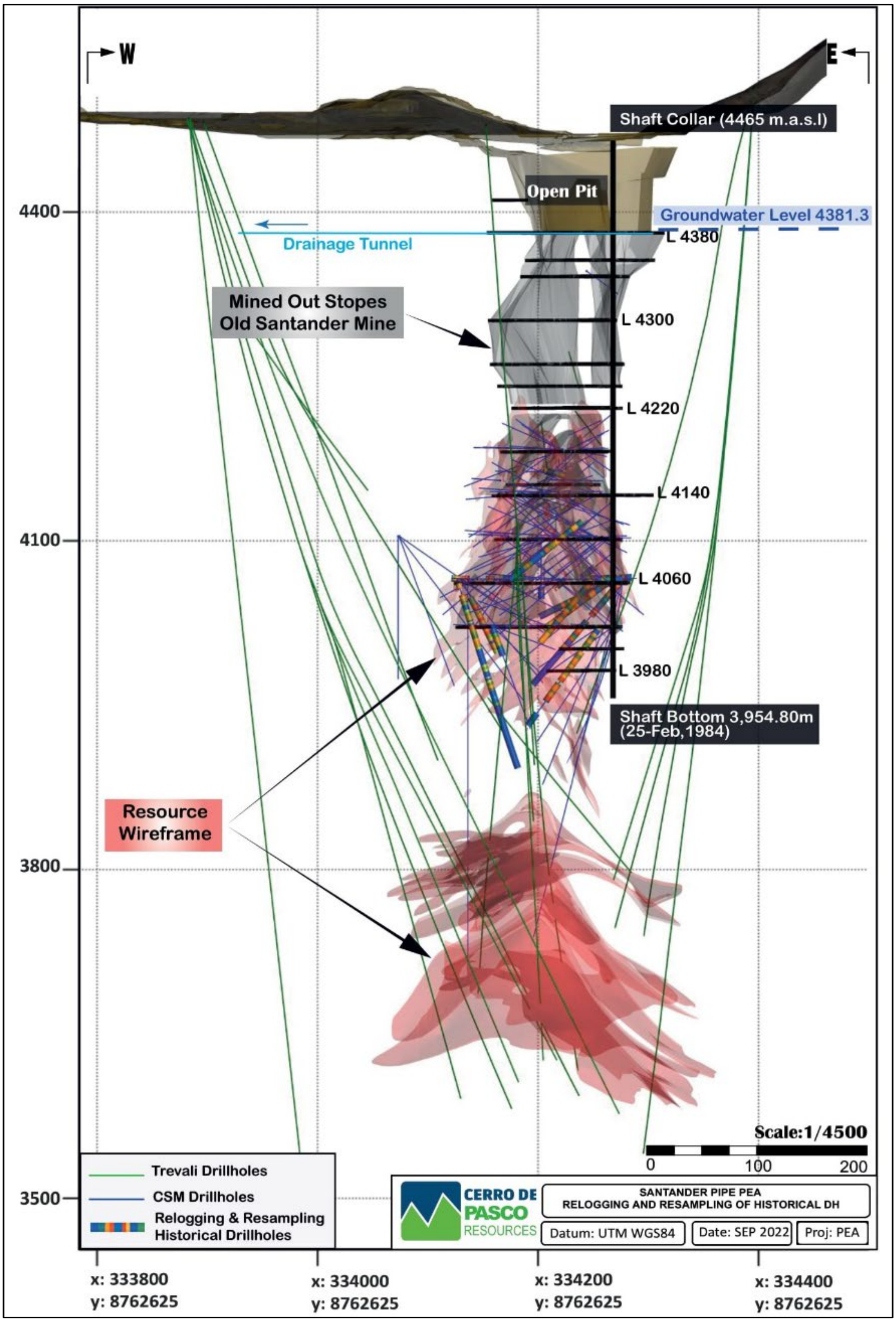
Source: CDPR (2021).

Location details of these 41 drill holes are summarised in Appendix B.

Figure 10-2 comprises a West-East cross-section of the Santander Pipe which shows the underground drilling of short drill holes as carried out by CMS, and the need to drill very long drill holes from surface as carried out by Trevali.

It is important to note the West-East sharp fold of the skarn mineralization below the bottom of the mine. It is the continuation northwards of this style of mineralization that has been the focus of most of the exploration carried out by CDPR during 2022, towards the area referred to as “Pipe North”.

Figure 10-2: West-East section shows the In-mine Drilling by CMS (purple) and Drilling from Surface (green) carried out by Trevali



Source: CDPR (2022).

10.4 Exploration Drilling to the North of the Santander Pipe

Drilling of the exploration areas adjacent to the Santander Pipe and between the Santander Pipe and the Magistral Mine was also carried out by Trevali with 11 drillholes totalling 8,035.25 m mainly aimed at the Blanquita prospect to the of the Santander Pipe, and by CDPR with 18 drillholes totalling 12,238.45 m mainly aimed at the deep continuation of skarn mineralisation to the north of the Santander Pipe (Table 10-3).

Table 10-3: Summary of Additional Drill Holes by Trevali and CDPR

Company	Years	No. Drill Holes	Total Meters
Trevali	2010 - 2021	11	8,035.25
CDPR	2022	18	12,238.45
	Summary	29	20273.7

Source: CDPR (2022).

Location details of these 29 exploration drill holes are summarised in Appendix C.

CDPR has maintained the procedures and QA-QC started by Trevali and the principal results of CDPR´s drilling are summarised in Table 10-4.

These drill holes have confirmed the northern continuation of the deep skarn mineralization drilled previously by CMS and found to be spreading northwards within a steep anticlinal fold which can be traced as continuing northwards towards the Puajanca prospect (Figure 10-3). A longitudinal section (Figure 10-4) shows the drill hole intersections made along this trend, and Figure 10-5 shows a cross-sectional interpretation of the anticlinal fold intersected in drill holes SAN 0282-22 and SAN 0283-22.

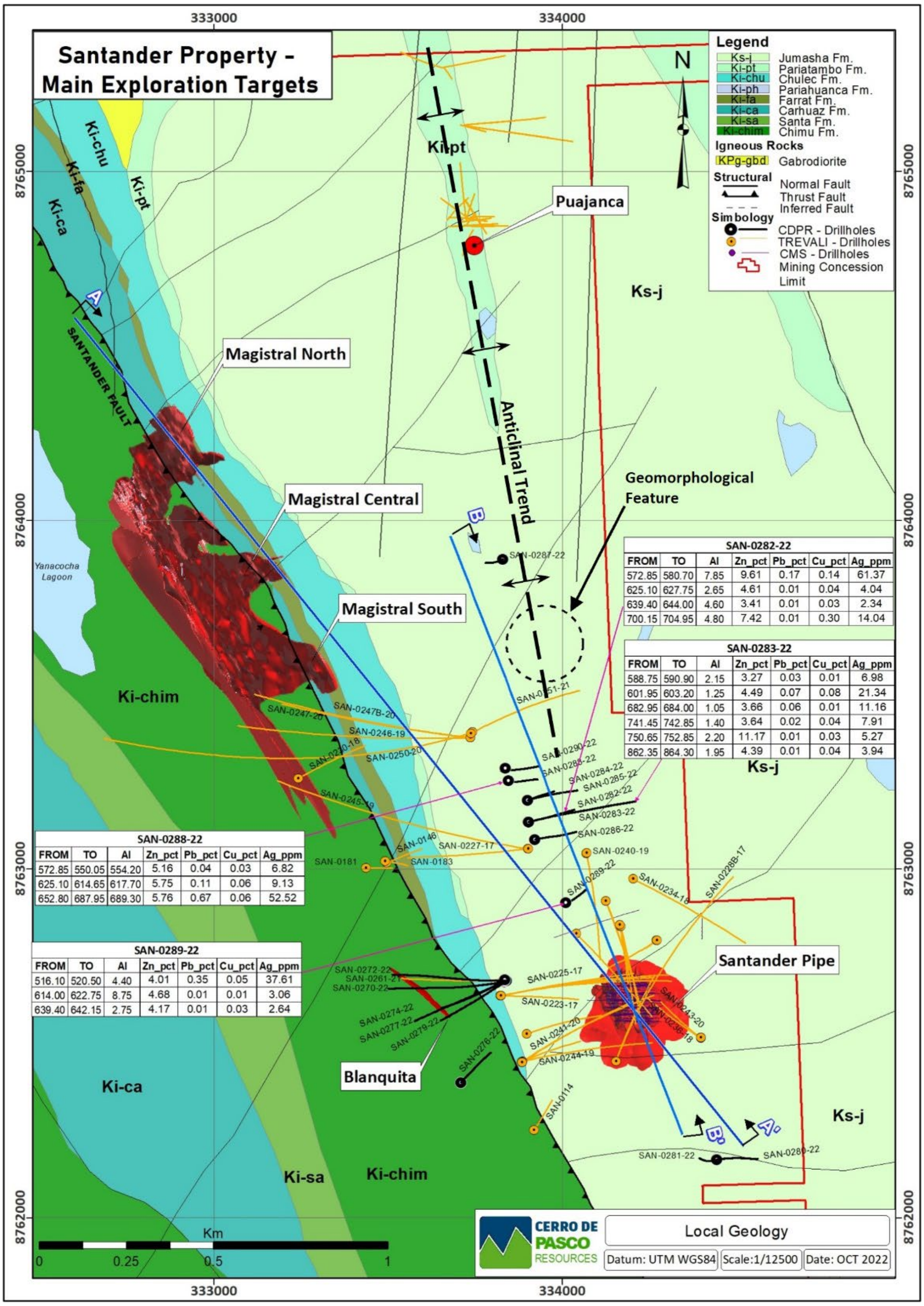
The geological map (Figure 10-3) shows the north-south alignment of the steep anticlinal fold and continuation towards the Puajanca prospect 1.5 km to the north of these two drill holes. DRA geologists have noted that there is a circular geomorphological feature filled with scree material along this northerly trend and suggest that this is a target that warrants drilling.

Table 10-4: Summary of CDPR´s Principal Drilling Results, 2022

Drill Hole	Metres		Metres		Zn	Pb	Cu	Ag	NSR_40
	From	To	Length	True Width	%	%	%	g/t	
SAN-0225H-19	604.00	605.90	1.90	1.25	3.74	0.11	0.05	22.02	76.88
SAN-0225H-19	607.65	609.25	1.60	1.60	5.91	0.07	0.08	18.61	114.32
SAN-0225H-19	733.90	741.90	8.00	7.09	8.50	0.00	0.08	3.92	153.58
SAN-0225H-19	773.95	775.80	1.85	1.63	3.36	0.00	0.12	6.40	66.22
SAN-0225H-19	791.35	793.00	1.65	1.35	4.27	0.00	0.05	2.30	77.53
SAN-0240--19	698.60	699.30	0.70	0.59	11.98	0.00	0.13	5.64	217.17
SAN-0240--19	742.85	749.35	6.50	5.43	9.96	0.00	0.22	10.39	187.01
SAN-0282-22	572.85	580.70	7.85	7.38	9.57	0.17	0.14	61.41	197.62
SAN-0282-22	639.40	644.00	4.60	2.66	3.30	0.01	0.03	2.00	59.78
SAN-0282-22	701.60	704.95	3.35	3.30	9.77	0.01	0.36	15.55	191.39
SAN-0283-22	750.65	752.85	2.20	1.10	11.14	0.01	0.03	5.19	198.20
SAN-0284-22	639.45	640.25	0.80	0.75	8.52	0.01	0.01	2.00	150.10
SAN-0284-22	647.75	648.65	0.90	0.90	5.14	0.01	0.03	4.02	92.77
SAN-0285-22	602.15	604.40	2.25	1.45	9.03	0.06	0.04	15.28	166.10
SAN-0285-22	624.20	626.00	1.80	1.75	8.63	0.02	0.10	11.66	159.68
SAN-0285-22	691.10	691.75	0.65	0.37	12.78	0.01	0.08	5.43	228.96
SAN-0286-22	635.25	636.05	0.80	0.61	7.65	0.02	0.01	2.00	135.04
SAN-0286-22	636.90	638.30	1.40	1.21	10.29	0.26	0.04	23.27	193.28
SAN-0286-22	698.60	699.75	1.15	1.15	7.65	0.02	0.07	5.73	138.80
SAN-0288-22	687.95	689.30	1.35	1.27	5.64	0.69	0.06	53.95	128.72
SAN-0289-22	517.15	518.55	1.40	0.59	6.37	0.49	0.06	63.61	142.78
SAN-0289-22	519.15	520.50	1.35	0.77	2.39	0.29	0.04	22.03	54.55
SAN-0289-22	614.00	616.50	2.50	1.77	8.26	0.01	0.01	3.31	146.16
SAN-0289-22	639.40	641.00	1.60	1.39	6.28	0.01	0.04	3.04	112.73

Source: CDPR (2022).

Figure 10-3: Geological map of the Santander Pipe and Magistral mines showing exploration drill holes to the north and west of the Pipe



SAN-0282-22						
FROM	TO	AI	Zn_pct	Pb_pct	Cu_pct	Ag_ppm
572.85	580.70	7.85	9.61	0.17	0.14	61.37
625.10	627.75	2.65	4.61	0.01	0.04	4.04
639.40	644.00	4.60	3.41	0.01	0.03	2.34
700.15	704.95	4.80	7.42	0.01	0.30	14.04

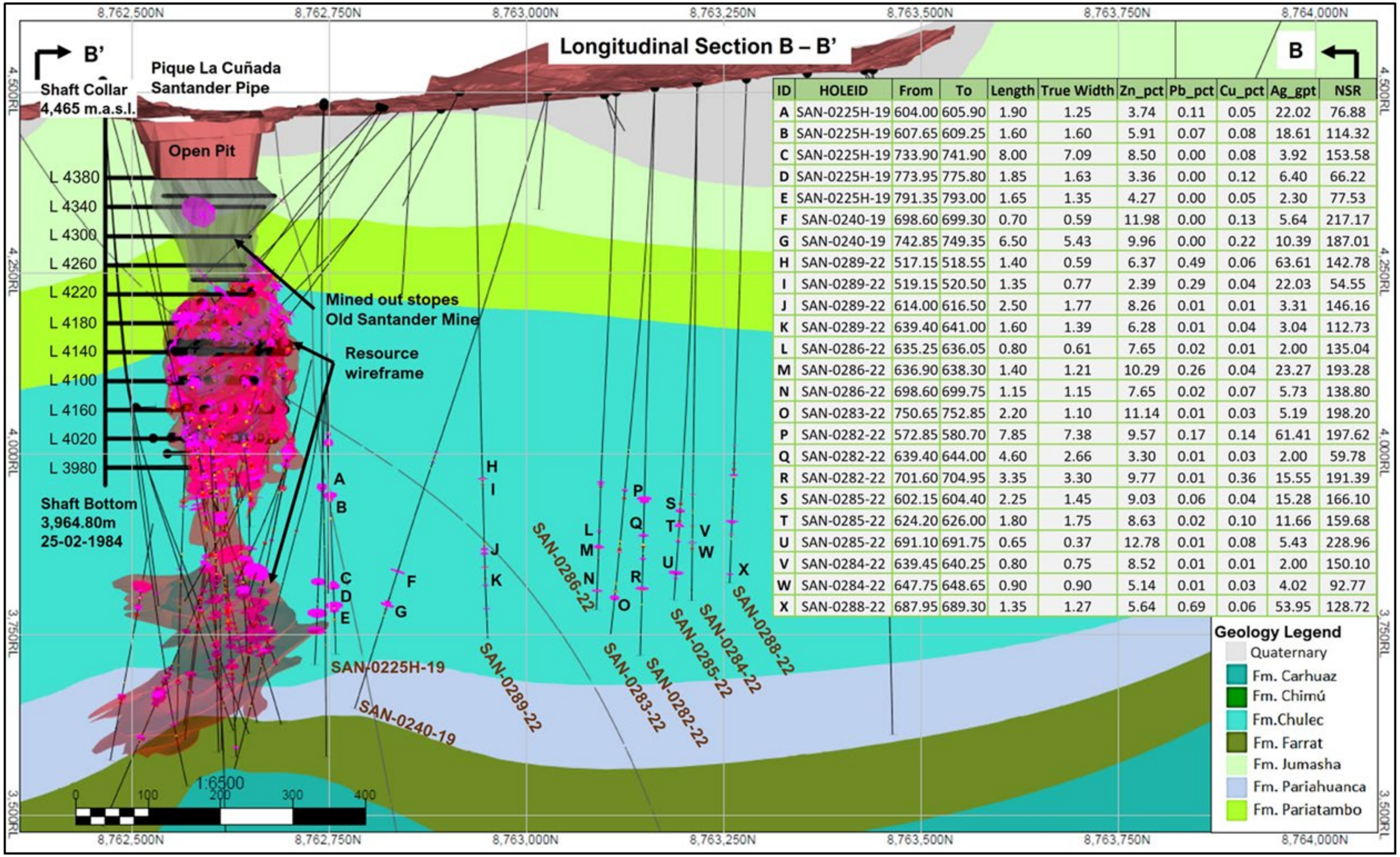
SAN-0283-22						
FROM	TO	AI	Zn_pct	Pb_pct	Cu_pct	Ag_ppm
588.75	590.90	2.15	3.27	0.03	0.01	6.98
601.95	603.20	1.25	4.49	0.07	0.08	21.34
682.95	684.00	1.05	3.66	0.06	0.01	11.16
741.45	742.85	1.40	3.64	0.02	0.04	7.91
750.65	752.85	2.20	11.17	0.01	0.03	5.27
862.35	864.30	1.95	4.39	0.01	0.04	3.94

SAN-0288-22						
FROM	TO	AI	Zn_pct	Pb_pct	Cu_pct	Ag_ppm
572.85	550.05	554.20	5.16	0.04	0.03	6.82
625.10	614.65	617.70	5.75	0.11	0.06	9.13
652.80	687.95	689.30	5.76	0.67	0.06	52.52

SAN-0289-22						
FROM	TO	AI	Zn_pct	Pb_pct	Cu_pct	Ag_ppm
516.10	520.50	4.40	4.01	0.35	0.05	37.61
614.00	622.75	8.75	4.68	0.01	0.01	3.06
639.40	642.15	2.75	4.17	0.01	0.03	2.64

Source: CDPR (2022).

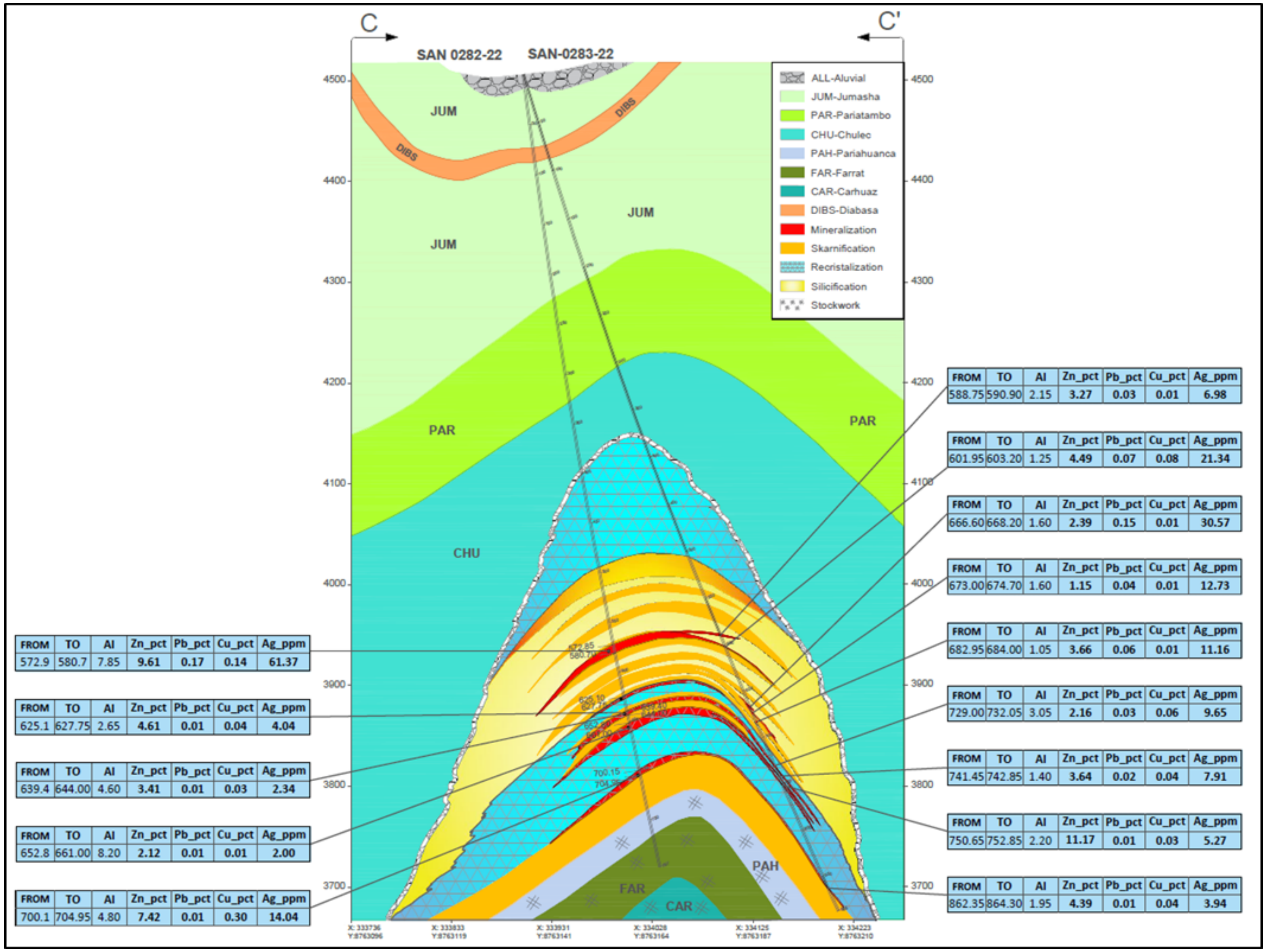
Figure 10-4: Geological Section B-B showing the Drill Hole Intersections made to the North of the Santander Pipe mine



ID	HOLEID	From	To	Length	True Width	Zn_pct	Pb_pct	Cu_pct	Ag_gpt	NSR
A	SAN-0225H-19	604.00	605.90	1.90	1.25	3.74	0.11	0.05	22.02	76.88
B	SAN-0225H-19	607.65	609.25	1.60	1.60	5.91	0.07	0.08	18.61	114.32
C	SAN-0225H-19	733.90	741.90	8.00	7.09	8.50	0.00	0.08	3.92	153.58
D	SAN-0225H-19	773.95	775.80	1.85	1.63	3.36	0.00	0.12	6.40	66.22
E	SAN-0225H-19	791.35	793.00	1.65	1.35	4.27	0.00	0.05	2.30	77.53
F	SAN-0240-19	698.60	699.30	0.70	0.59	11.98	0.00	0.13	5.64	217.17
G	SAN-0240-19	742.85	749.35	6.50	5.43	9.96	0.00	0.22	10.39	187.01
H	SAN-0289-22	517.15	518.55	1.40	0.59	6.37	0.49	0.06	63.61	142.78
I	SAN-0289-22	519.15	520.50	1.35	0.77	2.39	0.29	0.04	22.03	54.55
J	SAN-0289-22	614.00	616.50	2.50	1.77	8.26	0.01	0.01	3.31	146.16
K	SAN-0289-22	639.40	641.00	1.60	1.39	6.28	0.01	0.04	3.04	112.73
L	SAN-0286-22	635.25	636.05	0.80	0.61	7.65	0.02	0.01	2.00	135.04
M	SAN-0286-22	636.90	638.30	1.40	1.21	10.29	0.26	0.04	23.27	193.28
N	SAN-0286-22	698.60	699.75	1.15	1.15	7.65	0.02	0.07	5.73	138.80
O	SAN-0283-22	750.65	752.85	2.20	1.10	11.14	0.01	0.03	5.19	198.20
P	SAN-0282-22	572.85	580.70	7.85	7.38	9.57	0.17	0.14	61.41	197.62
Q	SAN-0282-22	639.40	644.00	4.60	2.66	3.30	0.01	0.03	2.00	59.78
R	SAN-0282-22	701.60	704.95	3.35	3.30	9.77	0.01	0.36	15.55	191.39
S	SAN-0285-22	602.15	604.40	2.25	1.45	9.03	0.06	0.04	15.28	166.10
T	SAN-0285-22	624.20	626.00	1.80	1.75	8.63	0.02	0.10	11.66	159.68
U	SAN-0285-22	691.10	691.75	0.65	0.37	12.78	0.01	0.08	5.43	228.96
V	SAN-0284-22	639.45	640.25	0.80	0.75	8.52	0.01	0.01	2.00	150.10
W	SAN-0284-22	647.75	648.65	0.90	0.90	5.14	0.01	0.03	4.02	92.77
X	SAN-0288-22	687.95	689.30	1.35	1.27	5.64	0.69	0.06	53.95	128.72

Source: CDPR (2022).

Figure 10-5: Cross Section C-C showing the Anticlinal structure trending Northwards and the DD intercepts made



Source: CDPR (2022).

10.5 Future Exploration Drill Hole Planning

10.5.1 Upgrading Santander Pipe Resources

Whilst there is a need to carry out further drilling to improve confidence and upgrade the Santander Pipe mineral resource estimate to support on-going PFS and FS technical studies, DRA recognises that carrying this out from surface is not an option because of the depth of the mineralization below the bottom of the mine. Also, because of the difficulty of accurate infill drilling which would often have to be advanced through old mine workings to home in on specific targets.

DRA also notes that drilling from an underground access via the Magistral mine is unlikely to be a practical consideration prior to the dewatering of the Santander Pipe mine. This is because of the very high-water pressure that might be encountered when drilling into structures connected with the flooded mine. If such drilling were carried out it would have to be drilled through pressure tested standpipes (each hole), and from sites that can be isolated from the Magistral mine if uncontrollable water inflow is encountered.

Accurate stope definition drilling to upgrade Indicated Resources to Measured Resources is required between the 4020 and 3860 level elevations. More widely spaced infill drilling is required to upgrade Inferred Resources to the Indicated category below the 3860 level and step out drilling is required to add to the Inferred category at greater depth and to the north and south of the deposit. All this drilling needs to be evaluated at the PFS stage for dewatering the Santander Pipe mine.

DRA does however note that in the interim the relogging and re-sampling of old drill cores should be continued as a matter of priority. Once the mine is being unwatered and the deep levels are being accessed, drilling can then commence with much shorter drill holes planned from underground.

10.5.2 The "Pipe North" Trend

Clearly the drill hole intersections summarized in Table 10-4 (Summary of CDPR´s Principal Drilling Results, 2022) can only be considered prospective at this point of time. However, these intercepts do warrant further drill hole exploration of the interpreted steep north-trending anticlinal feature which encapulates skarn-type bands of mineralization.

In this respect, the whole north-south trend right up to the Puajanca occurrence should be considered prospective, and further drilling along this trend is recommended in the search for shallower mineralization which may be easier to explore, develop and bring into production. In this respect, DRA notes that the circular geomorphological anomaly shown on Figure 10-3 may be a good location to start such drilling.

11 SAMPLE PREPARATION, ANALYSIS AND SECURITY

11.1 Introduction

The database used to estimate mineral resources for the Santander Pipe deposit contains 347 core holes for 49,755 metres. There are 11,846 intervals with assay determinations representing 23,597 metres of core. 306 of these holes containing 5,611 sample intervals, were drilled before 1993, when Compañía Minera Santander S.A.C. (CMS) operated the now-abandoned mine. Whilst CMS also collected channel samples from the underground workings, assay determinations for these were not available for the mineral resource estimate. 41 holes (31,959m) were drilled by Trevali between 2011 and 2020 and were focused mostly on extending the mineralization at depths below the mined levels.

Sample preparation, analyses, and security protocols were implemented during the Trevali period and, since acquiring the property in 2021, CDPR have maintained these with only minor changes. Sections 11.2 and 11.3 provide a summary of the protocols specific to the drilling at Santander Pipe. Details on protocols used for the Magistral mine infill and underground sampling are not included in this report and can be found in the NI43101 report issued in January of 2022. The quality control and quality assurance measures and results for the Santander Pipe drilling are discussed in subsections 11.4.1 and 11.4.2.

The sampling and quality-control procedures of the CMS historical holes and channel samples are not known. In consideration of this, during 2022, CDPR initiated work on re-logging and re-assaying core recovered from the historic drill holes. The work is in progress and the preliminary results and accompanying quality control are discussed in subsection 11.4.4 of this report.

Finally, during 2022 CDPR have executed 11 exploration drill holes to the north of the Santander Pipe (see Appendix C) aimed at outlining new mineralization discovered in this area. The protocols for this drilling remain largely unchanged. The quality control results for this drilling are summarised in subsection 11.4.3.

11.2 Core Logging and Sampling

11.2.1 Transport of Core to the Core Shed and Preparation for Logging

Core boxes are loaded onto the back of a truck and delivered by geological technicians to the geologists at the core shed. The core is received by the geologist in charge and a geological technician cleans and orientates the core before logging.

11.2.2 Core Logging Procedures

The core-logging procedure adopted by Trevali (2007–2021) has not changed much during this period. The logging process started as a paper logging format (2007 to 2015) and evolved to a digital logging process, involving logging with computers and electronic tablets with direct upload to Geobank (2015 to 2018), and Geotic (2018 to 2022). Prior to 2015, the detailed paper logs were manually uploaded to DH Logger. A “quick log” takes place before detailed logging, in order to identify major lithological units and mineralization and focus on the detailed logging requirements. Geotechnical logging of the core started in 2008, and is carried out immediately after the quick log, before the core is disturbed or broken for geological logging and sampling purposes. Detailed geological logs include information relating to lithology, alteration, mineralization, and structure (faults and fractures). In addition to this, DRA recommends measuring and recording relative bedding angles. Considering the stratigraphic and structural controls on the mineralization at Pipe, these angles are considered important for the geological interpretation.

11.2.3 Core Photographs

Following logging and prior to sampling, a technician takes digital photographs of each core box in consecutive order. Care is taken to ensure that geological/geotechnical features (rock-quality data, total core recovery, joints, and fractures) are adequately captured.

11.2.4 Specific Gravity

After logging, the specific gravity of the core is then measured using the Archimedes air-and-water method. The core is not sealed with wax. Whilst core samples were not indicated to be porous, the technician in charge should be aware that wax sealing will be required if porous units are encountered.

All diamond-borehole intervals are marked for sampling, and their bulk density is determined prior to cutting and sampling. To date, a total of 6,100 specific gravity measurements have been carried out on the Santander Pipe holes drilled since 2011. In addition, new specific gravity measurements are being taken on the historic drill core as part of the on-going re-logging and re-assaying of the historic core that has so far been recovered. The bulk density of a sample is determined using the following formula:

$$\text{Specific Gravity} = \frac{(\text{Sbair} - \text{bair})}{(\text{Sbair} - \text{bair}) - (\text{Sbwater} - \text{bwater})}$$

Where:

- Sbair = Weight of sample and tray in air (kg),
- bair = Weight of tray in air (kg),
- Sbwater = Weight of sample and tray in water (kg),
- bwater = Weight of tray in water (kg).

11.2.5 Drill-Core sampling

Several measures are undertaken to ensure appropriate sample selection. The samples are consistently taken from the same side of the core after the core is laid out with bedding planes facing up the hole and interlocked; a core reference line is drawn on the crest of the bedding planes and a wavy line or hatching is drawn on the side of the core to be retained before splitting.

This practice allows the sampler, geologist, and any other interested party to confirm that no sampling bias is introduced by the preferential selection of mineralised features. The core is then cut using a diamond saw with a rail guide on the core-saw bench to ensure that core halves are approximately equal. Once cut, samples are bagged in 6-mm heavy-duty plastic bags and weighed. The sample ticket/tag number is inserted into the bag. A duplicate of the sample ticket/tag is stapled to the core box to ensure a permanent record and the triplicate sample ticket/tag remains in the sample booklet. Approximately eight core-sample bags are combined into rice bags, which are then placed into larger bags holding up to 20 samples.

The remaining core is stored within the core logging facility, in corrugated plastic boxes, appropriately labelled with the relevant information.

Samples taken are typically 1 m in length within continuous geological intervals or broken at visible geological contacts. The smallest allowable sample interval is typically 0.2 m and the largest 2 m. DRA reviewed the drill-core sampling techniques and agrees that the sampling techniques are appropriate for this style of mineralization.

Samples are transported in a company vehicle to the laboratory with a completed sample shipping form. Three different laboratories have been used to process Santander Project exploration samples:

- 2007 to 2011 exploration core samples were sent to the ACME facility in Lima and the pulps were then sent to Vancouver, British Columbia, Canada for assaying.
- 2014 to 2018, the historic re-assayed core and the 2022 exploration drill hole samples were processed at the SGS managed on-site analytical laboratory.
- 2013, 2018 to 2021 exploration core samples were sent to ALS Global in Lima.

11.3 Sample Preparation and Analyses

During the history of the project, samples have been sent to four different laboratories:

- Historic samples (1976 to 1993) were assayed for Ag, Cu, Pb, and Zn at an on-site laboratory operated by CMS. No documentation (procedures, laboratory reports, assay certificates, etc.) exists for the CMS assay laboratory, which primarily assayed geology and concentrate samples produced during the mining of the Santander Pipe.
- From 2007 to 2011, exploration samples were sent to ACME Analytical Laboratories Ltd. in Vancouver (ACME Vancouver) and its affiliate preparation laboratory in Lima.
- In 2013 and later from 2018 to 2022, exploration samples were sent to ALS Global in Lima.
- Trevali implemented an on-site analytical laboratory in 2013 that is still operational today. This is managed and operated by SGS Peru, and primarily assays, mine channel and grab samples, infill-drilling samples (2014 to date), plant samples and concentrates, and was also used to prepare and assay exploration samples from 2014 to 2018. More

recently, the historic core re-assaying and the 2022 exploration drilling samples used SGS as the primary laboratory. The onsite laboratory is fully certified and CDPR is continuing the use of this laboratory for the processing of the Magistral mine-geology and production samples.

11.3.1 Laboratory Preparation Procedures and Analysis 2007 to 2011 - ACME Vancouver

Between 2007 and 2011, all samples were processed by ACME Analytical Laboratories Ltd. in Vancouver (ACME Vancouver) and its affiliate preparation laboratory in Lima. Upon arrival at ACME Lima, samples were weighed by the laboratory, and this weight was then cross-referenced with the in-house weight recorded by Trevali staff to ensure that no sample mix-up or tampering had occurred.

Following standard sample preparation in ACME´s Lima preparation facility, the resultant sample pulps (250 g) were flown to ACME Vancouver for geochemical analysis and assaying. All samples were analysed using ACME Vancouver's multi-element 7AX package, which utilizes an aqua regia digest of a 1-gram sample split with a combination of induced coupled plasma/atomic emission and mass-spectrometry finishes (ICP-AES and ICP-MS). High-grade samples above the assay upper limits were re-analysed (>4% Pb and/or >20% Zn, respectively), according to the Group 7AR package (0.1 g split, aqua-regia digestion with an atomic emission spectrometry finish). Samples containing greater than 400 ppm Ag were analysed by ACME Vancouver's Group 6 fire assay (30 g aliquots) as an internal check on the data.

11.3.2 Laboratory Preparation Procedures and Analysis – ALS Lima

Samples are crushed to 70% less than 2 mm, riffle-split to 250 g, and pulverized to >85% passing 75 µm. The 0.25 g aliquots are processed using the ME-ICP61 method with HNO3 -HClO4 -HF-HCl digestion. The residue is topped up with dilute hydrochloric acid, and the resulting solution is analysed by ICP-AES. The method provides assays for Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, K, La, Mg, Mn, Mo Na, Ni, P, Pb, S, Sb, Sc, Sr, Th, Ti, Tl, U, V, W, and Zn.

Over limits (Zn, Pb, Ag, Cu) are analysed using a 4-acid digestion and an ICP-AES finish (0.4g sample).

Au is analysed using method Au-GRA21 package, which uses a 30 g charge in fire assay and gravimetric finish.

11.3.3 Sample Preparation and Analysis, 2014 to date: on-site SGS laboratory

Samples are received in a preparation area, separate from the process samples. Samples are weighed and dried in the oven for three to five hours, then crushed to 90% passing 10 mesh. Bar codes are applied to each sample after crushing. The crushers are cleaned with compressed air (pressure of 80 pounds per square inch) after each sample. At the beginning and end of each batch of 40 samples, the crushers are cleaned with quartz.

The samples are then split, retaining 200 g. Each 200 g sample is pulverized to 95% passing 140 mesh. Laboratory control standards and blanks are inserted, making up 10% of the total number of samples. Digestion uses three acids (HNO3, HClO4, HCl) and results are obtained by atomic absorption spectroscopy AAS). The AAS machine is calibrated each shift and cleaned and calibrated when changing from geology samples to mill samples.

SGS generates monthly reports on QA/QC compliance and general laboratory management, and complies, through its parent company certification, with the requirements of ISO 9001:2000 and ISO 17025:1999.

11.4 Quality Assurance and Quality Control (QAQC)

11.4.1 QAQC Samples and Protocols

No information is available of the quality control procedures for assays performed on the historic drilling by the on-site laboratory operated by CMS (1976 to 1993). More recently, during 2022 work has been progressing on recovering, re-sampling, and re-assaying old core from the historic drilling. The work is ongoing and initial results are reviewed and discussed in section 11.4.4.

For the drilling performed since 2011, QAQC protocols have developed and changed over time. The following sections describe the main types of control samples commonly used and mostly included during the modern drilling at Santander Pipe.

Certified Reference Materials (CRMs)

CRMs are used as a means of controlling laboratory accuracy, and detect possible biases, drifts, or errors during the assaying periods. For Santander Pipe, most of the modern drilling included regular submission of 3 different CRMs (BVIP-006, BVIP-007, and BVIP-008) prepared and certified by Bureau Veritas in 2015 using materials collected from the Magistral mine. Materials were selected to represent low, medium, and high mineralized metal contents. The certification process involved ensuring homogeneity of the sample pulps and sending pulps to 5 reputable laboratories for assaying using an aqua regia digestion and atomic absorption. The results were reviewed statistically to eliminate any potential outliers and determine averages (best values) and standard deviations (control limits) for each CRM.

CRMs are inserted in sample batches at a rate of approximately 1 in 20. The geologist selects the appropriate CRM (low, medium, or high) in relation to the degree of mineralization observed in the sample.

Blanks

Blank samples are materials that contain negligeable or undetectable contents of the element of interest and are used to measure cross-sample contamination during the preparation or analytical processes.

Several types of blanks may be included in batch submissions. Field Blanks can be provided from core obtained through drilling of, for example, unmineralized cover rocks. Preparation Blanks can include coarse inert quartz samples that are frequently used by laboratories to clean the preparation equipment. Both Field and Preparation Blanks can be used to detect possible contamination issues in the sample preparation and analytical process.

Pulp Blanks are pulps of the same inert material and are used to measure contamination during the analytical process.

Preparation Blanks have been included for most of the modern drilling at Santander Pipe at intervals of approximately 1 in 40. The certified coarse silica Blank material was provided by SGS. These are normally inserted following high-grade samples identified by the geologist. For the latest exploration drilling in 2022, CDPR have also included the submission of Pulp Blanks, which are inserted between the high-grade and the Preparation Blank sample.

Field Duplicates

Field Duplicates are splits of drill core, RC cuttings or field samples from the same sample interval or location. These duplicates provide a measure of all levels of error, including the natural variability attributable to the geological characteristics of the mineralization, errors during the sample size reduction in the preparation process, plus analytical error.

Drilling at the Santander Pipe from 2009 onwards regularly includes ¼ core splits as Field Duplicates at a rate of approximately 1/40.

Preparation Duplicates

Preparation Duplicates are splits of one sample taken at the coarse crushing stage process, and immediately before the first split in the sample preparation process. These provide a measure of error attributable to the sample size reduction during the preparation, plus analytical error.

Drilling at the Santander Pipe included Preparation Duplicates for the first 4 holes drilled in 2011 and assayed at ACME Vancouver. Later drilling campaigns did not include Preparation Duplicates.

Pulp Duplicates

Pulp Duplicates are splits of 2 different pulps from the same sample that are collected at the end of the preparation phase. These provide a measure of errors associated to the sample pulp heterogeneity as well the analytical error.

Drilling at Santander Pipe has not included Pulp Duplicates.

External Laboratory Checks

External laboratory checks are aimed at providing a measure of relative inter-laboratory accuracy.

Inter-laboratory checks were undertaken for 10% of the assays performed at ALS Lima. These represent nearly 80% of that modern drill hole assays for the Santander Pipe. The SGS on-site laboratory was used for the verification process.

11.4.2 Santander Pipe Resource Drilling QAQC 2011-2021

41 resource definition holes were drilled at Santander Pipe by Trevali between 2011 and 2021. These include a total of 6,164 samples assayed at ACME Vancouver in 2011, at the SGS on-site laboratory in 2017 and at ALS Lima for drilling from 2017 onwards. Four short holes that did not reach the mineralized resource envelope did not include sample assays. Samples from one hole were partly assayed at SGS and then ALS in Lima. Details of the original and check samples are included in Table 11-1.

The first 4 holes drilled in 2011 (314 samples representing 5% of the sample data), were short and did not reach depths of the mineral resource. Assays for these holes were performed at ACME Vancouver, and checks included Preparation Duplicates and ¼ core Field Duplicates taken at intervals of approximately 1 in 20.

Most of the modern drilling at Santander Pipe was drilled between 2017 and 2020. These holes contain 95% of the modern assay data for Santander Pipe. Assays were initially performed at the SGS onsite laboratory (958 samples representing 16% of the sample data) and soon switched to ALS in Lima (4,892 samples representing 79% of the sample data). During this period, assay checks included the regular submission of blind CRMs, ¼ core Field Duplicates and Preparation Blanks. In addition, pulp samples from 3 drill holes assayed originally at ALS Lima, representing nearly 10% of the assays performed at ALS, were re-assayed at the SGS Santander laboratory on-site.

Table 11-1: QAQC samples for Santander Pipe drilling (2011-2021)

	Laboratory			
	ACME	SGS Santander	ALS	Total
Nº Drill Holes	4	6.5	26.5	37
Nº Samples	314 (5%)	958 (16%)	4892 (79%)	6164
CRM		68 (7.1%)	222 (4.5%)	290 (4.7%)
Blanks		35 (3.7%)	138 (2.8%)	173 (2.8%)
Preparation Duplicates	19 (6.1%)			19 (0.3%)
Field Duplicates	19 (6.1%)	25 (2.6%)	135 (2.8%)	179 (2.9%)
Laboratory Duplicates			465 (9.5%)	465 (7.5%)

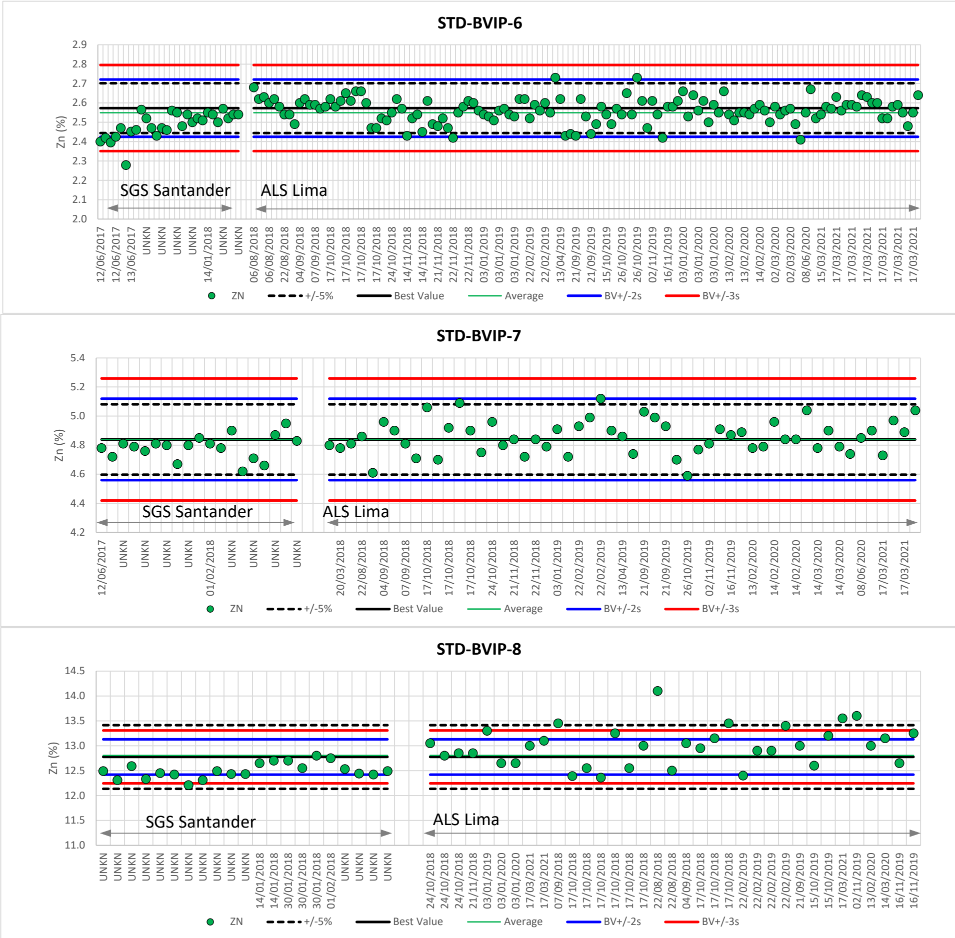
<u>Certified Reference Materials (CRMs)</u>

A summary of the results obtained for three CRMs for Zn, Pb and Ag is included in Table 11-2. Control charts for Zn for the duration of the drilling at Santander Pipe are included in Figure 11-1. The CRMs performed well, without noting any significant biases. Overall differences between the certified values and the average assayed values range from 0.4% to 4%. Whilst Zn values assayed at the SGS Santander on-site laboratory tend to be slightly biased low (-1.1% to -3.5%) in comparison to the certified values, this is not considered a significant issue.

Table 11-2: CRM Result Summary for Santander Pipe drilling (2017 - 2022)

Laboratory	CRM	Element	Best Value	Average	Difference	Number
SGS Santander	BVIP-006	Zn (%)	2.57	2.49	-3.50%	28
	BVIP-007	Zn (%)	4.84	4.79	-1.10%	19
	BVIP-008	Zn (%)	12.8	12.5	-2.20%	21
	BVIP-006	Pb (%)	0.28	0.28	2.60%	28
	BVIP-007	Pb (%)	2.81	2.78	-1.10%	19
	BVIP-008	Pb (%)	6.08	5.99	-1.40%	21
	BVIP-006	Ag (ppm)	18.4	19.2	4.00%	28
	BVIP-007	Ag (ppm)	116	116.8	0.70%	19
	BVIP-008	Ag (ppm)	105	107.3	2.20%	21
ALS Lima	BVIP-006	Zn (%)	2.57	2.56	-0.40%	131
	BVIP-007	Zn (%)	4.84	4.86	0.40%	55
	BVIP-008	Zn (%)	12.8	13	1.60%	35
	BVIP-006	Pb (%)	0.28	0.27	-1.00%	131
	BVIP-007	Pb (%)	2.81	2.79	-0.80%	55
	BVIP-008	Pb (%)	6.08	5.96	-2.00%	35
	BVIP-006	Ag (ppm)	18.4	18.1	-1.70%	131
	BVIP-007	Ag (ppm)	116	116.3	0.30%	55
	BVIP-008	Ag (ppm)	105	106.8	1.70%	35

Figure 11-1: CRM Control Charts for Santander Pipe drilling (2017 - 2022)



Source: Lyall Consult (2023).

Blanks

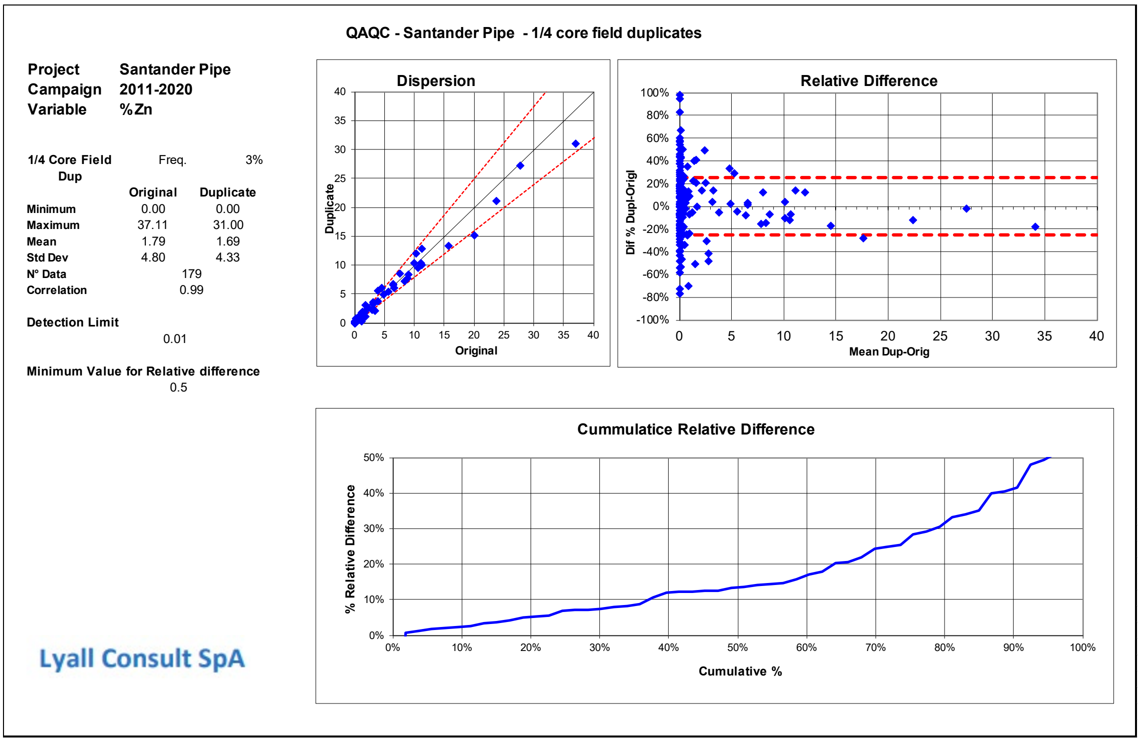
Of the 35 Preparation Blank samples submitted during the SGS assaying period, all of these returned values below detection limits for Pb (0.01%), Cu (0.01%) and Ag (4g/t). For Zn, with a detection limit of 0.01%, two samples returned a maximum value of 0.02%Zn, suggesting only very minor cross-sample contamination.

Of the 138 coarse blank samples included at ALS, the highest values for Zn were 0.06% and 0.026%, with all the rest falling below 0.015%. All Cu values fell below the detection limit of 0.01 %Cu and Ag below 4 g/tAg. For Ag, 51 of the 138 samples returned assays between 2 and 4 g/t, and these values are curiously coincident with slightly elevated copper values (0.002% to 0.004%). Considering that the silver detection limit at ALS is 0.5 g/t, values between 2 and 4 g/t are anomalous but not economically significant. Whilst the performance of blank samples for Zn and Pb indicate that contamination is negligeable, the higher Ag values could be indicative of minor contents in the blank quartz materials or laboratory calibration issues. This is not considered a relevant issue for the mineral resource model but could be important if Ag is used for exploration, where lower value anomalies are used for targeting. Further re-assays of the anomalous pulps are suggested to investigate whether these values are attributable to the laboratory calibration or the blank material.

Field Duplicates

The results of 179 ¼ core Field Duplicate samples for Zn assayed at ACME, SGS and ALS are shown Figure 11-2. 80% of the sample pairs returned relative differences of less than 30%. Similar results are observed for Pb, Cu and Ag. Whilst the differences can be regarded as high, this is considered fair for samples split before the preparation stages and can be attributable mostly to the in-situ geological variability. Moreover, whilst using ¼ core samples instead of the full remaining ½ core ensures that some of the sample will be preserved, the use of a smaller core mass will magnify the differences.

Figure 11-2: Field Duplicate for Santander Pipe Drilling (2017-2022): statistics, scatter, relative difference, and cumulative relative difference plots



Source: Lyall Consult (2023)

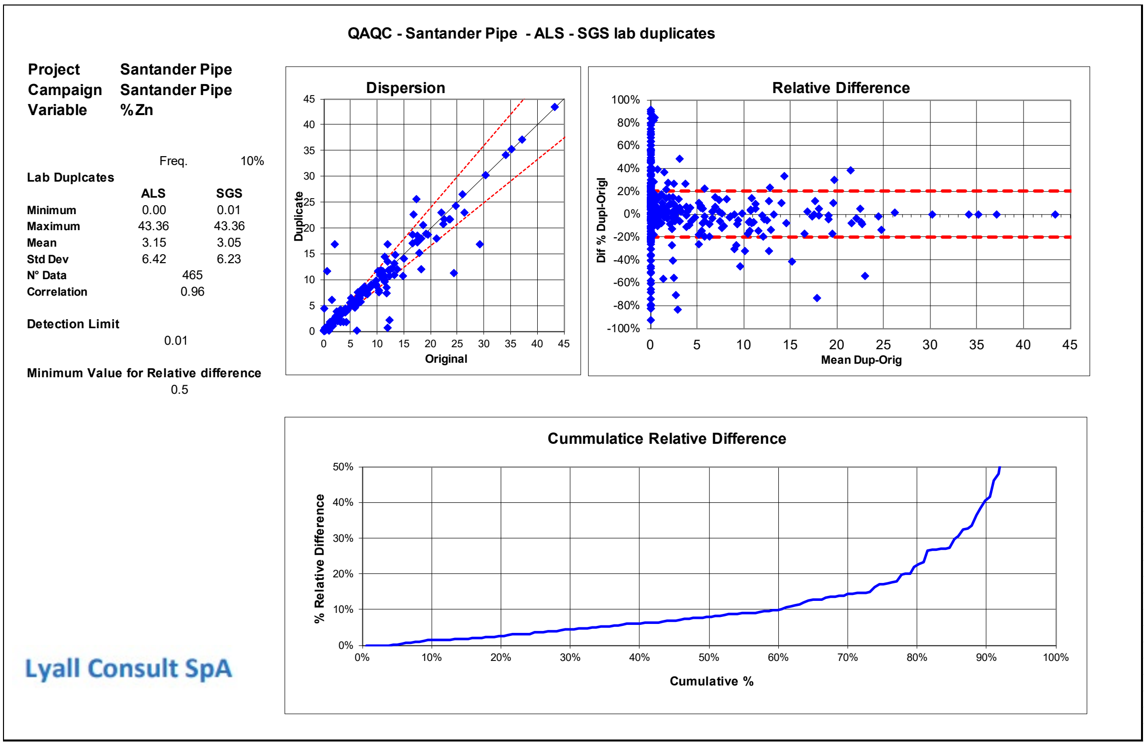
Laboratory Duplicates

Figure 11-3 shows statistics and plots for laboratory cross-check assays for pulp samples from 3 drillholes (SAN-228C-18, 228D-18 & 228E-18) originally assayed at ALS Lima and re-assayed at the SGS on-site laboratory.

Average grades show no significant differences between the two laboratories. A small difference in the overall average zinc grades is noted with SGS averaging 3% lower (3.15% Zn at ALS vs 3.05% Zn at SGS), which is consistent with CRM results.

On the other hand, there is significant dispersion between the results of sample pairs, which is unusually high for cross checks on pulp samples. For original Zn assays above 0.5%, 10% of the pairs have relative differences above 40% (Figure 11-3 – Cumulative relative difference plot). After reviewing the data in detail, it is apparent that there are mix-ups with the sample pairs that, most probably, occurred during the sample renumbering process. It was not possible to clearly identify all mix-ups, but it is probable that a significant proportion of pairs showing large relative differences are a result of clumsy re-numbering errors during the check batch preparation process. Consequently, it is strongly recommended to repeat a between-laboratory check process, making sure that mix-ups are avoided. For this process, it is suggested that, to avoid potential mix-ups, the sample numbers need not be changed, and that a nominal 5% of mineralized samples are chosen, representing batches submitted over the duration of the drilling campaigns.

Figure 11-3: External Checks for Santander Pipe Drilling (2017-2022): statistics, scatter, relative difference, and cumulative relative difference plots



Source: Lyall Consult (2023)

11.4.3 *Santander Pipe Exploration Drilling QAQC 2022*

During 2022, CDPR have drilled 9 exploration drill holes totalling 6,840 m on the Pipe North exploration target located on an extension of 300 to 700 metres to the NNW of the Santander Pipe deposit.

Sample preparation and assaying were performed at the SGS Santander laboratory. These included 806 sample intervals, 43 CRMs (BVIP-007 & BVIP-008), 23 ¼ core Field Duplicates, 19 coarse Preparation Blanks and 18 pulp laboratory Blanks.

The results of the two CRMs included do not show any significant bias with overall differences of less than +/-5% (Table 11-3). All the Blank check samples (preparation and pulp) returned values on or below the detection limits, confirming that there is no evidence of cross-contamination between samples. The results of the Field Duplicates were similar to those from previous campaigns.

Table 11-3: CRM Result Summary for Santander Pipe exploration drilling (2022)

CRM	Element	Best Value	Average	Difference	Number
BVIP-007	Zn (%)	4.84	4.73	-2.20%	29
BVIP-008	Zn (%)	12.8	12.5	-2.40%	14
BVIP-007	Pb (%)	2.81	2.74	-2.70%	29
BVIP-008	Pb (%)	6.08	5.87	-3.50%	14
BVIP-007	Ag (ppm)	116	120	3.00%	29
BVIP-008	Ag (ppm)	105	110	4.60%	14

11.4.4 Re-assaying of Historic Drill core

The lack of information relating to laboratory methods, assay certificates and quality control for the historic (pre-1993) drilling at Santander Pipe, led CDPR in 2022 to initiate work to recover old core in order to collect new geological and assay information. The remaining ½ core is mostly very small diameter (EX-21mm).

The ongoing work includes re-logging, specific gravity determinations, and sample preparation and re-assaying of the full remaining ½ core sample. In addition, some intervals that were not sampled previously are now being included in the sampling process. Assays are performed at the SGS Santander on-site laboratory and include quality control samples. Approximately 10% of the sample pulps are sent to ALS Lima as external laboratory checks.

DRA was provided with the re-assay data from 26 historic drill holes that include 427 samples, representing 8% of the historic core sample database of 5,611 samples. The results of the quality control samples were also provided.

DRA reviewed the results of the quality control samples and found these to be reliable. The results are similar to previous exercises and are summarised as follows:

- 35 blind CRMs for Zn, Pb, and Ag (BVI-006, BVI-007 & BVI-008) showed consistent results and differences between average values and certified values of less than 5% (Table 11-4)
- 19 Preparation Blanks and 18 Pulp Banks returning values on or below detection limits.
- 18 ¼ core Field Duplicates noting similar dispersions to previous exercises.
- 56 external checks with pulps re-assayed at ALS Lima. The results for Zn, Pb, Cu and Ag show good correlations with 90% of the mineralized intervals having relative

differences of less than 10%, and no significant differences in the average values between both laboratories.

Table 11-4: CRM Result Summary for Santander Pipe re-assaying of historic drilling

STD	Element	Best Value	Average	Difference	Number
BVIP-006	Zn (%)	2.57	2.5	-3.10%	2
BVIP-007	Zn (%)	4.84	4.73	-2.40%	11
BVIP-008	Zn (%)	12.8	12.4	-3.10%	22
BVIP-006	Pb (%)	0.275	0.28	1.80%	2
BVIP-007	Pb (%)	2.81	2.82	0.50%	11
BVIP-008	Pb (%)	6.08	5.85	-3.80%	22
BVIP-006	Ag (ppm)	18.4	18.6	0.60%	2
BVIP-007	Ag (ppm)	116	119	2.80%	11
BVIP-008	Ag (ppm)	105	110	4.50%	22

The results of the 427 historic ½ core re-assays comparing the originals (historic) to the new 2022 determinations carried out at SGS Santander are included in Figure 11-4, Figure 11-5, Figure 11-6, Figure 11-7 and Table 11-5, Table 11-6, Table 11-7, Table 11-8.

Whist the correlation between Zn values (Figure 11-4 and Table 11-5) is reasonable, a consistent bias is observed for values assaying between 0 to 7 % Zn with the new values assaying approximately 26% lower in this interval range. For values above 7%, there is no indication of bias and average values for Zn are similar. The overall difference for zinc is 9% lower for the 2022 assays.

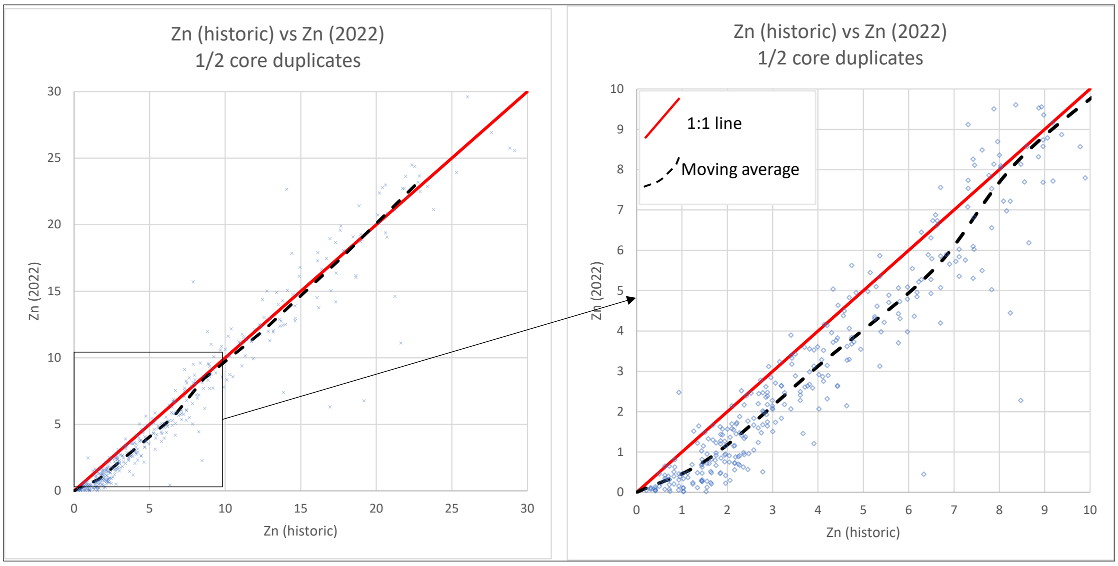
Significant differences are also observed for Ag and Pb (Figure 11-5, Figure 11-6, Table 11-6 and Table 11-7). Whilst Ag and Pb concentrations are significantly less than Zn, and much less significant to the economics, the bias observed in these elements is even more significant, with Ag averaging 20% lower and Pb 44% lower in the new assays. Dispersion between assay pairs for these elements is also very significant, and more than can be attributed to geological variability related to the ½ core sampling.

For copper (Figure 11-7 and Table 11-8), the new assays overall average is 19% higher, and dispersion is also significant.

The observed differences indicate that Zn and Ag assays are likely to be overstated in the historic data by as much as 9% for Zn and 20% for Ag. This is a matter for concern and more work is required to understand the nature and possible cause of these differences. The checks also indicate that laboratory precision for Pb, Cu and Ag in the historic assays is high for the concentrations of these elements at Santander Pipe and are therefore considered unreliable.

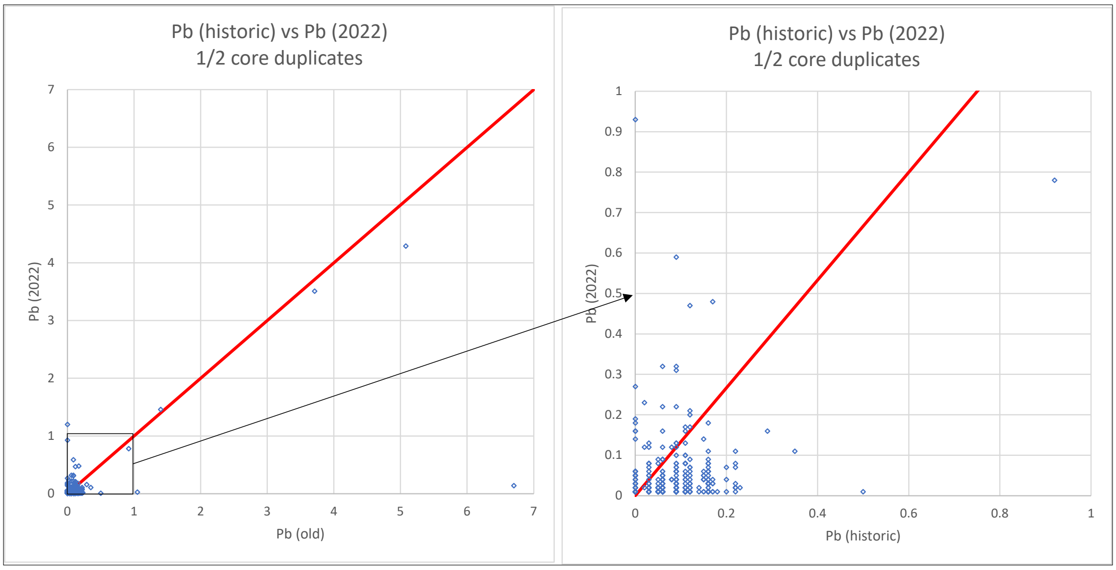
It is highly recommendable to continue and complete re-assaying of all the historic core that may be available. In doing so, particular care should be taken to ensure that there are no material losses and that quality control measures remain in place. On completion, and assuming a reliable outcome, re-assayed values should replace the historic values, and if the biases are confirmed, factors will need to be applied to any remaining historic assays used to develop future mineral resource models. It should be noted that the historic drilling is most significant in the upper levels of the Mineral Resource (3,885 to 4,020m), where this drilling comprises approximately 80% of the data. The Mineral Resources at these elevations contain 35% of the reported Mineral Resource at Santander Pipe. Mineral Resources below level 3885 are supported mostly by modern holes drilled by Trevali.

Figure 11-4: Zn Scatter plots comparing historic Santander Pipe assays to ½ core 2022 re-assay



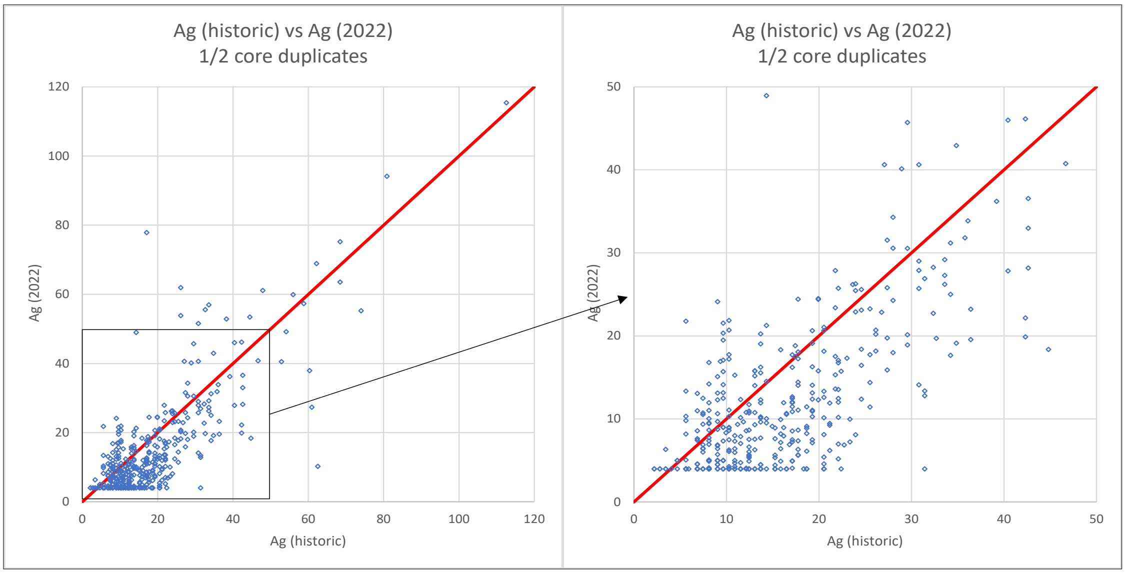
Source: Lyall Consult (2023)

Figure 11-5: Pb Scatter plots comparing historic Santander Pipe assays to ½ core 2022 re-assay



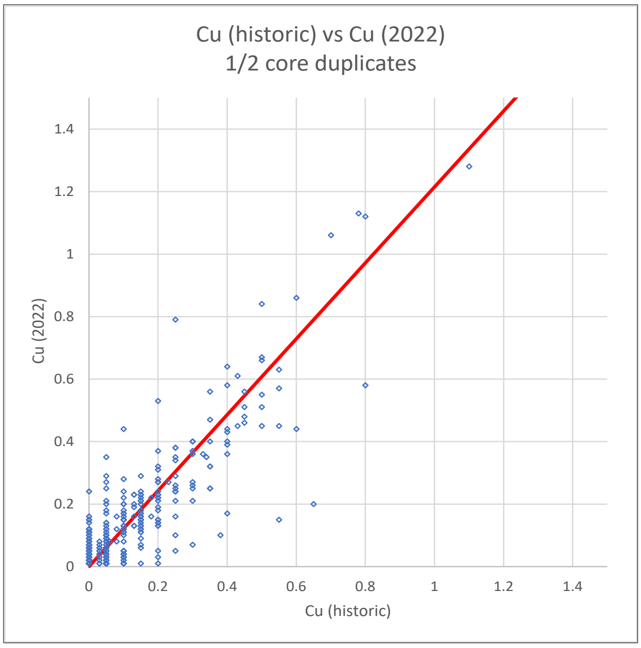
Source: Lyall Consult (2023)

Figure 11-6: Ag Scatter plots comparing historic Santander Pipe assays to ½ core 2022 re-assay



Source: Lyall Consult (2023

Figure 11-7: Cu Scatter plot comparing historic Santander Pipe assays to ½ core 2022 re-assay



Source: Lyall Consult (2023)

Table 11-5: Zn assays: difference between historic and 2022 value by grade interval

% Zn (avg)		% Zn	% Zn	Nº	% Diff
Min	Max	historic	2022		
0	2.5	1.64	0.87	151	47%
2.5	5	3.99	3.12	84	22%
5	7.5	6.57	5.55	53	16%
7.5	10	8.6	8.43	37	2%
10	15	12.5	12	51	4%
15	20	17.6	17.4	27	1%
20	30	22.8	23.2	24	-2%
	Total	**6.81**	**6.18**	**427**	**9%**

Table 11-6: Pb assays: difference between historic and 2022 value by grade interval

% Pb (avg)		% Pb	% Pb	Nº	% Diff
Min	Max	historic	2022		
0	0.1	0.07	0.03	358	60%
0.1	0.2	0.15	0.11	45	29%
0.2	5	1.36	0.97	15	29%
	Total	0.12	0.07	418	44%

Table 11-7: Ag assays: difference between historic and 2022 value by grade interval

g/t Ag (avg)		g/t Ag	g/t Ag	Nº	% Diff
Min	Max	historic	2022		
0	10	9.2	5.7	154	39%
10	20	16.4	11.5	158	30%
20	150	35.6	33.9	94	5%
	Total	18.1	14.4	406	20%

Table 11-8: Cu assays: difference between historic and 2022 value by grade interval

% Cu (avg)		% Cu	% Cu	Nº	% Diff
Min	Max	historic	2022		
0	0.1	0.03	0.04	248	-35%
0.1	0.2	0.13	0.16	84	-17%
0.2	0.3	0.24	0.26	30	-8%
0.3	0.5	0.38	0.4	28	-7%
0.5	1.5	0.58	0.75	18	-28%
	Total	0.12	0.14	408	-19%

11.4.5 Conclusions and Recommendations

Geological logging, sampling, assaying, SG determinations, data management and QAQC procedures used to characterise the mineralization at Santander Pipe for the modern drilling follow industry recognised best practices and provide a reliable base for the mineral resource modelling and estimation.

Much of the geological information from the historic drilling and underground mining at Santander Pipe remains on paper or digitised scans. It is recommended that efforts continue to recover potentially valuable information that can be used in future geological modelling exercises.

Whist the QAQC protocols in place are considered good, the following potential improvements are suggested:

- Field Duplicates – whilst these provide a good measure of all the sample errors mostly attributed to the in-situ geological variability, this is unlikely to change for the same mineralization style. Larger diameter core samples will help reduce the errors, but this is not expected to be significant, and this comes at a higher cost. Consequently, the frequency of these checks, currently at 1/40 can be relaxed for mineralization at Santander Pipe, to give way to other control samples. However, the 1/40 frequency should be maintained for newly discovered mineralized bodies or different styles of mineralization.
- Preparation and Pulp Duplicates – these are considered a standard best practice and are commonly used to understand and monitor variability relating to the sample preparation and analytical procedures. An insertion rate of 1 in 20 is typically used. It is recommendable to include checks of this type in CDPR's QAQC protocol.
- External Laboratory checks – CDPR has been using checks of this sort as a measure of relative accuracy between the two laboratories commonly used at Santander. It is recommended that these checks are carried out periodically on a regular basis during drilling campaigns. Samples should be chosen to represent all batches of mineralized materials. The external checks should also include CRM pulps. Re-numbering of the pulps can induce mix-up errors and is not considered necessary or advisable.
- QAQC reporting – as part of the control and assurance measures, it is recommended that CDPR implement periodic and regular reporting of exploration drilling QAQC results and actions that may have been taken to resolve issues detected in the process.

A review of the results of the QAQC on the assay determinations for modern drilling at Santander Pipe concludes that the assay data is reliable. No significant biases are observed for the elements of interest (Zn, Pb, Cu and Ag). Whilst cross-checks between the laboratories used for most of the assaying (SGS on-site laboratory and ALS Lima) revealed higher than expected differences, it is likely that this is a result of mix-ups during the sample re-numbering process. Consequently, it is strongly recommended to repeat a between-laboratory check process, making sure that mix-ups are avoided. For this process, it is suggested that, to avoid potential mix-ups, the sample numbers need not be changed, and that a nominal 5% of mineralized samples are chosen, representing batches submitted over the duration of the drilling campaigns.

The results of the 427 historic ½ core re-assays comparing the originals (historic) to the new 2022 determinations carried out at SGS Santander, show consistent biases for Zn, Pb and Ag, with the new assays returning averages that are 9% lower for Zn, 20% lower for Ag, 44% lower for Pb and 19% higher for Cu. Moreover, the results for Pb, Ag and Cu show a higher degree of dispersion that can be expected from ½ core re-sampling. This suggests that the historic laboratory results for these elements is of low precision for the concentrations of these elements at Santander Pipe.

It is highly recommendable to continue and complete re-assaying of all the historic core that may be available. In doing so, particular care should be taken to ensure that there are no material losses and that quality control measures remain in place. On completion, and assuming a reliable outcome, re-assayed values should replace the historic values, and if the biases are confirmed, factors will need to be applied to any remaining historic assays used to develop mineral resource models for future studies. It should be noted that the historic drilling is most significant in the upper levels of the Mineral Resource (3,885 to 4,020m), where this drilling comprises approximately 80% of the data. The Mineral Resources at these elevations contain 35% of the reported Mineral Resource at Santander Pipe. Mineral Resources below level 3885 are supported mostly by holes drilled by Trevali.

12 DATA VERIFICATION

12.1 Site Inspections

All previous studies on the property (Golder 2009, Golder 2010, Golder 2012, SRK 2017 and DRA 2022), included site inspections by QP's to verify data and ongoing procedures. All these concluded that the work was carried out to good industry standards and that the data was consistent with the field observations.

The latest site inspection to the property was carried out by DRA representatives Graeme Lyall (QP), Javier Aymachoque (QP), and Walter Neisser between the 13th and the 17th of December of 2021.

The on-site laboratory operated by SGS and responsible for assaying mine-geology and process samples was found to be well organized with internal protocols and QAQC in place.

Random drill-hole collar locations were checked with a portable GPS, returning differences of less than 5 m. Where possible, drill-hole collars from the Trevali drilling have been preserved with a concrete monument and hole casing protruding through the concrete. The drill-hole collars were clearly identified and labelled. CDPR indicated that not all drill-hole collars have been preserved in this way, due to local remediation requirements.

Mineralization was observed in surface outcrops at Puajanca in altered calcareous sediments. Controls on the mineralization, including the Magistral fault and the anticline hosting the mineralization at the Santander Pipe and the Puajanca deposit, are clearly identified.

There was no drilling activity ongoing during the site visit. The core-logging facilities were inspected. Drill core from two deep holes at Santander Pipe (SAN-0225-17 & SAN-0225D18), confirming mineralization at intervals with the higher assay results.

Most of the core is stored in the old mine buildings, and since the visit, CDPR have been making progress in recovering and re-sampling of historic core from Santander Pipe.

During the field inspection, DRA reviewed some historic mine plans and sections from the Santander Pipe and found them to be consistent with the information included in the database. While the latest mine plans used for the modelling are dated from February 1991, 19 months before ultimate closure, a closer review showed that mining over this final period was not significant and had focused on mining mineralization left in the upper levels of the mine, above the elevation to which Mineral Resources are declared.

12.2 Historic Data Verification

After acquiring the Santander property in 2007, Trevali conducted a detailed review and compilation of historic drill holes, channel samples and production data from the previously mined Santander Pipe. Historic reports, maps, sections, and drill logs were reviewed, digitized and catalogued. A database with a total of 318 drill holes (18,507 metres) and 974 channels (5,245 metres) from five mine levels was compiled. Historic operations reports were reviewed in order to compile both mine and plant production data; reports were supplemented, when necessary, by data from the Geology Department and Annual Mine reports.

For the 2017 Mineral Resource updates at the Santander property, SRK verified historical assay data against historical plans and sections prepared by the mine operators at the time of mining.

For the current study, CDPR have provided DRA with image copies of some historic sections and plans with the drill hole traces and assay information. These were georeferenced in 3D and DRA reviewed these against the 3D database used for the resource modelling finding no significant discrepancies. However, DRA notes that image copies provided are not the original compilations catalogued by Trevali which were used to build the drilling and sample databases. A proper verification would require reviewing the database against the full set of historic sections including the drill hole traces, samples and assay determinations. To the date of this report, CDPR has not been able to source the Trevali catalogue, nor a full set of plans and sections that verify the data.

The historic mine surveying used a local coordinate system. Sections, plans and data recorded in the local coordinate system were transformed to UTM (Zone 18) PSAD56 and WGS84 projections during the Trevali ownership. CDPR was not able to provide DRA with sufficient information to fully verify the coordinate transformation of historic data. Considering that the historic mine levels, where most of the data was collected, are not accessible, field verification of the surveying is not possible.

12.3 2011 to 2022 Data Verification

The Santander Pipe Mineral resource model was completed in Leapfrog EDGE in May of 2022 by Harold Villena from CDPR and Graeme Lyall (QP). DRA verified the Leapfrog datasets against data exported from the official CDPR Geotic database and found the data to be consistent.

DRA verified Zn, Pb, Cu, and Ag assays for five of the Trevali deep drill holes at Santander Pipe against digital copies of laboratory reports provided by CDPR. Four of these holes (SAN-0225E-17, SAN-0225E-19, SAN-0228D-17, and SAN-0237-19) including 805 assay intervals that were assayed at ALS Lima. One hole (SAN-0334-17) including 158 assay intervals, was assayed at the SGS on-site laboratory. A perfect match was obtained.

DRA has reviewed the drill-hole data for the Santander Pipe in three dimensions and did not note any significant inconsistencies.

12.4 Recommendations on Data Verification

Given the reliance on the historic data of a significant portion of the declared Mineral Resource as well as the unmined mineralization left behind in the upper levels above 4,020 m, DRA considers that future studies beyond a PEA level will require the following more detailed verification studies:

- CDPR should recover historic information (plans, sections, reports) that was compiled and catalogued by Trevali and used to develop the sampling databases. This will be required for verification as the project develops into more advanced study phases.

- The coordinate transform from the historic local coordinate system to the current UTM WGS84 projection needs to be documented and verified. The verification process could involve identifying historic triangulation control points and historic markers (e.g., the pipe shaft collar) and documentation as to their historic coordinates. By surveying the positions of these points in the WGS84 UTM projection, the transformation can be corroborated.

- Whilst channel sample traces for the underground mining at Pipe are included in the Mineral Resource Database, their respective assays are not. Recovering and including these assays in the database and confirming their positions, will be important for future studies, especially if considering mineralization remaining in the mined levels above level 4020.

- As mentioned in Section 11.4.5 the re-logging and re-assaying of all historic core that may be available, should be completed. On completion, and assuming a reliable outcome, re-assayed values should replace the historic values, and if biases are confirmed, factors will need to be applied to any remaining historic assays used to develop mineral resource models in future studies.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

This Section has been summarized and updated from the Report available on SEDAR entitled "Cerro de Pasco Resources - NI 43-101 and Resource Estimate Update for Santander Mine Magistral and Pipe Deposits, Huaral, Department of Lima, Peru", issued on January 24, 2022 prepared for Cerro de Pasco Resources with an effective date of December 31, 2021.

13.1 Introduction

This section describes the metallurgical testwork conducted for the Santander Pipe mineral that will be processed through the existing Santander Concentrator. Currently, this Concentrator processes material solely from the Magistral Mine. The Santander Concentrator was designed by Holland and Holland and built co-jointly by Trevali Peru S.A.C. and Glencore Los Quenuales. The Los Quenuales' 1,250 t/d Rosaura concentrator was purchased, relocated, and refurbished, with additional equipment added in order to process Santander material at production rates in the order of 2,000 t/d, with a maximum capacity up to 2,500 t/d. The metallurgical testwork conducted is similar to that conducted previously for the Magistral Mine including analytical assaying, mineralogy, abrasion indices, work indices, and bench scale flotation.

In this Report, CDPR uses the terms Upper and Lower Zones to describe the zones of the Santander Pipe Deposit. It is divided into the Upper Zone which was mined and processed to the 4020 elevation between 1958 to 1992 and halted due to the Peruvian economic crisis, and the Lower Zone, a deposit that has never been mined or processed and is described in Section 14 of this Report.

SGS Callao laboratories in Lima performed testwork on the Lower Zone and the metallurgical performance for the Upper Zone is based on the available historical records from the old Santander Processing Plant. Recent mineral processing testwork is described in Section 13.4 which evaluates the potential to modify or retrofit the existing Santander Processing Plant to accommodate processing of either Santander Pipe or Magistral mineralized material.

The existing Santander concentrator facility comprises a three-stage crushing circuit, two (2) parallel milling circuits, each with a rod and ball mill, flash lead flotation within the milling circuit; lead rougher, scavenger, and cleaner flotation; zinc rougher, scavenger, and cleaner flotation with a regrind mill, lead-concentrate thickening and filtration, zinc-concentrate thickening and filtration, final-tailings thickening, and a tailings-storage facility (TSF). The upgrade of the Santander concentrator will require retrofitting additional equipment to the existing lead flotation circuit which will allow this circuit to produce either a copper or a lead concentrate as well as a zinc concentrate.

13.2 Historical Testwork

13.2.1 2010 – Holland and Holland Consultants

A testwork program was designed and supervised by Holland and Holland Consultants and completed at Trevali's on-site metallurgical test facility in 2010. The program examined various mineral composite-blending strategies between the Magistral North and Central deposits, and the Magistral North and South deposits, respectively. The results of the testwork indicated recoveries to the separate rougher concentrates of 75%-80% silver, 90% lead, and 80% zinc to their respective concentrates. This indicated an excellent separation of the silver-lead minerals and a moderate-to-good separation of the zinc minerals from the host rock.

13.3 2019 – SGS Minerals Services Perú Testwork– Magistral Mine

In 2019, additional metallurgical tests were carried out to optimize the plant design and process flowsheet. These tests included the determination of comminution indices and analytical and mineralogical characterizations, in addition to flotation tests of lead and zinc ores to optimise the recovery and quality of the lead and zinc concentrates produced. For these tests, a blended head-sample composite was prepared with the following breakdown: 40% Magistral Centro, 20% Magistral Norte, 30% Magistral Sur, and 10% old tailings. The representative nature of this composite sample was not available in the Report.

13.3.1 Mineralogical Characterization

The sample was composed of the following:

- 9% lead and zinc minerals, namely galena and sphalerite/marmatite;
- 20% iron sulphides, mainly pyrrhotite and pyrite;
- 15% carbonates, mostly calcite; and
- 56% hard silicates, mainly quartz, feldspar, garnet, and pyroxene.

13.3.2 Abrasion Index (Ai)

The resulting average Ai is 0.2113, which is considered to be low with respect to abrasion. This value is used in the Bond mathematical model to predict steel consumption.

13.3.3 Bond Work Index Test

Bond work index test results (BWi) indicated that the sample has an average energy consumption of 13.14 kWh/t and classified the mineral as being of medium hardness.

13.3.4 Flotation

13.3.4.1 Open Circuit Flotation Tests

Open circuit flotation tests were carried out and focused on identifying operational parameters that could improve the recovery and grade of the final zinc concentrates produced in the plant.

From the tests conducted, the following was observed in the bulk lead concentrate:

- Using tap water from SGS laboratories resulted in greater amounts of zinc misreporting to the bulk lead concentrate.

- A reduction in xanthate (Z-11) dosage resulted in lower amounts of zinc reporting to the bulk lead concentrate in addition to the economic benefits of reduced xanthate consumption.

From the tests conducted, the following was observed during zinc rougher and cleaner flotation:

- Lower zinc recovery with a higher zinc grade occurred when water from SGS laboratories was used. In essence, mine site water is favourable with respect to the zinc flotation process.
- Re-grinding to a P_{80} of 50 μm did not produce a significant improvement in the recovery of zinc, although higher zinc grades were observed in the final concentrates due to higher selectivity in open cleaner flotation.
- Reducing the dosage of xanthate (Z-11) and copper sulphate ($CuSO4$) had a favourable effect with respect to the recovery of zinc.

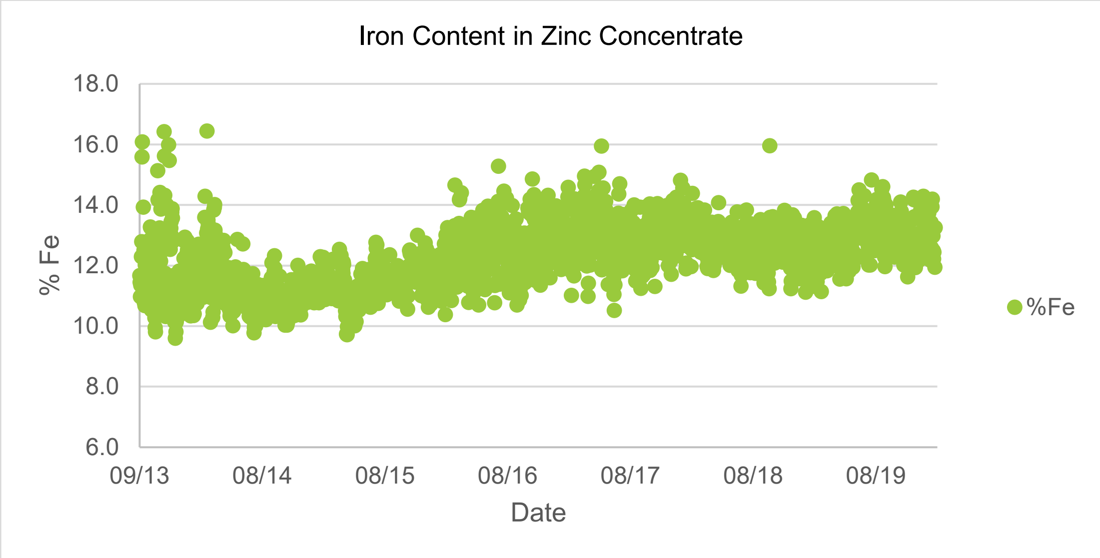
13.3.4.2 Closed Circuit Test

A six-cycle closed circuit (LCT) flotation test was carried out to observe the impact of recirculation during cleaning and scale up for feasibility. The results obtained indicated that maximum zinc recovery is in the order of 82% with a maximum zinc grade in the final concentrate of approximately 46% zinc.

13.3.5 Deleterious Elements

Iron is a deleterious element that needs particular management at the Magistral mine, due to its detrimental impact on the value of Zinc concentrate. The iron level content in Zinc concentrates from September 2013 to January 2019 can be seen in Figure 13-1. During that period, the level of iron increased by two (2) percentage points on average, from around 11.0% to over 13.0% Fe. Additional testing and mineralogical studies are required to understand and address this iron issue.

Figure 13-1: Iron Content in Zinc Concentrate



Source: DRA (2022).

13.4 2022 – SGS Minerals Services Peru Testwork – Santander Mine

The information in the following subsections is either translated, largely drawn and/or summarised from the Report entitled “Servicio de Pruebas Metalúrgicas de Conminución, Flotación y Análisis Mineralógico Informe Final” (“Metallurgical Testing Service for Comminution, Flotation, and Mineralogical Analysis Final Report”), submitted to CDPR, Prepared by SGS del Perú S.A.C, Project # Cz. MET 0194/2022 NR, Diciembre 2022.

Several mineral processing tests have been conducted recently to assess the feasibility of upgrading or retrofitting the Santander Processing Plant to process material from the Santander Pipe. As prior metallurgical testing was limited to samples from the Magistral Mine, the Santander Pipe samples will provide information about mineral recovery, required operating parameters, and expected concentrate grades and recoveries. The metallurgical testwork that will be conducted for the Santander Pipe will be similar to that completed originally for the Magistral Mine including analytical assaying, mineralogy, abrasion indices, bond work indices and bench scale flotation. These tests are carried out in one composite comprised of drillhole intercepts from the Santander Pipe Lower Zone.

13.4.1 Analytical Characterization

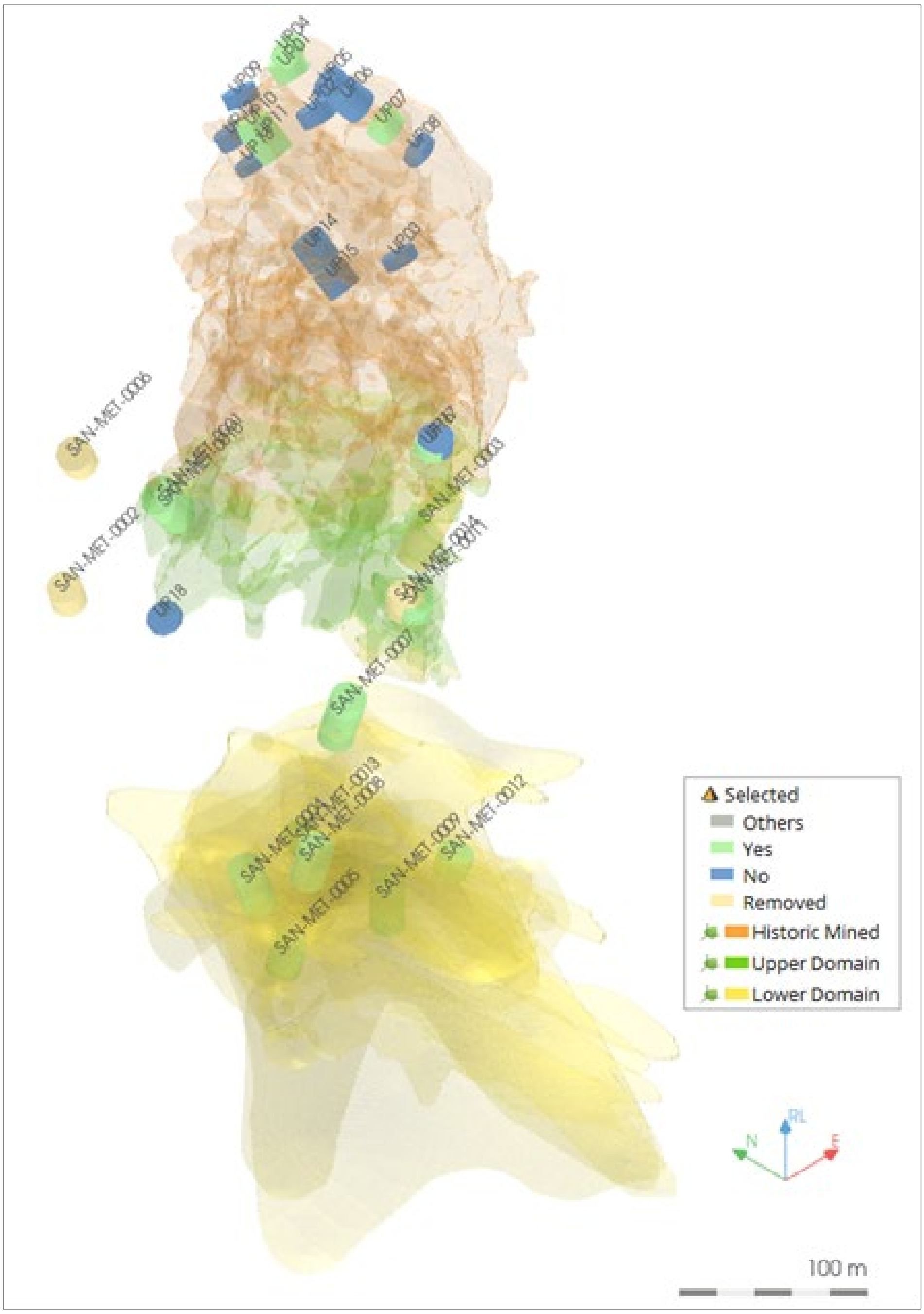
CDPR sent a total of seven (7) drillhole samples to SGS Callao as listed in Table 13-1.

Table 13-1: Santander Pipe Mineral Samples

Drillhole ID	From (m)	To (m)	Weight (kg)	Sample Code
SAN-0225E-18	818.4	840.4	30.41	SAN-MET-0013
SAN-0225D-18	771.5	803.1	36.47	SAN-MET-0004
SAN-0228C-18	763.0	782.2	23.07	SAN-MET-0005
SAN-0228D-18	629.7	666.9	45.22	SAN-MET-0007
SAN-0228C-18	692.7	719.3	32.02	SAN-MET-0008
SAN-0228B-17	749.0	785.5	48.44	SAN-MET-0009
SAN-0243B-19	820.2	834.1	19.43	SAN-MET-0012

From the seven (7) samples received, a composite sample was prepared and identified as: "COMP2-LOWER". SGS Mineral Resources was requested to execute a testwork program on this composite. DRA conducted Cancha Geometallurgical modeling to establish the representative nature of the sample from the Santander Pipe Lower Zone. Figure 13-2 illustrates the Upper and Lower Zones. The Lower Zone is depicted in yellow shading and the selected samples are shown in light green within the block model and are representative with respect to the Lower Zone.

Figure 13-2: Sample Selection Cancha Geometallurgy Modeling



Source: DRA - Cancha Geometallurgy Software (2022).

13.4.2 Head assays

Head assays for COMP2-LOWER from Inductive Coupled Plasma (ICP) Analysis results are presented in Table 13-2.

Table 13-2: Inductive Coupled Plasma (ICP) Results

Element	Al	Ca	Fe	K	Mg	Na	P	S	Ti
Unit	%	%	%	%	%	%	%	%	%
Head	2.31	>15	>15	0.28	0.7	0.62	0.07	6.18	0.1

Element	Ag	As	Ba	Be	Bi	Cd	Co	Cr	Cu
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Head	8	230	45	1	17	140	28	24	2,119

Element	Ga	La	Li	Mn	Mo	Nb	Ni	Pb	Sb
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Head	12	16	6	4,062	39	1	14	35	16

Element	Sc	Sn	Sr	Tl	V	W	Y	Zn	Zr
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Head	4	25	68	<2	34	160	11	>10,000	51

Head assays for COMP2-LOWER from X-ray fluorescence (XRF) analysis results are presented in Table 13-3.

Table 13-3: X-Ray Fluorescence (XRF) Results

Element	Fe	Fe_2O_3	Si	SiO_2	Ca	CaO	Mn	MnO	Al
Unit	%	%	%	%	%	%	%	%	%
Head	17.91	25.6	14.01	29.97	16.83	23.55	0.52	0.68	2.45

Element	Al_2O_3	Fe	Ti	TiO_2	Mg	MgO	P	P_2O_5	S
Unit	%	%	%	%	%	%	%	%	%
Head	4.64	17.91	0.14	0.23	0.79	1.3	0.05	0.11	7.1

Element	SO_3	K	K_2O	Cu	CuO	Zn	ZnO	As	As_2O_3
Unit	%	%	%	%	%	%	%	%	%
Head	17.73	0.27	0.33	0.23	0.29	6.78	8.44	0.02	0.03

Element	PbO	Na	Na_2O	Mo	MoO_3	LOI
Unit	%	%	%	%	%	%
Head	<0.01	2.05	2.77	<0.01	<0.01	10.74

13.4.3 *Mineralogical Characterization*

A mineralogical study was carried out at the by SGS Chile's Laboratory using a PMA type Tescan Integrated Mineral Analysis (TIMA) electron microscopy and X-ray diffractometry. Analysis was completed on four (4) COMP2-LOWER samples with different grind size feed distributions at P80 of: 75 µm, 106 µm, 125 µm, and 150 µm.

The objective of the study was to identify the mineralogical characteristics of the deeper Santander Pipe mineralization including mineral deportment and liberation and how this impact on the mineralogical behavior for the mineral and required process flowsheet to produce saleable products.

Mineralogical analysis identified that the predominant minerals of interest are sphalerite and chalcopyrite, with a high content of gangue minerals including silicates (garnet), inherent pyrite, and lower amounts of calcite.

TIMA was performed, and the results are as follows:

- The head grades of the composite sample were 6.7% Zn, 0.2% Cu, 18% Fe, and 7.2% S.
- The sample contains 63% garnet, 11.8% sphalerite, 7% pyrite and 3% of calcite.
- The contained zinc is entirely sphalerite, copper is in the form of chalcopyrite and iron: 6.1% sphalerite, 21% pyrite, 6% oxide and the remaining material is silica.

13.4.3.1 *Liberation*

- Sphalerite if mostly liberated (> 90% exposed area) at particle sizes below P80 < 125 µm (> 80% liberated).
- Chalcopyrite is mostly liberated (> 90 % exposed area) at particle sizes below P80 < 106 µm (> 77% liberated).

13.4.3.2 *Deportment*

Zinc deportment results shown in Table 13-4 indicate that the element of interest is all present in the sphalerite mineral. In Table 13-5, it is seen that copper is present in chalcopyrite. Iron deportment results in Table 13-6 show that iron is distributed in various minerals. In fact, it has a higher content in the garnet and pyrite. Furthermore, results indicate that iron has a significant presence in sphalerite.

Table 13-4: Zn Deportment

Sample	COMP 2 - LOWER (P_{80}=75um)	COMP 2 - LOWER (P_{80}=106um)	COMP 2 - LOWER (P_{80}=125um)	COMP 2 - LOWER (P_{80}=150um)
Sphalerite	100.00	100.00	100.00	100.00
Others	0.00	0.00	0.00	0.00
Total	**100.00**	**100.00**	**100.00**	**100.00**

Table 13-5: Cu Deportment

Sample	COMP 2 - LOWER (P_{80}=75um)	COMP 2 - LOWER (P_{80}=106um)	COMP 2 - LOWER (P_{80}=125um)	COMP 2 - LOWER (P_{80}=150um)
Chalcopyrite	99.32	99.97	99.94	99.71
Chalcocite	0.59	0.00	0.00	0.18
Bornite	0.00	0.03	0.06	0.06
Covellite	0.06	0.00	0.00	0.04
Tennantite	0.04	0.00	0.00	0.01
Others Sulphides	0.00	0.00	0.00	0.00
Others	0.00	0.00	0.00	0.00
Total	**100.00**	**100.00**	**100.00**	**100.00**

Table 13-6: Fe Deportment

Sample	COMP 2 - LOWER (P_{80}=75um)	COMP 2 - LOWER (P_{80}=106um)	COMP 2 - LOWER (P_{80}=125um)	COMP 2 - LOWER (P_{80}=150um)
Chalcopyrite	1.10	1.12	0.94	1.07
Chalcocite	0.00	0.00	0.00	0.00
Bornite	0.00	0.00	0.00	0.00
Covellite	0.00	0.00	0.00	0.00
Tennantite	0.00	0.00	0.00	0.00
Others Sulphides	0.06	0.01	0.02	0.10
Pyrite	22.84	20.28	21.71	20.64
Sphalerite	5.97	6.55	5.95	5.93
Hard Silicates	0.02	0.01	0.01	0.01
Phyllosilicates	0.65	0.63	0.64	0.46
Fe Oxid/Hidrox	6.05	6.07	5.54	5.93
Carbonates	0.10	0.10	0.08	0.06
Garnet	61.04	62.80	62.71	63.44

Sample	COMP 2 - LOWER (P_{80}=75um)	COMP 2 - LOWER (P_{80}=106um)	COMP 2 - LOWER (P_{80}=125um)	COMP 2 - LOWER (P_{80}=150um)
Piroxenes	2.07	2.28	2.30	2.24
Amphibole	0.06	0.09	0.08	0.09
Tourmaline	0.01	0.02	0.01	0.01
Other Silicates	0.01	0.01	0.01	0.01
Others	0.02	0.03	0.01	0.01
Total	**100.00**	**100.00**	**100.00**	**100.00**

13.4.4 Abrasion Indices

Abrasion index (Ai) tests were performed in order to assess the wear of steel components and coatings in crushers, roller mills, and mills.

The Abrasion index result was 0.289 and according to the classification of SGS minerals, it is considered to be in the low abrasion category. The test results are shown in Table 13-7.

Table 13-7: Abrasion Index

Sample Code	Ai	Classification	Steel Consumption Prediction, kg/kW-h							
			Wet rod mills. rods	Wet rod mills. liners	Wet ball mills. balls	Wet ball mills. liners	Dry ball mills. balls	Dry ball mills. liners	Crusher liners	Roll crusher shells
COMP2	0.289	Low Abrasion	0.120	0.011	0.104	0.008	0.012	0.001	0.021	0.042

13.4.5 Bond Work Index Test

Bond work index (Wi) tests were conducted to determine the Bond work index. This parameter can then be used to estimate the net energy requirements of the grinding circuit using Bond's Third Law of Comminution using the following equation:

$$W = W_i \left(\frac{10}{\sqrt{P}} - \frac{10}{\sqrt{F}} \right)$$

Work index test results indicated the sample having an energy consumption of 9.4 kWh/t, and according to SGS Minerals classification, the mineral is classified as being very soft, as shown in Table 13-8.

Table 13-8: Bond Work Index Tests

Sample Code	Work Index (Wi) kw-h/t	Mineral Classification	Average of the Last Three Cycles		
			Gpr (g/rev)	Mass (g)	% Circulating Load
COMP2	9.4	Very Soft	2.47	501	251

13.4.6 Flotation

13.4.6.1 Open Circuit Flotation Testing (OCT)

The purpose of the open circuit rougher and cleaner tests was to evaluate the zinc circuit and the copper circuit with the addition of a regrind mill. Thirteen tests have been conducted and a summary of the results is described below.

Rougher Tests

- Effect of Primary Grind Size – Copper Rougher Stage:

  Samples with two (2) separate particle size distributions were evaluated: P_{80} of 106 µm and P_{80} of 125 µm. The optimal grind size selected was a P_{80} of 106 µm. Results show that there was no significant difference in copper recovery at the copper rougher stage; however, with a finer particle size distribution a higher copper concentrate grade was obtained. In fact, with a P_{80} of 106 µm, a lower zinc and iron recovery was obtained after the copper rougher stage.

- Effect of pH – Copper Rougher Stage:

  Two (2) different pH levels were evaluated: 8.5 and 9.5. The selected pH value after the test was 9.5 resulting in higher copper and zinc recoveries and slightly lower iron grades in the copper rougher circuit.

- Effect of Depressor $ZnSO_4$ Dosage – Copper Rougher Stage:

  Three (3) different dosages of $ZnSO_4$ were evaluated as a depressant for zinc minerals: 200 g/t, 300 g/t, and 400 g/t. The dosage selected was 200 g/t as it lowered the Fe content in the copper concentrate. However, results did not show a direct or inverse trend and it is thus recommended to evaluate dosage levels below 200 g/t.

- Effect of Collector – Copper Rougher Stage:

  Two (2) different types of collectors were evaluated: Z-11 and AP-3894. The Z-11 was selected because it produced higher Cu recoveries in the rougher copper concentrate.

- Effect of Collector Z-11 Dosage – Zinc Rougher Stage:

  There were two (2) different dosages of Z-11 tested: 10 g/t and 15 g/t. Based on the Rougher Zinc concentrate results, 15g/t was found to be the optimal collector dose.

- Effect of Activator $CuSO_4$ Dosage – Zinc Rougher Stage:

  Activator $CuSO_4$ dosages tested were 400 g/t and 200 g/t and the results indicated that the optimal dosage was 400 g/t. In fact, the higher dosage increases Zn recovery and lowers Cu and Fe recoveries to the Rougher Zinc Concentrate.

- Effect of Collector – Zinc Rougher Stage:

  After testing the collectors Z-11 and F-4234, results demonstrated that F-4234 increased the Fe and Cu recoveries in the zinc concentrate and that Z-11 increased Zn recoveries. Due to its optimal performance, Z-11 was selected.

Cleaner Tests

- Effect of Grind Size – Copper Cleaner Stage:

  Two (2) particle size distributions were evaluated for the copper cleaner stage in cleaning rougher concentrates: P_{80} of 38 µm and P_{80} of 53 µm. The selected size for a higher copper recovery at the cleaner stage is a P_{80} of 38 µm.

- Effect of Grind Size – Zinc Cleaner Stage:

  As for the copper cleaners, two (2) grind sizes were tested: P_{80} of 38 µm and P_{80} of 53 µm. The selected size was a P_{80} of 53 µm as the results showed that a significantly higher zinc recovery in the zinc cleaners could be achieved at the coarser particle size distribution.

- Effect of Depressor $ZnSO_4$ Dosage – Copper Cleaner Stage:

  Two (2) dosages of $ZnSO_4$ depressant were evaluated: 50 g/t and 100 g/t. As the results showed a better depression of zinc, the optimal dosage selected for the copper cleaner stage was 100 g/t.

- Effect of Collector Z-11 Dosage – Copper Cleaner Stage:

  The dosages evaluated for the copper cleaners was 0.25 g/t and 0 g/t. The optimal dosage selected was 0.25 g/t. This dosage favors higher copper recoveries while slightly increasing Fe recovery and reducing Zn recovery.

- Effect of Collector Z-11 and Activator $CuSO_4$ Dosage – Zinc Cleaner Stage:

  Three (3) combined dosages of Z-11 and $CuSO_4$, respectively, were tested: 3 g/t and 50 g/t, 5 g/t, and 100 g/t and 0 g/t for reagents. The combination selected for the zinc cleaner stage was 3 g/t of Z-11 with 50 g/t of $CuSO_4$ as this combination produced higher zinc concentrations.

13.4.6.2 Closed or Locked Cycle Circuit Testing (LCT)

A Locked Cycle Test (LCT) was conducted using the optimal open circuit conditions defined in previous testwork stages. The objective of the LCT test was to simulate the expected concentrator performance with the effect circulating loads. Figure 13-3 illustrates the flotation flowsheet used for the LCT and Table 13-9 shows the LCT metallurgical balance and results.

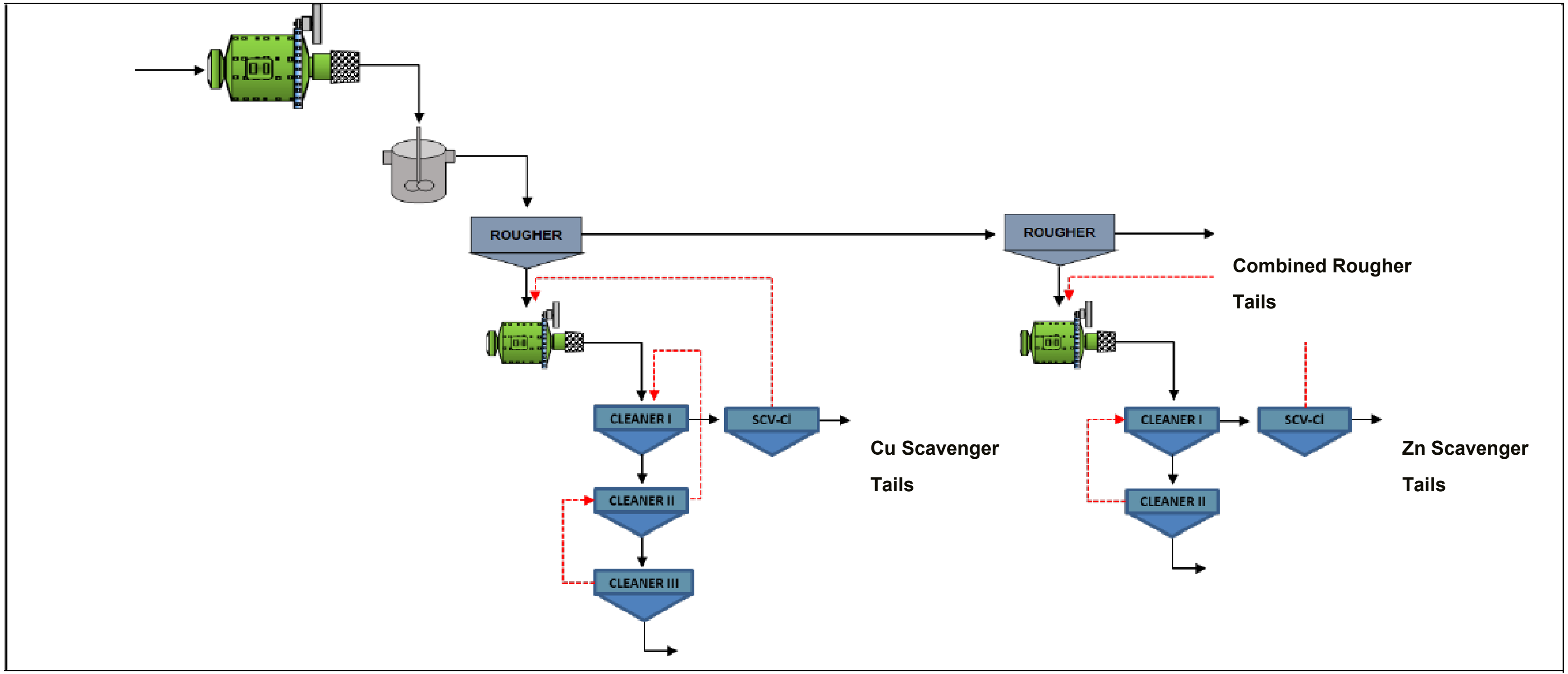
Results show that the quality of the concentrate is similar to that achieved historically with Santander Pipe Lower Zone. It is possible to obtain saleable commercial grade concentrates as follows:

- **Copper concentrate**: 21% Cu at close to 70% recovery.
- **Zinc concentrate:** 51% Zn at 89% recovery.

The high iron grade in the zinc concentrate is a result of the sphalerite containing 10% of iron in its chemical composition.

Results indicate high zinc grade in the copper concentrate and zinc tailings possibly caused by the presence of copper and iron ions in the process water.

Figure 13-3: Testwork Flow Diagram LCT



Source: SGS, 2022

Table 13-9: Metallurgical Balance of Combined Products – LCT Flotation

Product	Mass	Grade					Recovery				
		Ag	Cu	Zn	Fe	Pb	Ag	Cu	Zn	Fe	Pb
	%	g/t	%	%	%	%	%	%	%	%	%
Copper Cleaner Concentrate	0.83	433.82	20.83	13.64	25.94	0.05	52.15	69.50	1.74	1.17	12.78
Cu Cleaner + Scavenger Tails	1.56	37.05	0.41	11.65	27.62	0.01	8.33	2.56	2.78	2.33	5.27
Zn Cleaner Concentrate	11.39	13.83	0.33	50.85	12.18	0.00	22.72	15.05	88.71	7.51	10.03
Zn Cleaner+ Scavenger Tails	1.57	9.44	0.23	2.24	30.31	0.00	2.13	1.46	0.54	2.57	1.90
Combined Rougher Tails	83.88	0.77	0.03	0.36	18.72	0.00	9.35	8.65	4.61	85.02	66.76
Calculated Head	**100.00**	**6.93**	**0.25**	**6.53**	**18.47**	**0.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

13.4.7 *Mineralogy – Copper Concentrate*

Analysis of mineralogy in copper concentrate enables interpretation of the flotation process of sphalerite, which is a problematic mineral.

Results show that around 5% of the total zinc reporting to the copper flotation circuit with a 2% reporting to the final copper concentrate. In fact, 25.3% of the final concentrate is sphalerite where 19.5% of this sphalerite is associated with chalcopyrite. The balance of the sphalerite is liberated. It was expected that the liberation of sphalerite in the copper concentrate would be less than 10%. Mineralogy of the copper concentrate indicates the following:

- A high presence of recoverable zinc particles in the copper circuit; and
- A large quantity of zinc particles that were unrecoverable through flotation were detected in the copper circuit.

13.4.8 *Mineralogy – Zinc Concentrate*

Studying the mineral composition of the zinc concentrate allows for an improved understanding of the copper flotation process for chalcopyrite recovery, which presents difficulties within the zinc concentrate.

Mineralogical analysis shows that 18% of the total copper content reports to the zinc flotation circuit, with 15% reporting to the final zinc concentrate. The results show that 1.1% of the contained chalcopyrite is recovered to the zinc concentrate with 35.6 % associated with sphalerite and 60.5% is liberated. It is expected that the liberation of chalcopyrite in the zinc concentrate would be less than 10%. Mineralogy of the zinc concentrate reveals the following:

- Presence of copper particles that are recoverable in the zinc circuit;
- A high amount of copper particles that cannot be recovered through flotation were found in the zinc circuit.

13.4.9 *Deleterious Elements*

Both copper and zinc concentrates will be subject to penalty conditions, should significant grades of arsenic, cadmium, lead, bismuth, manganese, antimony, and mercury be present within the concentrates. Table 13-10 shows the LCT grades of each element for both the copper and zinc concentrates with important deleterious elements highlighted in blue.

As shown in Table 13-10, ICP and AAS analysis results demonstrate that the concentrates are clean and that none show the presence of deleterious elements which would lead to smelter penalties.

Table 13-10: ICP and AAS Analysis - Copper and Zinc Concentrates

Element	Ag	As	Be	Bi	Ca	Cd	Co	Cr	Cu
Unit	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
Comp Conc Cu	>100	136.00	<0.5	185.00	1.27	374.00	101.00	22.00	>10000
Comp Conc Zn	16.30	197.00	<0.5	21.00	1.27	1307.00	187.00	24.00	4006.70

Element	Fe	Ga	K	La	Mg	Mn	Mo	Na	Ni
Unit	%	Ppm	%	ppm	%	ppm	ppm	%	ppm
Comp Conc Cu	>15	11	0	12	0	1593	1102	0	138
Comp Conc Zn	12	<10	0	7	0	4681	25	0	107

Element	Pb	Sb	Sc	Sn	Sr	Ti	V	Y	Zn
Unit	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
Comp Conc Cu	679	14	3	15	9	0	4	1	>10000
Comp Conc Zn	107	5	1	29	5	0	5	1	>10000

Element	Zr	Hg	SiO_2	Cl
Unit	ppm	ppm	%	ppm
Comp Conc Cu	17	1	3	299
Comp Conc Zn	12	1	3	132

14 MINERAL RESOURCE ESTIMATE

14.1 Introductory Statement

Historic Mineral Resources for the Santander property have been reported for four discrete areas: (1) Magistral Deposits, (2) Santander Pipe, (3) Puajanca deposit and (4) Tailing's area. The current NI 43-101 report covers Mineral Resources only for the Santander Pipe deposit.

Prior to this study, the resources reported for the Santander Pipe were based on a model completed at the end of the year 2020 and revised and signed off by DRA in the NI 43-101 report submitted in January 2022. Since then, the Mineral-Resource model for the Santander Pipe has been updated following observations and recommendations made by DRA.

The current resource model for the Santander Pipe was initially developed by CDPR. This model was reviewed and revised with DRA to ensure that all aspects relating to the Mineral Resource estimate comply with CIM reporting standards.

14.2 Data available for estimate

A review of the data available for the resource model resulted in eliminating 17 historic holes that showed inconsistencies. The final database used for the Santander Pipe Resource modelling included 306 historic boreholes (17,797 m) and 41 core holes drilled by Trevali between 2011 and 2021. Nine of the Trevali holes executed after 2011 did not reach depths below the unmined levels at 4,020 masl. From 2017 to 2020, Trevali drilled a further 34 deep holes, including 21 deflections off mother holes, targeting mineralization below the mined areas at elevations between 3,600 m and 4,000 masl. Table 14-1 summarizes the drilling data used for the resource modelling.

Table 14-1: Drill hole information used for developing the Santander Pipe resource model

Period	Nº Holes	Meterage (m)
pre-1993	306	17,797
2011	5	2,115
2017	9	6,749
2018	9	7,620
2019	12	11,488
2020	6	3,986
Total	**347**	**49,755**

Table 14-2 summarizes drill-hole intercepts included inside the interpreted mineralization envelopes and distinguishes data between three elevation intervals: (1) above 4,020 m represents the historic mined levels (Mineral Resources are not reported above this elevation), (2) between elevations of 3,885 m and 4,020 m represents the unmined portion of the main mineralized zone, and (3) below 3,885 m represents a discrete and deeper mineralized zone outlined through drilling.

Table 14-2: Drill hole information inside the mineralized envelopes used for developing the Santander Pipe resource model

Period	Total		Above Level 4,020 m		Between levels 4,020 m and 3,885 m		Below Level 3,885 m	
	Nº Holes	Meterage (m)	Nº Holes	Meterage (m)	Nº Holes	Meterage (m)	Nº Holes	Meterage (m)
Pre-1993	277	10,803	273	9,931	27	789	3	84
Trevali (2009-20)	30	926	12	265	10	179	21	483
Total	**307**	**11,729**	**285**	**10,196**	**37**	**968**	**24**	**567**

14.3 Geological Model and Domain

Within the Santander Pipe, primarily zinc skarn mineralization is hosted in stratigraphic bounded units. The geometry of the mineralized units is controlled by an NNW trending dome-shaped anticlinal structure with mineralization mostly along the fold limbs. Current drilling has recognised mineralization extending along a 170-meter diameter pipe-like feature to depths of 800 m below surface (3,700 masl). Two main mineralised zones are recognised at depth: (1) mineralized strata above 3,950 masl that has been largely mined down to level 4,020 m, and (2) mineralization below 3,850 m outlined by the deeper exploration drill holes. Between these two zones, lies approximately 100 m of mostly unmineralized strata, where the predominance of unfavourable marls in this part of the Chulec formation are responsible for the lack of mineralization.

Interpreted envelopes for mineralized volumes were based on a Net-Smelter-Return (NSR) cut-off of US$40M and a minimum thickness of 1 m. The basis for the NSR calculation is detailed in section 14.7.2.

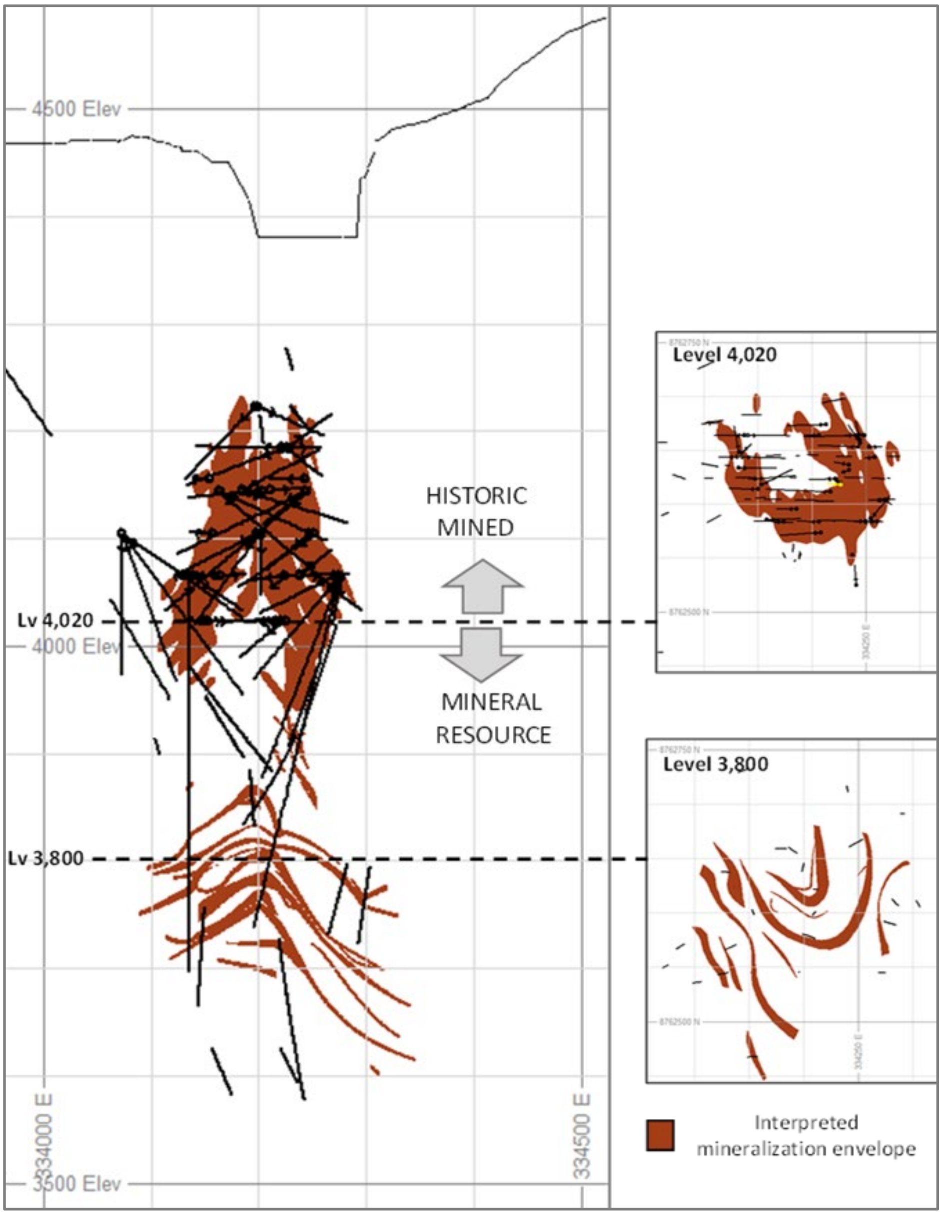
Geological interpretations of the mineralized envelopes in the upper mineralized zone were initially based on historic cross sections and plans developed using information collected from the underground mine. Digital copies of the historic information were 3D-referenced in Leapfrog Geo and used, together with the historic and new drill hole data, to generate a 3D wireframe model of the mineralised volume using Leapfrog's implicit 3D-modelling capabilities.

For the lower elevation zone (below level 3,885 m), the mineralized envelopes were interpreted based on drill hole information, mostly drilled between 2017 and 2021. The mineralization at these elevations is controlled by a flatter anticlinal dome structure with thinner mineralized units.

Figure 14-1 shows a North-facing section and two-level plans through the interpreted model.

For the Santander Pipe, mineralization falling inside the mineralized envelope was considered as a single domain for estimating grades and specific gravity.

Figure 14-1: Santander Pipe Mineralization Model – Section N8,762,620 and two-level plans



Source: Lyall Consult (2023)

14.4 Exploratory Data Analysis

14.4.1 Sample lengths & Compositing

Table 14-3 shows the statistics for sample lengths included in the Santander Pipe mineralized zone. For the historic data, 80% of the data have lengths between 1.6 m and 3.6 m, averaging 2.6 m. For the holes drilled by Trevali, sample lengths average 1.0 m, with 80% of the lengths falling between 0.5 m and 1.7 m.

Table 14-3: Sample lengths inside mineralized skarn envelope – Historic and Trevali drilling

	Historic (m)	Trevali (m)
Number	4,280	908
Mean	2.6	1.02
Standard Deviation	0.8	0.45
Minimum	0.4	0.15
Maximum	6.08	2
Percentile 0.1	1.55	0.45
Percentile 0.9	3.61	1.7

For grade interpolation, sample lengths from the historic and new drilling were regularised to 2-metre composites. The statistics included in the following sections are based on these 2-meter composites.

14.4.2 Statistics

Statistics and histograms for zinc, lead, copper, and silver contents of 2-metre composites falling within the mineralised envelopes (<4,020 masl) are shown in Table 14-4, Table 14-5, and Figure 14-2.

The Santander Pipe mineralization is characterised by high Zn, low Pb and moderately elevated copper and silver contents. Correlations between Ag and Pb and Ag and Cu are indicative of argentiferous galena and Cu-Ag sulphide minerals.

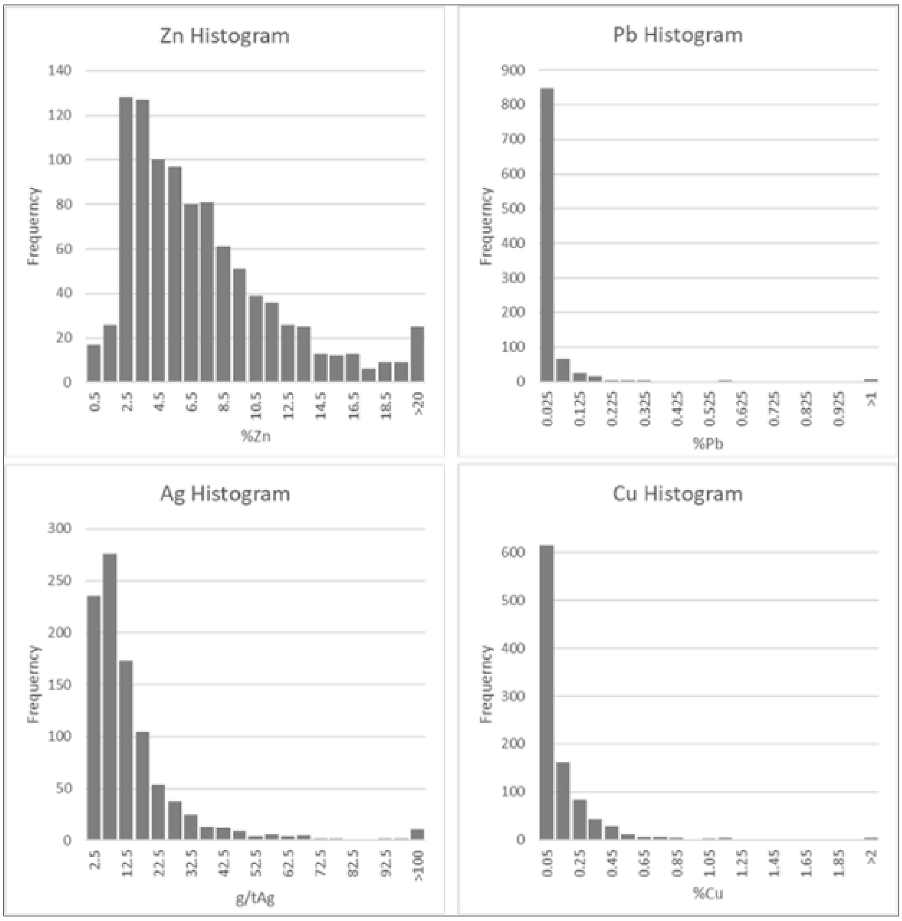
Table 14-4: Zn, Pb, Cu & Ag - Statistics for 2 m composite samples inside mineralized envelope (<4,020 masl)

	Zn (%)	Pb (%)	Cu (%)	Ag (%)
Count	981	981	981	978
Mean	7.16	0.03	0.15	14.6
Standard Deviation	4.86	0.19	0.26	18
Coefficient of Variation	0.68	5.74	1.74	1.23
Minimum	0	0	0	0
Maximum	32.6	3.58	3.01	171
p05	2.06	0.0001	0.0001	1.42
p95	16.9	0.12	0.5	45
p99	22.8	0.57	1.28	102

Table 14-5: Zn, Pb, Cu & Ag - Correlations for 2 m composite samples inside mineralized envelope (<4,020 masl)

	Zn	Pb	Cu	Ag
Zn	1			
Pb	-0.02	1		
Cu	0.22	-0.02	1	
Ag	0.05	0.47	0.47	1

Figure 14-2: Zn, Pb, Cu & Ag – Histograms for 2 m composites (<4,020 masl)



Source: Lyall Consult (2023)

14.5 Mineral-Resource Modelling

14.5.1 Block Model

The block model for the Santander Pipe mineralization was developed in Leapfrog Geo. The block-model parameters and extent are summarized in Table 14-6.

Table 14-6: Santander Pipe – Block-Model Parameters

Axis	Origin	Block Size (m)		Number
		Parent	Sub-block	
East	333,890	5	0.3125	111
North	8,762,400	5	0.3125	100
Elevation	3,517	5	0.3125	229

14.5.2 Interpolation Parameters and Variography

Zinc, Lead, Silver, Copper, and Iron contents were interpolated in Leapfrog Edge by Ordinary Kriging.

Outlier grade composites were capped at threshold values shown in Table 14-7. In most cases, the chosen threshold corresponds approximately to the 99th percentile value. For Pb, a higher threshold was chosen after observing a significant difference whilst using the 99th percentile value. A comparison between the capped and uncapped average values shows that the impact of capping on the overall average grade is negligible.

Table 14-7: Capping for 2 m composites inside mineralised envelope (<4,020 masl)

	Maximum Value	99th percentile	Capped Value	Uncapped Mean	Capped Mean	Difference %
Zinc (%)	32.6	22.8	23	7.16	6.94	-3%
Lead (%)	3.6	0.6	2	0.033	0.031	-9%
Copper (%)	3	1.3	1.3	0.15	0.14	-4%
Silver (g/t)	171	102	100	14.6	14.3	-2%

A block discretization of 3 m x 3 m x 3 m was used to represent the block volume for estimation.

The variogram models used in the block estimation were determined from the experimental variograms calculated in Leapfrog Edge and are included in Table 14-8.

Estimation was carried out in a single extended search, restricting the number of composites to the five closest holes, or 10 closest 2-metre composites. Details are included in Table 14-9.

Table 14-8: Santander Pipe - Semi-variogram Models

Variable	Dip	Dip Dirn	Pitch	Nugget	Structure	Sill	Type	Major	S-major	Minor
Zn	0	0	90	0.2	1	0.46	Sph	15	12	12
					2	0.34	Sph	40	30	20
Pb	0	0	90	0	1	0.45	Sph	20	20	12
					2	0.55	Sph	60	100	60
Ag	0	0	90	0.05	1	0.6	Sph	20	15	12
					2	0.35	Sph	90	90	90
Cu	0	0	90	0.05	1	0.6	Sph	20	15	12
					2	0.35	Sph	90	90	90
Fe	0	0	90	0.05	1	0.25	Sph	7	7	7

Table 14-9: Santander Pipe – Search Parameters

Major	Semi-Major	Minor	Min	Max	Max/hole
Azi 0, Dip 0	Azi 90, Dip 0	Azi 0, Dip 90			
180	120	60	4	10	2

Variable orientations of searches and variogram axes were used in the interpolation. The orientations were determined using Leapfrog Edge and were based on mineralization envelope surfaces representing the anticlinal structure.

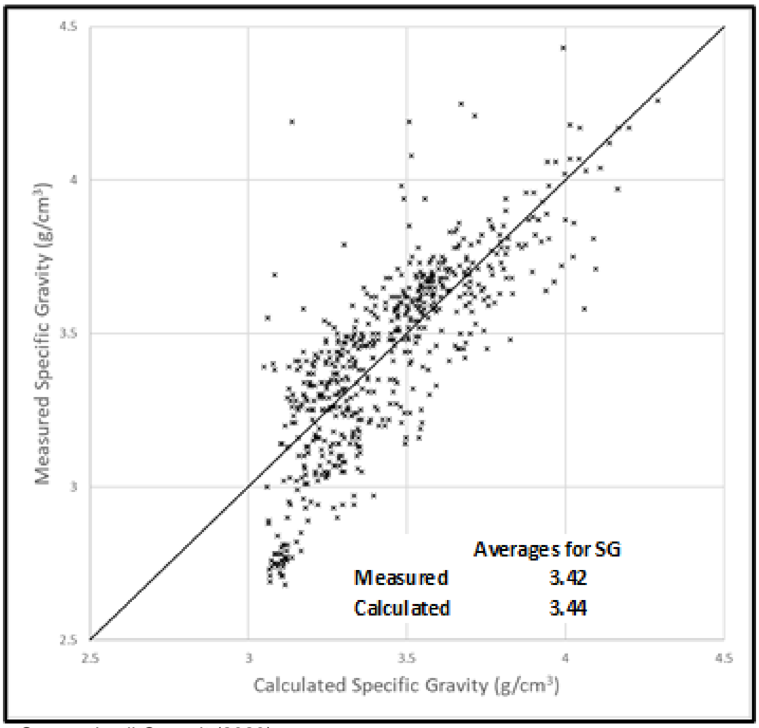
14.5.3 Specific Gravity

Recent drilling carried out by Trevali includes 24 holes with 774 specific-gravity (SG) determinations falling inside the modelled mineralized skarn of the Santander Pipe. Considering that the historic data supporting a large part of the Mineral Resource does not include specific-gravity measurements, density values were assigned to blocks inside the modelled mineralized skarn using the following multilinear regression:

Calculated SG = (0.0143 x Zn) + (0.0983 x Pb) + (0.1076 x Cu) + (0.0247 x Fe) - (0.0017 x Ag) + 3.0270

DRA has reviewed the regression applied and considers it appropriate. Figure 14-3 compares the Measured Specific Gravity determinations against the values calculated from the regression. The average values are similar.

Figure 14-3: Santander Pipe – Specific Gravity – Comparison between Measured and Calculated values



Source: Lyall Consult (2023)

Blocks in waste zones outside the mineralized envelope were assigned an average density value of 2.77 g/cm3, determined from 719 measurements in unmineralized limestones taken from the Trevali´s Santander Pipe drill holes.

14.5.4 Resource Classification

Under CIM Definition Standards, Mineral Resources are classified into three confidence categories. In order of increasing confidence, blocks can be classified as either Measured, Indicated, or Inferred. Important considerations in assigning a resource category are spatial aspects, including continuity of grade, and the locations, types, and spatial density of the informing data. In addition, it is important to consider the relative confidence of all the data inputs.

Both aspects including (1) the spatial density of informing data and (2) the reliability of the data, have been considered for classifying the Santander Pipe Mineral Resources.

Table 14-10 shows the searches employed to determine the spatial density of informing data used to initially classify Measured, Indicated, and Inferred blocks. Search ellipsoids were orientated parallel to the controlling anticlinal structure.

Table 14-10: Santander Pipe – Searches used for Resource Classification

Category	Orientation	Major	Semi-Major	Minor	Min Holes
Measured	Variable	20	20	10	3
Indicated	Variable	40	40	20	2
Inferred	Variable	60	60	30	1

Whilst the data spacing for much of the higher elevation (3,885 to 4,020 masl) mineralization is sufficient to classify these as Measured, these have been downgraded to an Indicated category in consideration of the limitations in the historic data, and the reliance of the resource model on this data in the upper parts of the model (Table 14-2).

DRA also notes that the revised interpretation used for the current model has corrected inconsistencies noted in the previous resource model for the Santander Pipe, which were reported in the January 2022 NI 43-101 report. In consequence, a significant portion of the lower-elevation mineralization (below 3,885 masl) has now been upgraded from the Inferred to the Indicated category.

A vertical section through the classified model is shown in Figure 14-10.

14.6 Model Validation

An essential step in resource modelling is the verification process. Statistics, swath plots (spatial averages) and visual checks comparing the block estimates to the informing data are presented in the following subsections.

Spatial clustering of the data has been accounted for by means of running a “nearest-neighbour” (NN) block-grade assignation. In other words, each block within the mineralized envelope is assigned the grade of the closest 2 m composite sample. By this way, the composite statistics (mean and variance) are preserved, and appropriate weighting is provided for comparing with the kriged interpolated grade estimates.

14.6.1 Statistics

The 2-meter composites are compared to the block estimates in Table 14-11. The results show only minor differences between composite and estimated grades. Block variances are significantly lower than the composite sample variances, with a Variance Reduction Factor (vrf = Sample Variance / Block Variance) for Zn of 0.25. This suggests that grade-tonnage estimates include an important degree of smoothing necessary to account for volume variance adjustments required for mine development studies.

Table 14-11: Santander Pipe – Grade Statistics comparing composites to block estimates

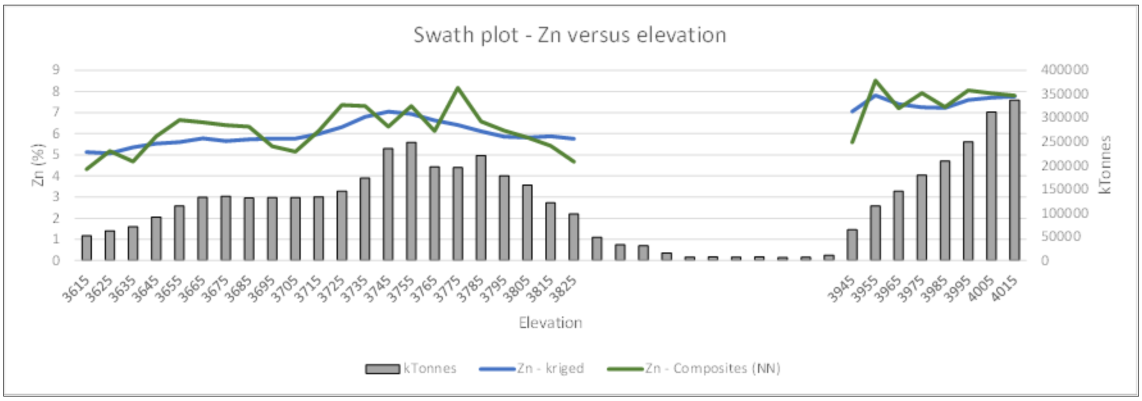
Elevation Interval	Variable	Composites (Nearest-Neighbour)					Block Model					Difference	
		Min	Max	Mean	SD	Var	Min	Max	Mean	SD	Var	Mean	vrf
3885 m to 4020 m 1,656 kt	Zn %	0.00	23.0	7.66	4.90	24.04	2.11	19.0	7.50	2.36	5.59	-2%	0.23
	Pb %	0.00	2.0	0.032	0.141	0.020	0.00	2.3	0.030	0.081	0.007	-9%	0.33
	Ag g/t	0.00	100.0	14.6	13.8	191.4	2.40	80.7	15.6	8.2	67.2	7%	0.35
	Cu %	0.00	1.3	0.108	0.145	0.021	0.00	0.8	0.114	0.091	0.008	6%	0.39
Below 3885 m 3,348 kt	Zn %	0.03	23.0	6.42	4.22	17.81	1.75	17.4	6.13	1.63	2.67	-5%	0.15
	Pb %	0.00	1.5	0.012	0.082	0.007	0.00	1.0	0.008	0.038	0.001	-29%	0.21
	Ag g/t	0.01	100.0	9.9	15.6	243.8	1.27	77.2	9.4	7.5	56.4	-5%	0.23
	Cu %	0.00	1.3	0.193	0.260	0.067	0.02	1.1	0.189	0.125	0.016	-2%	0.23
Total 5,005 kt	Zn %	0.00	23.0	6.83	4.50	20.21	1.75	19.0	6.58	2.01	4.05	-4%	0.20
	Pb %	0.00	2.0	0.018	0.106	0.011	0.00	2.3	0.015	0.057	0.003	-17%	0.29
	Ag g/t	0.00	100.0	11.5	15.2	231.3	1.27	80.7	11.5	8.3	68.5	-0.1%	0.30

14.6.2 Swaths

Swath plots are commonly used to compare block estimates to sample averages within coordinate slices oriented in specific directions. Observed differences may be suggestive of extrapolation or over-smoothing of the block estimates. Large differences can often be attributed to areas with limited sampling of the mineralized zone.

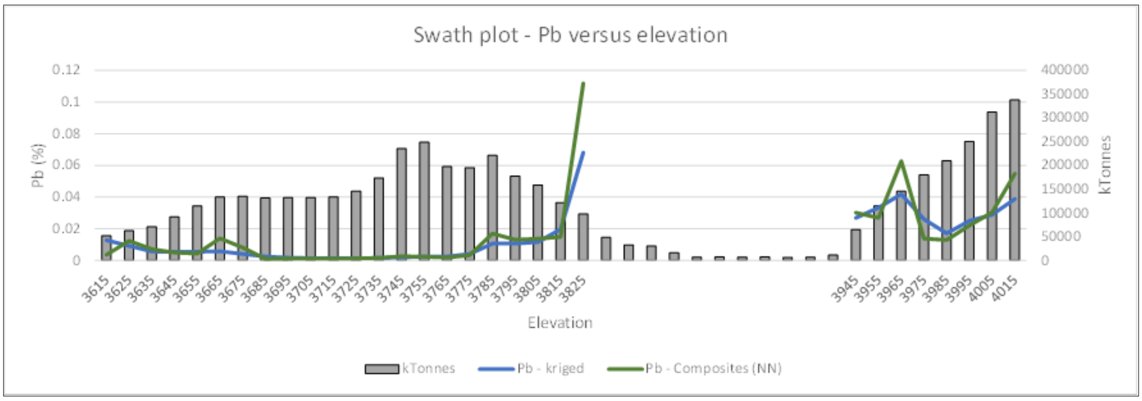
Figure 14-4, Figure 14-5, Figure 14-6, Figure 14-7, Figure 14-8, and Figure 14-9 compare block estimates to the composite (NN) averages along Elevation, Northing and Easting coordinate slices, for Zn, Pb, Ag and Cu. Averages for slices representing less than 50,000 t have been omitted from the graphs. DRA notes similar behaviour of estimated and composite value averages in all directions, replicating trends. There is no indication of biases, extrapolation, or over-smoothing of the block estimates.

Figure 14-4: Santander Pipe – Swath Plot – Zn vs Elevation



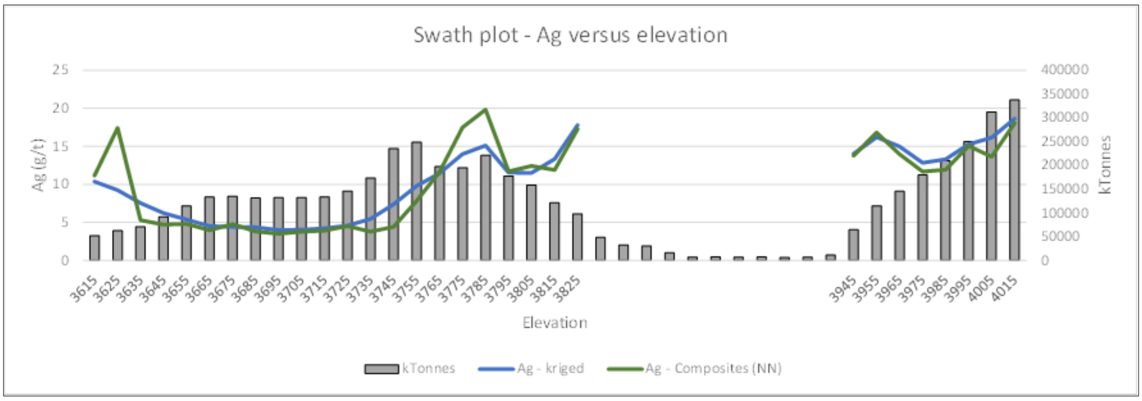
Source: Lyall Consult (2023)

Figure 14-5: Santander Pipe – Swath Plot – Pb vs Elevation



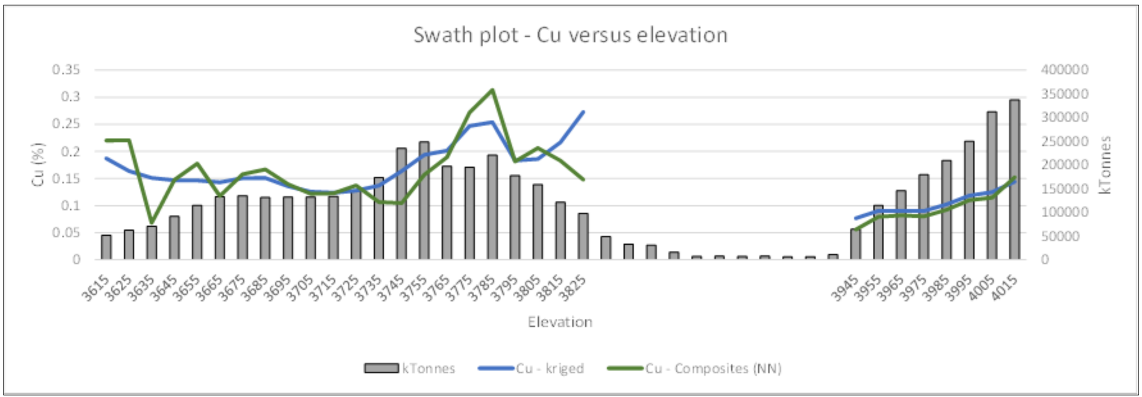
Source: Lyall Consult (2023)

Figure 14-6: Santander Pipe – Swath Plot – Ag vs Elevation



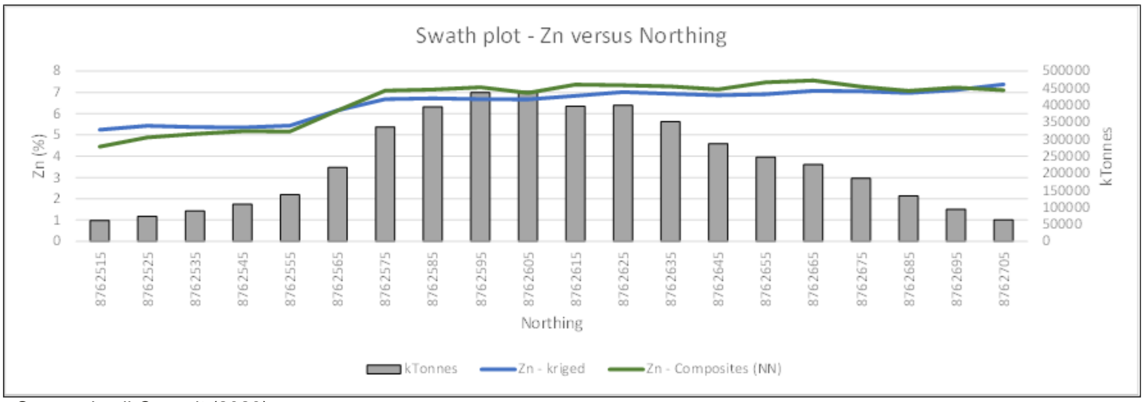
Source: Lyall Consult (2023)

Figure 14-7: Santander Pipe – Swath Plot – Cu vs Elevation



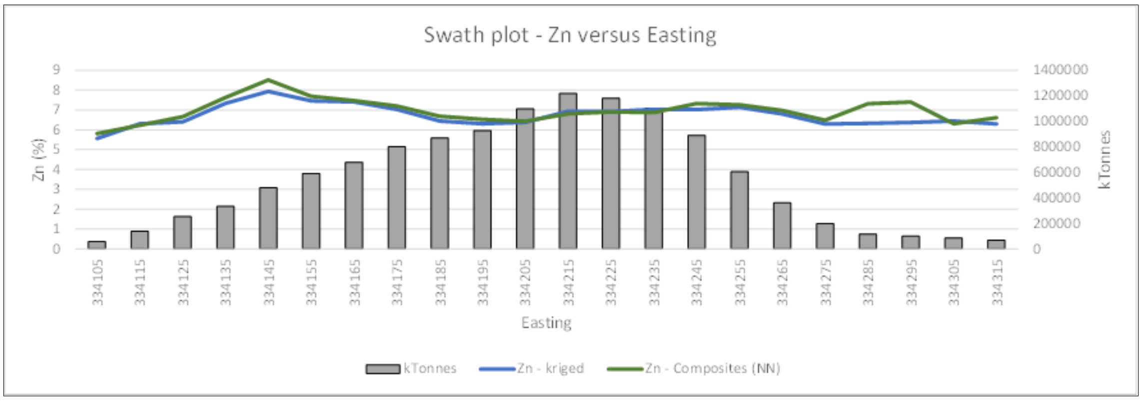
Source: Lyall Consult (2023)

Figure 14-8: Santander Pipe – Swath Plot – Zn vs Northing



Source: Lyall Consult (2023)

Figure 14-9: Santander Pipe – Swath Plot – Zn vs Easting

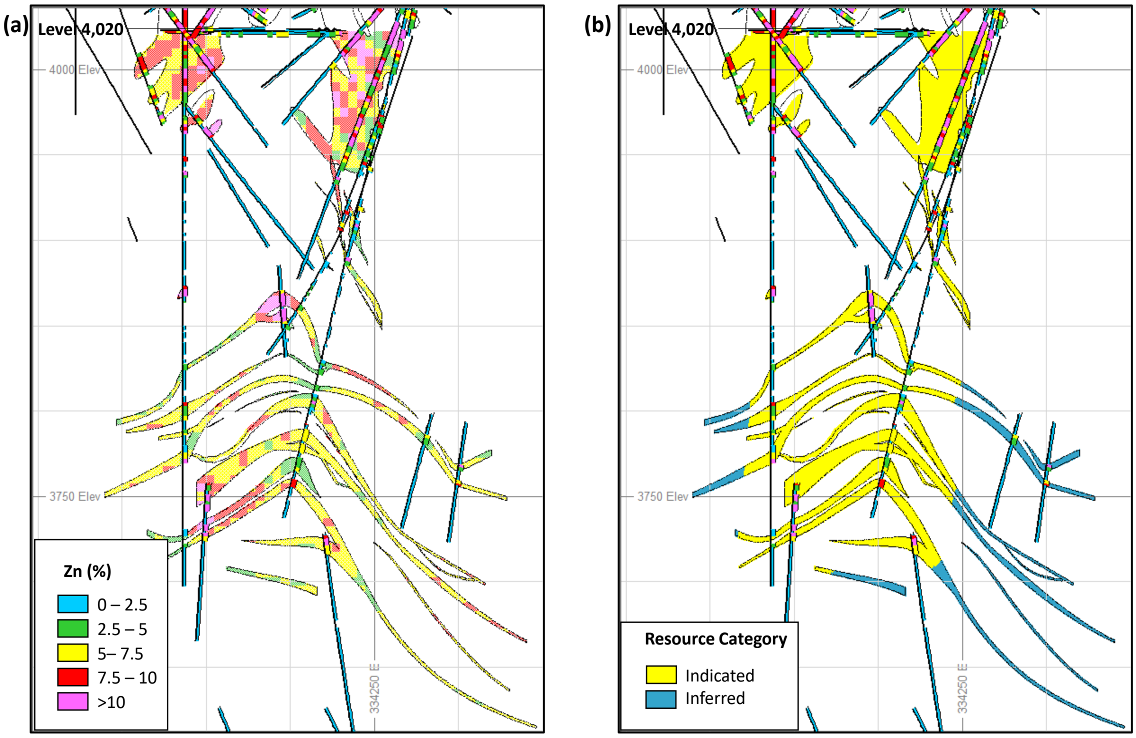


Source: Lyall Consult (2023)

14.6.3 Visual

The final step in the verification process was to visually review sections and plans comparing block-estimated values against the drill-hole composite assays. Figure 14-10 shows a North-facing section through the centre of Santander Pipe comparing composite grades to block-estimated grades, noting a good correlation. The right-hand side of the section shows the final classification of the blocks.

Figure 14-10: Santander Pipe Section N8,762,620 - (a) Comparison between Zn in composites vs estimated block grades, (b) Resource Classification



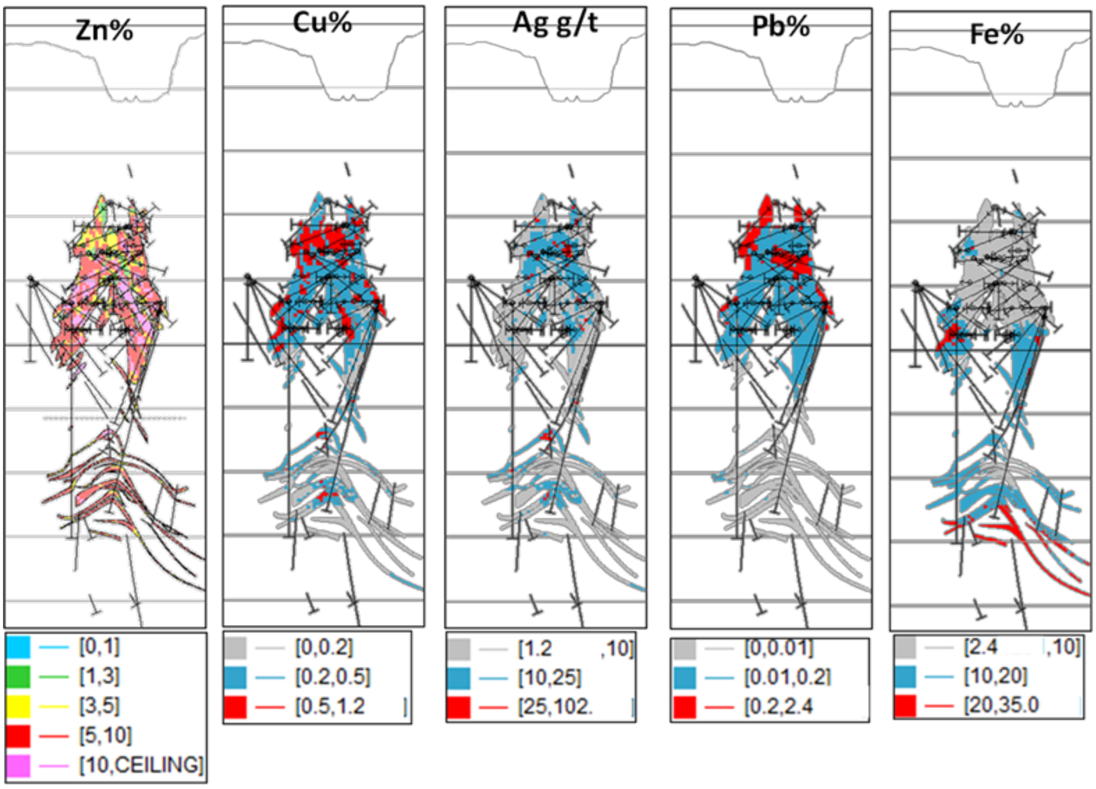
Source: Lyall Consult (2023)

14.7 Mineral Resources

14.7.1 Mineral-Resource Model

The resulting Mineral Resource block model includes three-dimensional interpretations of waste and mineralized units extending some 900 m below surface. Estimates for Zn, Cu, Ag, Pb and Fe have been interpolated into the interpreted mineralized blocks. Specific gravity and resulting tonnage estimates have been assigned to mineralized blocks based on well-established correlations with these elements. Figure 14-11 shows North-facing cross sections with estimated Zn, Cu, Ag, Pb and Fe contents for the interpreted mineralized zone.

Figure 14-11: Santander Pipe Section N8,762,620 - Zn, Cu, Ag, Pb & Fe block estimates



Source: Lyall Consult (2023)

14.7.2 Mining Considerations

By definition, a Mineral Resource must have "reasonable prospects for eventual economic extraction".

The declared Mineral Resources for the Santander Pipe are below an elevation of 4,020 masl, nearly 500 m below surface, and an eventual mining operation will require underground methods. Historic mining continued at Santander Pipe until mid-1992, when production ceased, leaving considerable high-grade mineralization in the ground. DRA considers that a substantial portion of this mineralization satisfies the requirement of "reasonable prospects for eventual economic extraction".

The flatter-lying and thinner geometry of the mineralized units observed at depth at Santander Pipe, is likely to have implications on dilution and mining methods. It should be noted that Mineral Resources do not include considerations for dilution or mining losses and these will need to be evaluated and included in any eventual more detailed mining study.

Processing considers milling and flotation recovering zinc, lead, copper, and silver in concentrates using current infrastructure that may require some modifications to include copper in the recovery circuits.

Mineral Resources are reported above a Net-Smelter-Return (NSR) cut-off of US$40. The calculation of the NSR factors in metal prices, recoveries, as well as treatment and refining charges, and deductions. The numbers used are based on recent production and processing of the Magistral-mine products, and CDPR corporate guidance. Metal prices are based on LME 2021 averages. The metal prices, recoveries and the final multiplying factors required to calculate the NSR are included in Table 14-12.The mineralization at Santander Pipe is excluded from the Glencore off-take agreement and, therefore, does not include further charges on the final products.

Table 14-12: Santander Pipe – NSR Calculation Parameters

	Metal Prices	Recoveries	Factors
Zinc	USD/3000 tonne	90%	17.5 x %Zn
Lead	USD/2,200 tonne	70%	11.1 x %Pb
Copper	USD/9,300 tonne	60%	40.8 x %Cu
Silver	USD/25oz	50%	0.37 x g/t Ag

14.7.3 *Mineral-Resource Statement*

The Mineral Resources for the Santander Pipe deposit are summarized in Table 14-13.

Table 14-13: Mineral-Resource Statement, Santander Pipe Deposit

Elevation Zone	Category	Tonnage (kt)	Zn (%)	Pb (%)	Ag (g/t)	Cu (%)
Between 4,020 m and 3,885 m	Indicated	1,656	7.5	0.03	15.6	0.11
	Inferred	-				
Below 3,885 m	Indicated	1,569	6.34	0.003	11.2	0.23
	Inferred	1,779	5.95	0.013	7.9	0.15
Total	**Indicated**	**3,225**	**6.94**	**0.017**	**13.5**	**0.17**
	Inferred	**1,779**	**5.95**	**0.013**	**7.9**	**0.15**

Footnotes:

- Mineral Resources are reported above a US$40 NSR cut-off.
- Metal prices used in the NSR calculations were US$3,000/t for Zn, US$2,200/t for Pb, US$9,300/t for Cu, and US$25/oz for Ag.
- NSR = (17.5 x %Zn) + (11.1 x %Pb) + (40.8 x %Cu) + (0.37 x g/t Ag), assuming recoveries of 90% for Zn, 70% for Pb, 60% for Cu and 50% for Ag.

14.8 Discussion on Mineral Resources

14.8.1 Santander Pipe Geological Model

The current geological model for the mineralization at Santander Pipe was developed using Leapfrog's implicit-modelling algorithms. Whilst the use of these algorithms can substantially reduce modelling timeframes, DRA believes that the models can be improved by interpreting and modelling geological controls on sections and incorporating these explicitly in generating the 3D models.

During the current study, CDPR has been recovering, relogging and resampling old cores from the historic drill holes. Whist this information was not available for inclusion in the current model, DRA considers important that this information be incorporated into future modelling efforts.

DRA recommends that future improvements to the geological model consider the following aspects:

- Improve understanding and interpretation of stratigraphic controls by:
    - Measurement of relative bedding angles should be collected from core and used in cross-section interpretations. Relative bedding angles can be plotted on sections to give a range of possible angles relative to the cross section.
    - Recover and digitize bedding-angle measurements from historic underground plans, to be used in the interpretation.
    - Future drilling campaigns should include some holes with oriented cores.
    - Investigate use of 4A multi-element data for lithological and/or alteration fingerprinting.
- Fully incorporate historic geological sections and plans developed from the underground mine into the 3D model.
- Interpret geological control sections for upper and lower zones that include the above-mentioned recommendations and use these as controls in the Leapfrog implicit modelling.
- 3D modelling of lithology and alteration units in waste areas surrounding the mineralized units. This may have important implications for the estimation of densities, geotechnical or hydrogeological characteristics.

14.8.2 Mineral Resources remaining in historic mined-out levels

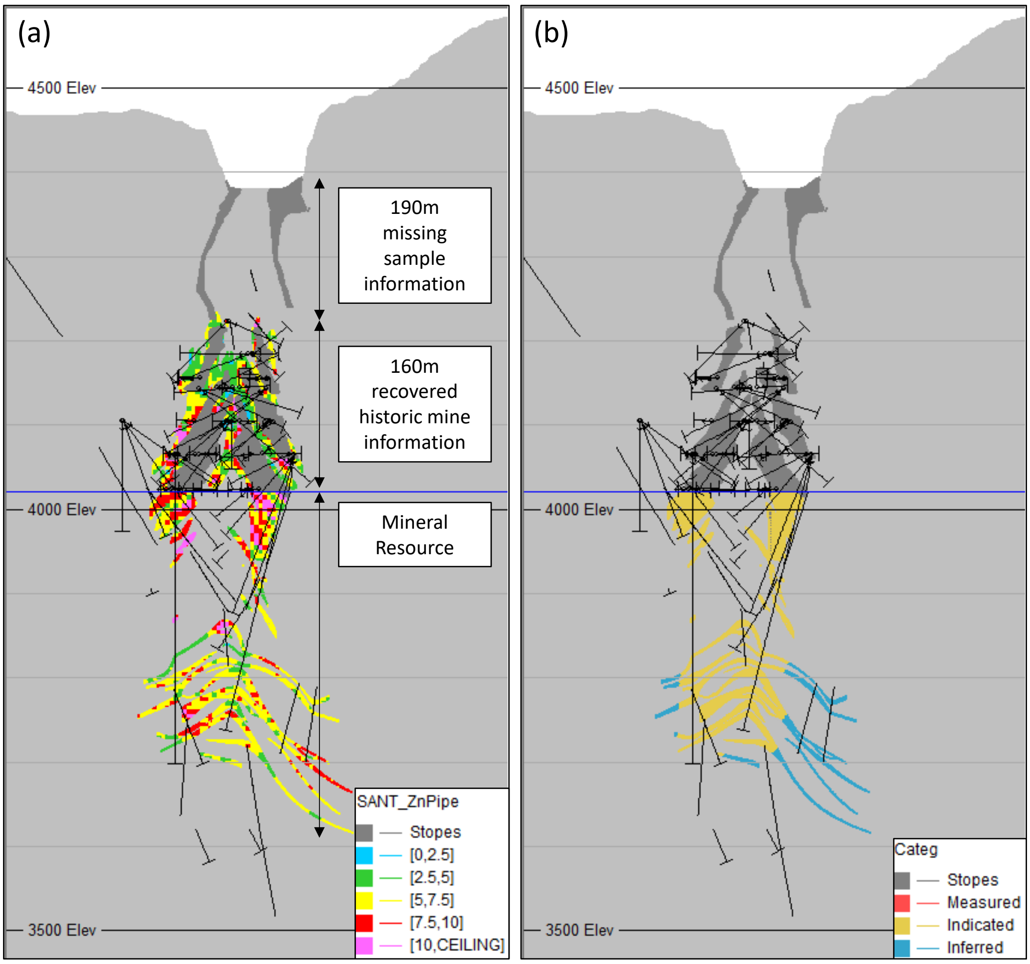
Whilst previous studies (Golder in 2012 and SRK in 2017) have included estimates of unmined Mineral Resources left in the historic mine portion of the deposit (above level 4020), this was not included in the scope of the current PEA. Moreover, historic records confirmed by the Golder and SRK studies suggest that these may be significant.

Historic cut-off grades were higher than current considerations, resulting in those materials that, under current economic conditions, would be considered ore, were left unmined. Additionally, there were other non-technical issues that anticipated mine closure in the early 90's, and that would have resulted in recoverable materials being left behind (see subsection 6.1).

DRA considers that the recovery of potential economic mineralization in the historic mined areas represents an opportunity to improve initial mining cash flows and the overall project economics. During the current study, CDPR has been progressing with recovering historical information that would be required to evaluate the Mineral Resources and potential mining opportunities in these areas. DRA strongly recommends that these efforts continue, and that the information be included in a future Mineral-Resource estimate for the mined-out areas.

Figure 14-12 shows a cross section of mineralization modelled in the mined levels of the deposit, above level 4020. Whilst sampling, geological, and underground mining information has been recovered and digitized from the lower mine levels (4,020 masl to 4,200 masl), detailed information has not yet been sourced for the upper levels of the underground and open pit historic mine (4,200 to 4,480 masl).

Figure 14-12: North section showing potential for additional mineral resource in historic mined elevations



Source: Lyall Consult (2023)

15 MINERAL RESERVE ESTIMATES

Not applicable.

16 MINING METHODS

The selection of the mining method is critical as it impacts dilution, productivity, sustainability and production capacity, as well as development, backfill, and ventilation requirements. Bench and fill with mechanized ore extraction is the mining method applied currently at the adjacent Magistral Mine. Current mine production capacity is between 2,000 – 2,500 tpd of zinc-lead-silver ore.

16.1 Hydrogeology

The information in this section is largely drawn and/or summarised from the internal report entitled “Santander Pipe - Geotechnical Assessment for Underground Mine”, prepared by Alfonso Palacio Castilla, Senior Project Engineer, CDPR, June 2022.

The document Geotechnical Assessment for Underground Mine provides an overview of the hydrogeological setting within the Santander Property and its implications on the dewatering of the Santander Pipe. It notes that groundwater inflows should be determined through a hydrogeological model in the next phase of the project, depending on the mining alternative selected out of the PEA. It also indicates that the regional groundwater system is recharged by rainfall captured in the topographic highs, above 4,600 masl. The fracturing and the presence of quaternary deposits favor hydraulic connection in between shallower recharge levels and deeper parts of the system.

An earlier report from FloSolutions (FloSolutions, 2019) notes that in 2019 the water balance estimated 200 mm/year of ground water recharge, in general, and 400 mm/year for the Jumasha formation and quaternary deposits. Groundwater discharge occurs in the topographic lows, in between 4350 and 4600 masl and is manifested as natural springs that feed the lakes and streams.

Hydraulic conductivity is within the range 1.0E-5 to 1.0E-8 m/s, i.e., in the medium to low range. When Jumasha, Oyón and Chulec formations are affected by intense fracturing and faulting show higher hydraulic conductivity, closer to 1.0E-5 m/s.

The 2011 pumping tests show that the transmissivity of the rock mass in highly variable and within the range of 0.14 to 111.43 m2/day, which comprises very low, low and medium transmissivity classes.

A 1993 report from Buenaventura Ingenieros notes that at the time of the Santander Pipe shut down (Buenaventura Ingenieros, 1993), the mine was flooded to the 4380 level and water inflows were 2,500 gal/min, approximately 158 L/s. It is worth noting that at similar depth of mining (400 to 500 m), the total inflow at the Magistral mine is approximately 500 L/s. It is believed that this is due to the fact that Magistral is closer and under influence of the Santander Fault, a major thrust fault in the area.

16.2 Geotechnical

The geotechnical criteria used in the evaluation of the Santander Pipe mining plan are supported by the report *Geotechnical Assessment for Underground Mine Design* (Palacio, 2022), which describes the methods developed by CDPR to prepare and analyse the drillhole data, evaluate ground support requirements, determine stable stope dimensions, and estimate external dilution. The available drillhole database contains geotechnical data in terms of the RMR system.

As noted in subsection 14.3 and illustrated by Figure 14-1, two mineralized zones have been identified: (a) mineralized strata above 3,950 masl that has been largely mined down to level 4020 (the *upper zone*), and (2) mineralization below 3,885 masl, outlined by more recent holes (the *lower zone*). The different morphology and depth of these zones require different geotechnical characterization.

Most of the samples mapped or evaluated in this report, have an RMR of between 50 and 60, associated with a type IIIA quality. Considering a relation of the RMR classification with Barton´s Q (Barton criterion of 2007), the Q value is between 1 and 4.

The lower UCS limit for the limestone formations at the Santander Pipe is 120 MPa. The next phase of the project must consider testing additional samples from the area.

For stress evaluation, the equations from the report Estudio Geomecánico – Mina Santander (Trevali Perú, 2020, p. 34) are considered:

$$\sigma_v = \gamma z \qquad \sigma_h = K\sigma_v \qquad K = 0.4 + \left(\frac{650}{z}\right)$$

Where:

σv = Principal Vertical Stress (MPa);

γ = rock mass unit weight (MN);

z = Depth (m)

σh = Principal Horizontal Stress (MPa);

K = Correlation coefficient between σv and σh

The resulting principal vertical and horizontal stresses are shown in Table 16-1.

Table 16-1: Principal vertical and horizontal field stress

Area	Level	Depth (m)	σ_v (MPa)	K	σ_h (MPa)
Top level – Upper Zone	4020	424	11	1.9	22
Bottom level – Upper Zone	3940	504	14	1.7	23
Top level – Lower Zone	3825	619	17	1.5	24
Bottom level – Lower Zone	3680	764	21	1.3	26

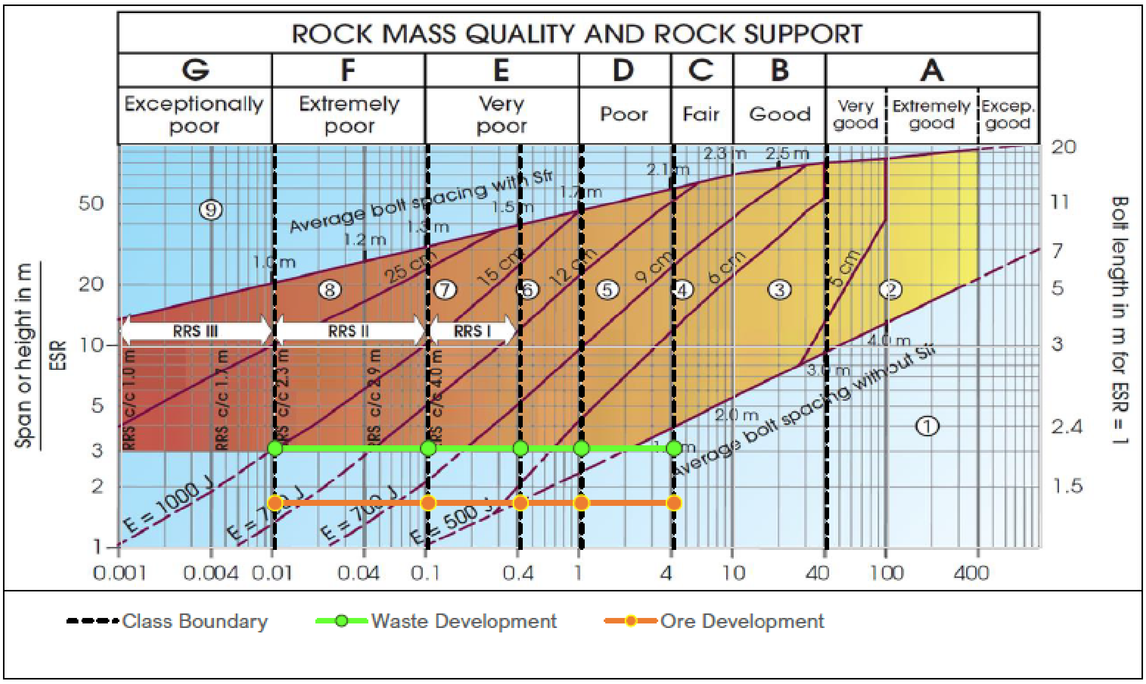
Source: Geotechnical Assessment for Underground Mine Design (Palacio, 2022).

16.3 Empirical Assessment for Mine Development and Design

The Empirical Ground Support Chart from the Q-system (Norwegian Geotechnical Institute, 2015) as well as the formula MUS = 2 x Q x 0,4 (Barton, Lien, & Lunde, 1974) were applied for the estimation of ground support requirements for mine excavations for waste and ore development including the evaluation of maximum unsupported spans or MUS (Palacio, 2022).

Figure 16-1 shows the Q Ground Support Chart applied to the Santander Pipe. The horizontal axis corresponds to the rock mass classes and the vertical axis corresponds to the equivalent dimension (De). The latter is obtained from De = Span (m) / Excavation Support Ratio (ESR). The span is assumed to be 5 m for all openings, and the ESR is assumed as 1.6, for waste development, and 3.0 for ore development.

Figure 16-1: Empirical ground support chart applied to the Santander Pipe



Source: Palacio (2022); based on Norwegian Geotechnical Institute (2015).

Table 16-2 shows the summary of ground support recommendations and maximum unsupported spans for each rock mass category at the Santander Pipe.

Table 16-2: Summary of ground support recommendations for waste and ore development

Excavation Type	Rock Mass Class	Ground Condition Q	% Frequency	Q Min	Q Max	RMR Min	RMR Max	MUS	De	Ground Support
Waste Development	II	Fair to Good	13%	4.00	40.00	60	75	3.5	3.1	Spot bolting / 2.4 m long, Ø39 mm split sets @ 1.6 m + welded wire mesh
	IIIA	Poor	51%	1.00	4.00	50	60	2.0	3.1	2.4 m long, Ø19 mm grouted/resin bolts @ 1.5 m, 5 cm of reinforced shotcrete
	IIIB	Very Poor	21%	0.40	1.00	45	50	1.4	3.1	2.4 m long, Ø19 mm grouted/resin bolts @ 1.5 m 7.5 cm of reinforced shotcrete
	IV-A	Very Poor	12%	0.10	0.40	35	45	0.8	3.1	2.4 m long, Ø19 mm grouted/resin bolts @ 1.3 m 10 cm of reinforced shotcrete
	IV-B	Extremely Poor	3%	0.01	0.10	20	35	0.3	3.1	2.4 m long, Ø19 mm grouted/resin bolts @ 1 m 15 cm of reinforced shotcrete + lattice girders or RRS @ 2.3m
Ore Development	II	Fair to Good	21%	4.00	40.00	60	75	3.5	1.7	Spot bolting / 2.4 m long, Ø39 mm split sets @ 1.6 m + welded wire mesh
	IIIA	Poor	54%	1.00	4.00	50	60	2.0	1.7	2.4 m long, Ø39 mm split sets @ 1.5 m welded wire mesh
	IIIB	Very Poor	16%	0.40	1.00	45	50	1.4	1.7	2.4 m long, Ø39 mm split sets @ 1.5 m, 5 cm of reinforced shotcrete
	IV-A	Very Poor	6%	0.10	0.40	35	45	0.8	1.7	2.4 m long, Ø39 mm split sets @ 1.3 m, 7.5 cm of reinforced shotcrete
	IV-B	Extremely Poor	3%	0.01	0.10	20	35	0.3	1.7	2.4 m long, Ø39 mm split sets @1m, 10 cm of reinforced shotcrete systematic cable bolting

Source: Modified from Palacio (2022); based on Norwegian Geotechnical Institute (2015).

16.3.1 *Empirical Assessment for Stope Design*

For stope stability analysis, the assessment was made using the stability graph criterion proposed by Mathews in 1981 (Mathews et al., 1981) and the criteria updated by Mawdesley (Mawdesley et al., 2001). For this estimation it is necessary to estimate the modified stability number (N'), which is obtained according to the rock mass conditions present in the study area and is determined by means of the following relation:

$$N' = Q' \times A \times B \times C$$

Where:

Q'= Barton rock quality index (Barton et al., 1974), with Jw =1 and SRF=1

A = Stress condition factor

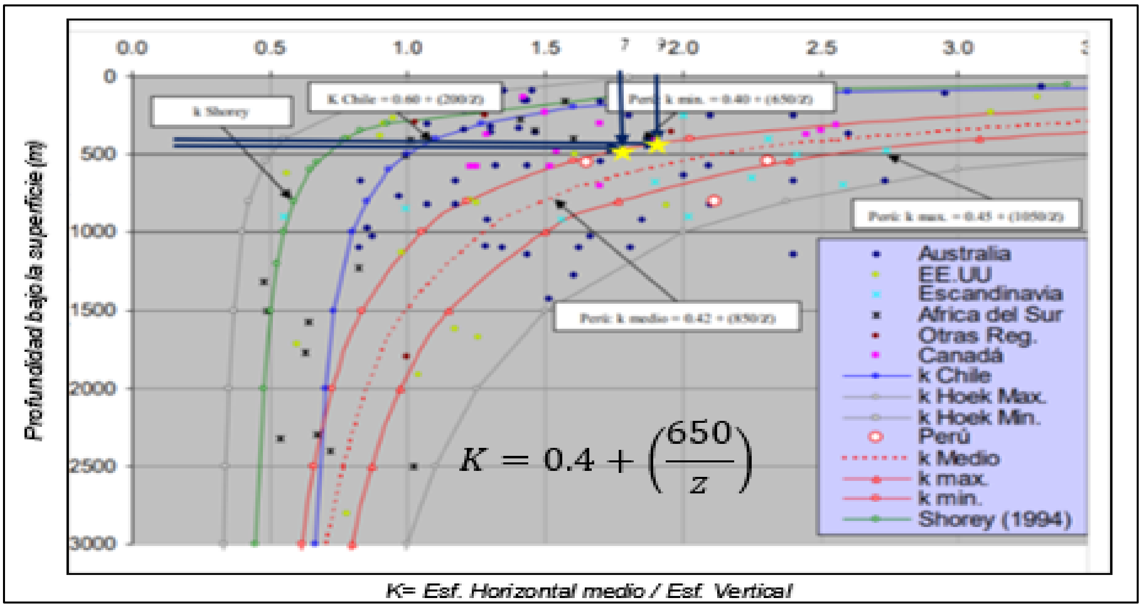
B = Structure orientation factor

C = Gravitational component factor

The value of stress factor A is determined from the ratio of the uniaxial compressive strength for the intact rock divided by the maximum induced tangential stress acting on the analyzed stope face.

The constant K or in-situ stress state to find the acting horizontal stress is determined using a mathematical regression of the curves established from global measurements. The in-situ vertical and horizontal stress estimation graph for the upper zone is shown in Figure 16-2.

Figure 16-2: Horizontal Stress Coefficient (k) for the upper zone

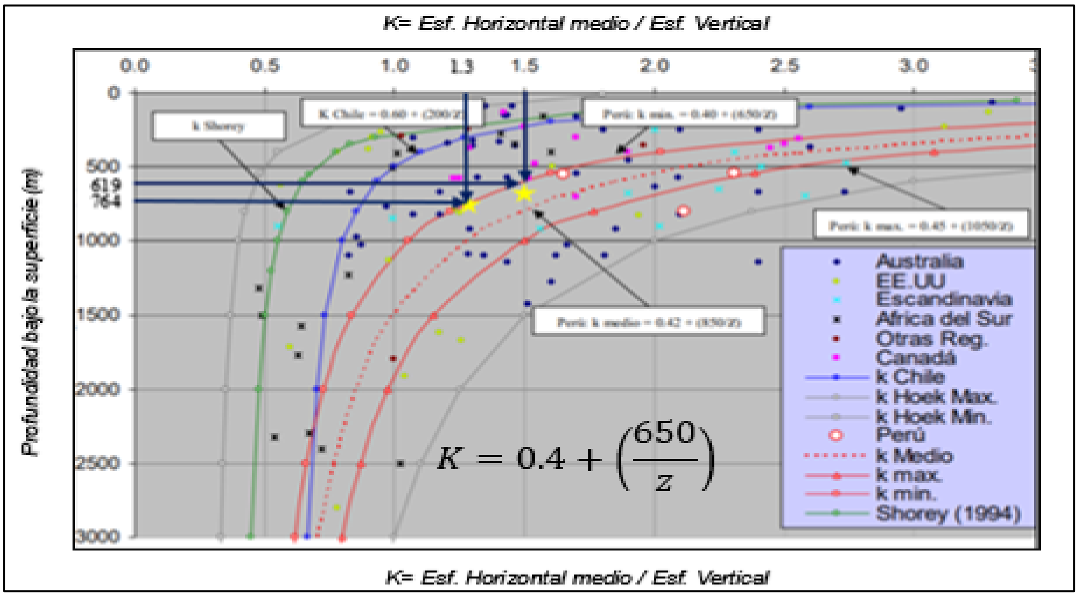


Source: Estudio Geomecánico -Mina Santander (Trevali Perú, 2020).

- If z is 424 m, then k = 1.9
- If z is 504 m, then k=1.7

In the lower zone, the ore minerals appear as manto-like bodies, alternating with the occurrence of skarn-rich levels. Their strike and dip coincide with the surrounding cretaceous sediments where they reach a thickness of between 5 and 25 m. The graph shown in Figure 16-3 was used to determine the K values for the lower zone.

Figure 16-3: Horizontal Stress Coefficient (k) for the lower zone

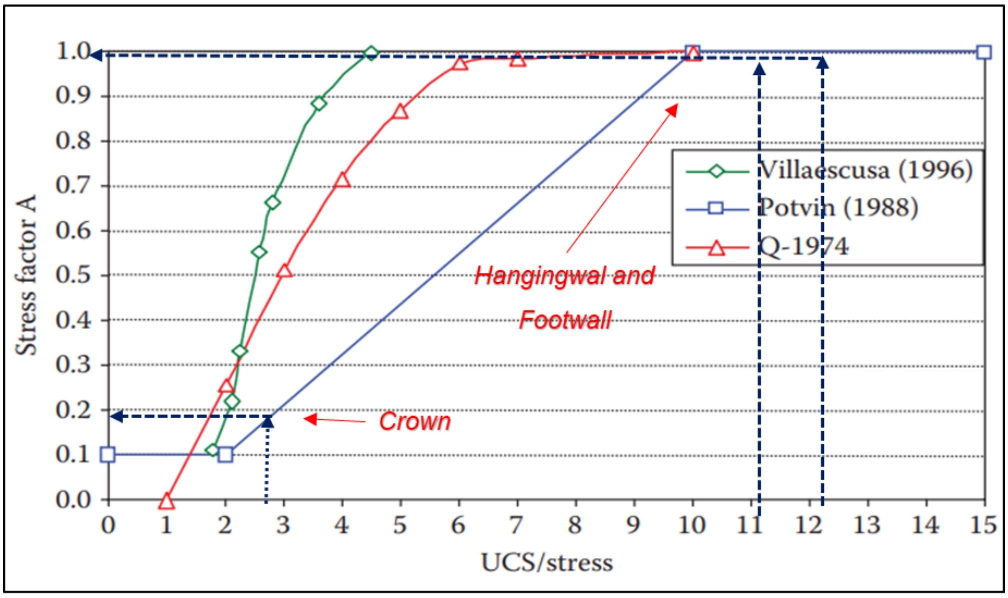


Source: Estudio Geomecánico -Mina Santander (Trevali Perú, 2020).

- If z is 619 depth then k = 1.5
- Si z es 764 depth then k=1.3

The stress factor A is determined based on the k values previously calculated and using the graph developed by Potvin (see Figure 16-4). The results can be seen in Table 16-3 and Table 16-4.

Figure 16-4: Factor A determination using Potvin´s graph



Source: Geotechnical Design for Sublevel Open Stoping (Villaescusa,2017).

Table 16-3: Factor A - Upper Zone

Depth (m)	Results	Hanging wall	Footwall	Back
424-504	Compression factor (UCS)	147	147	85
	Induced stress (σ1)	11.3	11.3	30
	UCS /σ1	12.7	12.7	2.8
	Factor A	1.0	1.0	0.2

Table 16-4: Factor A - Lower Zone

Depth (m)	Results	Hanging wall	Footwall	Back
619-764	Compression Factor (UCS)	147	147	85
	Induced stress (σ1)	14.0	14.0	35.7
	UCS /σ1	11	11	2.4
	Factor A	1.0	1.0	0.2

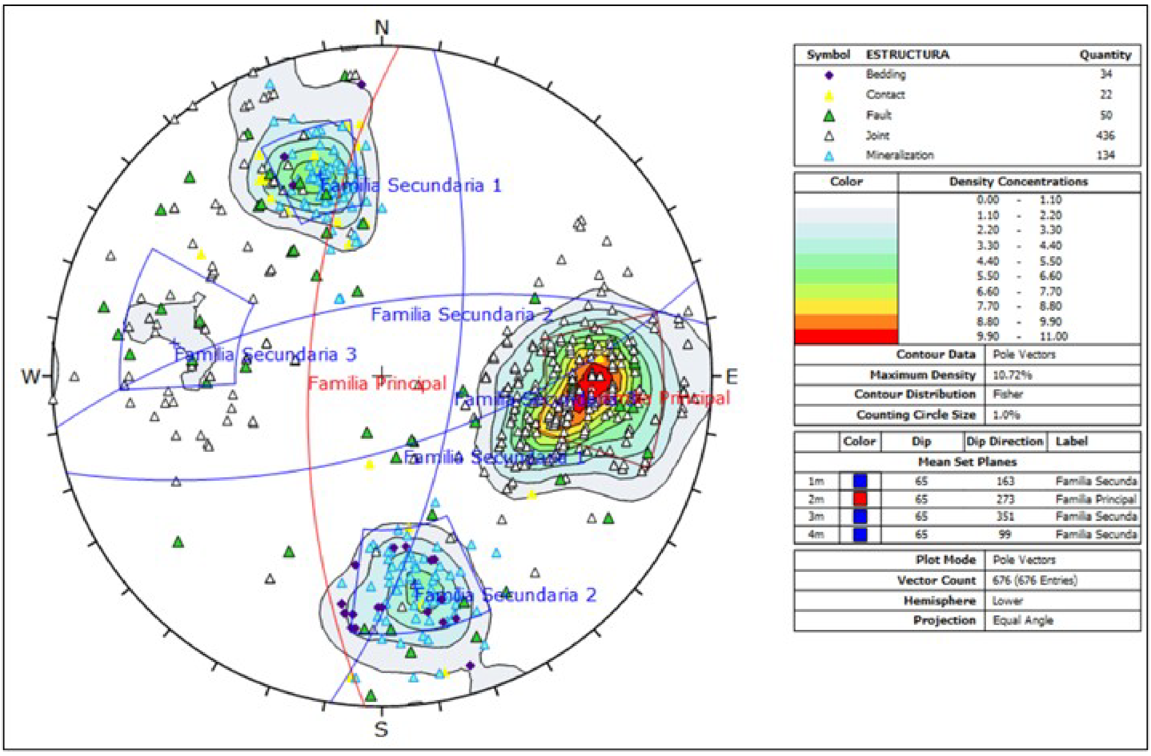
Factor B is a measure of the relative orientation of the dominant structures relative to the excavation surface. This factor considers the presence of discontinuities with unfavorable orientation relative to the faces of an excavation. The main structural features of the discontinuities were established according to Palacio (2022). Depending on the stopes strike and dip (see Table 16-5), wedge faults or planar sliding faults may be generated for the hanging wall, footwall and back.

Table 16-5: Strike and dip of projected stopes

	Hanging wall and Footwall	Back
Stope strike	30° NW	60° NW
Stope dip – Upper zone	80° NE	0°
Stope dip – Lower zone	50° NE	0°

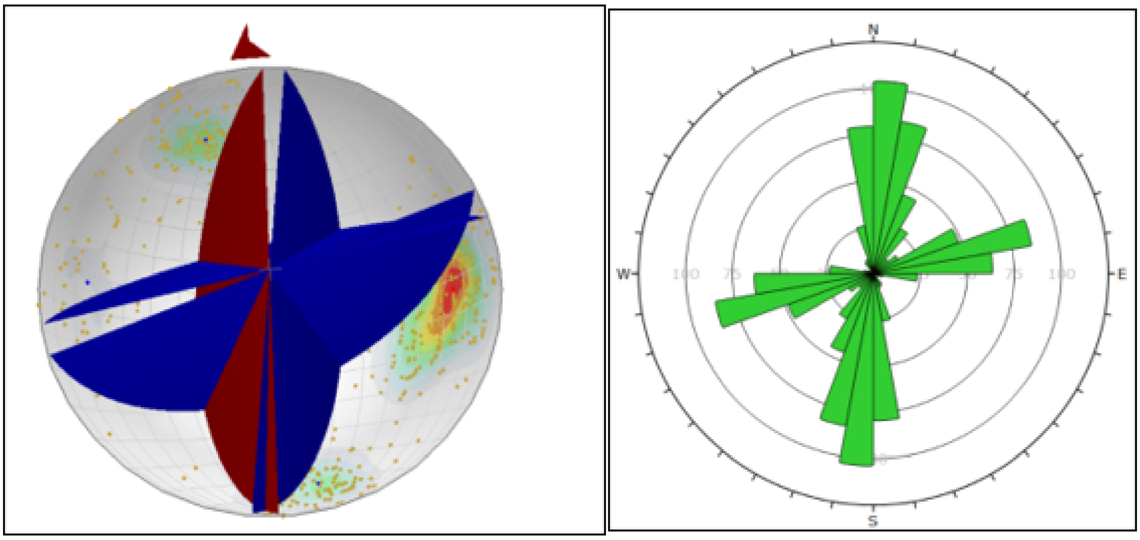
According to the structural information obtained from Palacio (2022), four discontinuity systems have been identified. The main family with the highest concentration of discontinuities has a dip and dip direction of 65° and 273°, respectively. Using kinematic analysis, the main joint set was determined, characterized by being approximately parallel to the main set of regional faults (with a variation angle lower than 25°), represented by the Santander fault system (see Figure 16-5 and Figure 16-6).

Figure 16-5: Santander discontinuity contour graph



Source: Minconsulting (2022); modified from Palacio (2022).

Figure 16-6: Santander discontinuity rosette charts



Source: Minconsulting (2022).

The analysis considers the faults and joints, which show a close relationship and represent a conditioning factor to the stability of the excavation. The difference between the strike of the stope face (hanging wall, footwall, and back) with respect to the most critical jont set (in this case, the one parallel to the strike of the excavation) was calculated. Likewise, the difference between the dip of the joint sets and that of the stope face was calculated, for different cases according to the mineralized zone. In the upper zone, there are subvertical stopes with dip angles greater than 80° and uniform hanging wall (see Table 16-6).

Table 16-6: Differences in dip - Upper zone – Levels 3940 and 4020

		Hanging wall and Foot wall		Back	
		Δ Strike	**Δ Dip**	**Δ Strike**	**Δ Dip**
Stope Dip > 80°	Joint Set 1	35	40	65	65
	Joint Set 2	80	40	50	65
	Joint Set 3	40	40	70	65
	Joint Set 4	45	40	75	65
	Lower dip	35	40	50	65

However, the hanging wall dip in the lower zone is variable. At 3825 level, for instance, hanging wall dips equal to 55° are found. As in the case of the upper zone, the difference between the dip of the joint sets and that of the stope face was calculated. However, the most critical condition is when there is little difference in dip. A similar analysis was carried out for the 3680 level, and the results are presented in Table 16-7.

Table 16-7: Differences in dip - Lower zone – Levels 3825 and 3680

		Hanging wall and Foot wall		Back	
		Δ Strike	**Δ Dip**	**Δ Strike**	**Δ Dip**
Stope Dip > 80°	Joint Set 1	40	35	40	115
	Joint Set 2	40	80	40	65
	Joint Set 3	40	40	40	115
	Joint Set 4	40	45	40	65
	Lower dip	40	35	40	65

Finally, factor B values were obtained for each zone of the Santander Pipe. The results for upper zone stopes with dips between 78° and 80°, and lower zone stopes with dips between 46° and 50°, are shown in Table 16-8.

Table 16-8: Factor B – Upper and lower zones

	Stope Dip (°)	Depth (m)	Hanging wall	Foot wall	Back
Upper Zone	80	424-504	0.35	0.35	0.83
Lower Zone	50	619-764	0.35	0.35	0.83

Factor C is a measure of the influence of gravity on the stability of the stope walls. The analysis for the hanging wall and stope back is focused on the formation of wedges, whereas for the footwall it is concerned with displacement failures, depending on the angle between the discontinuities and the stope walls. The factor C values for the upper and lower zones are shown in Table 16-9.

Table 16-9: Factor C – Upper and lower zones

	Depth (m)	Hanging wall	Footwall	Back
Upper Zone	424-504	7.0	4.5	2
Lower Zone	619-764	4.1	4.5	2

The stability numbers (N') estimated from the parameters described in this subsection are presented in Table 16-10.

Table 16-10: N' Stability Numbers

	Depth (m)	Hanging wall	Footwall	Back
Upper Zone	424-504	5.6	3.6	1.1
Lower Zone	619-764	3.3	3.6	1.1

16.3.2 Stope Support Recommendations and Potential Dilution

Table 16-11 shows stope support recommendations and potential dilution based on the empirical assessment described in the 16.3.1.

Table 16-11: Recommended stope support

Excavation Type	Stope Face	N'	Ground Support
Upper Zone	Back	0.5	It is expected that over 20% dilution could be produced at the stope back, hence, cable bolts are required to support fractured, loose ground.
Upper Zone	Hanging wall 55°	2.3	It is expected that 10-20% dilution could be produced at the stope hanging wall, hence, reinforcement of the fair to good quality ground is recommended, preventing major unravelling
Upper Zone	Hanging wall 65°	2.7	
Upper Zone	Hanging wall 75°	3.2	
Lower Zone	Back	0.5	It is expected that over 20% dilution could be produced at the stope back, hence, cable bolts are required to support the fractured, loose ground.
Lower Zone	Hanging wall 50°	2.1	It is expected that 10-20% dilution could be produced at the stope hanging wall, hence, reinforcement of the fair to good quality ground is recommended, preventing major unravelling
Lower Zone	Hanging wall 55°	2.3	

Source: Palacio (2022); Hutchinson & Diederichs (1996).

16.3.3 Hydraulic Radius and Stability Probability

With the objective of proposing stable stopes dimensions, stope stability was determined according to the methodology described by "E*xtending the Mathews Stability graph for open-stope design*" (Mawdesley et al., 2001), where a logistic regression based on the Mathews stability graph method was performed to delineate and statistically optimize the location of the stability zones. Isoprobability contours were generated for all stability results with the advantage of reducing uncertainty and statistically quantifying the stability zone. It is considered as a stable excavation if the stability probability is equal to or greater than 85%.

Table 16-12 and Table 16-13 show the stope stability probability for three different stope configurations in the upper and lower zones. It can be seen that in all scenarios the back of the stopes is marginally stable (85.3%). In both the upper and lower zones, the scenario with a 30-m stope height results in unstable footwalls.

Table 16-12: Stope stability probability – Upper zone

Description		Stope dimensions			Hydraulic Radius (HR)			Stability Probability (%)		
Scenario	Depth (m)	Height (m)	Width (m)	Length (m)	Hanging Wall	Foot Wall	Back	Hanging Wall	Foot Wall	Back
U-01-SLS	424 - 504	15	7	15	3.78	3.78	2.39	91.7%	88.7%	85.3%
U-02-SLS	425 - 504	20	7	15	4.31	4.31	2.39	90.2%	86.7%	85.3%
U-03-SLS	426 - 504	30	7	15	5.03	5.03	2.39	88.0%	83.9%	85.3%

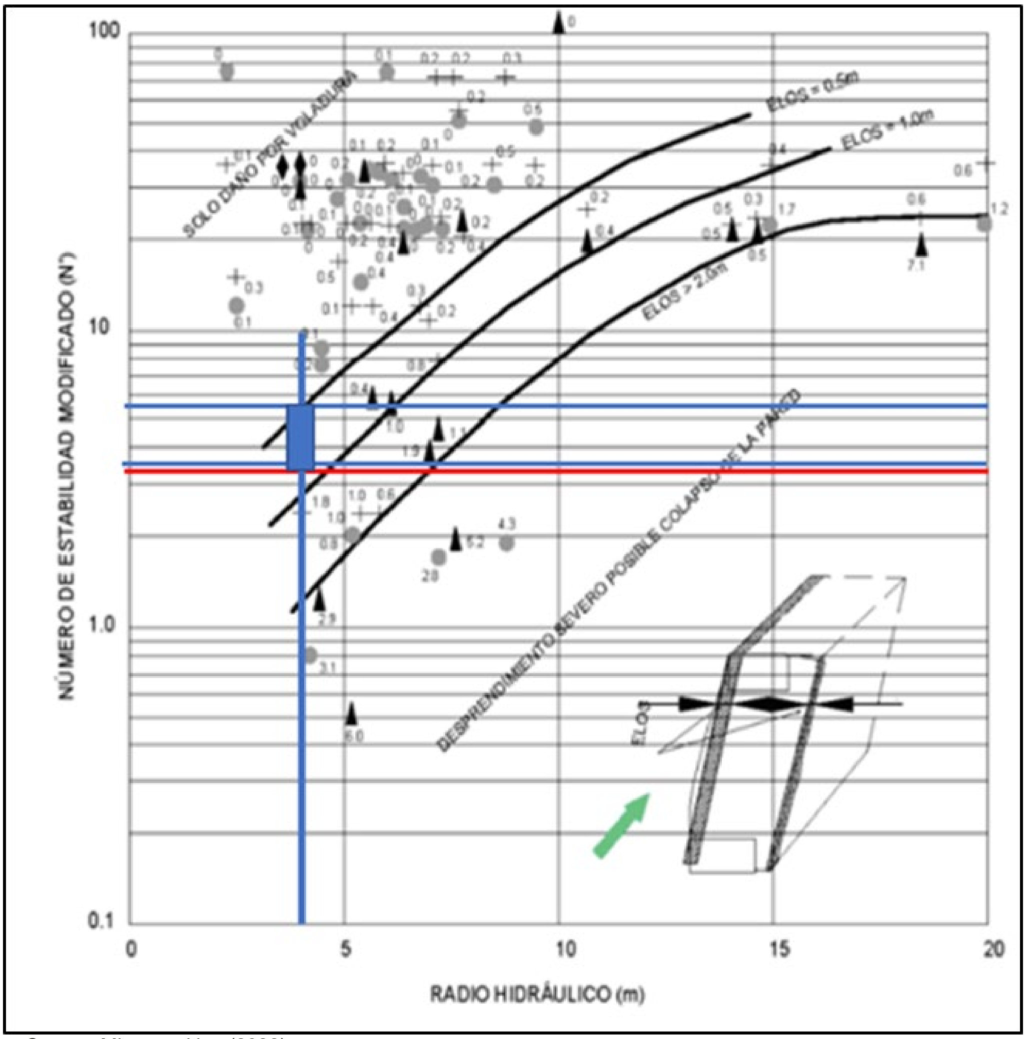
Table 16-13: Stope stability probability – Lower zone

Description		Stope dimensions			Hydraulic Radius (HR)			Stability Probability (%)		
Scenario	Depth (m)	Height (m)	Width (m)	Length (m)	Hanging Wall	Foot Wall	Back	Hanging Wall	Foot Wall	Back
L-01-SLS	619 - 764	15	7	15	4.25	4.25	2.39	86.2%	86.9%	85.3%
L-02-SLS	619 - 764	20	7	15	4.76	4.76	2.39	84.1%	84.9%	85.3%
L-03-SLS	619 - 764	30	7	15	5.42	5.42	2.39	81.4%	82.4%	85.3%

16.3.4 Empirical Estimation of Equivalent Linear Over-Break in the Hanging wall

Based on the corresponding stability numbers (5.6 for the upper zone and 3.3 for the lower zone, see Table 16-10), and an average hydraulic radius of about 4.0 m, the average hanging wall dilution (Equivalent Linear Over-Break or ELOS) is estimated at about 0.5 meters, with lower values at the upper zone and higher values at the lower zone (see Figure 16-7).

Figure 16-7: Empirical Estimation of Equivalent linear Over-Break



Source: Minconsulting (2022).

16.4 Mining Method Selection

According to the report from Buenaventura Ingenieros (1993), the upper zone of the Santander Pipe was mined between 1969 and 1992 using the Sublevel Stoping method. Sublevels were developed every 40 meters. At the stopes, drawpoints were developed every 10 meters (2.5 m x 3.0 m). As noted in Section 6 of this report, mine production peaked at close to 300,000 t/y in 1985.

The UBC mining method selection methodology, developed by Miller et al. (1995), based on a methodology proposed by Nicholas (1981), has been applied. The methodology consists of a numerical classification according to the geotechnical characteristics, stress state and geological characteristics of the deposit. The evaluation was adjusted to the deposit characteristics which has two distinct main zones, upper and lower, with different geometry, thickness, and depth.

As noted in 16.2, the upper zone includes mineral resources located between 3,885 masl and 4,020 masl, whereas the lower level includes mineral resources below 3,885 masl.

Table 16-14 shows the parameters used as inputs in the mining method selection process. It should be noted that the Rock Substance Strength (RSS) has been considered in the moderate range, due to the redistribution of stresses generated by the old excavations adjacent to the study area, which act on the support pillars.

Table 16-14: Inputs to Santander Pipe Mining Method Selection

Inputs	Upper Zone	Lower Zone
Overall shape	Irregular	Tabular
Thickness	10 – 30 m	3 – 10 m
Mineralization dip	> 55°	20° – 55°
Grade distribution	Gradational	Gradational
Depth	100 – 600 m	> 600 m
RMR hanging wall	Moderate 40 - 60	Moderate 40 - 60
RMR mineralized zone	Moderate 40 - 60	Moderate 40 - 60
RMR footwall	Moderate 40 - 60	Moderate 40 - 60
RSS hanging wall	5 – 10	5 – 10
RSS mineralized zone	5 – 10	5 – 10
RSS footwall	5 – 10	5 – 10

Source: Geotechnical Assessment for Underground Mine Design (Palacio, 2022).

Table 16-15 shows the results of the use of the UBC methodology for mining method selection at the Santander Pipe.

Table 16-15: Mining Method Evaluation – UBC Methodology

Upper Zone			Lower Zone		
Mining Method	Total Score	Ranking	Mining Method	Total Score	Ranking
Cut and fill	35	1	Cut and fill	35	1
Open pit mining	30	2	Longwall mining	29	2
Sublevel stoping	29	3	Sublevel stoping	25	3
Sublevel caving	26	4	Shrinkage stoping	23	4
Block caving	25	5	Square set	19	5
Shrinkage stoping	22	6	Room and pillar	17	6
Square set	19	7	Top slicing	17	7
Top slicing	12	8	Open pit mining	-19	8
Room and pillar	-35	9	Sublevel caving	-23	9
Longwall mining	-77	10	Block caving	-24	10

Source: Geotechnical Assessment for Underground Mine Design (Palacio, 2022).

16.5 Mine Modelling

16.5.1 Net Smelter Return (NSR)

An NSR calculation was performed on every block of the block model, considering grade, metal price, metallurgical recovery and smelter terms (concentrate treatment charges, refining charges, deductions and applicable penalty payments). The NSR calculation is summarized in Table 16-16.

Table 16-16: NSR Calculation Parameters

	Unit	Quantity
Zn Price	US$/t	2,786.6
Cu Price	US$/t	9,300.4
Ag Price	US$/oz	21.9
Grade, Zn in ore	%	6.59%
Grade, Pb in ore	%	0.02%
Grade, Cu in ore	%	0.16%
Grade, Ag in ore	g/t	11.51
Zn concentrate moisture	%	8.60%
Zn recovery to Zn concentrate	%	94.90%
Grade, Zn in Zn concentrate	%	48.17%
Deduction, Zn in Zn concentrate	%	8.00%
Base Zn Treatment Charge	US$/DMT	180.0
Penalties	US$/DMT	8.0
Freight - Mine to Smelter	US$/DMT	80.0
Zn NSR, FOB Mine	**US$/t ore**	**110.5**
Cu concentrate moisture	%	8.00%
Cu recovery to Cu concentrate	%	60.00%
Grade, Cu in Cu concentrate	%	21.00%
Deduction, Cu in Cu concentrate	%	3.00%
Base Cu Treatment Charge	US$/DMT	150.0
Cu Price Escalator Charge	US$/DMT	0.0
Penalties	US$/DMT	0.0
Freight - Mine to smelter	US$/DMT	80.0
Cu NSR, FOB Mine	**US$/t ore**	**6.7**
Ag recovery to Cu concentrate	%	46.90%
Deduction, Ag in Cu concentrate	Oz/DMT	3.5
Ag Refining Charge	US$/DMT	37.3
Ag NSR, FOB Mine	**US$/t ore**	**3.3**
Total NSR, FOB Mine	**US$/t ore**	**120.5**

The NSR equation is as follows:

NSR = 16.78 x Zn grade (%) + 10.12 x Pb grade (%) + 41.26 x Cu grade (%) + 0.30 Ag grade (g/t)

An NSR cut off was determined based on all fixed and variable costs applicable to the operation. Non-isolated mining blocks with an average NSR value above the economic cut-off value and with existing access are included in the conceptually economic envelope. Mining blocks which do not meet the criteria described above are classified as waste.

Based on the average 2020 operating costs of the adjacent Magistral Mine and benchmarking, the break-even NSR economic cut off for each mining method considered is shown in Table 16-17.

Table 16-17: NSR Cut-Off by Mining Method

Mining method	Sublevel Stoping	Room & Pillar	Cut & Fill
NSR cut off (USD/t)	44.0	43.0	50.0

16.5.2 *Stope Design*

Underground mine design followed the sequence presented in Figure 16-8.

Figure 16-8: The Mine Design Process

The stope optimizer tool of the Deswik design software Deswik.SO was used for stope design. In designing a stope, the optimal mineable shapes are sought, considering the geometry of the deposit. These optimal mineable shapes will be solids that will be evaluated against the geological block model when looking for the solid that is optimal for a mining plan, in this case the one that has a grade higher than the cut-off grade.

Sectional contours are defined by four points in the hanging wall and footwall. Constraints can be applied on the dip and strike of the final stope shape. Deswik.SO provides a stope shape that maximizes the value of the recovered resource above a cut-off, while providing practical mining parameters such as minimum and maximum mining widths, stope dilutions, minimum and maximum stope angles, pillars in between stopes, minimum and maximum stope heights, etc.

16.5.3 Minable Resource Estimation

For the upper and lower zones, the estimation was carried out with different stope heights and lengths. For the lower zone, additional mining methods were also evaluated. A dilution of 0.5 meters for the hanging wall and footwall was assumed (see 16.3.4). The minimum mining width for this exercise was 2.0 m, similar to the narrower stopes currently being mined at the Magistral mine. The results are shown in Table 16-18 and Table 16-19.

Table 16-18: Mineable Resources – Upper zone

Scenario	Cut-off US$/t	Height m	Length m	# Stopes	Tonnes	Zn %	Pb %	Ag g/t	Cu %	NSR US$/t
U-01-SLS	44	20	20	112	2,055,234	5.30	0.02	10.70	0.08	100.15
U-02-SLS	44	25	25	66	2,019,072	5.16	0.02	10.46	0.08	97.64
U-03-SLS	44	30	30	49	2,258,084	4.70	0.02	9.53	0.07	88.81
U-04-SLS	44	15	15	213	2,085,739	5.48	0.02	11.18	0.08	103.60

SLS: Sublevel stoping

Table 16-19: Mineable Resources – Lower zone

Scenario	Cut-off US$/t	Height m	Length m	# Stopes	Tonnes	Zn %	Pb %	Ag g/t	Cu %	NSR US$/t
L-01-SLS	44	15	15	265	2,312,974	4.10	0.00	6.26	0.13	79.36
L-02-SLS	44	20	20	125	2,074,105	3.84	0.00	5.94	0.12	74.50
L-03-SLS	44	25	25	73	1,908,627	3.59	0.00	5.60	0.12	69.67
L-04-SLS	44	30	30	45	1,779,593	3.56	0.00	5.48	0.11	68.99
L-05-C&F	50	5	10	2,337	2,953,299	4.80	0.00	7.33	0.15	92.85
L-06-R&P	43	10	10	1,071	2,857,092	4.23	0.00	6.33	0.13	81.70

SLS: Sublevel stoping
C&F: Cut and fill
R&P: Room and pillar

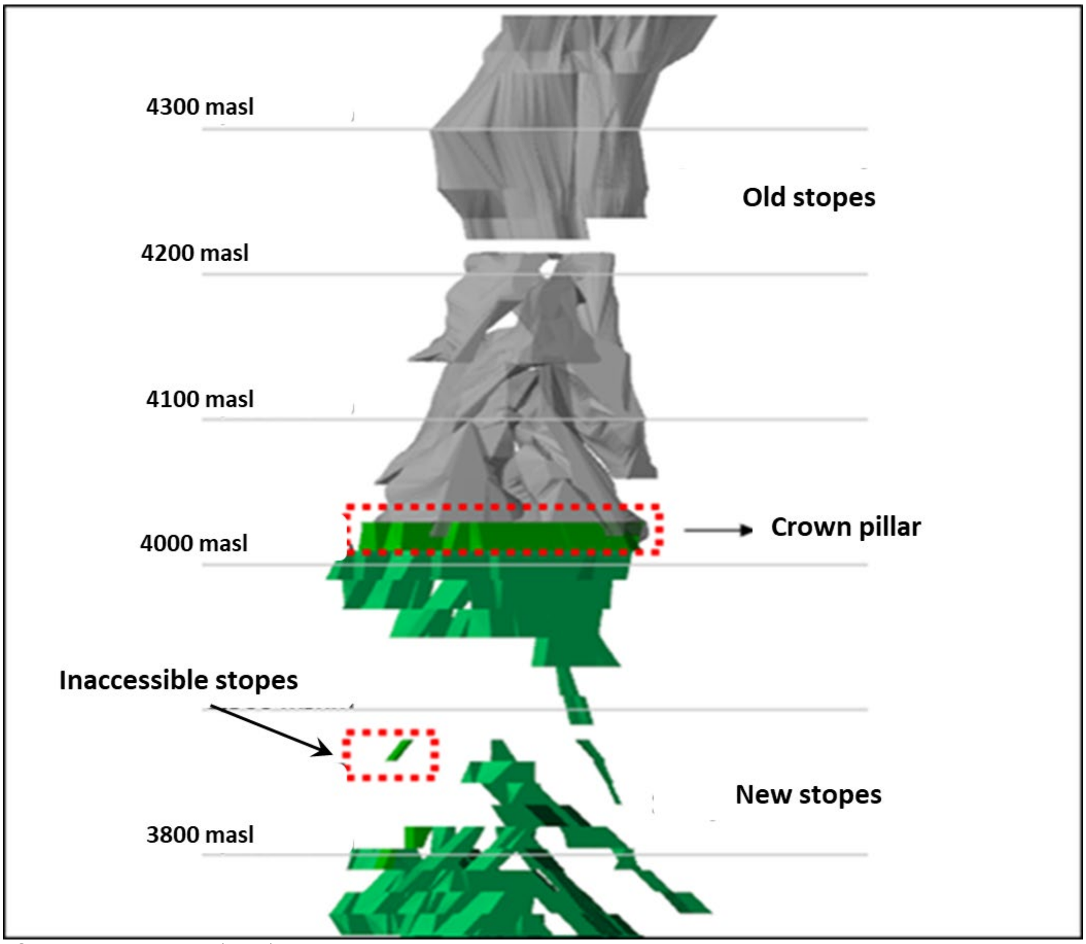
Taking into account productivity, stope stability and impact on life of mine, scenarios U-01-SLS and L-01-SLS were selected. The resulting minable resources are shown in Table 16-20.

Table 16-20: Mineable Resources – Scenarios selected

Scenario	Tonnes	Zn %	Pb %	Ag g/t	Cu %	NSR US$/t
U-01-SLS	2,055,234	5.30	0.02	10.70	0.08	100.15
L-01-SLS	2,312,974	4.10	0.00	6.26	0.13	79.36
TOTAL	**4,368,208**	**4.66**	**0.01**	**8.35**	**0.11**	**89.14**

Due to the proximity of previously mined areas to the top of the upper zone mineral resources, a crown pillar was considered in the mine design. Also, stopes that were more than 100 m from main development were not included in the minable resources (inaccessible stopes, see Figure 16-9).

Figure 16-9: Crown pillar and inaccessible stopes



Source: Minconsulting (2022).

Table 16-21 shows the tonnage of mineral resources in inaccessible stopes and the crown pillar.

Table 16-21: Tonnage in crown pillar and inaccessible stopes

Description	Tonnes	Zn %	Pb %	Ag g/t	Cu %	NSR US$/t
Inaccessible stopes	11,639	2.43	0.01	5.62	0.07	47.53
Crown pillar	577,557	4.38	0.02	10.05	0.08	83.95
Total	**589,196**	**4.35**	**0.01**	**9.97**	**0.08**	**83.23**

The next phase of the Santander Pipe project should include the evaluation of the condition of the previously mined areas in order to assess properly the need for, and the characteristics of, the crown pillar.

Table 16-22 shows the minable resource included in the base case for this study.

Table 16-22: Base case minable resource

Tonnes	Zn %	Pb %	Ag g/t	Cu %	NSR US$/t
3,779,012	4.71	0.01	8.10	0.11	90.06

16.5.4 Mine Layout

As described in subsection 6.3 and depicted by Figure 6-3, the La Cuñada shaft provided access to the old Santander Mine and served as the only mineral and waste extraction route. The development of the Santander Pipe requires the drainage of the old mine (currently flooded) and the rehabilitation of the shaft. CDPR is currently driving an exploration tunnel from the lower part of the Magistral Mine to the Santander Pipe. As discussed in subsection 16.7, a mine access study completed by Subterra indicates that the most suitable option for transporting the Santander Pipe mineral to the existing processing plant is through the existing shaft (Subterra, 2022).

The general layout of the Santander Pipe requires the excavation of ventilation raises.

16.5.5 Main Ramps and Access Design

The following criteria must be considered in the design of the ramps and stope accesses:

Ramps:

- Gradient: +/- 13 maximum.
- Turning radius: 25 meters
- Refuge station: every 500 meters
- Truck loading chamber: every 300 meters.
- Dimensions: 5.0 m high x 4.0 m wide.

Access and drawpoints:

- Gradient: From -15 % to +15 %.
- Dimensions: 4.0 m high x 4.0 m wide

Other excavations:

- By-passes 5.0 m x 4.0 m
- Refuge station: 2.0 m x 2.0 m
- Ventilation shaft: 3.0 m diameter
- Loading chamber: 4.0 m x 4.0 m

Other excavations include the explosives storage magazine, canteen and dining facilities, pumping station, and electrical substation.

16.5.6 Mining Cycle

The mining cycle includes drilling, blasting, ventilation, scaling, mucking, loading and handling of waste, and ground support installation. These activities must be carried out safely and in compliance with established safe work procedures.

Mechanized drilling equipment, such as jumbo rigs, will be used for all development and production work. Raise boring equipment will be used for the excavation of raises and ventilation shafts.

Cartridge and packaged explosives, appropriate for the wet conditions of the mine, will be used. Scissors lifts or similar equipment will be used whenever mine personnel require access to the upper parts of the drilled face.

Mucking will be carried out with low-profile loaders (LHDs). Remote controlled operation of the LHDs will be incorporated when it is not deemed safe for the operator to enter the blasted area. Depending on the haulage distance, LHDs or dump trucks will transport the ore to the ore passes that communicate to the shaft.

Ground support will be completed in accordance with the guidelines shown in Table 16-2. This report does not consider any other type of additional support for the stopes, other than timely backfill. However, cable bolting should be evaluated for supporting large stopes. Scaling equipment should be used to remove loose rock from recently blasted faces.

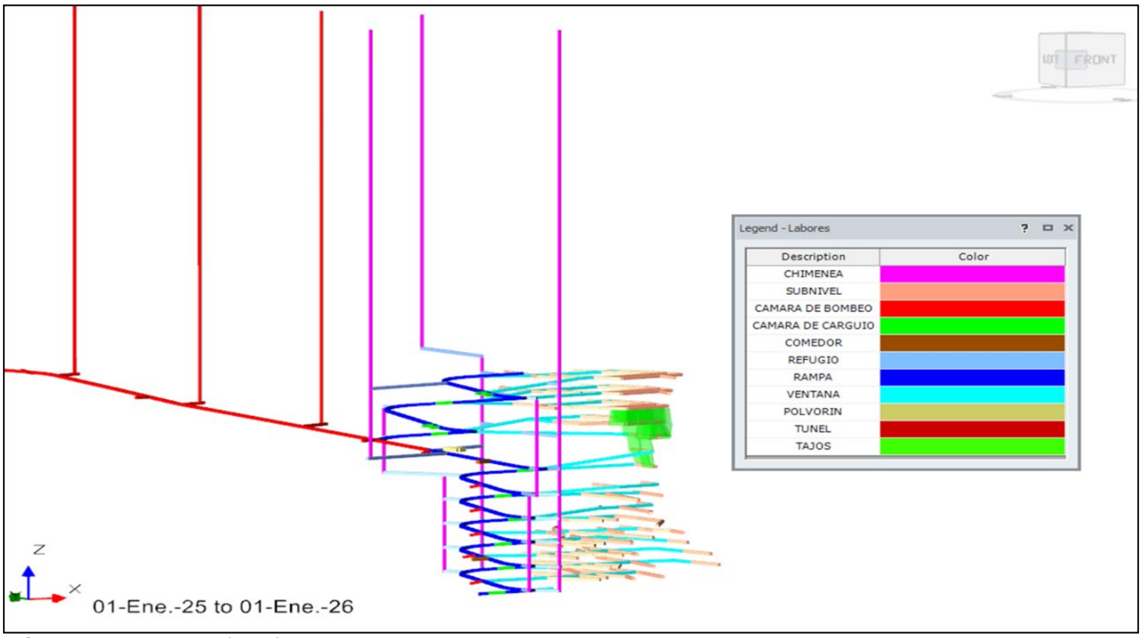
The proposed mining method includes waste rock backfill. Other types of backfill, such as hydraulic or paste, may be required in the lower zone to support shallow stopes, facilitate the mining sequence and reduce dilution. This should be evaluated in the next study phase.

16.5.7 Sequencing

The development of the mine can start only once the old mine has been drained to the level at which the Magistral tunnel will communicate to the Santander Pipe. At that moment, the upper zone, which has the mineral resources with the highest grade and greater widths, will be developed, while the drainage of the rest of the mine continues and the hoisting system is installed and commissioned. The sequencing strategy contemplates the development of main levels every 100 meters. The estimated production rate is 2,500 tpd.

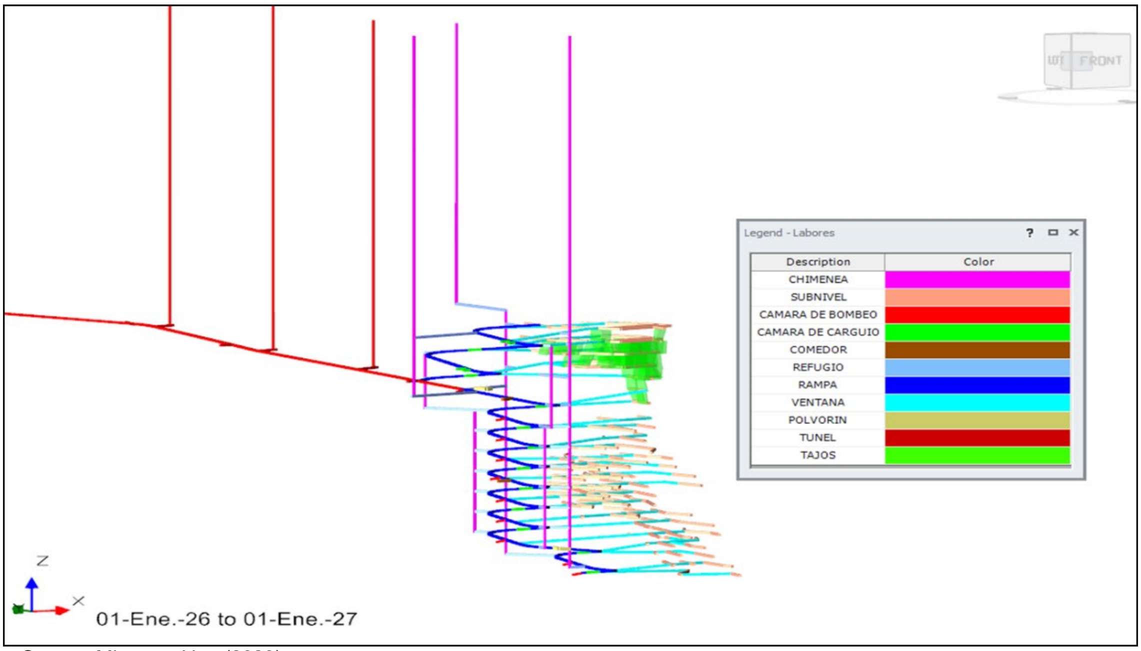
A high level mining sequence is illustrated by Figure 16-10, Figure 16-11, Figure 16-12, Figure 16-13, and Figure 16-14.

Figure 16-10: Mine development and mining sequence – 2025



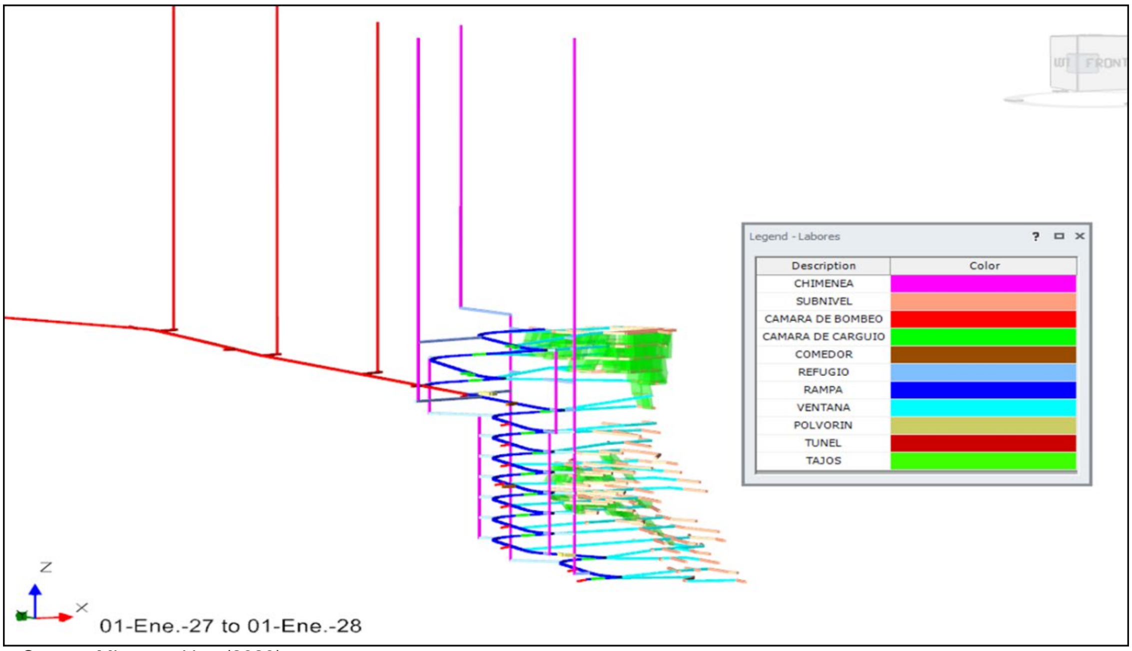
Source: Minconsulting (2023).

Figure 16-11: Mine development and mining sequence – 2026



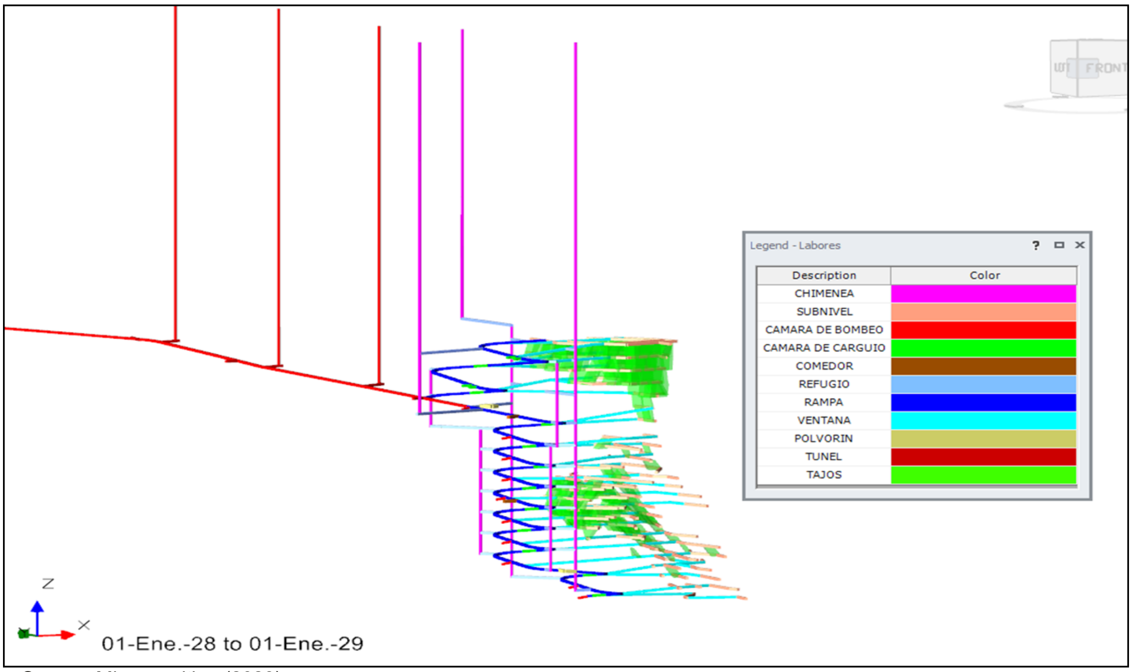
Source: Minconsulting (2023).

Figure 16-12: Mine development and mining sequence – 2027



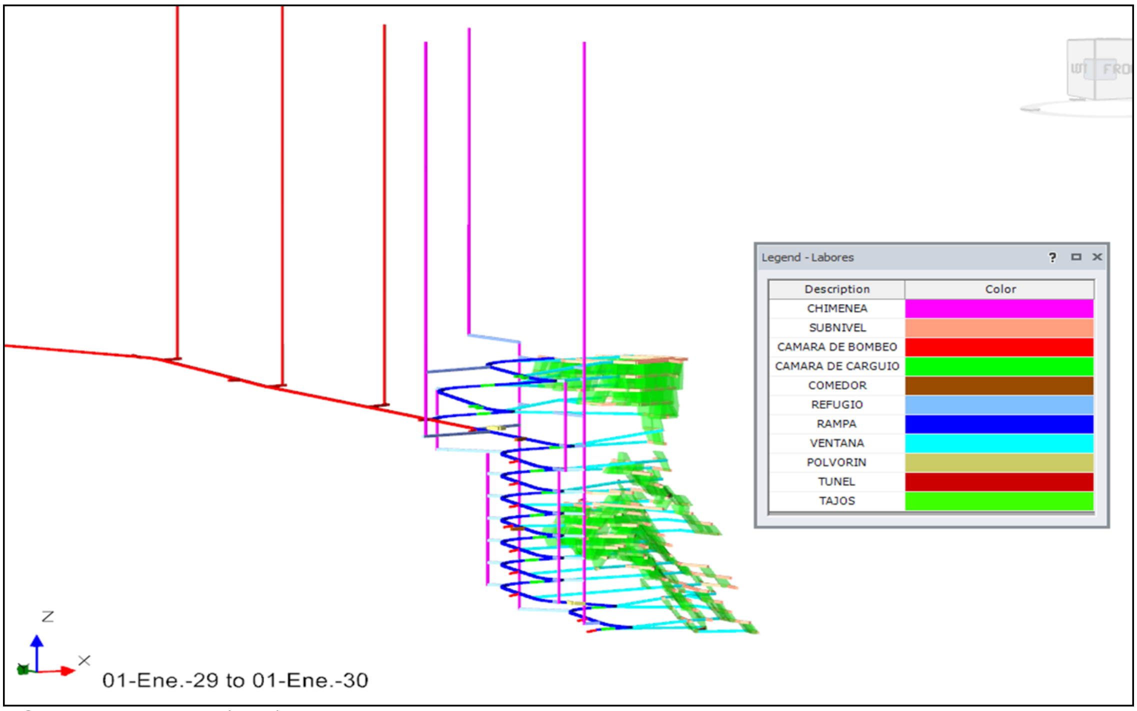
Source: Minconsulting (2023).

Figure 16-13: Mine development and mining sequence – 2028



Source: Minconsulting (2023).

Figure 16-14: Mine development and mining sequence – 2029



Source: Minconsulting (2023).

Sequencing was carried out considering the equipment performance/utilization presented in Table 16-23.

Table 16-23: Equipment performance

Equipment	Performance	Unit
Jumbo	150	m/month
Simba Stopes	200	m-drilled/d
LHD (6YD3) Preparation and development	960	t/d
LHD (6YD3) Stopes	850	t/d
LHD (6YD3) Backfill	850	t/d
Raise Boring	35	m3/d

16.5.8 Development Program

The mine development program is shown in Table 16-24, Table 16-25, and Table 16-26.

Table 16-24: Mine development program

Description	Total m	2024 m	2025 m	2026 m	2027 m	2028 m	2029 m
Pumping station	130	51	39	40	0	0	0
Loading chamber	408	228	85	96	0	0	0
Service raise	562	305	79	178	0	0	0
Ventilation raise	2,161	1,451	496	213	0	0	0
Canteen	36	18	18	0	0	0	0
Explosives magazine	77	50	0	27	0	0	0
Ramps	3,267	1,880	704	684	0	0	0
Refuge	107	61	24	22	0	0	0
Sublevel	7,580	336	4,695	2,550	0	0	0
Drawpoint	4,910	2,031	1,239	1,640	0	0	0
Crosscut to RB raise	1,491	1,089	121	282	0	0	0
Total development	**20,729**	**7,499**	**7,499**	**5,731**	**0**	**0**	**0**

Table 16-25: Mine development program by activity

Description	Total m	2024 m	2025 m	2026 m	2027 m	2028 m	2029 m
Non-production development	13,149	7,164	2,805	3,181	0	0	0
Production development	7,580	336	4,695	2,550	0	0	0
Total	**20,729**	**7,499**	**7,499**	**5,731**	**0**	**0**	**0**

Table 16-26: Mine development program by type

Work Type	Total m	2024 m	2025 m	2026 m	2027 m	2028 m	2029 m
Horizontal development	18,007	5,743	6,924	5,339	0	0	0
Vertical development	2,723	1,756	575	391	0	0	0
Total	**20,729**	**7,499**	**7,499**	**5,731**	**0**	**0**	**0**

16.5.9 Production Program

The LOM production program is presented in Table 16-27.

Table 16-27: LOM production plan

Description	Total	2024	2025	2026	2027	2028	2029
Stopes and Sublevels (t)	3,846,564	0.00	539,827	900,000	900,000	900,000	606,736
NSR ($/t)	89.25	0.00	97.99	94.72	98.70	78.21	75.72
Zn (%)	4.67	0.00	5.14	5.01	5.05	4.12	4.01
Pb (%)	0.01	0.00	0.02	0.01	0.01	0.00	0.00
Ag (g/t)	8.05	0.00	10.12	9.44	11.08	4.93	4.30
Cu (%)	0.11	0.00	0.10	0.08	0.15	0.11	0.09
Upper Zone (t)	1,509,887	0.00	376,849	698,100	434,938	0.00	0.00
NSR ($/t)	106.71	0.00	102.55	99.45	121.99	0.00	0.00
Zn (%)	5.67	0.00	5.47	5.30	6.43	0.00	0.00
Pb (%)	0.02	0.00	0.02	0.02	0.02	0.00	0.00
Ag (g/t)	11.02	0.00	10.36	10.30	12.74	0.00	0.00
Cu (%)	0.08	0.00	0.07	0.07	0.11	0.00	0.00
Lower Zone (t)	2,336,677	0.00	162,978	201,900	465,062	900,000	606,736
NSR ($/t)	77.97	0.00	87.45	78.38	76.93	78.21	75.72
Zn (%)	4.03	0.00	4.38	4.04	3.75	4.12	4.01
Pb (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ag (g/t)	6.14	0.00	9.56	6.46	9.52	4.93	4.30
Cu (%)	0.13	0.00	0.18	0.13	0.19	0.11	0.09

16.6 Mine Equipment, Manpower, and Services

16.6.1 Mining Contractor

It is expected that CDPR will continue the contracting practices that they have implemented at the Magistral mine: The contractor provides personnel and equipment for mine development, stope production, and mine services, and CDPR provides mine planning, technical services, and supervision.

16.6.2 Mine Equipment

The equipment requirements have been determined based on the productivity ratios shown in Table 16-23 for a production rate of 2,500 tpd. Main equipment requirements are listed in Table 16-28.

Table 16-28: Yearly mine equipment requirements @ 2,500 t/d

Equipment	2023	2024	2025	2026	2027	2028	2029
Boomer Jumbo	2	3	3	3	2	0	0
LHD (6YD3)	1	1	3	6	6	6	5
Shotcrete robot	1	1	2	2	2	2	2
Concrete mixer trucks	2	2	4	4	4	4	4
Raise Boring	1	1	1	1	1	0	0
Simba	0	1	1	4	4	3	2
Scaler	1	1	1	1	1	1	1
Service Truck	1	1	1	1	1	1	1
Pick Up	5	5	5	5	5	5	5
Truck Ore/Waste	2	3	6	9	8	7	6
Utility Truck	1	1	1	1	1	1	1

16.6.3 *Manpower*

Table 16-29 shows the Santander Pipe mine staffing requirements per shift. Mine operating personnel will work under a rotation system of 12 hours per shift, two shifts per day.

Table 16-29: Mine staffing requirements per shift

Mine Staff	2023	2024	2025	2026	2027	2028	2029
Equipment operators	18	21	29	38	36	30	27
Auxiliary operators	6	8	9	12	11	6	5
Blasting	4	7	8	11	8	6	5
Services	5	5	5	5	5	5	5
Ventilation	2	2	2	2	2	2	2
Engineering and surveying	2	2	2	2	2	2	2
Supervisor	5	5	5	5	5	5	5
Total	**42**	**50**	**60**	**75**	**69**	**56**	**51**

16.6.4 *Mineral and Waste Handling*

Through the main and secondary ramps, production will be transported by LHDs or dump trucks to rock passes connected to the shaft. All blasted material will be hoisted to surface via the rehabilitated La Cuñada shaft. Waste rock will be used as stope backfill where possible.

16.7 Mine Access Study

This subsection is based on a mine access study carried out by Subterra (Subterra, 2022), in which options for accessing the Santander Pipe via an exploration ramp from the Magistral Mine and the existing La Cuñada shaft were considered. Specific aspects of the Subterra study were updated to incorporate changes to the CDPR exploration program and new information.

16.7.1 Access via La Cuñada Shaft

As described in subsection 6.3 and depicted by Figure 6-3, the La Cuñada shaft provided access to all the levels of the old Santander Mine, with loading pockets located every 80 m. Figure 16-15 shows the location of the shaft collar. It can be seen that it is about 300 m from the process plant and approximately a 600-m drive to the ROM stockpile, located southwest of the process plant.

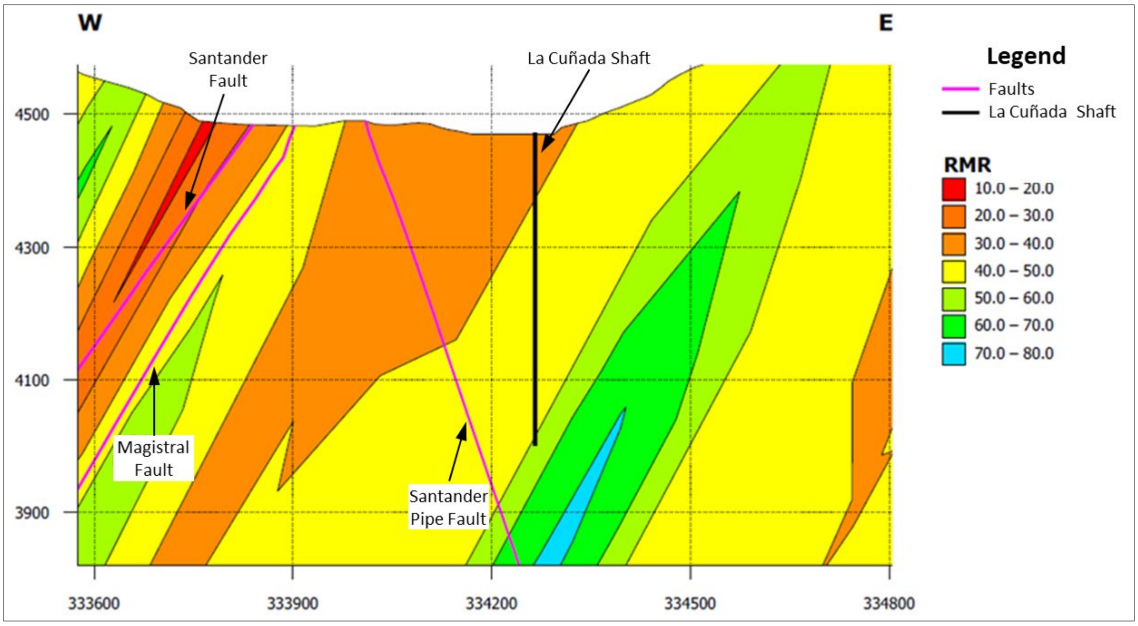
Figure 16-15: Location of the La Cuñada Shaft

Source: Google Maps (2023).

Figure 16-16 shows a vertical section through the La Cuñada shaft with plots of RMR contour lines. The corresponding geotechnical information was provided by CDPR. It can be seen that, with the exception of the first 90 m, approximately, the quality of the rock in which the shaft was excavated can be classified as fair (40 < RMR < 60). Additionally, CDPR has informed that only the shaft collar and the initial 10 m of the shaft are supported by a concrete structure, and that the rest of the shaft never required ground support (Subterra, 2022).

As discussed previously (see subsection 6.3), the La Cuñada shaft and the old Santander Mine are flooded. Using a Solinst water level meter, CDPR determined that on June 21, 2022, the water level at the shaft was 83.66 m below surface (see Figure 16-17). This means that the water level at the shaft was at 4,381.3 masl, an elevation similar to that of the 4380 Baños tunnel, used to drain the old Santander Mine operation (see Figure 6-3 and Figure 6-4). The Baños tunnel is an integral part of the proposed Santander Pipe mine drainage system described in subsection 16.9.2 and illustrated by Figure 16-24.

Figure 16-16: Vertical section showing RMR contours and La Cuñada shaft



Source: Subterra (2022).

Figure 16-17: Measuring the water level at the La Cuñada shaft

Source: CDPR (2022).

Using a plummet and an analog meter, CDPR determined that the shaft was open and unobstructed to a depth of 403 m (see Figure 16 17). The actual depth is calculated as follows: 10,000 m – 9,597 = 403 m. The length of the available line prevented CDPR from lowering the plummet further down the shaft, as old records indicate that the shaft is 510 m deep (subsection 6.3). Nonetheless, there is enough evidence at this stage of the project to assume that the entire shaft is open and unobstructed.

Figure 16-18: Measuring the depth of the La Cuñada shaft

Source: CDPR (2022).

Given the location of the La Cuñada shaft in relation to the process plant and the existing Santander Pipe mineral resources, and having confirmed that the excavation itself is in good condition, its use as the main mine access and mineral/waste extraction route was investigated.

Table 16-30 shows the basic requirements of the Santander Pipe hoisting system.

Table 16-30: Basic requirements for the hoisting system

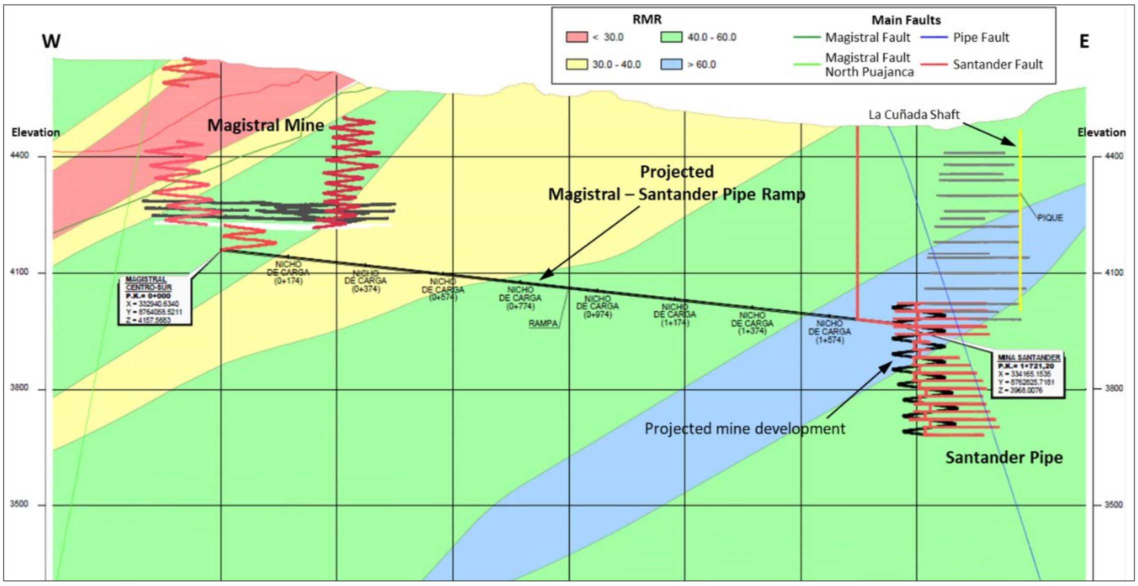
Item	Description
Depth	500 m
Maximum hoisting capacity	2,500 tpd mineral / 500 tpd waste
Hoisting system availability	18 h/day (production) / 20 h/day (service)
Hoisting speed	5.0 m/s (production)
Type of hoist	Double drum
Hoist motor	370 kW
Skip / Cage	2 x 6 t / 1 x 5 t (two levels)
Tower height	40 m
Safety standard	Articles 296 and 297 of the Peruvian Occupational Health and Safety Regulations (Supreme Decree N° 024-2016-EM, amended by Supreme Decree N° 023-2017-EM).

Source: Subterra (2022); modified by DRA.

16.7.2 Access via the Magistral – Santander Pipe Ramp

CDPR has projected an exploration ramp (*the Ramp*) from the Magistral Mine to the Santander Pipe deposit (see Figure 16-19). Due to its exploratory nature, the actual layout of the ramp may change. However, CDPR´s intention is to link Magistral and the Santander Pipe, and to use the ramp to explore targets already identified from surface drilling and complete the infill drilling program at the Santander Pipe required to upgrade its mineral resources.

Figure 16-19: Projected Magistral – Santander Pipe ramp

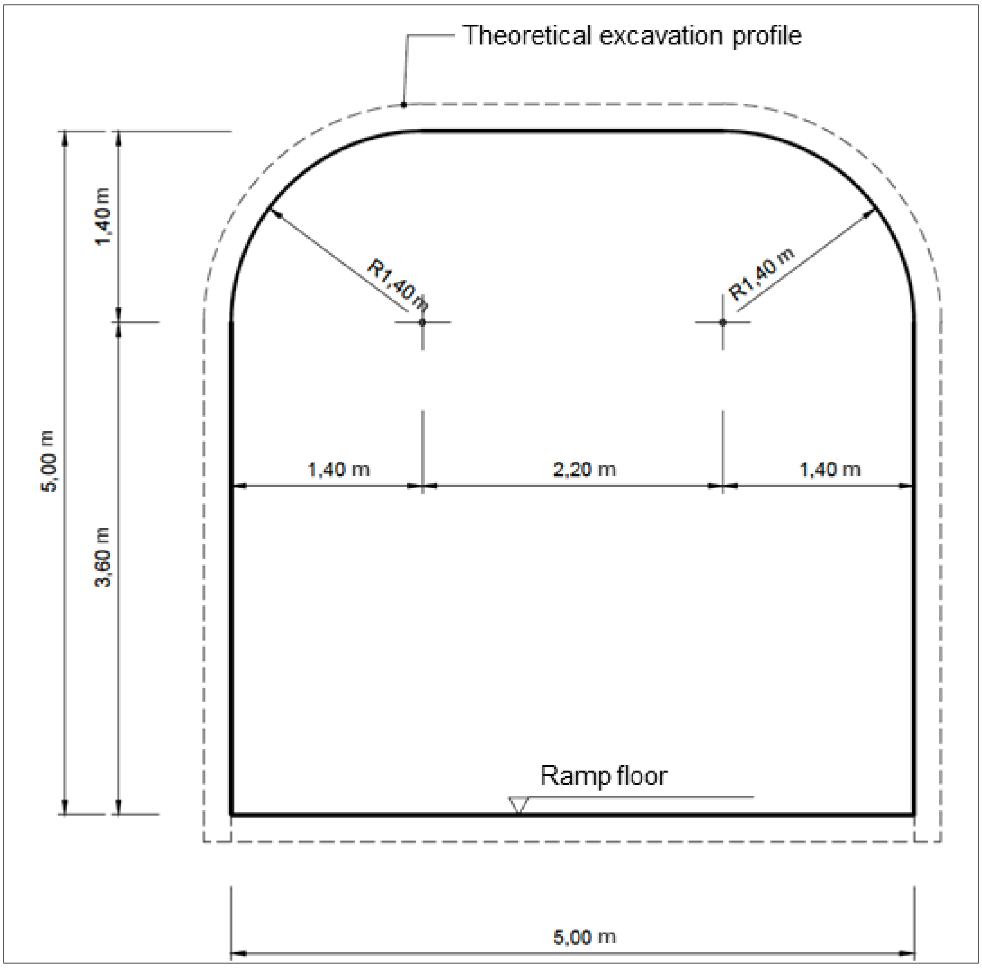


Source: Subterra (2022).

The Ramp represents a viable option for accessing the Santander Pipe and eventually hauling ore and waste to the process plant or waste dump, respectively. Since it will be driven for exploration purposes, most of the Ramp is not considered in the Santander Pipe mine CapEx (see subsection 21.4.2). This is a significant advantage, from a mine access trade-off viewpoint.

Subterra completed a design of the Ramp using the geotechnical information provided by CDPR and taking into account the ore and waste haulage requirements of the Santander Pipe, as well as mine ventilation needs. The basic section of the Ramp can de seen in Figure 16-20.

Figure 16-20: Basic section of the Magistral – Santander Pipe ramp



Source: Subterra (2022).

Ground support requirements were based on the corresponding RMR classification of the rock to be excavated. As seen in Figure 16-19 the Ramp will cross rock with RMR that falls in three different ranges, resulting in three different "section types" (see Table 16-31). Subterra developed ground support guidelines for each of those section types (see Table 16-32). This information was used by Subterra to estimate equipment requirements, advance rates and costs (Subterra, 2022).

Table 16-31: Ramp section types

From (m)	To (m)	RMR	Ramp Section Type
0.0	139.8	40 - 60	ST-II
139.8	703.6	30 - 40	ST-III
703.6	1,515.3	40 - 60	ST-II
1,515.3	1,721.2	> 60	ST-I

Source: Subterra (2022).

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Table 16-32: Ground support guidelines for the Ramp

Section Type	Shotcrete Thickness (cm)	Concrete Sill Thickness (cm)	Weld Mesh	Rockbolt Pattern 1" ϕ x 2.0 m (m)	Steel Sets @ 1 m	Other
ST-I	-	-	3/8" ϕ 150 x 150 mm	2.0 x 2.0	-	-
ST-II	-	10.0	-	1.5 x 1.5	-	-
ST-III	5.0	20.0	-	-	4" W-beam 13 lbs/ft	Occasional anchoring (*)

(*) Untensioned grouted dowels, 1 3/8" ϕ x 6.0 m, 0.4 m spacing

Source: Subterra (2022).

The location of the main entrances to the Magistral Mine in relation to the ROM stockpile can be seen in Figure 16-21. It is expected that, if the Magistral – Santander Pipe ramp were to be used for the extraction of ore, the truck fleet would enter and exit the mine thorugh the Magistral South portal, which is located at about 1,800 m from the ROM stockpile. Thus, the one-way distance from the Santander Pipe to the ROM stockpile would be approximately 8.0 km. It would take a truck between 1.25 and 1.5 hours to complete a round trip from the Santander Pipe to the ROM stockpile, including loading and dumping times. This would result in a fleet of 10 30-t trucks, not including stand-by units.

16.7.3 Conclusion – Mine Access Study

Driven mostly by operational considerations, the mine access study resulted in a recommendation to rehabilitate the La Cuñada shaft for mineral hoisting, avoiding the larger operational costs from mineral haulage through the Ramp. In addition, and depending on operational needs, CDPR could use the combination of shaft and ramp for mineral and/or waste transport to surface.

Figure 16-21: Magistral Mine entrances

Source: Google Earth (2023).

16.8 Mine Ventilation

The objective is to design the main ventilation system to supply fresh air in the necessary quantity and quality to all work faces during the operation of the Santander Pipe Project, complying with the Occupational Safety and Health Regulations in Mining, approved by D.S. N° 024-2016-EM and its amendment D.S. N° 023-2017-EM.

The scope is to ventilate the mine workings of the Santander Pipe project, from level 4,480 masl to level 3,620 masl, while it operates at a throughput capacity of 2,500 t/day.

16.8.1 Design Parameters

Financial parameters and costs

- Life of Mine: 7 years (includes pre-production development and production stage)
- Interest rate: 10%
- Energy cost: 0.10 US$/KWH
- Fans cost: 500 US$/HP, includes starter panels
- Fixed cost of raise excavation: 238.0 US$/m
- Variable cost of raise Excavation: 208.7 US$/$m^3$

Environmental Parameters

- Shaft collar elevation: 4,464.4 masl
- Dry temperature: 11.7 °C
- Relative humidity: 39.7%
- Barometric pressure: 17" Hg
- Air density: 0.0437 lb/ft3

Ventilation Parameters

- Magistral tunnel and main ramps section: 5.00 m x 4.00 m
- Drawpoint section: 4.00 m x 4.00 m
- Sublevel section: 4.00 m x 4.00 m
- Ventilation raise diameter: 3.10 m
- Friction factor "K" in main ramps: 80.9x10-10 lb-min2/ft4
- Friction factor "K" in draft and sublevel: 80.9x10-10 lb-min2/ft4
- Friction factor "K" in shaft: 27x10-10 lb-min2/ft4
- Shock factor "X" in main ramps, draft and sublevel: 0.10
- Shock factor "X" in ventilation raise: 1.30

16.8.2 Ventilation System

Air requirements by the Santander Pipe project have been analyzed in accordance with the Peruvian Regulation D.S N° 024-2016-EM (amended by D.S N° 023-2017-EM), which establishes the parameters of quantity and quality of air that must be supplied to the working areas of an underground mine. Key aspects of such regulations are shown in Table 16-33 and Table 16-34.

Table 16-33: Air Requirements According to Peruvian Regulations

Description	Quantity	Units
Staff (altitudes higher than 4000 masl)	6	m^3/min
Diesel equipment	3	m^3/min-HP
Minimum air velocity (dynamites)	20	m/min
Minimum air velocity (ANFO)	25	m/min
Maximum air velocity	250	m/min
Airflow leakage	15	%

Source: Extract from Article N° 248 DS 024-2016 EM (air quantity and Annex 38° DS 023-2017 EM).

Table 16-34: Air Quality Parameters According to Peruvian Regulations

Chemical agents (in the air)	TWA	STEL	Limit (C)
Carbon monoxide (CO)	25 ppm		
Carbon dioxide (CO_2)	5,000 ppm	3,000 ppm	
Nitrogen dioxide (NO_2)	3 ppm	5 ppm	
Oxygen (O_2)	0.195		0.225
Hydrogen sulfide (H_2S)	10 ppm	15 ppm	

Source: Extract from Annex N° 15, DS 024-2016 EM (occupational exposure limits for chemical agents).

Ventilation at the mine includes:

- The main ventilation system;
- Auxiliary ventilation system (for stopes and blind developments).

Table 16-35 details the yearly mine ventilation air requirements (2023 and 2024 are pre-production years). It can be seen that the maximum air requirement takes place in 2026 (the first year of full production).

Table 16-35: Mine ventilation requirements

Flow	2024	2024	2025	2026	2027	2028	2029
Flow (m^3/min)	4,726	5,473	9,230	12,863	12,171	11,336	10,125
Flow (cfm)	166,906	193,267	325,943	454,268	429,816	400,327	357,552

Table 16-36 shows the detailed calculation of the air requirements for 2026, when such requirements peak.

Table 16-36: Maximum ventilation air requirements – Year 2026

Description	Quantity	Nominal Power (HP)	Elevation (%)	Effective Power (HP)	Mechanical Availability (%)	Utilization Factor (%)	Airflow	
							(m³/min)	CFM
Jumbo	3	100.5	80%	80	85%	20%	123	4,344
Scoop 6 yd³	6	270.0	80%	216	85%	83%	2,743	96,868
Shotcrete robot	2	100.5	80%	80	85%	20%	82	2,896
Concrete mixer truck	4	234.7	80%	188	85%	70%	1,341	47,343
Simba	4	100.5	80%	80	85%	20%	164	5,792
Scaler	1	69.7	80%	56	85%	20%	28	1,004
Service truck	1	100.5	80%	80	85%	70%	144	5,068
Pick-up truck	5	174.0	80%	139	85%	70%	1,242	43,874
Dump truck	9	429.0	80%	343	85%	60%	4,726	166,892
Utility truck	1	100.0	80%	80	85%	70%	143	5,043
Equipment requirement	36						10,736	379,124
Personnel requirement	75						450	15,892
Sub total							**11,186**	**395,016**
Leakage (15%)	15%						1,678	59,252
Total							**12,863**	**454,268**

Table 16-37 shows the inflow and outflow air balance and indicates a 105% coverage.

Table 16-37: Airflow in-out balance

Air inflow		
Location	**Airflow**	
	(m^3/min)	**CFM**
Magistral - Santander Pipe Ramp	4,001	141,300
RB 1	7,614	268,900
Santander Pipe Shaft	1,900	67,100
Total	**13,516**	**477,300**
Air outflow		
Location	**Airflow**	
	(m^3/min)	**CFM**
RB 2	7,088	250,300
RB 3	7,258	256,300
Total	**14,345**	**506,600**
Air requirement	12,863	454,268
Air surplus	652	23,032
Difference of inflow and air outflow	6%	
Coverage	105%	

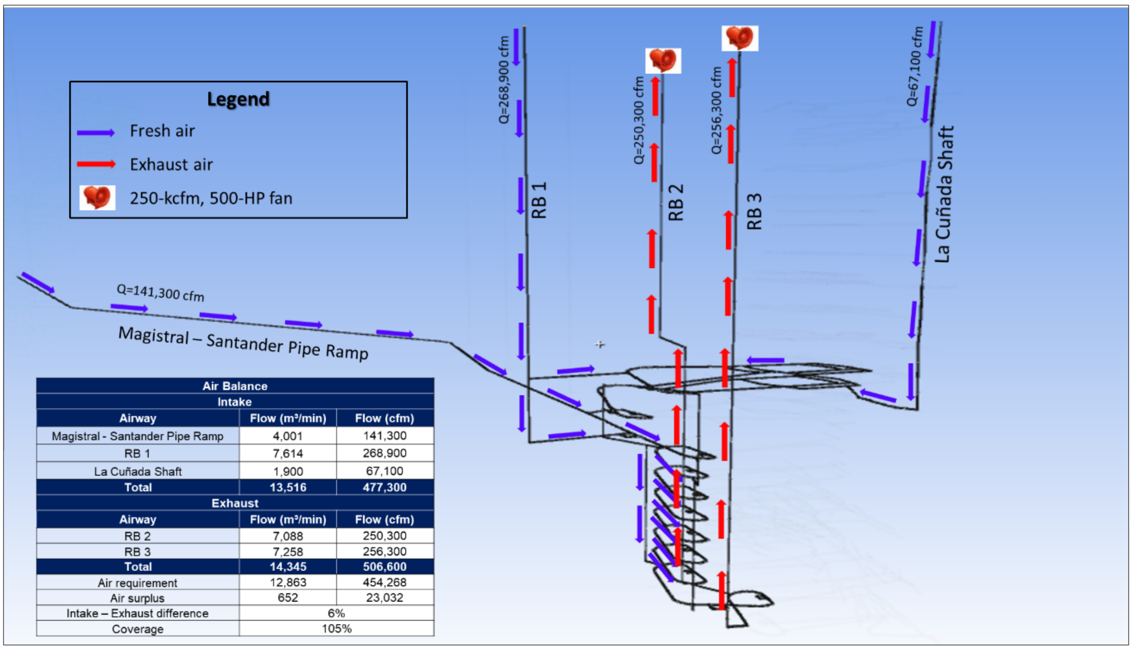
Table 16-38 shows the technical characteristics of the main exhaust fans. The selection of the fans was made with the support of the VentSim software, aligned with the current regulation and based on the maximum requirement of 454,300 cfm of fresh air flow.

Table 16-38: Specifications of main fans

Location	Type	Quantity	Airflow (cfm)	Total Pressure (" H_2O)	Power (HP)	Operation Altitude (masl)
Surface RB 2	Axial	1	250,000	9.2	500	4 470
Surface RB 3	Axial	1	250,000	9.2	500	4 470
Total		**2**	**500,000**		**1,000**	

Figure 16-22 shows the location of the fans and the ventilation circuit.

Figure 16-22: Location of main fans and ventilation circuit



Air Balance		
Intake		
Airway	**Flow (m³/min)**	**Flow (cfm)**
Magistral - Santander Pipe Ramp	4,001	141,300
RB 1	7,614	268,900
La Cuñada Shaft	1,900	67,100
Total	**13,516**	**477,300**
Exhaust		
Airway	**Flow (m³/min)**	**Flow (cfm)**
RB 2	7,088	250,300
RB 3	7,258	256,300
Total	**14,345**	**506,600**
Air requirement	12,863	454,268
Air surplus	652	23,032
Intake – Exhaust difference	6%	
Coverage	105%	

Source: Minconsulting (2023).

16.8.3 Raise Ventilation Requirements

In addition to the existing mine infrastructure and ongoing development, it will be necessary to excavate three ventilation raises from surface (raise-bored), one for fresh air inflow and two for exhaust air outflow.

Table 16-39 provides the characteristics of the ventilation raises.

Table 16-39: Specifications of the ventilation raises

Raise	Diameter (m)	Length (m)	Function
RB 1	3.10	564	Air inflow
RB 2	3.10	820	Air outflow
RB 3	3.10	831	Air outflow
Total		**2,215**	

CDPR should consider increasing the cross-section of the Magistral-Santander Pipe crosscut currently been excavated to 5.0 m x 4.5 m, in order to eliminate the necessity for the four ventilation raises included in the original underground exploration program.

16.8.4 Conclusions and Recommendations

- The air requirement for a 2,500-t/day operation is 454,300 cfm, which will be covered by the fresh air inflow of 477,300 cfm.
- To meet the air coverage target, three ventilation raises are required, one for fresh air inflow and two for exhaust air outflow, each 3.10 m in diameter and 2,215 m in total length. In addition, two 250,000 cfm fans, 9.2" H_2O of total pressure and 500 HP of motor power each are required.
- CDPR should consider increasing the cross-section of the Magistral-Santander Pipe crosscut to 5.0 m x 4.5 m, in order to eliminate the necessity for the four ventilation raises with a total length of 2,180 m.

16.9 Mine Drainage

The objective is to design the mine dewatering system for the commissioning of the Santander Pipe Project, complying with the Occupational Safety and Health Regulations in Mining, approved by D.S. N° 024-2016-EM and its amendment D.S. N° 023-2017-EM.

The scope of the dewatering system design is from the 4,090 masl Magistral level to the 3,620 masl Santander Pipe level, during the development, preparation and production of 2,500 t/day of ore.

16.9.1 Dewatering System of the Magistral Mine

The Technical Report "Cerro de Pasco Resources - NI 43-101 and Resource Estimate Update for Santander Mine Magistral and Pipe Deposits, Huaral, Department of Lima, Peru" issued by DRA on January 24, 2022, states the following:

- The mine drainage system currently removes excess groundwater from a maximum flow of 650 l/s.
- The mine has five pumping stations in the Magistral Centro zone and they are as follows (see Table 16-40):
    - Principal Station Level 4370-1
    - Secondary Station Level 4300-1
    - Secondary Station Level 4230-1
    - Secondary Station Level 4160-1
    - Secondary Station Level 4090-2

Table 16-40: Magistral Centro mine drainage system

Station	NV-4370-1	NV-4300-1	NV-4230-1	NV-4160-1	NV-4090-2
Flow Rate (l/s)	327	55	46	67	47
	327	55	62	71	50
		60	69	77	77
		68	62		
		66			
Total	**654**	**304**	**239**	**215**	**174**

- Principal station Level 4370-1 consider the following:

  Dewatering circuit N° 01:

  - 02 pumps - 800 HP installed in the Main Pond Level 4370-1, that pumps through a 20”- Ø steel pipe to the Lv surface. 4580 (average flow: 327,0 l/s – static head: 215 m).

  Dewatering circuit N° 02:

  - 02 pumps - 800 HP installed in the Main Pond Level 4370-1, that pumps through a 20” Ø steel pipe to the Lv surface. 4580 (average flow: 327,0 l/s – static head: 215 m).

- Secondary Station Level 4090-2 consider the following:

  - 02 Type “H” pumps - 150 HP installed in pond N° 1_Rp (-) 3400, pump through 6” Ø HDPE pipes to CA 4008 of Level 4160-1 (average flow: 47.0 l/s – static head: 123m).
  - 03 Type “H” pumps - 150 HP installed in pond N° 2 that pump through 6” Ø HDPE pipes to CA 4008 of Level 4160-1 (average flow: 49.7 l/s – static head: 122m).
  - 04 Type “N” pumps - 150 HP installed in pond N° 3 that pump through 6” Ø HDPE pipes to Pond CA 3855-1 of Level 4160-1 (average flow: 77.4 l/s – static head: 51m).

- The Auxiliary Station Level 4090-2 in the deepest area of the mine, consists of 01 Maxi Pump Type “H” - 58 installed at the top of Rp (-) 3400, which pumps through a 4” Ø HDPE pipes to Pond N ° 1 of Level 4090-2 (average flow: 27 l/s – static head: 59m).

16.9.2 Dewatering System of the Santander Pipe

The dewatering system of the Santander Pipe project will have two stages:

- Dewatering system for the excavation of the Magistral Ramp
- Dewatering system for the operation of the Santander Pipe mine

16.9.2.1 *Dewatering System of Magistral – Santander Pipe Ramp*

The conceptual mine access study carried out by Subterra (Subterra, 2022), indicates an estimated flow of 20 l/s of water during the ramp excavation; this flow considers applying pre-grouting in localized high-permeability areas to prevent high inflows. Therefore, a maximum flow of 20 l/s is assumed for the sizing of the pumps that will operate during the construction of the Magistral ramp.

Design Parameters

- Discharge elevation: 4,096 masl, Magistral Secondary Pumping Station, Level 4090-2.
- Pumping start elevation: 3,924 masl, Santander Pipe pumping station.
- Ramp length: 1,500 m
- Ramp slope: 12%
- Flow rate: 20 l/s
- Pipe diameter: 4”

Dewatering System Dimensioning

The components of the dewatering system were determined with the support of the Pumpsim software, as follows:

- A main sump on Level 4015: 15 m x 4 m x 4 m
- A main sump on Level 3924: 15 m x 4 m x 4 m
- An auxiliary sump every 200 m: 60 m3
- A HDPE pipe line
    - Length: 1,500 m
    - Nominal diameter: 4”
    - Inner diameter: 89 mm
    - External diameter: 109 mm
    - Rating: 16 bars
- Three 70-HP pumps, with a capacity of 20 l/s, two in operation and one in stand-by (see Table 16-41).

Table 16-41: Specifications of Magistral – Santander Pipe ramp drainage pumps

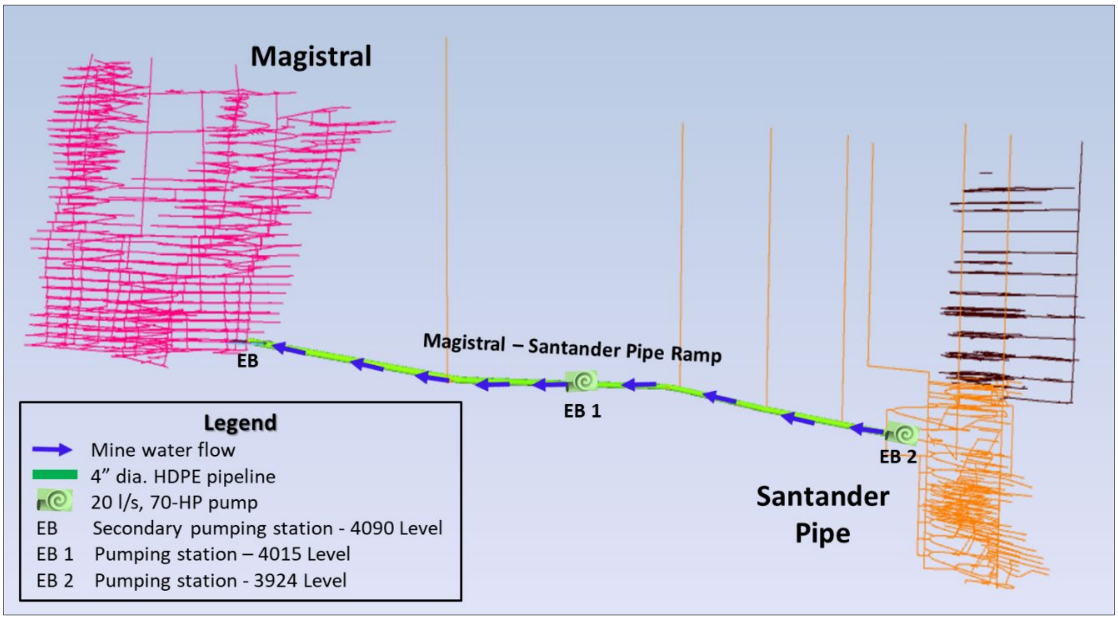
Operating Altitude	Pipe Diameter (in)	Flow Rate (l/s)	Pumping Height (m)	Efficiency	Derating Factor	Power (HP)	Selected Power (HP)
4015 masl	4	20	152.10	80%	79%	63	70
3924 masl	4	20	157.20	80%	79%	65	70

The water resulting from the ramp excavation will be managed as follows:

- Install the 4” diameter HDPE pipe network.
- Build auxiliary 60-m3 sumps every 200 m that will be equipped with 20-l/s pumps.
- 750 m from the beginning of the ramp, at level 4015, a 15 m x 4 m x 4 m sump will be excavated, where one 20-l/s, 70-HP pump will be installed.
- 1500 m from the beginning of the ramp, at Level 3924, another 15 m x 4 m x 4 m sump will be excavated, where one 20-l/s, 70-HP pump will be installed.
- The water pumped from the ramp will be discharged at the Secondary Station Level 4090-2, from there it will be integrated into the pumping system of the Magistral mine.
- The design flow of 20 l/s must be confirmed by a hydrogeological study of the project area.

Figure 16-23 shows the ramp excavation dewatering system.

Figure 16-23: Magistral – Santander Pipe ramp dewatering system



Source: Minconsulting (2023).

16.9.2.2 *Dewatering System of the Santander Pipe Mine*

Santander Pipe mine operations will be approximately similar to Magistral central zone, where 215 l/s and 174 l/s are pumped through Secondary Stations Level 4160-1 and Level 4090-2, respectively. According to BISA (1993), the pumping rate at the Santander Pipe before mine closure was 2,500 gallons/minute, equivalent to 158 l/s.

For the dimensioning of the installed capacity of the Santander Pipe drainage system, an average flow of 200 l/s is assumed. Likewise, it is assumed that the Santander Pipe shaft will be drained and commissioned with a mine dewatering capacity of 200 l/s.

Design Parameters

- Discharge elevation: 4,380 masl, existing drainage tunnel to Baños River (“*Baños Tunnel”*).
- Pumping start elevation 3,620 masl, Santander Pipe pumping station.
- Flow rate: 200 l/s
- Pipe diameter: 12” y 14”

Dewatering System Dimensioning

Section 1: Between Level 3620 and Level 3924, Santander Pipe.

- Two pumping stations: at level 3620 and level 3780.
- Three HDPE pipe lines.
    - Nominal diameter: 14”
    - Inner diameter: 250 mm
    - External diameter: 356 mm
    - Rating: 18.41 bars
- Two sumps of 15.0 m x 4.0 m x 4.0 m each.
- Three 400-HP, 100-l/s pumps, two in operation and one in stand-by.
- Three 350-HP, 100-l/s pumps, two in operation and one in stand-by (see Table 16-42).

Table 16-42: Pump selection – Santander Pipe Lower Zone

Location	Operating Altitude	Pipe Diameter (in)	Flow rate (l/s)	Pumping Height (m)	Efficiency	Derating Factor	Power (HP)	Selected Power (HP)
Santander Pipe	3620 masl	14	100	167.80	80%	79%	349	400
	3780 masl	14	100	145.90	80%	79%	303	350

Section 2: Between Level 3924 and Level 4380, existing drainage tunnel to Baños River (“Baños Tunnel”).

- Two pumping stations: level 3924 and level 4220.
- Three lines of galvanized steel pipes.
    - Nominal diameter: 12”
    - Inner diameter: 289 mm
    - External diameter: 324 mm
    - Rating: 34.68 bars
- Two sumps of 15.0 m x 4.0 m x 4.0 m each.
- Three 600-HP, 100-l/s pumps, two in operation and one in stand-by.
- Three 450-HP, 100-l/s pumps, two in operation and one in stand-by (see Table 16-43).

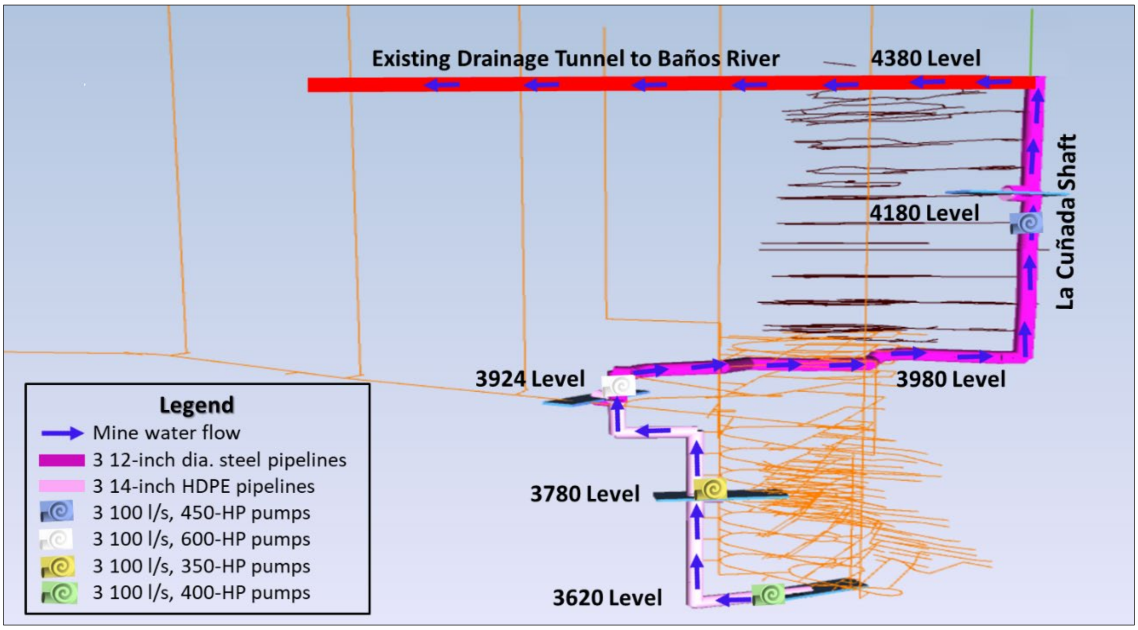
Table 16-43: Pump selection - Santander Pipe Upper Zone

Location	Operating Altitude	Pipe Diameter (in)	Flow Rate (l/s)	Pumping Height (m)	Efficiency	Derating Factor	Power (HP)	Selected Power (HP)
La Cuñada Shaft	3924 masl	12	100	259.40	80%	79%	540	600
	4220 masl	12	100	203.30	80%	79%	423	450

Three pumping lines are considered in parallel because the design flow rate of 200 l/s was assumed based on information from the Magistral mine and historical data from Santander Pipe mine, which must be confirmed with a hydrogeological study of the project area.

Figure 16-24 shows the proposed Santander Pipe mine Dewatering system.

Figure 16-24: Dewatering system of the Santander Pipe



Source: Minconsulting (2023).

16.9.2.3 Conclusions and Recommendations

- The Santander Pipe mine dewatering system, in the production stage, must be independent of the Magistral mine. Magistral installed pumping capacity is limited to a maximum flow rate of 650 l/s.
- The design flow rate for the dewatering system of the Santander Pipe mine operation was assumed to be 200 l/s based on information from the Magistral mine drainage system, where 215 l/s and 174 l/s are pumped through Secondary Stations Level 4160-1 and Level 4090-2, respectively. This conceptual design also considered the historical

pumping rate of 2,500 gallons/minute, equivalent to 158 l/s, at the old Santander Mine operation. A hydrogeological study must be carried out in the next phase of the project to confirm the expected water inflows at the Santander Pipe.

16.10 Backfill

The use of waste rock fill has been considered for this study. Table 16-44 shows an estimate of the volume of rock fill that the Santander Pipe mine will require.

It will be important for the following phases of the project to carry out the necessary studies on the possibility of using backfill that can provide stope support, particularly in the lower zone where the characteristics of the mineralization may require support for dilution control.

Table 16-44: Backfill requirements - Santander Pipe

	Total	2023	2024	2025	2026	2027	2028	2029
Rock fill (m^3)	1,034,394	0	0	63,472	240,252	250,267	263,191	217,212

16.11 Maintenance Facilities

To increase the productivity of the operation, the location of a maintenance workshop within the underground mine is considered, which must be located at the end of the Magistral ramp. This workshop will support major and minor maintenance work, both preventive and predictive. The workshop must have the following infrastructure:

- Washing area for mechanical equipment.
- Maintenance area for jumbos and scoops.
- Spare parts warehouse.
- Oils and lubricants storage.
- Tire storage.
- Welding area including a ventilation raise.
- Electric board.
- Grease trap.
- Sanitary facilities.
- Maintenance office.

16.12 Other Services and Infrastructure

Other complementary underground infrastructure services include two underground explosives magazines, refuge and rescue chambers for personnel, as well as two canteens inside the mine and warehouses for service material.

The supply of compressed air will be considered for activities such as concrete pouring, loading of drills, among other activities; this will require the use of two compressors with a capacity of 800 CFM and a 300-HP motor, considering the same installed capacity as that in the Magistral mine.

17 RECOVERY METHODS

This Section has been summarised and updated from the Report available on SEDAR entitled "Cerro de Pasco Resources - NI 43-101 and Resource Estimate Update for Santander Mine Magistral and Pipe Deposits, Huaral, Department of Lima, Peru, issued on January 24, 2022 prepared for Cerro de Pasco Resources with an effective date of December 31, 2021.

17.1 Plant Flowsheet and Process Description

The Santander concentrator was designed by Holland & Holland and built co-jointly by Trevali Peru S.A.C, and Glencore Los Quenales. The now Santander concentrator was purchased, relocated, and refurbished from what was previously the Los Quenales' Rosaura concentrator. Production rates increased from 1,250 t/d to 2,000 t/d with the addition of additional new equipment.

Operations began in 2013 with continual optimization of the plant and processing of the Santander Mine Magistral ore. Current plant operations is led by CDPR management overseeing contracted labour, staff and supervision (Tecnomin). The plant is operated 24 hours a day 7 days per week with monthly scheduled downtime to perform planned maintenance. Since operations began, the plant has operated trouble-free, experiencing only minimal unplanned breakdowns, and processing a total of 7.07 million tonnes of Magistral ore up to the end of December 2022.

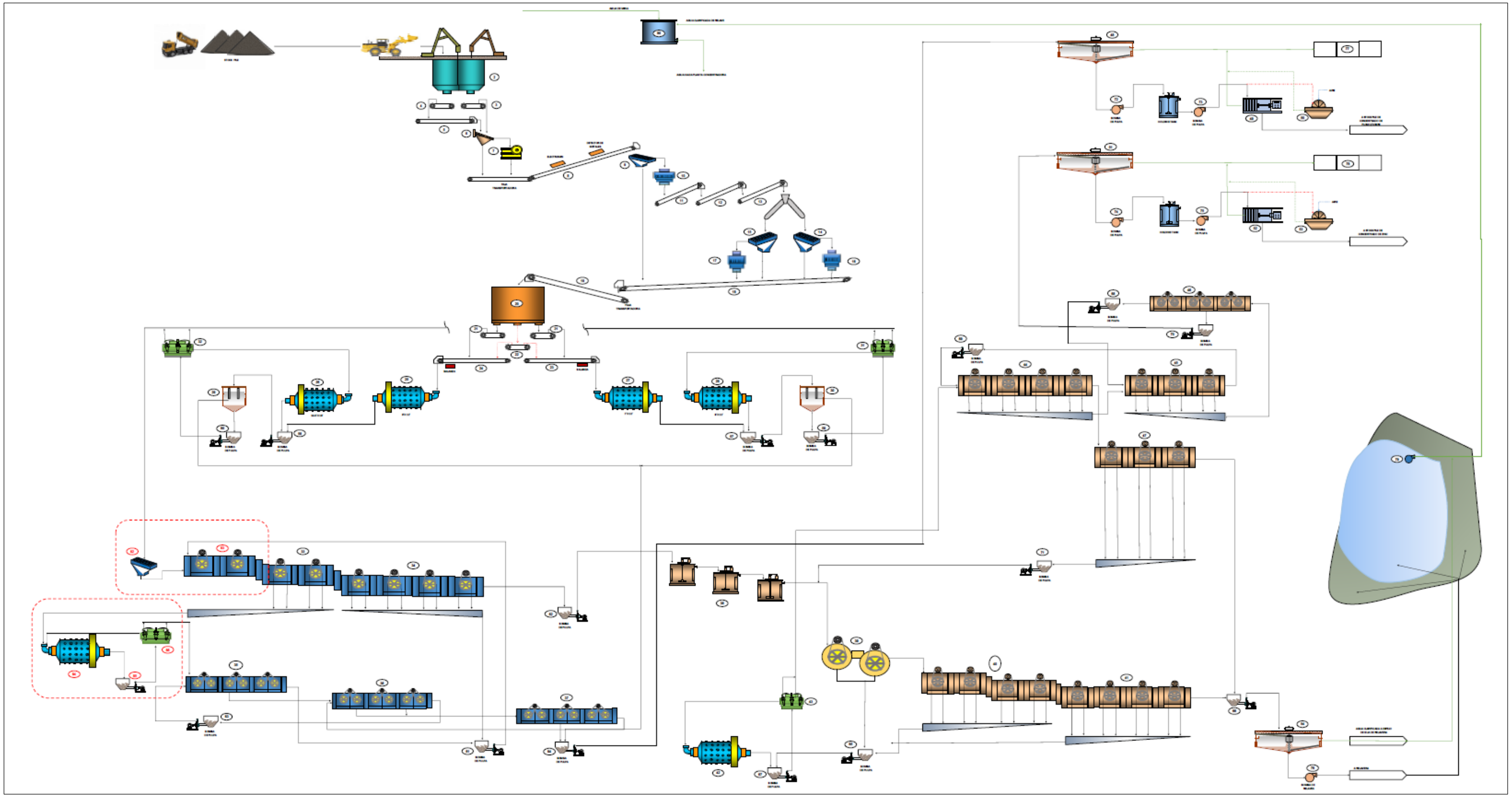
The Santander concentrator currently processes Magistral ore and has two (2) distinct flotation circuits, one to concentrate lead and the other for zinc concentrate production. To upgrade the Santander concentrator to have the ability to also process Santander Pipe mineralized material to produce copper concentrate, the existing lead flotation circuit will need to be modified.

The concentrator utilizes a three-stage crushing plant to reduce ROM material to a nominal size of 80% passing 25 mm. The crusher product is then fed into a rod-ball mill circuit where the minerals are prepared for flotation. A sequential flotation circuit is used to recover the valuable minerals into separate concentrates. The concentrates are then dewatered and trucked to Callao.

Figure 17-1 illustrates the Santander concentrator flowsheet and additional equipment required to process Santander Pipe Lower Zone mineralized ore and is marked with red boxes. It is possible to see that only the lead flotation circuit will need to be modified.

Table 17-1 presents the Santander Plant major installed equipment list including the equipment required to produce copper concentrates by retrofitting equipment to the existing lead flotation circuit and is highlighted in red. A horizontal regrind ball mill and ancillary equipment will need to be added to regrind copper rougher concentrates prior to cleaner flotation. A horizontal vibrating screen should also be installed to remove trash and any coarse oversize from the rougher flotation feed stream.

Figure 17-1: Santander Concentrator Plant Flowsheet with Proposed Upgrades



Source: Modified from CDPR (2022).

Table 17-1: Equipment List

Description	Equipment	Capacity	HP
CRUSHERS			
Rockbreaker	BTI		30
Rockbreaker	SANDVIK		30
Apron Feeder		36”	
Apron Feeder		42”	
Conveyor Belt 1A			15
Double Deck Screen	DD SIMPLICITY	4´x12´	25
Primary Jaw Crusher	SANDVIK CJ-211	24"x36"	125
Conveyor Belt N°1			25
Electromagnet	ERIEZ SE-7125		15
Secondary Screen	DD SANDVIK	5´x14	25
Secondary Cone Crusher	SYMONS	4 1/4´	200
Conveyor Belt N°2			25
Conveyor Belt N°3			40
Conveyor Belt N°4			25
Tertiary Screen N°1		5´x14´	25
Tertiary Screen N°2		5´x14´	25
Tertiary Cone Crusher N°1	SANDVIK - CH-430	3´	175
Tertiary Cone Crusher N°2	SANDVIK - CH-430	3´	175
Conveyor Belt N°5		36"x151m	50
Conveyor Belt N°6		36"x110m	40
			870
MILL			
Belt Feeder s1@3			33
Conveyor Belt N°7		36"x48m	20
Conveyor Belt N°8		36"x48m	25
Rod Mill N°1	COMESA	7´x12´	400
Ball Mill N°1	COMESA	8´x12´	600
Rod Mill N°2	MARCY	9.5´x12´	500
Ball Mill N°2	COMESA	10.5´x13´	800
Pumps N°1 and 2	WILFLEY 5K		100
Pumps N°3 and 4	WILFLEY 5K		150
Pumps N°7 and 8	M&M SRL-C	5"X4"	100
Vertical Spindle Pumps (2)			25
Hidrostal Pump			25
			2,778

Description	Equipment	Capacity	HP
FLOTATION			
Horizontal Vibrating Screen	VIBRAMECH H1-36-12	4’x12’	8
Rougher Cell - Pb (4)	OUTOKUMPU	N°8	25
Scavenger Cell - Pb (4)	OUTOKUMPU	N°8	25
Primary Cleaner Cells - Pb (6)	DENVER	Sub A-24	40
Tertiary Cleaner Cells - Pb (2)	DENVER	Sub A-24	40
Regrind Ball Mill	FTM	4’x8’	40
Secondary Cleaner Cells - Pb (4)	DENVER	Sub A-24	40
Pumps N°2 and 3°			100
Pumps N°1A and 1B			15
Pumps N° 4A and 4B	WILFLEY		75
Pumps N° 5A and 5B			20
Zinc Conditioners (3)		8´x8´	12.5
Rougher Cells - Zn (2)	OUTOKUMPU	N°30	60
Second Rougher Cells - Zn (4)	OUTOKUMPU	N°8	40
Scavenger Cells - Zn (4)	OUTOKUMPU	N°8	25
Regrind Ball Mill		5´x10´	250
Primary Cleaner Cells - Zn (4)	OUTOKUMPU	N°8	25
Primary Scavenger Cleaner Cells - Zn (3)	OUTOKUMPU	N°8	25
Second Cleaner Cells - Zn (3)	OUTOKUMPU	N°8	30
Third Cleaner Cells - Zn (6)	DENVER	N°30	40
Secondary Scavenger Cleaners - Zn (6)	DENVER	N°30	40
Pumps N° 105 and 106			100
Pumps N° 107A and 107B			30
Pumps N° 110A and 110B			25
Pumps N° 108A and 108A-1			25
Pumps N° 108AB and 108B-1			25
Pumps N° 102 and 102A			25
Pumps N° 101 and 101A			25
Pumps N° 109A and 109B			25
Pumps N° 103 and 104			150
			1,405.5

Description	Equipment	Capacity	HP
FILTERS			
Pressure Filter Pb	ANDRITZ	1200x1200	30
Thickener Pb		30´x10´	25
Pressure Filter Zn	ANDRITZ	1500x1500	30
Thickener Zn		50´x12´	25
Holding Tank (2)			15
Peristaltic Pump (4)	BREDEL		30
Pumps N° 11, 12, 02 and 03			20
Vertical Spindle Spillage Pumps (3)		2.5"	20
			195
TAILINGS			
Tailings Pump	WILFLEY 5K		60
Open Pit Pump			25
Pumps 2290 1 and 2	FLY 2400		125
			210
		TOTAL	**5,462.5**

17.2 Production Plan

Table 17-2 presents annual recovery data for processed Magistral Mine ore at the Santander concentrator plant from 2017 to 2022.

Table 17-2: Magistral Concentrate Production 2017 –2022

Year	Tonnes	Tonnage (t)		Recoveries (%)			Grades		
		Zn Conc.	Pb Conc	Zn	Pb	Ag	Zn(%)	Pb(%)	Ag (Oz/t)
2017	839,546	60,841	10,792	87.38	81.21	64.55	47.56	47.27	58.79
2018	803,263	64,923	7,636	89.27	78.72	60.54	47.69	50.18	65.23
2019	875,680	82,484	11,543	87.77	83.01	62.11	46.82	49.91	56.96
2020	724,341	70,836	6,426	89.76	81.36	60.10	47.70	50.40	67.38
2021	694,038	56,282	5,281	94.23	77.93	62.05	47.63	47.67	76.69
2022	533,563	37,001	1,488	94.57	67.55	43.14	47.84	50.56	75.89

CDPR has completed a recent production plan which involves processing of the Magistral Mine for three (3) years followed by processing of mineralized material from the Santander Pipe. Table 17-3 presents the production and the demarcation between the tonnage from the Magistral Mine and Santander Pipe.

Table 17-3: Production Plan for Magistral and Santander

Year	Tonnage		
	Magistral Mine (t/y)	**Santander Pipe** (t/y)	**Combined Total** (t/y)
2023	678,500	0	678,500
2024	708,768	0	708,768
2025	130,392	539,827	670,219
2026	0	900,000	900,000
2027	0	900,000	900,000
2028	0	900,000	900,000
2029	0	606,736	606,736
Total	**1,517,660**	**3,846,563**	**5,364,223**

17.3 Crushing

Run-of-mine (ROM) material is delivered to the primary crusher pad where it is stored for blending prior to crushing. A fixed grizzly (12 inches aperture), located above the coarse ore bin, prevents oversized material from entering the primary crusher. A rock breaker located above the grizzly is used to break oversized rocks.

The coarse material bin (75 t live capacity) discharges to two (2) 36 in and 42 in wide apron feeders. The discharge from the bin is screened on a 4 ft by 12 ft double deck screen with 8-inch apertures on the top deck and 4-inch apertures on the bottom deck. Screen undersize passes to the collection conveyor while the oversize from screen oversize passes to the 24-inch x 36-inch primary jaw crusher.

Jaw crusher discharge combines with the by-pass fines for conveying to the secondary cone crusher. A 5-ft by 14-ft double deck screen ahead of the 4.25-ft standard Symons cone crusher is fitted with 3-inch aperture upper deck screen panels and 1 inch aperture lower deck panels. Fines less than 1 inch passes to the tertiary crushers while the oversize from the screen passes to the secondary cone crusher operating in open circuit.

The secondary cone crusher discharge combines with the screen fines greater than 1 inch and are conveyed to the tertiary screens. Tertiary screen oversize passes to two tertiary cone crushers. The cone crushers are 3-ft short head units, operating in open circuit. Fines from each tertiary screen combine with tertiary cone crusher discharge and are fed to the fine ore bin, as nominal 1 inch top size material.

17.4 Grinding

The grinding stage consists of two circuits in parallel, each containing a primary rod mill in open circuit, followed by a secondary ball mill in closed circuit.

The first circuit has a 7 ft by 12 ft rod mill, operating with an 8 ft by 12 ft ball mill. The second circuit has a 9.5 ft by 12 ft rod mill, operating with a 10.5 ft by 13 ft secondary ball mill. Both circuits are identical in operation and are described below.

A 1,800-t fine ore bin discharges onto two (2) belt feeders equipped with weight-o-meters for metallurgical accounting purposes. The belt feeders deliver the ore to their respective rod mill with a third feeder present as a standby unit.

The discharge from both the rod and ball mills are combined and pumped to a skim-air (SK) flotation cell for high-grade copper recovery. The SK flotation cell concentrate reports to the final copper concentrate.

The SK flotation cell tailing is pumped to a cyclone battery of 15-inch cyclones. Cyclone overflow from the first circuit is recycled into the feed of the copper crushing circuit and mixed with the fine ore bin discharge, while the cyclone underflow is circulated back into the ball mill feed chute for further grinding.

Cyclone overflow from the second circuit feeds the flotation circuit at approximately 35% solids w/w and at a P_{80} of 105 microns.

17.5 Flotation and Dewatering

The flotation circuit will need to be modified slightly for the Santander Pipe material. Two (2) additional equipment items will be added to the lead flotation circuit: a trash screen and regrind mill. As a result, the existing lead circuit will be modified to produce copper concentrate from the Santander Pipe deposit.

The flotation circuit consists of a two-stage sequential float. When processing Magistral material, lead is floated prior to zinc flotation by depressing the zinc sulphides, which are then activated and floated. With material from Santander Pipe, copper minerals are floated prior to separate zinc flotation.

The feed entering the flotation circuit is screened on a 4 ft by 12 ft horizontal high-frequency vibrating screen for cleaning prior to flotation. The copper rougher-scavenger flotation cells consist of eight (8) OK8 unit cells, in a 2-2-4 configuration. The first two (2) cells will be used as conditioning cells followed by two (2) flotation cells to produce a copper rougher concentrate that passes to the copper regrind cluster cyclones.

The last four (4) cells produce a copper scavenger concentrate which is pumped back to the head of the copper circuit. Scavenger tailings form the feed to the zinc circuit.

The underflow from the regrind cyclone cluster in the regrind circuit goes to a 4 ft by 8 ft regrind mill operating in closed circuit with the cyclone cluster. Cyclone overflow passes to the primary copper cleaners.

The primary cleaner consists of six (6) DR24 cells, with primary cleaner tailings combining with the scavenger concentrate, which are recycled to the head of the copper circuit. Concentrate from the primary cleaner flows by gravity to the secondary copper cleaners, which consists of four (4) DR24 cells. Tailings from the secondary cleaners pass to the feed box of the primary copper cleaner. The concentrate from the secondary cleaners flows by gravity to the two-cell DR24 tertiary copper cleaners. The tailings from the tertiary copper cleaners pass to the secondary copper cleaners, while the tertiary concentrate (final copper concentrate) is sampled by an automatic cutter and pumped to the copper concentrate thickener.

The tailings from the copper circuit are conditioned with reagents in three (3) zinc conditioner tanks in series. The discharge from the third conditioner flows by gravity to the first zinc rougher flotation cells consisting of two (2) OK30 tank cells operating in series. The discharge from the second tank cell gravitates to a bank of eight (8) OK8 cells operating as the second zinc rougher and scavenger bank in a 2-2-4 configuration. Tailings from the zinc scavenger bank (final tailings) flow to the tailings thickener.

Concentrate from the two (2) tank cells and the eight (8) rougher-scavenger cells combine and are fed to the zinc regrind cluster cyclones.

Regrind circuit feed is classified using 10 inch cyclones, with the underflow passing to the 5 ft by 10 ft regrind mill operating in closed circuit with the cyclone cluster. Cyclone overflow passes to the primary zinc cleaner that consists of seven (7) OK8 cells. Four (4) cells operate as the first cleaner, with concentrate fed to the secondary zinc cleaner, while the tailings are fed to the zinc cleaner scavenger. Cleaner scavenger concentrate is recycled to the head of the zinc feed while the tailing discharges as final tailings.

The secondary zinc cleaner consists of three (3) OK8 cells. Tailings from the second cleaner are recycled to the first cleaner, while the concentrate from the second zinc cleaner gravitates to the third-stage zinc cleaner.

The third zinc cleaner consists of six (6) DR30 cells. Tailings from the third zinc cleaner recycle to the second zinc cleaner, while the concentrate passes to the zinc concentrate thickener for dewatering.

The diameters of the copper concentrate thickener, zinc concentrate thickener, and tailings thickener are 30 ft, 50 ft, and 80 ft, respectively.

Water from the concentrate thickeners passes to sedimentation ponds prior to discharging to the process water system where they are recycled back to the plant. Water from the tailing thickener is gravity fed to the tailings pond prior to being recycled back to the process water system.

Tailing thickener underflow (nominal 50-60 % solids by weight) is pumped to the tailing disposal dam. The concentrate thickener underflow is fed to holding tanks and used as a feed supply to the filter units.

The copper concentrate is filtered by an Andritz plate filter press. Concentrate (nominal moisture content 6-7% by weight) is discharged, by gravity, to the holding shed below for storage prior to being dispatched to Callao.

A 29-plate 1.5 m square fully automated unit filters the zinc concentrate. The concentrate (nominal 8% moisture by weight) is discharged to the holding pen below the filter for storage prior to despatch to the port of Callao.

A standby 5-disc filter is available with a diameter of 6 ft.

17.6 Mass Balance

Mass and water balances for Santander Pipe material have been calculated at the PEA level based on the flowsheet developed and the selected design criteria.

Table 17-4 and Table 17-5 summarize the mass balance for copper and zinc flotation, respectively, at an average throughput rate of 106 t/h. Fresh water requirements are of 100 to 200 m³/h (Figure 17-2 and Figure 17-3).

The throughput and flow rate average rates are expressed in one (1) m³/h of water is equivalent to one (1) t/h.

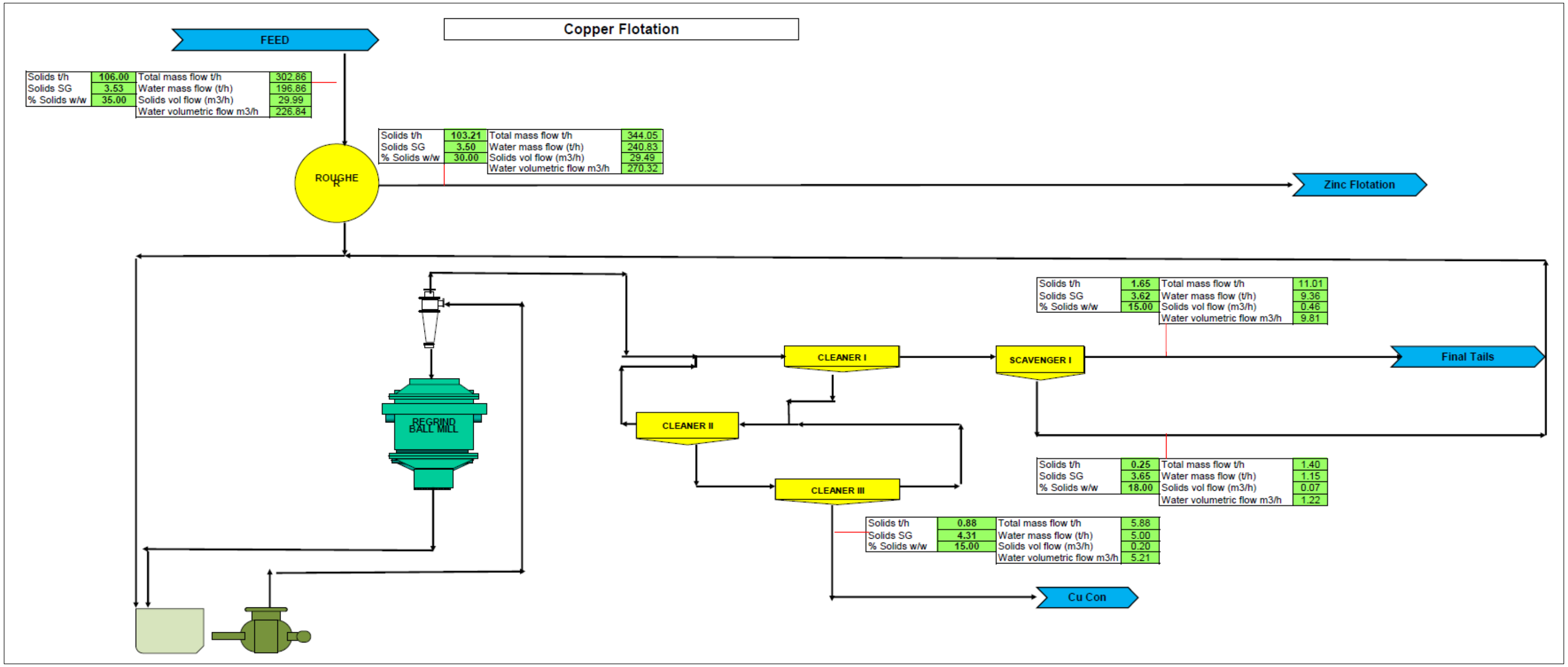
Table 17-4: Mass Balance Copper Flotation

Description	Solids (t/h)	Total Mass Flow (t/h)	Water Mass Flow (t/h)	Solid Volumetric Flow (m³/h)	Water Volumetric Flow (m³/h)
Rougher Feed	106	302.86	196.86	29.99	226.84
Cu Rougher Tails	103.21	344.05	240.83	29.49	270.32
Cu III Cleaner Concentrate	0.88	5.88	5	0.20	5.21
Scavenger Tails	1.65	11.01	9.36	0.46	9.81
Scavenger Concentrate	0.25	1.40	1.15	0.07	1.22

Table 17-5: Mass Balance Zinc Flotation

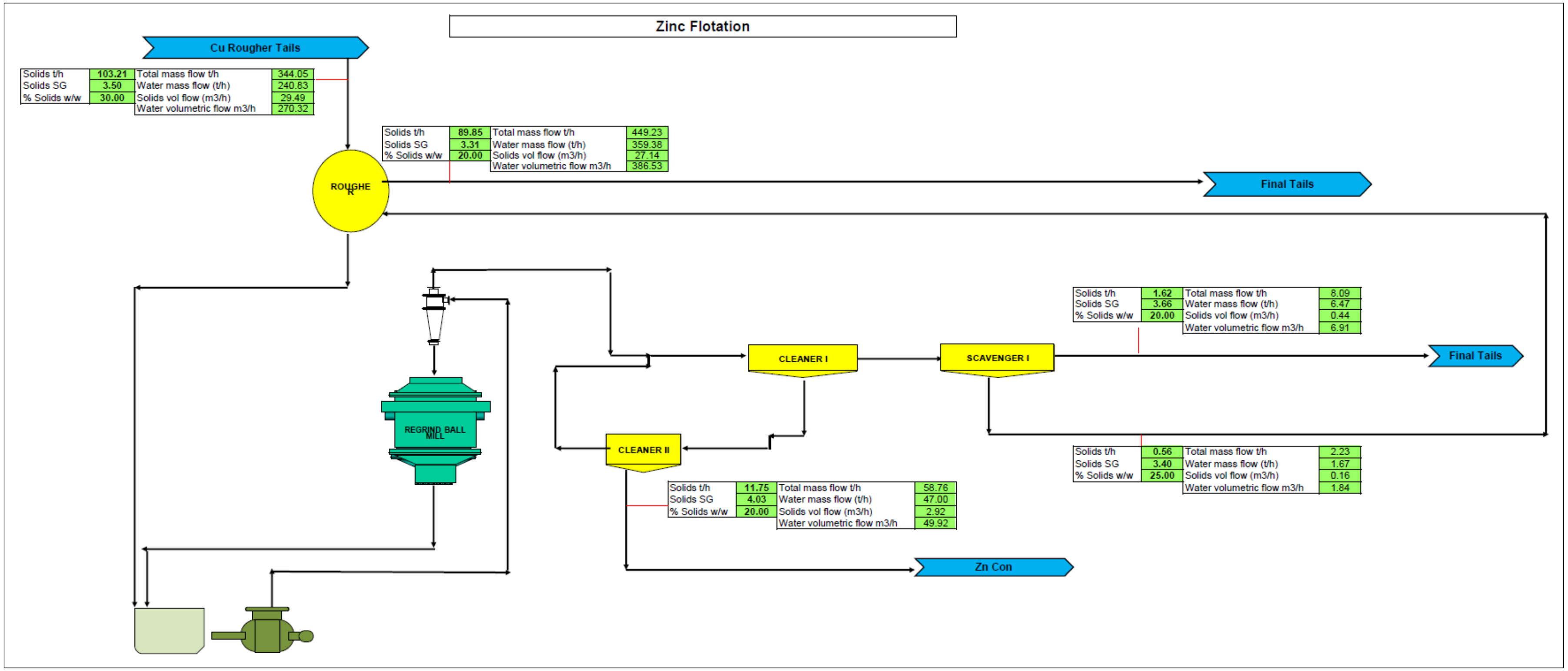
Description	Solids (t/h)	Total Mass Flow (t/h)	Water Mass Flow (t/h)	Solid Volumetric Flow (m³/h)	Water Volumetric Flow (m³/h)
Rougher Feed	103.21	344.05	240.83	29.49	270.32
Zn Rougher Tails	89.85	449.23	359.38	27.14	386.53
Zn II Cleaner Concentrate	11.75	58.76	47.00	2.92	49.92
Scavenger Tails	1.62	8.09	6.47	0.44	6.91
Scavenger Concentrate	0.56	2.23	1.67	0.16	1.84

Figure 17-2: Copper Flotation



Source: Modified from Original DRA, 2023.

Figure 17-3: Zinc Flotation



Source: Modified from Original DRA, 2023.

18 PROJECT INFRASTRUCTURE

The property is self-sufficient in terms of infrastructure required to support day-to-day production from the existing Magistral mine, and most of it was constructed during the pre-production period of 2011 through 2013, with the only external inputs being electrical reticulation, fuel, and processing reagents. The process plant was designed by Holland and Holland, and commissioned by Trevali and Glencore Los Quenuales.

18.1 Access

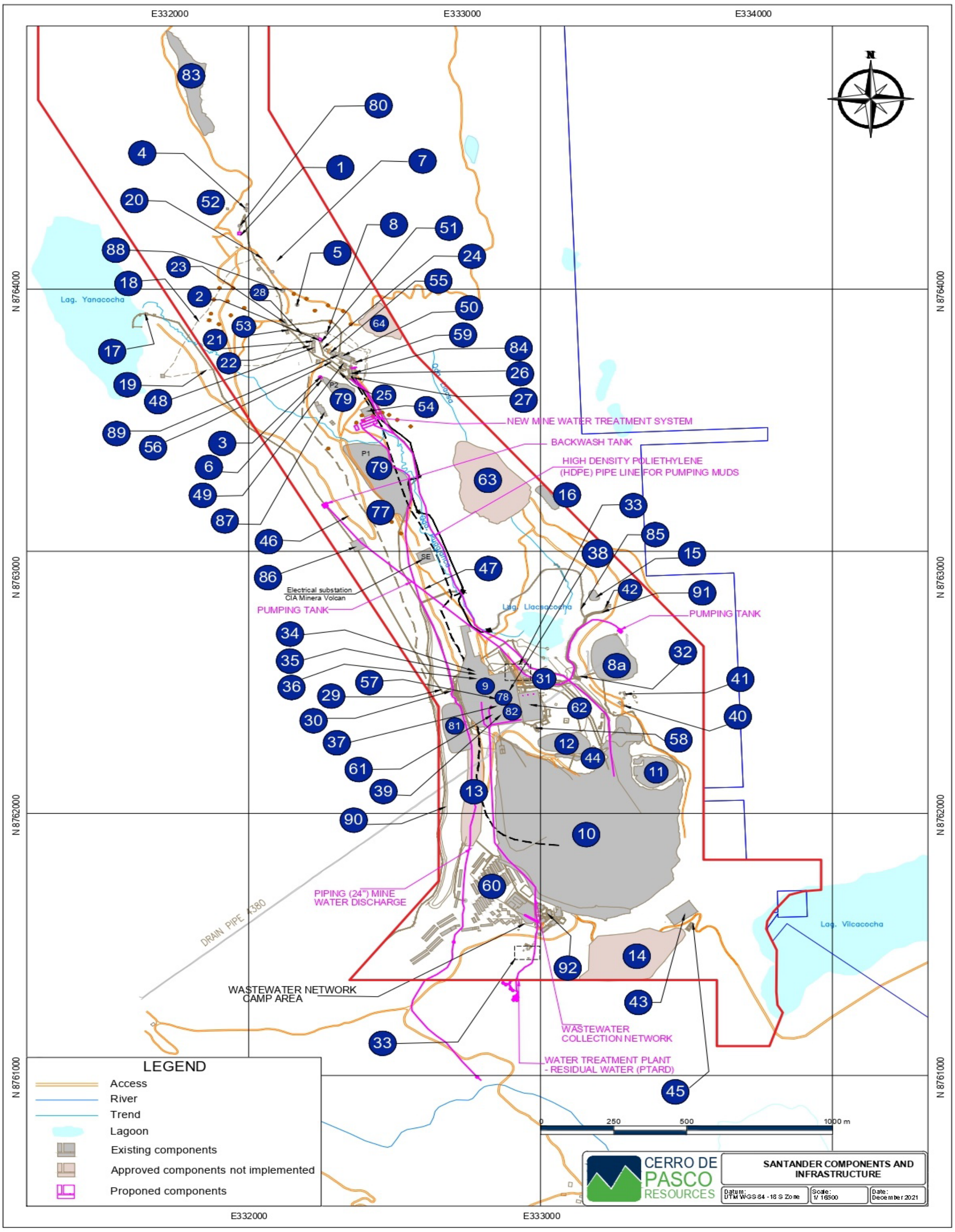
Access to the project is described in Section 5. In summary, the site can be accessed via three different routes serving as the means for transporting goods and consumables to the project and transporting concentrates from the project to the port of Callao, near Lima.

Route 1, via the town of Canta, is the preferred route for the transporting of personnel, materials, and consumables to the Project. It is currently being upgraded by the Government with large sections of road been widened and paved.

18.2 Mine Site Facilities

The Magistral mine, Santander Pipe mine, concentrator plant, TSF and water storage facility (WSF) (acid water storage and treatment), and all other mine facilities are located between an elevation of 4,200 and 4,700 masl. All mine facilities are located within 5 km of the process plant (Figure 18-1).

Figure 18-1: Location of infrastructure mentioned in Table 18-1



Source: CDPR (2021).

The on-site facilities include:

- Processing plant, facilities and equipment list described in Section 17 (Recovery Methods).

- Principal central substation, electrical substations, substation No. 6 (mine level 4370 MC), No. 7 (mine level 4300 MN), No. 8 (mine level 4300 MC), No. 9 (mine level 4230 MC), No. 10 (mine level 4370 MC), No. 11 (mine level 4160 MC), and No. 12 (mine level 4090 MC).
- Magistral mine entrances; Magistral North (4670 level), Magistral Central (4580 Level), Magistral South (4540 Level).
- Santander Pipe shaft collar.
- Tailings Storage Facility (TSF).
- Pumping and water treatment; separate underground pumping systems for acidic (approximately 15% of total) and neutral waters (approximately 85% of total), surface drainage and pumping network, acid neutralization facility and industrial water treatment facility.
- First aid and emergency response building (including ambulance).
- Assay laboratory (SGS managed).
- Core logging facility and core sheds (various).
- Guardhouses (various).
- Canteen and dining facilities (staff and workers).
- Staff and workers camp.
- Staff offices (safety, security, environment, human resources, technical services and management).
- Contractor offices (mine, plant and other contracted services).
- Truck shop.
- Truck wash facility.
- Shotcrete plant.
- Warehouse.
- Fuel storage and distribution facilities.
- Reagent storage and distribution facilities.
- Explosive magazines.

The list of existing project infrastructure is presented in Table 18 1.

Table 18-1: List of Existing Project Infrastructure

<table>
<tr><th colspan="2">EXISTING COMPONENTS</th><th colspan="3">EXISTING COMPONENTS</th></tr>
<tr><td>1</td><td>Mine Entrance Level 4670 (Magistral North)</td><td>48</td><td colspan="2">Compressed air housing</td></tr>
<tr><td>2</td><td>Mine Entrance Level 4580 (Magistral Central)</td><td>49</td><td colspan="2">Lamp house and training room</td></tr>
<tr><td>3</td><td>Mine Entrance Level 4540 (Magistral South)</td><td>50</td><td colspan="2">Maintenance workshop</td></tr>
<tr><td>4</td><td>Ventilation Raise CH 2110V (Troncal N°1)</td><td>51</td><td rowspan="4">Electrical substation</td><td>Main substation</td></tr>
<tr><td>5</td><td>Ventilation Raise CH 1630V (Troncal N°2)</td><td>52</td><td>Substation 2011</td></tr>
<tr><td>6</td><td>Ventilation Raise CH 1390V</td><td>53</td><td>Substation 1630</td></tr>
<tr><td>7</td><td>Ventilation Raise CH 1860 S</td><td>54</td><td>Substation 1690</td></tr>
<tr><td>8</td><td>Ventilation Raise CH 1540 S</td><td>55</td><td colspan="2">Canteen, mine office and warehouse</td></tr>
<tr><td>8a</td><td>Santander Pipe mine Shaft</td><td>56</td><td colspan="2">Toilets & septic tanks</td></tr>
<tr><td>9</td><td>Industrial zone (Process Plant)</td><td>57</td><td>Assay Laboratory</td><td>Laboratory in Process Plant zone</td></tr>
<tr><td>10</td><td>Tailings storage facility (TFS)</td><td>58</td><td colspan="2">Fuel station</td></tr>
<tr><td>11</td><td>Waste Dump Desmonte 1 (Ex depósito de desmonte Tacora)</td><td>59</td><td colspan="2">Used oil deposit</td></tr>
<tr><td>12</td><td>Waste Dump 2</td><td>60</td><td colspan="2">Workers camp</td></tr>
<tr><td>13</td><td>Waste Dump 1</td><td>61</td><td>Industrial zone</td><td>Offices</td></tr>
<tr><td>14</td><td>Waste Dump Chupa</td><td>62</td><td colspan="2">Staff camp</td></tr>
<tr><td>15</td><td>Borrow area for top soil</td><td>63</td><td colspan="2">Waste Dump Polvorin</td></tr>
<tr><td>16</td><td>Borrow area for top soil (explosive magazine)</td><td>64</td><td colspan="2">Waste Dump Magistral Central</td></tr>
</table>

EXISTING COMPONENTS			EXISTING COMPONENTS		
17	Catchment pond Yanacocha lagoon		33	Domestic water treatment system	
18	Water supply line-Ch 1860		65	Treatment subsystem N°1	Grates
19	Water supply line-Ch 1540		66		Septic tank N°1
20	Bypass 1860		67		Septic tank N°2
21	Bypass 1570		68		Filtration tanks N°1
22	Coronation canal		69		Filtration tanks N°2
23	Reservoir		70		Filtration tanks N°3
24	Mine drainage pipeline		71		Filtration tanks N°4
25	Recirculation pipeline		72	Treatment subsystem N°2	Septic tanks N°3
26	Sedimentation pond		73		Septic tanks N°4
27	Drying bed		74		Filtration tanks N°5
28	Water reservoir for fire suppressant usage		75		Filtration tanks N°6
29	Tailings pipeline from mills		76		Recirculation tanks
30	Supernatant water pipeline		77	Drilling platforms (30)	
31	Tailings pipeline		78	Increase in the production capacity of the process plant from 2000 TMPD to 2500 TMD	
32	Water supply line to process plant				
33	Domestic water treatment system		79	P1.Waste dump Magistral South	
34	Industrial zone	Reagent warehouse N°1		P2.Waste dump Magistral South	

EXISTING COMPONENTS			EXISTING COMPONENTS	
35		Reagent warehouse N°2	80	Deepening of Magistral Norte from the 4440 to 4370 level
36		Reagent warehouse N°3	81	Run of Mine (RoM) Stockpile
37		General warehouse	82	Industrial zone (Auxiliary workshop)
38		Concentrate warehouse	83	Borrow material (waste) Magistral Norte
39		Core shed	84	Mine water management
40	Explosive magazine 1 - ANFO		85	Coronation channel and runoff water discharge
41	Explosive magazine 2 - Accessories		86	Optimization of the drinking water treatment system
42	Explosives magazine 3 - Explosives & detonators		87	Shotcrete plant
43	Domestic waste storage area (land fill)		88	Mine Canteen (underground)
44	Hazardous waste storage area		89	Communication system
45	Contaminated soils (oil & fuel)-Storage &treatment Area		90	Secondary access to mine & west coronation canal
46	Access to mine		91	Access to explosive magazine
47	Access to Process Plant		92	First aid post & clinic

18.3 Tailings Storage Facility (TSF)

The existing TSF has been constructed in 3 lifts starting in 2013 with the building of dams 1 and 2. Initial construction was to increase the dam wall by 14 m in its central part to an elevation of 4,474 masl, but it was only built to 4,471 masl.

Construction continued in May 2018 to reach the original planned 2013 objective of 4,474 masl with construction continuing in 2021 to add an additional 1.40 m resulting in the current elevation of 4,475.40 masl with 6,113,230 tonnes of tails deposited in the TSF since 2013 (Table 18-2).

SRK Consulting has recently completed a feasibility study for the expansion of the TSF, with the dam expected to reach the 4,483.0 masl elevation (see SRK Consulting, 2022). This would add 2.98 Mm^3 of additional tailings storage capacity at the TSF, enough to support 5.2 years of process plant operation (assuming a yearly tailings production rate of 800,000 t).

For tailings deposition, the tailings sludge is pumped approximately 420 m from the process plant to the TSF for disposal. The current TSF elevation is 13 m higher than the process plant foundations, and this will increase as additional lifts are added to the TSF. The current production of tailings from the processing of the Magistral mine is between 1,800 to 2,250 tpd.

The tailings slurry is sent via 8” diameter high-density polyethylene pipes, by a Wilfley 6k pump (plus one additional on standby), to an 80'x14’ thickener designed by FIMA, from where it is collected and displaced by a Wilfley 5K pump to its final discharge in the TSF. The tailings pipeline (8-inch pipes) runs along the northwest perimeter of the TSF and provides access to 3 different discharge points 50 m apart. Each of the discharge points are fitted with pinch valves in order to favor sedimentation. A concrete reinforced contingency catchment area has been constructed to capture tailings runoff in case of clogging. During tailings transportation it is estimated that the sludge contains 25 - 30% solids.

The current TSF is deposited up to the 4,472.5 masl elevation, and control of the tailings deposition is facilitated by two internal dikes which are used to control the migration of the tailings across the facility. The beach slope is continuously changing according to the deposition of the tailings with the objective of assuring secure sedimentation in areas that are considered vulnerable in relation to slope stability.

A supernatant water recovery system has been installed to recover water from the pooled water in the TSF whereby fixed submersible pumps, or pumps installed on rafts, collect and transport supernatant water via pipeline to the main water tank (1,500 m^3) located in the upper part of the process plant, to feed the process plant operations.

Table 18-2: Tailings deposited in the TSF since 2013

Year	Tailings (Tonnes)	Tailings (m^3)
2013	228,181	162,986
2014	510,563	364,688
2015	694,957	496,398
2016	706,304	504,503
2017	767,914	548,510
2018	730,704	521,932
2019	781,953	615,711
2020	647,079	490,211
2021	550,501	423,463
2022	495,074	400,449
Total	**6,113,230**	**4,528,851**

18.4 Mine waste dumps

The mine currently has one active waste dump (waste dump Magistral South) used for removing waste material that could not be effectively disposed of underground. This waste material does not generate acid waters. The waste is generated mainly from mine development activities and is not expected to increase significantly over the life of the mine unless some additional infrastructure or new mine areas are incorporated into the mineral portfolio.

The historical waste dumps are:

- Waste Dump 1
- Waste Dump 2
- Waste Dump Chupa
- Waste Dump Desmonte 1 (Ex Tacora, old Santander mine waste dump area, now rehabilitated)
- Waste Dump Magistral Central.

18.5 Mineral Stockpiles (RoM)

The Magistral mine currently has three mineral stockpiles which store material from the MN, MC and MS sections of the mine (due to mixing of different ore types). Once stockpile material of unknown grade has been sampled and results obtained, the geology department, in coordination with the mine and planning departments, takes the decision on whether to transport this material to the plant or to the waste stockpile.

18.6 Concentrate transportation

Tractor trailers that can transport two 25 t containers each are used to transport concentrate. The containers must be made of stainless steel. Each container is registered and weighed at the mine scales before loading. The sampling and weighing processes are carried out on the concentrate prior to the unit being sealed and registered. The concentrate is then transported by road to the port of Perubar in the Callao province close to Lima, for subsequent shipping to purchasers in 400 to 600-t lots.

18.7 Power supply

The main power supply to the mine is delivered by two electricity companies.

1. Compañía Minera Chungar S.A.C., which supplies through the Shelby Transmission Lines (50kV) with an approximate distance of 61 km and power of 7 MW. Power is distributed through the 50 kV Shelby Substation and Infrastructure. All are owned by Compañía Minera Chungar S.A.C., which transforms the 50 kV/22.9 kV power for subsequent distribution to the substations of the plant 22.9 kV / Mine 10 kV and Camps 0.23 kV.

2. Tingo (Volcán) transmission line, with an approximate distance of 17 km, and power of 5 MW. Power supplied by the Tingo Transmission line is received through the Substation Magistral Centro and related infrastructure. Owned by the Santander Mining Unit, which transforms the 22.9 kV / 10 kV energy for distribution to the mining operations, and the power supply to the main ventilation fans and pumps.

Both the above-mentioned lines are interconnected to the National Interconnected System (SEIN). At the Magistral Centro substation, both lines at 22.9 kV have a link system in the event of an outage to supply power to the circuits considered critical within the unit. The current distribution considering the maximum demands at peak hours is as follows:

- Mine: 7.70 MW
- Plant: 3.60 MW
- Camps and auxiliary infrastructure: 0.40 MW

The maximum demand at peak hours is approximately 11.70 MW out of a contracted power of 12 MW, representing 98% of the contracted power. With a future projection to give continuity to mining operations for exploitation, development and preparation, the following will be required:

1. Optimise/Renovate Transmission Lines.
2. Optimise/Renovate the 50 kV Substation section lines to the Magistral Centro Substation.
3. Optimise/Renovate the Magistral Centro substation with equipment and infrastructure.

4. Optimise/Renovate the 50 kV substation with equipment and infrastructure.
5. Increase the contracting power with the supply companies per the projection of the operations.

18.7.1 Main substation

The principal substation of the mine comprises a 6 to 8 MVA transformer with a transformation ratio of 50 to 22.9 kV, connection-disconnection elements, and protection relays.

18.7.2 Distribution

Power distribution at the property is primarily through the use of overhead transmission lines on wooden posts. The basic distribution scheme is a 22,900-volt circuit via substations.

18.7.3 Mine distribution

Power supply for the underground portion of the Magistral mine consists of three circuits with the following arrangements:

- Mine
  - Volcan Line:
    - Transformer 6/7.5 MVA – Cell 01 (Substation N° 6, 9 and 11) = 2.5 MW
    - Transformer 6/7.5 MVA – Cell 02 (Substation N° 10) = 2.3 MW
  - Shelby Line:
    - Transformer 3 MVA – Cell 01 (Substation N° 8) = 0.8 MW
    - Transformer 3 MVA – Cell 02 (Substation N° 7, 11) = 1.2 MW
    - Transformer 2.25 MVA – Surface (Fans and compressor) = 0.9 MW
- Concentrator Plant - Tailings
  - Concentrator Plant:
    - Transformer 5/6.5 MVA – 22.9/2.3 kV = 3.6 MW
  - Tailings:
    - Transformer 1 MVA – Tailing Substation = 80 KW
    - Transformer 75 KVA – Llacsacocha = 20 KW
- Camp Site
  - Site:

- Transformer 800 KVA – Camp Substation = 0.4 MW

18.8 Accommodation

The main mine camp facilities can accommodate approximately 75-100 people and is located approximately 200 m to the east of the process plant at an elevation of 4,500 masl. Other lodgings (approximately 350 people) for mine contractors are located in a separate camp situated approximately 830 m southwest of the plant.

Accommodation in the mining camp within the complex is sufficient for the CDPR workforce, contractors, and consultants. A canteen is also located on site with a capacity to feed approximately 500 people.

18.9 Water

Process water that is required for the process plant and mining operations is sourced from the overflow collection ponds of the TSF and seepage from the underground mine. The total volumetric consumption approved for the process plant is 273.4 l/s (EIAd 2008).

The permitted water usage was originally granted according to the requirements for the full production capacity of the processing plant. Water for current production is within the approved limits. Should extra water be required for potential future expansions, CDPR anticipates that additional water will be sourced from both the TSF and underground mine as required, which are both within the current process plant battery limits.

Facilities associated with water management include:

- Separate underground pumping systems for acidic (approximately 15% of total) and neutral waters (approximately 85% of total).
- Surface drainage and pumping network.
- Acid neutralization facility.
- Industrial Water Treatment facility.

The site water management, including water treatment and permits, is described in Section 20.

18.10 Communications Systems

The mine site has a communication network of telephones (Telefónica Peru) and licensed radio repeaters within the mining area which covers the site, mine camp and other facilities. There is an onsite server with a link to the CDPR Lima office.

18.10.1 Radio

The daily communication at the operations is undertaken using a radio system. Tunnel Radio's TR-155/500 UltraComm System is a multi-channel system. The TR-155VHF system operates in the 150-170 MHz range and the TR-500 operates in the 400-500 frequency range. The radio system is amplified through a series of antennas that provides signal to the majority of the surface concession area along with the underground mine workings.

18.10.2 Voice

The mine has a SIP TRUNK service provided by Telefonica, which is located at CDPR's main offices in Av. Santo Toribio N° 115. SIP TRUNK is a voice over Internet Protocol technology and streaming media service based on the Session Initiation Protocol by which Internet telephony service providers deliver telephone services. CDPR distributes the SIP TRUNK numbers in two groups with the Lima head office receiving 20 channels and the mine operations receiving 10. The system is supported through Telefónica's MPLS IP network as an element of interconnectivity that is a standard in the industry, allowing the operation of multiple voice sessions.

18.10.3 Data

Telefónica provides the info-Internet and VPN services for the mine installations, 70 mbps of dedicated Internet and a 20mbps of VPN connection with an additional 20 mbps VPN connection for the Lima office.

The Internet service for the mine is managed through an AD server with Fortinet Security support.

The VPN with prioritization of IP traffic is applied on the Real Time Flow (voice or video), and the Data Flow, optimizing the quality of call and file transfer between the Lima – Santander mine offices.

19 MARKET STUDIES AND CONTRACTS

The company's revenue is generated through the sale of Zn and Pb-Ag concentrates from the Magistral concessions, as follows:

- Off-take Agreement with Glencore for 100% of Zn and Pb-Ag concentrates production LoM is limited to existing mining areas under production (Magistral deposit). Thus, any production from future developments, such as the Santander Pipe or Puajanca are not within the off-take agreement area (see Section 4.0 for effective area and definition of off-take agreement area).
- Commercial terms include settlements of monthly deliveries considering an average price of the commodity as quoted on the London Metal Exchange (LME), and commercial deductions for content. Other variables such as TC's and a roll back charge including freight and logistics are negotiated during Q1 of each year.

19.1 Market Studies

The Magistral mining area is an operating unit with a concentrate sales contract in place with Glencore. All commercial terms and financial conditions under this off-take agreement are arms-length; including payment terms and penalties that were negotiated with the buyer. All commercial terms entered between the buyer and CDPR are regarded as confidential. Thus, market studies are not relevant to the sale of concentrate produced from this area which are bound by the Glencore Off-take Agreement.

On the other hand, it is expected that an eventual off-take agreement for the Santander Pipe mining area will include customary arms-length commercial terms and financial conditions similar to the ones in place currently with Glencore. The Santander Pipe is expected to produce Zn and Cu-Ag concentrates.

The following subsections present a summary outlook of the metals relevant to the Santander Pipe mining area.

19.1.1 Zinc

World zinc mine production is forecast to rise by 3.9% to 13.28 Mt in 2022, a marginal decline from the 4.1% growth in 2021 and while Europe accounts for around 12% of global refined zinc output, zinc availability on the European continent has been hammered recently due to the energy crisis triggered by the Russia-Ukraine war as well as a supply disruption. Consequently, zinc prices shot up to US$4,460 on April 2022. In addition, social unrest and labor disputes further deepen the fear of a supply shortage, estimated at more than 300,000 t in 2022.

After a strong post-pandemic recovery of 5.7% in 2021, global demand for refined zinc metal is forecast to rise by merely 1.6% in 2022. China zinc imports dropped by 75% during the first four months of 2022. Nonetheless, when comparing the supply and demand of zinc in 2022, zinc demand outpaced production growth.

Looking forward, zinc has a bright outlook fueled by the surge of the rechargeable battery sector. Likewise, global zinc demand for renewable energy technologies will continue to increase during the next decade.

19.1.2 Lead

Lead is closely related to zinc, since the two base metals are often mined together and both are mainly used in the production of cars. In the case of lead, and while lead prices hit a four-year high last March as demand for industrial metals was buoyed by the post-Covid-19 economic recovery in the fourth quarter of 2021; a downtrend trend has been observed since March 2022 as global consumption for the metal was expected to fall because of lower demand caused by the slowing global economic growth.

In particular, it should be noted that China is the world's largest consumer of refined lead, accounting for 40% of global demand. Lockdown in the Chinese financial hub of Shanghai severely affected demand and market sentiment for all industrial metals, causing prices to fall.

Even though Beijing has loosened its zero-COVID policy, investors remain wary about demand in China as a new COVID-19 variant threatens to dampen consumer spending and construction activity.

Lead-acid batteries are mainly used to power internal combustion engines (ICE) in vehicles and air crafts. As the global decarbonization trend accelerated over the past year with increased motorists switching to battery electric vehicles (BEV), the slowing sales of ICE vehicles have also reduced lead-acid battery demand.

While many analysts believed the decarbonization trend could likely cut lead demand in the longer term, the World Bank believed the short-to-medium trend could be supported by replacement battery use and auxiliary electric vehicle (EV) functions.

19.1.3 Silver

The nature of silver as an industrial metal has been enhanced by energy transition initiatives which will positively impact demand in the short, medium and long term. Furthermore, the pandemic as well as the Ukraine conflict have, in effect, reinforced investment in energy-transition initiatives. For example, electric vehicles batteries that use around 40 grams of silver per vehicle are experiencing strong demand growth globally.

On the other hand, although silver supply rebounded in 2021 on the back of a 5% increase in mine production with respect to 2020, silver supply has dropped into a deficit since last year, and analysts are estimating a 70 Moz deficit for 2022.

Other factors affecting the supply component includes declining silver head grades and rising fuel costs and greater exploration investments; as well as the risk of lower prices for by-product metals, such as lead, zinc and copper, that accounts for about 70% of silver supply. If macroeconomic conditions soften in the medium-term and price support eases for those by-product metals, silver mining supply is also vulnerable. Without the subsidy effect of higher by-product prices, the outlook for silver supply could be even weaker than expected.

In summary, while silver supply faces some constricting trends, the rebound in demand could prove sustainable, thanks to silver's critical role in growing green energy initiatives.

19.1.4 Copper

Traditionally, copper prices move up and down with the business cycle: higher prices meant strong economic growth; lower prices indicated a recession was on the horizon. However, the objective to move away from carbon has given the metal a bullish trend. Even heading into recession, copper prices are at more than US$8,000/t, well above its 10-year average of US$6,750. Furthermore, in the last 60 days, in spite of economic concerns over the US, Europe and China, copper prices have gone up nearly 10%. That also indicates that when economic growth accelerates, perhaps by 2024, copper prices could gather significant strength.

In fact, as the world moves away from fossil fuels and embraces wind, solar and electric vehicles, copper will be in great demand. Of all sources of electricity, wind power is, by far, the most copper-intensive, followed by solar panels. According to the International Energy Agency, an offshore wind turbine requires about 8 metric tons of copper per megawatt. A gas-fired power plant requires less than 2 tons per megawatt. The average car, fueled by gasoline or diesel, uses about 25 kilograms of copper; an electric car needs more than double that amount.

19.2 Commodity Price Projections

The unprecedented energy crisis in Europe, soaring inflation, and the COVID lockdown in China constitutes a looming threat for a global economic recession that weigh on metal price performance. Still, the fundamentals of base metals remain strong reflected on the long-term price forecasts applicable to the Santander Pipe shown in Table 19-1.

Table 19-1: Long-term metal prices forecasts

	Latest*	2022	2023	2024	2025	Long Term
Zinc (US$/t)	3,070	3,500	3,200	3,100	3,000	2,800
Pb (US$/t)	2,182	2,100	2,100	2,300	2,400	2,100
Ag (US$/oz)	22.75	21.84	23.25	24.50	24.50	22.00
Cu (US$/t)	8,370	8,723	8,253	9,597	9,921	9,002

Pricing estimates based on Concesus Pricing publication as of Dec 2022 (Compiled by CIBC Global Mining Group, part of CIBC Capital Markets)

*Prices as of 01.12.2022

These price projections are considered acceptable as long-term prices for use in resource estimation and associated studies.

It should be noted that the resolution of the current three mega global crises (inflation, Ukraine war, and elimination of Covid-related restrictions in China) represent a significant upside scenario for base metals and all three are trending slowly in the right direction.

19.3 Treatment & Rollback Charges

With the temporary shutdown of Europe zinc refineries due to the energy crisis, treatment charges could go up from US$230/t in 2022 to US$300/t in 2023. However, assuming that during 2023 the Ukraine conflict comes to an end, by 2024 TC should normalize in the US$200/t to US$250/t range (Table 19-2).

With regards to the rollback charge, in 2021, as a consequence of the COVID-19 pandemic, global supply chains and shipments slowed, causing worldwide shortages and affecting consumer patterns. Causes of the economic slowdown included workers becoming sick with COVID-19 as well as mandates and restrictions affecting the availability of staff, resulting in a significant increase in ocean freight as seen in the historic data (Table 19-2). This trend is expected to continue easing during the first half of 2023 and normalized by the end of next year. Rollback values should be back to historic values (US$80/t to US$90/t) by 2024.

Table 19-2: Historical Treatment and Rollback Charges

Historic Values	2018	2019	2020	2021	2022
TC - Zn (US$/t)	147	247	300	159	230
RB - Zn (US$/t)	86	79	90	127	129
TC - Pb (US$/t)	98	98	183	136	130
RB - Pb ((US$/t))	88	78	90	119	135
RC - Ag (US$/oz)	0.60	1.50	1.50	1.50	1.50

Source: CDPR (2022).

19.4 Contracts

No contracts have been executed in relation to possible concentrate delivery commitments from Santander's Pipe mining area. However, CDPR is seeking to assign, in due time, an off-take agreement for this area together with a financing structure to develop and put into production the Santander Pipe area.

19.5 Operations

CDPR has 30 major contracts for services relating to operations at the mine regarding mining activities, ground support, raise boring, drilling, transportation, electrical installations, plant and mine maintenance, explosives and civil works, treatment process and energy.

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

All permits had been sourced previously by Trevali Perú, which was the previous company´s legal name, which has now been changed to Cerro de Pasco Resources del Perú (CDPR).

In this Report, CDPR has been named as the Company that will continue with all future permitting either through the previous company´s name Trevali Perú or Cerro de Pasco Resources-Subsidiaria Peru S.A.C which is the new local subsidiary company name that was registered with SUNAT on February 3, 2022.

To accompany the reading of this Section, an overview of Peruvian Mining and Environmental Law and Regulations can be found in Appendix B of the previous NI 43-101 Technical Report completed by DRA in January 2022.

20.1 Environmental Compliance

The Santander Property complies with the terms of obtaining environmental certification, among which the Environmental Impact Study stands out, and with each of the conditions provided in the resolutions of the environmental impact authorization issued by the National Environmental Certification Service (SENACE). The last environmental impact study was the First Modification of the Environmental Impact Assessment (First MEIA) approved with R.D. N° 073-2019-SENACE-PE/DEAR on May 2, 2019, from which three supporting technical reports were managed, the last being the Third ITS approved with R.D. No. 00058-2022-SENACE-PE/DEAR on April 11, 2022.

20.2 Background Information

The Santander Property is located within the boundaries of the rural community of Santa Cruz de Andamarca (CC Santa Cruz de Andamarca) and is politically located in the district of Santa Cruz de Andamarca, in the province of Huaral, Department of Lima, Perú. Geographically, the mine is situated in the western Andean Mountain range, Cordillera Occidental, at an altitude of 4,000 to 5,300 masl, and in the headwaters of the Baños river, tributary of the Chancay river, which runs to the Pacific Ocean. Environmentally, the mine is located in the Puna ecoregion and its Holdridge life zone is the Subtropical Pluvial Alpine Tundra (tp-AS).

In general terms, the weather in the area of the mine is cold and wet, with an average annual rainfall less than 700 mm and an average annual temperature of 6°C. It has rainy summers and dry winters with moderate frost (SENAMHI).

In terms of land use capacity, soils are suitable for cold climate grassland and protection, and actual land use is limited to urban use (private or government), natural pastures, and unproductive land.

20.3 Permitting Requirements

The development of economic activities in the Peruvian territory, such as those related to the mining industry, is subject to a broad range of general environmental laws and regulations, such as:

- The General Environmental Law, enacted by Law N° 28611 and its modifications.
- The Organic Law for the Sustainable Exploitation of Natural Resources, enacted by Law N° 26821.
- The Law on the National System of Environmental Impact Assessment, enacted by Law N° 27446 and its Regulations, approved by Supreme Decree N° 019-2009-MINAM.
- The Environmental Quality Standards for Water, approved by Supreme Decree N° 004-2017-MINAM.
- The Environmental Quality Standards for Air, approved by Supreme Decree N° 003-2017-MINAM.
- The Environmental Quality Standards for Soil, approved by Supreme Decree N° 011-2017-MINAM.
- The Environmental Quality Standards for Noise, approved by Supreme Decree N° 085-2003-PCM.
- The General Law on Solid Wastes, enacted by Legislative Decree N° 1278 and its Regulations approved by Supreme Decree N° 014-2017-MINAM, among others.
- The Mine Closure Law, enacted by Law N° 28090 and its Regulations approved by Supreme Decree N° 033-2005-EM and its amendments.
- Dispositions for the Single Procedure of the Environmental Certification for National Environmental Certification Service for Sustainable Investment (SENACE) approved by Supreme Decree N° 004-2022-MINAM.

Additionally, the environmental aspects of the mining industry are specifically governed by Supreme Decree N° 040-2014-EM and Supreme Decree N° 042-2017-EM, and its amendments, as well as RM N° 120-2014-MEM/DM and Supreme Decree N° 004-2022-MINAM.

These environmental laws and regulations govern, inter alia, the generation, storage, handling, use, disposal and transportation of hazardous materials; the emission and discharge of hazardous materials into the ground, air or water; and the protection of biological diversity. They also set environmental quality standards for noise, water, air and soil, which are considered for the preparation, assessment and approval of any environmental management instrument.

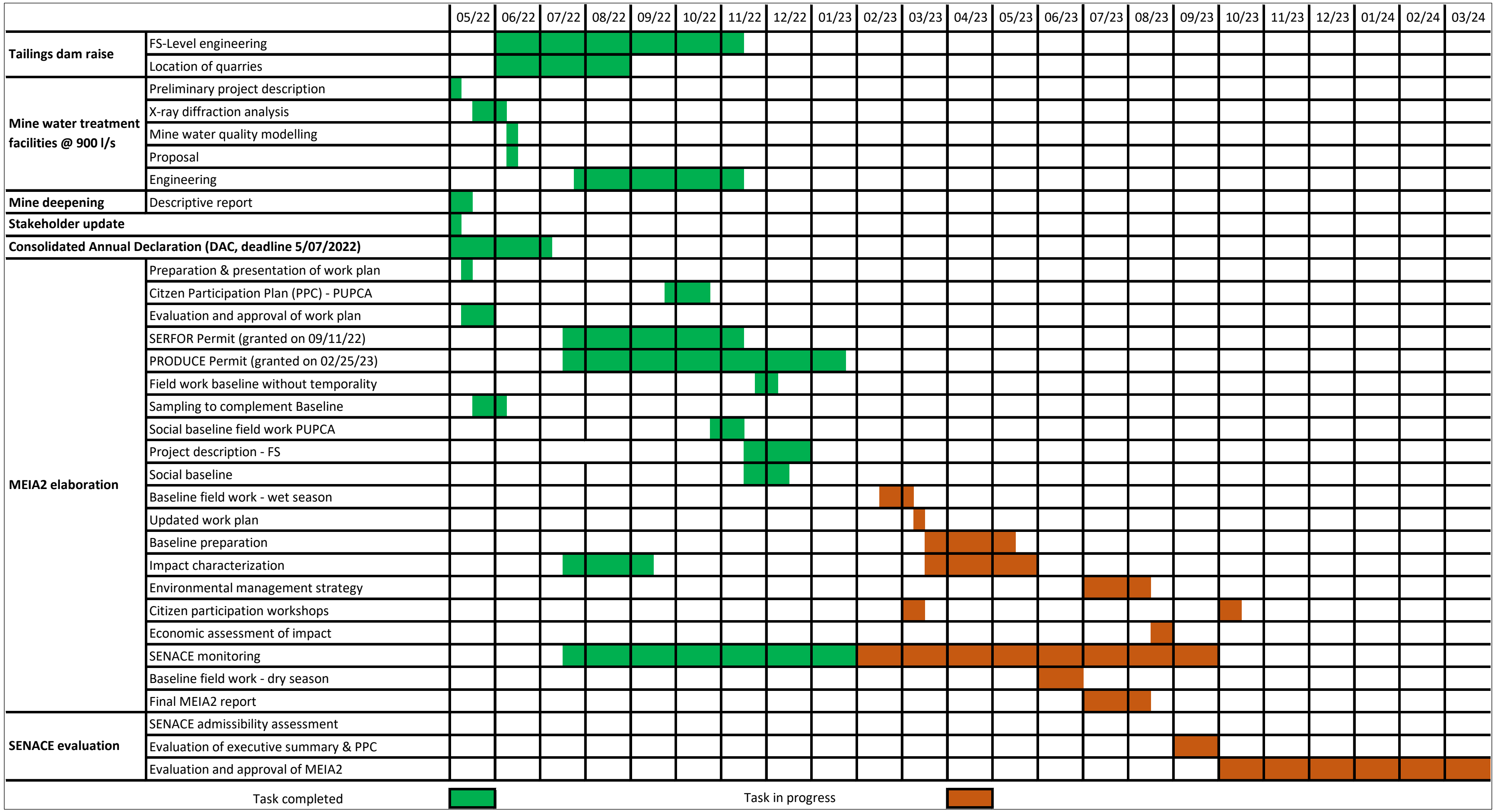
The most important permits that have been granted to Santander, which support its operation are as follows:

- Environmental Impact Assessment for the exploitation of tailings reprocessing (approved by R.D. N° 158-2009-MEM/AAM, 29/10/2009).
- Modification of Environmental Impact Assessment for the exploitation of tailings reprocessing (approved by R.D. N° 396-2010-MEM/AAM 30/11/2010).
- The Santander Mine exploration environmental impact study (approved by R.D. N° 122-2012- MEM/AAM, 18/04/2012).
- Tailings Deposit Closure Plan (approved by R.D. N° 018-2012/MEM-AAM, 26/01/2012).

- The Supportive Technical Report (Informe Técnico Sustentatorio, or ITS) Confirmation of Mineral Resources and Improvements in Wastewater Management at UM Santander (approved by R.D. N° 457-2015-MEM-DGAAM, 26/11/2015).
- Second ITS for increasing production capacity of the concentrating plant from 2,000 to 2,500 tpd at UM Santander (approved by R.D. No. 108-2016-MEM/AAM, 13/04/2016).
- Update of the Santander mine closure plan (approved by R.D. N°. 013-2014-MEM/AAM, 08/01/2014).
- Detailed technical report (Memoria Técnica Minera or MTD): In compliance with D.S. N°. 040-2015-EM, a MTD was submitted for all activities, extensions, and/or components declared to be regularized. MINEM approved by R.D. N° 090-2017-MEM-DGAAM, 27/03/2017.
- Third ITS for the retreatment of tailings through conventional methods: excavation and loading (Approved by R.D. N ° 001-2018-SENACE-JEF / DEAR, 04/01/2018.
- First Modification of the Detailed Environmental Impact Study of the Santander Mining Unit (First MEIA, approved by R.D. N° 073-2019-SENACE-PE/DEAR, 02/05/2019).
- First ITS (to the First MEIA) for the expansion of the Santander Tailings Deposit (by 10%) and confirmation of reserves, (approved by R.D. N° 116-2019-SENACE-PE / DEAR, 17/07/2019).
- Second ITS for the replacement of borrow material for the construction of the tailings dam and the addition of three borrow material quarries (approved by R.D. N° 0051-2021-SENACE-PE/DEAR, 24/03/2021).
- Third ITS for the Technological improvement on the mine water treatment plant (approved by R.D. N° 00058-2022-SENACE-PE/DEAR, (11/04/2022).
- Second Amendment of the Santander mine closure plan (approved by R.D. N° 115-2021-MINEM/DGAAD, 18/06/2021).

CDPR is currently in the process of drafting the second modification of its detailed environmental impact assessment study (Second MEIA-d or MEIA2) of the Santander Mining Unit. This study was initiated in 2019, but due to the pandemic it was put on hold. CDPR requested to SENACE on May 24, 2022, the monitoring of the preparation of the MEIA-d and submitted on October 19, 2022, the request for approval of the Citizen Participation Plan (CPP) for the review of compliance with admissibility requirements of the application for approval by the environmental authority (Refer to Figure 20-1).

Figure 20-1: Schedule – Second MEIA-d



Source: CDPR (2023).

The main objective of the Second MEIA-d is to obtain environmental certification. The proposed modifications for the Second MEIA are aimed at extending the life of mine and will be made on previously approved components, which are detailed below:

Regrowth of the tailings for the next 5+ years of operation, which consists of the regrowth of the Santander tailings deposit to 4483 meters above sea level; the same that is developed on the basis of the construction of the Santander tailings deposit from the current 4475.4 meters above sea level.

Expansion of the Valeria and Magistral Norte Extendida quarries extended to use the borrow material (loose material) in the regrowth of the tailings deposit dams.

Expansion of the mine water treatment system from 500 L/s to approximately 1200 L/s.

Deepening of the Magistral Mine and production expansion to include the Santander Pipe and its Pipe North Extension.

In the framework of the Second MEIA-d, citizen participation mechanisms will be developed before and during the preparation and evaluation of the environmental impact study, which will be exposed in a citizen participation plan to be approved by the environmental authority.

On December 10, 2019, the proposal for mechanisms for citizen participation with stakeholders in the area of social influence (direct and indirect) for the stage before the preparation of the MEIA, was presented to SENACE. Then, SENACE recommended certain guidelines for the execution of mechanisms in February 2020. To date, the mechanisms developed were the interaction with the population (CC Santa Cruz de Andamarca and CC San José de Baños) in charge of a team of facilitators, the distribution of informative material and interviews with stakeholder groups.

During the preparation and evaluation phase of the Second MEIA, the following mechanisms will be carried out: two participative workshops, establishment of a permanent information office (to be located in Santa Cruz de Andamarca) to receive information and distribution of information material of the project, and among other initiatives applied during the evaluation phase of the Second MEIA.

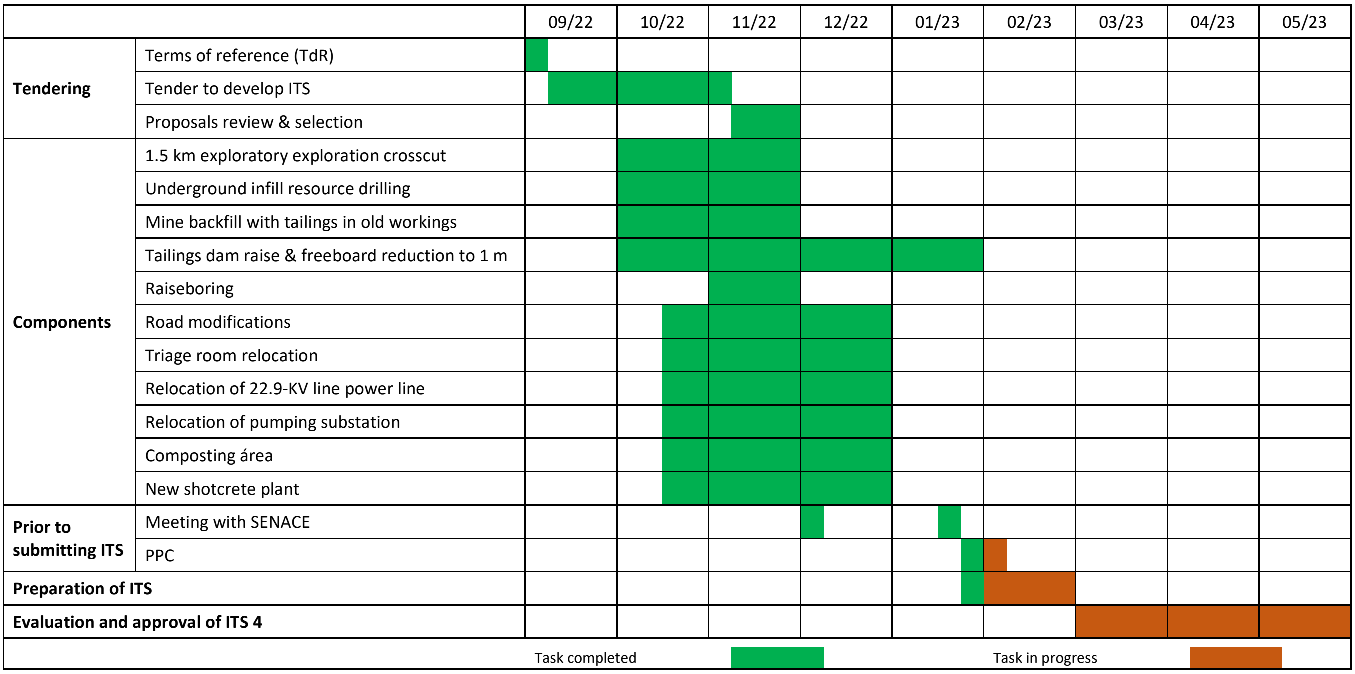
Coordination’s with SENACE are ongoing to define the workplan and required environmental baseline fieldwork that will be accompanied by SENACE.

To date, a preliminary participative workshop has been completed, as well as a brief ethnographic assessment of the CC San José de Baños and CC Santa Cruz de Andamarca, using surveys and semi-structured interviews.

Field work for the environmental and social baseline study commenced in November 2022, and the monitoring for the wet season will be completed in January 2023. The monitoring baseline work for the dry second will be carried out in June 2023. It is expected that the Second MEIA-d will be presented to SENACE in May 2023, and baseline information for the dry season will be submitted as complementary information during the review process of the study. CDPR expect the approval of the Second MEIA-d by SENACE, in 2024.

On the other hand, the preparation of the 4th Supportive Technical Report (ITS) is underway. The main objective of the ITS will be to certify the approval of additional TSF capacity and tailings backfill in old stopes of the underground operation. It is expected that the 4th ITS will be presented to SENACE for evaluation in February 2023, and approval will be obtained in May 2023 (see Figure 20-2).

Figure 20-2: Schedule - 4th Supportive Technical Report (ITS)



Source: CDPR (2023).

20.3.1 *Mining Plans and Authorizations to Start of Mining Activities*

The General Mining Directorate (DGM) is a line unit of the Ministry of Energy and Mines (MINEM), dependent on the Office of the Vice Minister of Mines. The DGM is the competent authority for the approval of mining plans and authorizations to start development, preparation and subsequent exploitation activities, which allow for the construction and subsequent exploitation of a deposit to be carried out. Similarly, the granting of Mining Operation Certificates is also the responsibility of this authority.

Additionally, the DGM also has jurisdiction over beneficiation concessions. It authorizes the operation of leaching and concentration plants and subsequently, after the respective field inspections, authorizes their operation.

The Ministry of Energy and Mines, through the General Directorate of Mining Environmental Affairs (DGAAM), is the competent authority for the approval of the Mine Closure Plan and environmental permits for exploration and its updates and modifications. In addition, DGAAM is responsible for the approval of the modification of the concession of benefit, among other mining procedures.

20.3.2 *Approved Permits*

The list of permits and licenses presented was prepared based on reports from the MINEM, Public Registry of Mining (currently INGEMMET), National Water Authority (ANA), National Public Registry Authority (SUNARP), General Directorate of Environmental Health (DIGESA) National Superintendence for the Control of Security Services, Weapons, Ammunition and Explosives for Civil Use (SUCAMEC), notary public documents, and information provided by CDPR. Table 20-1 summarizes the approved environmental permits to date.

Based on current permits and licenses, CDPR has implemented water management control system, including, but not restricted to, a sedimentation pond for the discharge from the mine drainage system; a domestic wastewater treatment system; and periodic monitoring and reporting of surface water quality, as required by current laws and regulations.

Current licenses allow CDPR to use 10.6 L/s of surface water from Yanacocha lake, and 24.45 L/s of groundwater from Pique-La Cuñada (La Cuñada Shaft, part of the old Santander Mine operation in the Santander Pipe).

According to CDPR, the components proposed to be modified will not have the need to modify or expand the points of discharge and water catchments currently approved in the U.M. Santander. However, because the Santander mine is flooded, corrective discharge measures and other measures indicated in previous reports of the Environmental Evaluation and Control Agency (OEFA) must be complied with to avoid environmental sanctions.

MINEM granted permission to operate the plant at 2,500 tons per day in April 2016. Trevali was authorized, in January 2019, to operate the regrowth of the tailings deposit "Santander" Lateral Dyke N° 1 and Lateral Dyke N° 2 from elevation 4,471.10 meters above sea level (masl) to 4,474 masl. In January 2020, the modification of the "Santander Concentrator Plant" benefit concession was approved for the construction of the regrowth of the tailings deposit from 4,474 masl to 4,475.40 masl.

Also, there is the authorization for storage of explosives and materials of 2 areas for powder magazine / warehouse type permanent and superficial explosives permits, one to store explosives and another for blasting accessories, which has been granted by SUCAMEC in January 2023 until January 2028.

Table 20-1: Summary of Santander´s Approved Environmental Permits to Date

Type of Permit	Objective & Description	Approval Authority	Approval Document	Period	Issuance Date
EIA - Tailings Reprocessing	Approval for tailings reprocessing	MINEM/AAM	R.D. N° 158-2009-MEM/AAM	Indefinite	29-Oct-09
	MEIA approval for tailings reprocessing	MINEM/AAM	R.D. N° 396-2010-MEM/AAM	Indefinite	30-Nov-10
EIA - Exploitation	EIA of 50 kV transmission line and Shelby substation	MINEM	R.D. Nº 003-2011-MEM/AAM	Indefinite	5/01/2011
	Environmental assessment of the risks and plans for proposed activities	MINEM/AAM	R.D. N° 122-2012-MEM/AAM	Indefinite	18-Apr-12
	ITS 1 EIA: Confirmation of Mineral Resources and Improvements in water Management in the U.M. Santander	MINEM/AAM	R.D. N° 457-2015-MEM-DGAAM	Indefinite	26-Nov-15
	ITS 2 EIA: Increase production capacity from 2000- 2500 TMD	MINEM/AAM	RD N° 101-2016-MEM/AAM	Indefinite	13-Apr-16
	MTD: Regularize EIA components at Santander site	MINEM	RD N° 040-2015-EM	Indefinite	27-Mar-17
	ITS 3 EIA: Reuse of tailings through conventional methods	SENACE	RD N° 001-2018-SENACE-JEF/DEAR	Indefinite	04-Jan-18
	MEIA - First Amendment to EIA: Environmental assessment of the risks and plans for proposed activities	SENACE	R.D. N° 073-2019-SENACE-PE/DEAR	Indefinite	02-May-19
	ITS 1 MEIA: TSF extension and additional drilling	SENACE	R.D. N° 116-2019-SENACE-PE/DEAR	Indefinite	17-Jul-19
	ITS 2 MEIA: Borrowed material required for tailings construction and mine fill	SENACE	R.D. N° 00051-2021-SENACE-PE/DEAR	Indefinite	24-Mar-21
	ITS 3 MEIA: Modification of mine water treatment system to 500 l/s, confirmation of exploration reserves	SENACE	R.D. N°00058-2022-SENACE-PE/DEAR	Indefinite	11-Apr-22
	Second MEIA: Second MEIA: Deepening of the Magistral Mine, operation of the Santander Pipe, expansion of the tailings dam to 4,483 masl, expansion of the mine water treatment system to 1,200 L/s	SENACE	In preparation from 2019	In process	In process

Type of Permit	Objective & Description	Approval Authority	Approval Document	Period	Issuance Date
Mine Closure Plan – Santander Mine	**Closure plan of tailings reprocessing**	**MINEM**	**R.D. Nº 018-2012-MEM/AAM**		**26-Jan-12**
	First Closure Plan Amendment: Include or update closure plan	MINEM/AAM	R.D. N° 013-2014-MEM/AAM	2019	08-Jan-14
	Second Closure Plan Amendment: Approve activities related to mine closure, and the budget that reflects the value of a warrant that must be provided by Santander	MINEM/AAM	RD N° 115-2021-MINEM/DGAAM	2030 (including post-closure activities)	18-Jun-21
	Mine Closure Plan Update 2022:	MINEM	MCP under review by MINEM	To be defined	End of 2022
Permits Related to the Use of Water for Mining Activities	The National Water Authority (Spanish acronym: ANA) approved the license of the use of water for mining purposes. La Cuñada Shaft	ANA/ALA	Resolución Administrativa No. 0121-2022-ANA-AAA.CF-AL.CHH	Indefinite	28-Jun-22
	Yanacocha Lagoon surface water use.	ANA/ALA	R.A. N° 0117-2022-ANA-AAA.CF-ALA.CHH.R.A. N° 081-2013-ANA-AAA.CF-ALA.CHH.	Indefinite	27-Jun-22
Permits Related to the Discharge of Water	To discharge industrial water to a surface water body	ANA	R.D. N° 199-2019-ANA-DCERH	04 years from the effective discharge	29-Nov-19
Permits Related to the Discharge of Domestic (non-industrial) Water	Authorization for disposure of domestic water	DIGESA	RD N° 004-2010/DSB/DIGESA/SA	Indefinite	06-Jan-10
Certificate of Absence of Archaeological Remains (CIRA)	Confirmation of the absence of archaeological remains in the operational area	Ministry of Culture	CIRA N° 2011-431/MC	Indefinite	18-Nov-11
Certificate of Absence of	Confirmation of the absence of archaeological remains in the north area	Ministry of Culture	CIRA N° 207-2019-DCE/MC (North)	Indefinite	19-Jun-19

Type of Permit	Objective & Description	Approval Authority	Approval Document	Period	Issuance Date
Archaeological Remains (CIRA)	Confirmation of the absence of archaeological remains in the south area	Ministry of Culture	CIRA N° 225-2019-DCE/MC (South)	Indefinite	19-Jun-19
Surface Property Agreement	Surface and Easement Usufruct Agreement signed on December of 2007 with Comunidad Campesina (Framing Community) of Santa Cruz de Andamarca, for a term of 5 years. In October of 2015 the term was extended for 15 years.	Community – Notary Public	Notary Public ROZ N° Kardex: 158350 (20/12/2007) Notary Public MNP N° Kardex: 81315, Escritura: 1968 (15/10/2015)	Sep-2030	27-Sep-15
Mineral Exploration	DIA - NORTH: Environmental permit for exploration platforms in North area (all Santa Cruz and Catalina areas)	MINEM/AAM	R.D. N° 083-2020-MINEM/DGAAM	18 months	24/07/2020
	EIAsd: Permit for146 surface exploration platforms in the area of Santa Cruz de Andamarca.	MINEM	R.D. N° 090-2012-MINEM/AAM	18 months	26/03/2012
	Closure plan for exploration work	MINEM	R.D. Nº 101-2011-MEM/AAM		7/04/2011
Explosive Magazine Permit	Authorization to store explosives (surface)	SUCAMEC	Resolución de Gerencia N° 02339-2022-SUCAMEC/GEPP	20-Nov-22	08-Jun-22
	Authorization to store explosive accessories (surface)	SUCAMEC	Resolución de Gerencia N° 02341-2022-SUCAMEC/GEPP	20-Nov-22	08-Jun-22
	Authorization to store ANFO (surface)	SUCAMEC	Resolución de Gerencia N° 02340-2022-SUCAMEC/GEPP	20-Nov-22	08-Jun-22
	Authorization to store explosives (underground)	SUCAMEC	Resolución de Gerencia N° 02344-2022-SUCAMEC/GEPP	20-Nov-22	08-Jun-22
	Authorization to store explosive accessories (underground)	SUCAMEC	Resolución de Gerencia N° 02342-2022-SUCAMEC/GEPP	20-Nov-22	08-Jun-22
	Authorization to store ANFO (underground)	SUCAMEC	Resolución de Gerencia N° 02343-2022-SUCAMEC/GEPP	20-Nov-22	08-Jun-22

Type of Permit	Objective & Description	Approval Authority	Approval Document	Period	Issuance Date
	Authorization to store explosives (surface)	SUCAMEC	Resolución de Gerencia N° 00096-2023-SUCAMEC/GEPP	5 years	6-Jan-23
	Authorization for blasting accessories (surface)	SUCAMEC	Resolución de Gerencia N° 00149-2023-SUCAMEC/GEPP	5 years	10-Jan-23
Acquisition and Use of Explosives	Authorization to purchase explosives	SUCAMEC	Resolución de Gerencia N° 00407-2022-SUCAMEC/GEPP	12-Feb-23	26-Ene-22
Radio electric stations	Required to use radio frequency in the mine	MTC	Resolución Directoral N° 986-2020-MTC/28	02-Sep-26	07-Sep-20
Processing Plant Construction and Operation Permit	Mineral processing concession (original authorization)	DGM/ MINEM	R.D. N° 250-2013-MEM/DGM	Indeterminate	27-Sep-13
	Increase production capacity of the concentration plant up to 2000 TM/D		RD N° 0396-2014-MEM/DGM/V	Indeterminate	01-Sep-14
	Increase the production capacity up to 2500 TM/D		RD N° 0395-2016-MEM/DGM/V	Indeterminate	13-Apr-16
	Modification benefit concession to expand the tailings storage facility by 10%		Resolución N° 0005-2020-MINEM-DGM/V	Indeterminate	06-Jan-20
Approval to Store Hazardous Substances and/or Dangerous Goods	Use, purchase and store dangerous goods, listed by regulator	SUNAT	Renovación N° 7C2000-2021-0001479	17-Sep-23	16-Sep-21
Authorization to Commence Exploitation Activities	Exploitation activities on the approved areas (Magistral mine)	MINEM	R.D. N° 207-2013-MEM/DGM	Indeterminate	13-Aug-13
Cyanide use Authorization	Use of cyanide	MINEM	Informe N° 0157-2021-MINEM-DGM/DTM	2022	31-Dec-22

20.4 Mine Closure

20.4.1 Operating and Post Closure Requirements and Plans

Feasibility level closure plans are required by Peruvian Law. CDPR has an approved mine closure plan and several mine closure amendments for the Santander Project, these include:

- Mine Closure Plan for the Reprocessing of Tailings from the Santander Deposit (SVS 2010), approved by R.D N°. 018-2012-MEM-AAM (26/01/2012) and report no. 093-2012-MEM- AAM/ABR/SDC/MES.
- Modification of the Santander Mine Unit Closure Plan, approved by R.D. N° 013-2014-MEM/AAM (08/01/2014) and Report no. 021-2014-MEM-AAM/ABR/SDC/MES/GPV.
- Update of the Santander Mine Unit Closure Plan, approved by R.D. N° 097-2019-MINEM/DGAAM (21/06/2019) and report no. 307-2019-MINEM-DGAAM/DEAM/DGAM/PC.
- Second Modification of the Santander Mine Unit Closure Plan, approved by R.D. N° 115-2021/MINEM-DGAAM (18/06/2021).

Currently, the Third Modification of the of the Santander Mine Unit Closure Plan, which does not include new closure components, has been submitted to MINEM on November 29, 2022, and is in the process of being evaluated. This plan includes the modification of the physical and financial schedule of the Second Modification Closure Plan, taking as a base year 2022. In addition, the progressive closing, final closure and post-closure budget will be updated based on the inflation rate for the year 2022.

On the other hand, according to the proven and probable reserves of the Consolidated Annual Declaration (2022), processing 62,500 tons per month, there would be ore until March 2025. Consequently, the useful life of the mine will be from January 2023 to March 2025, which only considers the Magistral Mine LoM.

20.4.2 Reclamation and Closure Schedule

The closure plan considers temporary, progressive, and final closure activities. The progressive closure is performed simultaneously with the mining operations until August 2022, while the final closure activities will have a duration of three years. Post-closure maintenance and monitoring activities will commence immediately upon completion of the final closure and will last for the subsequent five years.

The closure plan budget and schedule approved by the Second Modification of the Santander Mine Unit Closure Plan, approved by R.D. N°. 115 -2021/MINEM-DGAAM and approved by the DGM as per Report N° 220-2021/MINEM-DGAAM-DEAM-DGAM are shown in Table 20-2.

Table 20-2: Closure Plan Budget

Item	Approved Budget (US$)	Period (years)
Progressive closure	558,902.99	until 2022
Final closure	13,190,182.00	2023-2025
Post closure	639,980.74	2026-2023
Total	**14,389,065.73**	
Warranty	**13,830,162.74**	

Source: Report Nº 220-2021/MINEM-DGAAM-DEAM-DGAM.

The mining operator shall honour the guarantee by providing/paying annuities each year, so that the total amount required for final and post-closure is completed, as shown in Table 20-3.

Table 20-3: Closure Plan - Annual Program for Guarantee Payment

Due Date	Amount (US$)	Acumulated Amount (US$)	Status of Payment
2020		11,516,713.00	Completed
2021	2,031,241	13,547,954.00	Partially completed (*)
2022	1,366,021	14,913,975.00	Completed

(*) The guarantee was constituted for the amount of US$ 11,516,713, the same amount as for the year 2020, because the Second Modification of the Closure Plan was approved in June 2021, and the constitution of guarantees is carried out in January of each year.

The current mine closure document states that progressive closure activities will last until August 2022, following final closure in a span of three years. However, CDPR has filed a new DAC and a modification of the mine closure document (Third Mine Closure Plan), along with the preparation of the Second EIA amendment to raise the tailings dam, to continue production and reprogram the mine closure schedule.

20.5 Social or Community Impact

CDPR maintains a good relationship with the population of the area of direct and indirect social influence, which is composed of the following four communities: CC Santa Cruz de Andamarca, CC Santa Catalina, CC San José de Baños and CC San Juan de Chauca respectively. To strengthen and maintain the Social License to Operate, CDPR carries out projects and/or actions for the benefit of the population within the framework of our social responsibility policy. In this regard, regular community meetings and consultations are held with local stakeholders. Those activities are carried out by CDPR's Community Relations department.

The mine and its infrastructure are situated on land owned by the CC Santa Cruz de Andamarca. The easement agreement between the CC Santa Cruz de Andamarca and CDPR for the use of the land for mining purposes was recently renewed in 2015 and remains valid until 26 September 2030.

Santander's Community Relations department promotes the sustainable development of the mine's neighboring communities, among which the Sustainable Development Program stands out, exclusively agricultural, agricultural and agribusiness projects. In compliance with the signed agreements between the rural community of Santa Cruz de Andamarca and the Company has invested US$ 2,585,171 in the period covering 2009 to 2022. The community investment covers the following key areas:

- Human social development
- Health and nutrition
- Education and culture
- Annual payments and donations
- Mitigation of impacts

20.5.1 *Voluntary Sustainable Development Program*

The principal goal of CDPR's Voluntary Sustainable Development Program is to stimulate the local economy through the establishment of permanent facilities for community development and the provision of technical support to encourage development of local businesses. For this purpose, an amount of US$ 70,319 has been invested between 2009 and 2022 in the following projects:

- The Company implemented a program for the genetic improvement of cattle through artificial insemination (from 2018 to 2019).
- From 2020 to 2021, a pilot project was implemented to support the production and marketing of dairy products (training in industrialized production, supply of production equipment, conservation, and refrigeration for the marketing of milk products, creation of own brand, sanitary registration).
- Technical training was provided on livestock management, agriculture skills, water resources management, and in other key areas.
- Support for community development planning was provided through workshops.
- Training in leadership and community management was provided to the community members at large.

20.5.2 *Health and Nutrition*

Before the pandemic, the Company developed a program to manage chronic childhood malnutrition for children, in alliance with the Ministry of Health personnel in the communities of Santa Cruz and San José de Baños. The program worked with local mothers and nutritionists to develop balanced food preparation, and also included the provision of nutritious food packages.

For the wider community, the Company implemented annual health checks focused on prevention and care sessions with specialist doctors such as a pediatrician, a geriatrician, an ophthalmologist, a gynecologist, a psychologist, and general medical practitioners.

20.5.3 Education and Culture

Every year CDPR provides packages of school supplies for all the students (approximately 100 per year) for three Rural Communities (Santa Cruz de Andamarca, San José de Baños and San Juan de Chauca) situated within the area of social influence of the operation.

Up to 2020, the Company maintained an academic reinforcement program, called "Productive Vacations" for primary and secondary schoolchildren in the Santa Cruz de Andamarca district which supported elementary courses such as mathematics and communication, English and arts. In 2021 this program was suspended due to the Covid-19 pandemic.

20.5.4 Impact mitigation and donations

The following activities are carried out on a continuous basis to control and mitigate impacts generated by the operation:

- Annual maintenance of access roads.
- Dust control through the irrigation of roads, to avoid dust contamination of grazing land and the affectation of the populations that inhabit or work in the route of transit of vehicles of Santander.
- Donations for the celebration of Mother's Day, Father's Day, Christmas, traditional holidays, anniversaries, amongst others.
- Between 2008 and 2021 the operation has invested approximately US$ 350,000 to carry out road maintenance, dust control, and for donations.

20.5.5 Annual payments and other contractual obligations

Annual cash payments are made in compliance with the obligations as stipulated in the easement contract. The Company has complied with all its obligations regarding the payments to the community strengthening fund, as well as the donation of 103 Brown Swiss cows. The design and implementation of a project for the implementation of a technical irrigation system is ongoing.

20.5.6 Communication and dialogue

A direct communication process has been established between the Santander Community Relations personnel and the representatives of the communities. In 2022 a permanent Community Relations Office was implemented in the district capital of Santa Cruz de Andamarca. The short lines between the Company and the community enable the Community Relations department to resolve community requests and grievances in a timely manner. In particular, it has enabled the Community Relations team to build a high level of trust with the community members, and as a result the risk of conflict has been reduced to a minimum in the last three years.

21 CAPITAL AND OPERATING COSTS

The capital cost estimate was prepared with an expected accuracy range of +50% / -35% accuracy of actual costs (Class 5 AACE estimate). Base pricing is in the fourth quarter of 2022 US dollars with no allowances for inflation or escalation beyond that time. The estimate includes direct and indirect costs, as well as owner´s costs and contingency associated with mine, mine infrastructure, process facilities and on-site infrastructure. The following areas are included in the estimate:

- Underground mine (mine development, equipment fleet, new hoisting system, and support infrastructure and services);
- Modifications to the process plant to produce a Cu-Ag concentrate; and,
- Expansion of the tailings storage facility (TSF).

A small amount of engineering work, being in the range of 1-2% of total engineering for the project was carried out to support the estimate. The estimate was based on the following project-specific information:

- Preliminary conceptual mine design criteria;
- Preliminary conceptual modification to the existing process flowsheet;
- Preliminary mining equipment fleet;
- Preliminary conceptual mine plan; and,
- Feasibility study of the TSF expansion (completed by a third party).

Historical data available from the operation of the adjacent Magistral mine and similar projects was used to estimate development costs and mine infrastructure costs.

The following assumptions were considered:

- With the exception of the hoisting system (hoist and hoist control equipment) all equipment and materials will be new;
- Main equipment will be purchased and manufactured in appropriate sizes to be transported;
- All underground mine development and preparation work will be carried out by contractors;
- Contractors will be contracted under unit price contracts; and,
- The project will be executed by CDPR, with a team of professionals currently assigned to the Magistral mine.

The following are excluded from the capital cost estimate:

- Land acquisition;
- Finance costs and interests during construction;
- Costs due to fluctuations in exchange rates;
- Cost of working capital;
- Changes in the design criteria;

- Changes in scope or accelerated schedule;
- Changes in Peruvian legislation;
- Site mitigation (identification and removal of contaminated soils – oil, fuel spilled, heavy metals, pesticides, etc.);
- Other than specified obligations and taxes;
- Provisions for force majeure;
- Wrap-up insurance; and,
- Reschedule to recover delays due to:
  - Changes in scope;
  - Force majeure;
  - Notice to proceed with construction;
  - Labour conflicts;
  - Non-availability of qualified and other labour; and,
  - Lack of geotechnical and environmental definitions.

The proposed project includes two and a half years pre-production period, in which ongoing studies and permitting processes will be completed, the Santander Pipe drained, and the underground mine will be developed. Based on the current indicated and inferred mineral resources (minable resources), a total mine life of four and a half years is expected, operating at 2,500 t/d.

21.1 Labor and Equipment Costs

Labor and equipment costs were included in the unit costs when applied.

21.2 Material Costs

All materials required for mine development and facilities construction are included in the capital cost estimate.

Material costs related to the TSF were determined by a third party, by material-take off quantities from sketches/drawings and installation unit costs.

21.3 Contingency

The contingency was established deterministically applying the following percentage factors associated with a PEA level estimate:

- 10% for underground mine pre-production development, TSF expansion, tailings transport and deposition system, and owner´s direct costs;
- 20% on underground mine infrastructure, process plant modifications/upgrades, underground exploration development, in-fill drilling program, on-site site infrastructure direct costs, and on the indirect costs; and,
- 30% on the hoisting system, drainage of the flooded mine, and PFS-level studies.

21.4 Capital Costs

The total estimated capital cost for the Santander Pipe project is approximately US$68.0 million (Table 21-1). The initial capital of approximately US$52.4 million covers two years of pre-production work. The capital costs are broken down into the following two timeframes:

- Initial capital costs: Includes accesing the Santander Pipe from the ongoing Magistral cross-cut, exploration development, in-fill drilling, PFS-level studies, drainage of the flooded mine, mine development, rehabilitation of the La Cuñada shaft, modifications to the process plant, and production start-up at 2,500 t/d; and
- Sustaining capital costs: include the expansion of the existing TSF, and production and underground mine development.

Sustaining capital costs are estimated at approximately US$15.6 million, including contingency. Reclamation and closure costs have not been included in the project CapEx.

The aggregate capital estimate is considered to be within a +50%/-35% accuracy of actual costs. Base pricing is in the fourth quarter of 2022 US dollars, with no allowances for inflation or escalation beyond that time.

Table 21-1: Capital Costs Summary

Capital Costs Summary	**MUSD**
Mine	34.6
Process Plant	0.6
Site Infrastructure	0.9
Indirect Costs	5.9
Owner's Costs	1.8
Contingency	8.5
Total Initial Capital	**52.4**
Mine	10.4
Tailings dam and tailings transport and disposal	2.9
Other sustaining CapEx	0.6
Contingency	1.7
Total CapEx (Initial+ Sustaining)	68.0

21.4.1 Initial Capital Costs

The initial capital supports the design, construction and start-up of the Santander Pipe project (see Table 21-2).

Table 21-2: Initial Capital Costs

Initial Capital Costs	2023	2024	Total
Mine	0.0	34.6	**34.6**
Process Plant	0.0	0.6	**0.6**
Site Infrastructure	0.0	0.9	**0.9**
Indirect Costs	1.8	4.1	**5.9**
Owner's Costs	0.7	1.2	**1.8**
Contingency	0.6	8.0	**8.5**
Total Initial Capital	**3.1**	**49.3**	**52.4**

21.4.2 Mine Capital Costs

The mine capital cots of the Santander Pipe project are presented in Table 21-3.

Table 21-3: Mine Capital Costs

Mining Capital Costs	MUSD
Horizontal mine development	11.3
Vertical mine development and raise boring	5.0
Underground waste transport	0.5
Drainage of flooded mine	1.4
Shaft preliminary works, disassembly and fitting out	1.5
Shaft rehabilitation (second hand hoist)	12.1
Surface platforms for raise boring	0.1
Mine pumping system	2.3
Mine ventilation	0.5
Contingency	6.7
Total Initial Capital	**41.3**
Horizontal mine development	6.7
Vertical mine development and raise boring	2.6
Underground waste transport	0.4
Underground mine infrastructure	0.7
Contingency	1.3
Total Sustaining Capital	**11.7**
Total Mine Capital Costs	**53.0**

Mine development costs were determined based on an actual budgetary quote provided by the current mine contractor working at the Magistral Mine (see Appendix D).

The CapEx of the rehabilitaded hoisting system at the La Cuñada shaft was estimated by Subterra (Subterra, 2022). After reviewing several options with CDPR, and taking into accout the current mine life of the Santander Pipe, it was decided to consider used equipment for the rehabilitation of the shaft. Subterra´s estimate of the CapEx required to install a used hoisting system at the La Cuñada shaft can be seen in Table 21-4.

Table 21-4: Hoisting system CapEx – Used equipment

Item	Equipment (MUS$)	Installation/Contractor (MUS$)
Engineering and design	0.30	0.00
Hoist	2.00	1.00
Hoist room	1.00	0.50
Foundations	0.00	1.00
Cable and accessories	0.15	0.10
Skips	2.00	0.50
Electrical & mechanical	2.00	1.00
Shipping	0.00	0.50
Vendor support	0.00	0.00
Subtotal	**7.45**	**4.60**
Total		**12.05**

Source: Subterra (2022).

21.4.3 *Process Plant, Site Infrastructure, and TSF Capital Costs*

The process plant, site Infrastructure and TSF capital costs are shown in Table 21-5.

Table 21-5: Process Plant, Site Infrastructure and TSF Capital Costs

Process Plant, Site Infrastructure and TSF Capital Costs	MUSD
Process Plant	0.6
Site Infrastructure	0.9
Contingency	0.3
Total Initial Capital	**1.8**
Tailings dam and tailings transport and disposal	2.9
Site Infrastructure	0.6
Contingency	0.4
Total Sustaining Capital	**3.9**
Total Process Plant, Infrastructure and TSF Capital Costs	**5.8**

21.4.4 Indirect and Owner´s Costs

The indirect and owner´s costs of the project are shown in Table 21-6.

Table 21-6: Indirect and Owner´s Costs

Indirect and Owner´s Costs	MUSD
Exploration decline	1.8
Exploration crosscuts	2.0
Underground drilling program - PFS level	1.2
Underground drilling program - FS level	0.6
Analytical, geotechnical and metallurgical labs	0.2
Geological modelling & mineral resource estimate	0.1
Total Indirect Costs	**5.9**
Owner’s team, permits, health and safety, security, insurance	1.1
Prefeasibility study (PFS)	0.7
Total Owner´s Costs	**1.8**
Contingency	1.5
Total Initial Capital	**9.2**
Total Sustaining Capital	**0.0**
Total Indirect and Owner´s Costs	**9.2**

21.4.5 Capital Cost Summary

The capital cost estimate is presented in Table 21-1, and comprises US$ 52.4 million of Initial Capital and US$ 15.6 million of Sustaining Capital, for an approximate total of US$68.0 million of Capital Costs. Capital costs include the direct costs for project execution, as well as the indirect costs associated with design, construction and commissioning. Indirect project capital costs include third party consultants and construction facilities and services. Percentage factors were based on DRA’s experience with similar projects that were used to determine indirect project costs, based on the project direct costs.

21.5 Operating Costs

This subsection describes the basis of estimate and approach taken in calculating the operating costs for the Project. The Operating Cost Estimate (OpEx) is presented in United States Dollars (USD). DRA developed these operating costs in conjunction with CDPR. The estimate includes mining, processing, and general and administration (G&A).

21.5.1 *Basis of OpEx Estimate*

The operating cost estimate was prepared with an expected accuracy range of +50% /- 35% accuracy of actual costs (Class 5 AACE estimate). Base pricing is in the fourth quarter of 2022 US dollars, with no allowances for inflation or escalation beyond that time.

The OpEx estimate is based on designed consumable rates, and received contractor quotations for mining and current process plant operating costs. Both process and mining personnel and salary requirements were estimated based on current operating practices at Magistral and DRA's experience on similar projects.

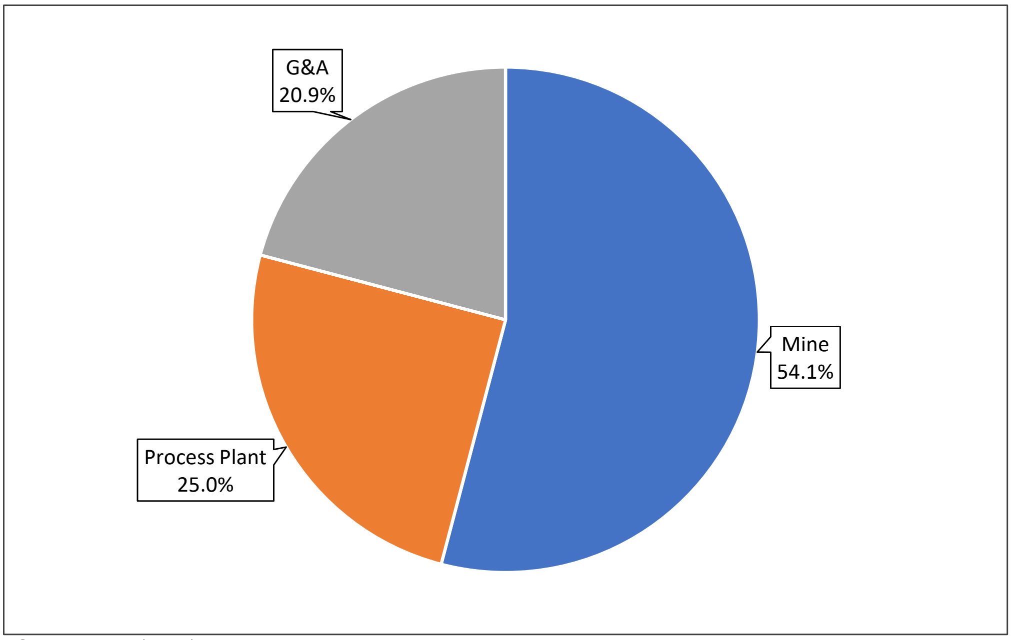
21.5.2 *OpEx Estimate Summary*

The breakdown of the yearly and LoM unit costs is shown in Table 21-7 and Figure 21-1.

Table 21-7: Unit Operating Cost Summary

	2025 (US$/t)	2026 (US$/t)	2027 (US$/t)	2028 (US$/t)	2029 (US$/t)	LOM (US$/t)
Mine	33.7	24.7	22.7	23.4	27.2	25.6
Process Plant	13.2	11.6	11.6	11.6	11.6	11.9
G&A	11.0	9.7	9.7	9.7	9.7	9.9
Total Unit Cost	**57.9**	**46.1**	**44.1**	**44.8**	**48.6**	**47.4**

Figure 21-1: Unit Operating Cost Summary



Source: DRA (2023).

21.5.3 Mine Operating Costs

Mine operating costs were based on the Santander Pipe mine plan, equipment requirements, and workforce requirements. The operating costs were determined assuming that a contractor would develop and operate the mine. This would decrease initial capital costs; make use of an experienced labour force, most of which is currently working at the adjacent Magistral mine; and reduce the time to develop and prepare the mine. It is expected that, given the competitive nature of the mine contractor sector in Peru, this would result in lower operating costs, similar to those CDPR is achieving at Magistral.

Mine operating costs include all the supplies, parts, and labour costs associated with mine supervision, operation, and equipment maintenance. The required mining equipment fleets and workforce were estimated based on industry standards and current operating practices at Magistral. The estimated mining operating costs were developed from unit rates quoted by the current contractors operating at the Magistral. The mining operating costs are presented in the following categories:

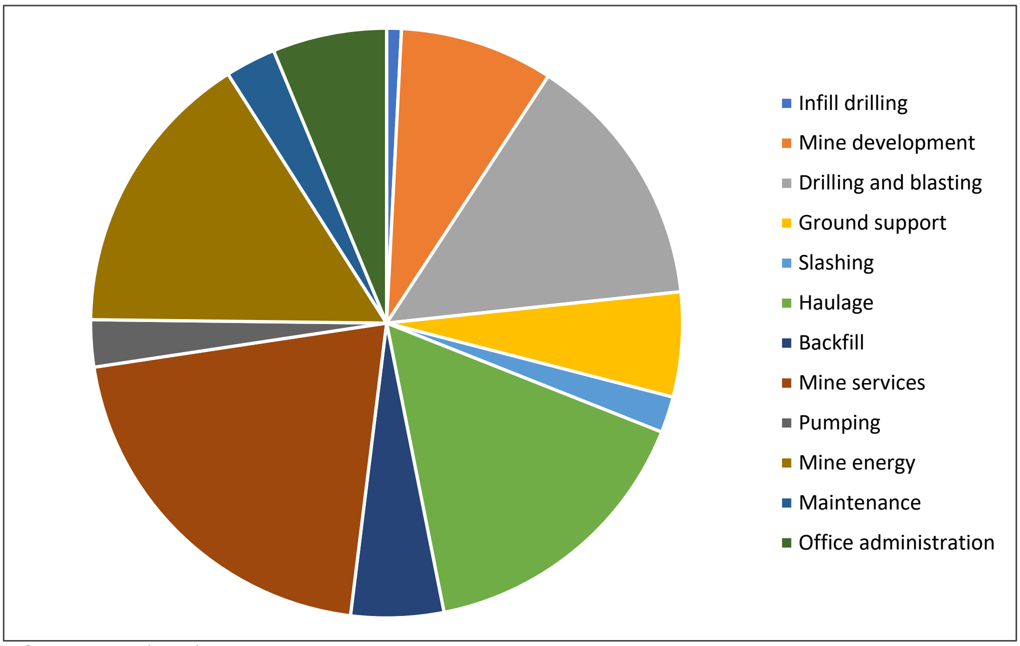
- Infill drilling
- Mine development
- Drilling and blasting
- Ground support
- Slashing
- Haulage
- Backfill
- Mine services
- Pumping
- Mine energy
- Maintenance
- Office administration

The breakdown of the yearly and LoM mining unit costs is shown in Table 21-8 and Figure 21-2.

Table 21-8: LOM Mining Operating Costs Summary

	LOM (US$/t)	LOM (KUS$)
Infill drilling	0.2	792
Mine development	2.1	8,269
Drilling and blasting	3.6	13,891
Ground support	1.5	5,654
Slashing	0.5	1,954
Haulage	4.1	15,628
Backfill	1.3	4,985
Mine services	5.3	20,348
Pumping	0.7	2,538
Mine energy	4.1	15,579
Maintenance	0.7	2,723
Office administration	1.6	6,142
Total Mine	**25.6**	**98,503**

Figure 21-2: Breakdown of LOM Mining Operating Costs



Source: DRA (2023).

21.5.4 Process Plant Operating Costs

The process operating cost estimate accounts for the operating and maintenance costs associated with the 2,500 t/d process plant operation, support services infrastructure, and tailings disposal to the TSF. Process plant operating costs were estimated based on current operating costs at the existing process plant. The plant currently processes Magistral ore and produces Zn and Pb-Ag concentrates, and will undergo minor modifications to produce Zn and Cu-Ag concentrates (see Section 13 and Section 17).

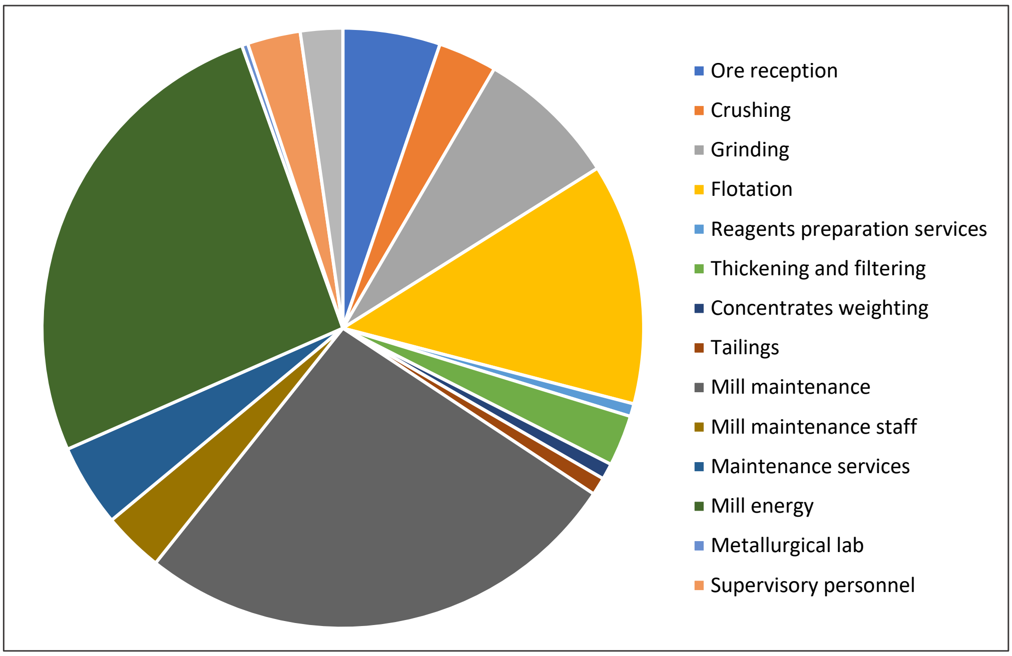
Monthly costs for reagent consumption, equipment consumables, plant staff, plant supervisory personnel, maintenance, metallurgical lab, and office administration were provided by CDPR for the period January 2019 – December 2020. These were factorized and scaled, to obtain 2022 operating costs. On average, the LOM estimated plant operating costs are 6.1% higher than the average costs for 2019 and 2020.

As can be seen in Table 21-9, the unit cost for LoM process operating is estimated at $11.86/t processed. The breakdown of processing operating costs is shown in Figure 21-3.

Table 21-9: Process Plant Operating Costs Summary

	2025		2026 - 2028		2029		LOM	
	US$/t	MUS$	US$/t	MUS$	US$/t	MUS$	US$/t	MUS$
Ore reception	0.69	0.37	0.61	0.55	0.61	0.37	**0.62**	**2.39**
Crushing	0.42	0.23	0.37	0.33	0.37	0.22	**0.38**	**1.44**
Grinding	1.01	0.55	0.89	0.80	0.89	0.54	**0.91**	**3.49**
Flotation	1.72	0.93	1.51	1.36	1.51	0.92	**1.54**	**5.94**
Reagents preparation services	0.09	0.05	0.08	0.07	0.08	0.05	**0.08**	**0.31**
Thickening and filtering	0.36	0.20	0.32	0.29	0.32	0.19	**0.33**	**1.25**
Concentrates weighting	0.11	0.06	0.10	0.09	0.10	0.06	**0.10**	**0.39**
Tailings	0.13	0.07	0.11	0.10	0.11	0.07	**0.11**	**0.43**
Mill maintenance	3.49	1.88	3.07	2.76	3.07	1.86	**3.13**	**12.04**
Mill maintenance staff	0.43	0.23	0.38	0.34	0.38	0.23	**0.39**	**1.49**
Maintenance services	0.59	0.32	0.52	0.47	0.52	0.31	**0.53**	**2.03**
Mill energy	3.46	1.87	3.04	2.74	3.04	1.85	**3.10**	**11.93**
Metallurgical lab	0.04	0.02	0.04	0.03	0.04	0.02	**0.04**	**0.15**
Supervisory personnel	0.38	0.20	0.33	0.30	0.33	0.20	**0.34**	**1.30**
Office administration	0.30	0.16	0.26	0.24	0.26	0.16	**0.27**	**1.04**
Total	**13.23**	**7.14**	**11.64**	**10.48**	**11.64**	**7.06**	**11.86**	**45.63**

Figure 21-3: Breakdown of LOM Process Plant Operating Costs



Source: DRA (2023).

21.5.5 Power Operating Costs

Power consumption at the mine was estimated based on the power requirements by the major and secondary mining equipment. Assumptions include:

- 80% correction factor;
- Mine ventilation and raise boring equipment operate 16 h/d;
- Mine pumps operate 24 h/d; and
- Drilling and ground support equipment operate 8 h/d.

An energy cost is $0.10/kWh has been used as the basis for the PEA. The resulting average annual operating cost for mine power is $3.1 million.

Power costs at the process plant were provided by CDPR for the period January 2019 – December 2020 and were factorized and scaled to obtain 2022 operating costs. The resulting average annual operating cost for process plant power is $2.5 million.

21.5.6 General and Administrative Operating Costs

The LoM G&A operating cost is estimated at $38.0 million or US$9.9/t processed. The G&A includes: management labour costs, site services labour costs, engineering and geology labour costs, vehicle costs, office supplies, personnel protection equipment, environmental monitoring and compliance, licences and permits, safety and first aid equipment, security supplies, communications equipment, software, legal fees, travel, training, community assistance, and maintenance for all buildings and equipment not directly related to mining or processing.

21.5.7 Labour Costs

Mine and plant operating personnel will work under a rotation system of 12 hours per shift, two shifts per day. Labour costs were included in the cost information of the current operation provided by CDPR. These labour costs include basic salaries as well as personnel health insurance costs and any additional benefits required by law.

Mine labour costs are included in the unit rates quoted by the CDPR contractor currently working at the Magistral Mine.

A preliminary staffing plan estimate for the operation of the underground mine based on experience with similar projects is shown in Table 21-10.

Table 21-10: Mine Personnel Requirements per Shift

	2025	2026	2027	2028	2029
Equipment operators	29	38	36	30	27
Auxiliary operators	9	12	11	6	5
Blasting	8	11	8	6	5
Services	5	5	5	5	5
Ventilation	2	2	2	2	2
Engineering and surveying	2	2	2	2	2
Supervisor	5	5	5	5	5
Total	**60**	**75**	**69**	**56**	**51**

22 ECONOMIC ANALYSIS

22.1 Cautionary Statements

The economic analysis contained in this report is based, in part, on Inferred Mineral Resources, and is preliminary in nature. Inferred Mineral Resources are considered too geologically speculative to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. There is no certainty that economic forecasts on which this PEA is based will be realized.

Certain information and statements contained in this section and in the Technical Report are “forward looking” in nature. Forward-looking statements include, but are not limited to, statements with respect to the economic and study parameters of the project; Mineral Resource estimates; the cost and timing of any development of the project; the proposed mine plan and mining methods; dilution and extraction recoveries; processing production rates; projected metallurgical recovery rates; infrastructure requirements; capital, operating and sustaining cost estimates; the projected LoM and other expected attributes of the project; the NPV and IRR and payback period of capital; capital; future metal prices; the timing of the environmental permitting process; requirements for additional capital; environmental risks; and general business and economic conditions.

All forward-looking statements in this Technical Report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted.

The forward-looking statements in this Technical Report are subject to the following assumptions:

- There being no signification disruptions affecting the development and operation of the project;
- The availability of certain consumables and services and the prices for power and other key supplies being approximately consistent with assumptions in the Technical Report;
- Labour and materials cost being approximately consistent with assumptions in the Technical Report;
- The timelines for prior consultation and wet season/dry season baseline data collection being generally consistent with PEA assumptions, and permitting and arrangements with stakeholders being consistent with current expectations as outlined in the Technical Report;
- All environmental approvals, required permits, licenses and authorizations will be obtained from the relevant government departments and other relevant stakeholders;
- Certain tax rates, including the allocation of certain tax attributes, being applicable to the project;
- The availability of financing for CDPR’s planned development activities;

- The timelines for underground exploration and development activities on the project; and
- Assumptions made in Mineral Resource estimate and the financial analysis based on that estimate, including, but not limited to, geological interpretation, grades, commodity price assumptions, extraction and mining recovery rates, geotechnical, hydrological and hydrogeological assumptions, capital and operating cost estimates, and general marketing, political, business and economic conditions.
- Treatment charges, freight charges, metal prices and other details are included in Section 19 of this report.

22.2 Methodology Used and Input Parameters

The financial analysis was carried out using a discounted cash flow (DCF) methodology. Net annual cash flows were estimated projecting yearly cash inflows (or revenues) and subtracting projected yearly cash outflows (such as capital and operating costs, royalties and taxes). These annual cash flows were discounted back to the date of the beginning of capital expenditure and totalled to determine the NPV of the project at selected discount rates. A discount rate of 6.0% was used as the base discounting rate.

In addition, the IRR expressed as the discount rate that yields an NPV of zero, and the payback period expressed as the estimated time from the start of production until all initial capital expenditures have been recovered, were also estimated.

Sensitivities to variations in commodity prices, grades, initial capital costs and operating costs were carried out to identify potential impacts on NPV.

All monetary amounts are presented in constant fourth quarter of 2022 US dollars. For discounting purposes, cash flows are assumed to occur at the end of each period. Revenue is recognized at the time of production.

Principal assumptions are summarized in Table 22-1.

Table 22-1: Key Input Parameters for Economic Analysis

Input Parameter	Values	Units
Project timeline		
Pre-production period	2.5	years
Full production	4.5	years
Mine operating days per year	365	days
Mill operating days per year	365	days
Mill feed rate	2,500	t/d
Concentrate grade		
Zinc	51.0	%
Copper	21.0	%
Concentrate moisture	8.0	%
Concentrate freight charges	80	US$/t
Treatment charge		
Zinc	200	US$/DMT
Copper	128	US$/DMT
Long-term metal prices		
Zinc	2,800	US$/t
Copper	9,002	US$/t
Silver	22.0	US$/oz
Zinc deduction	8.0	%
Smelting payable		
Copper	96.4	%
Silver	90.0	%
Base discount rate	6.0	%

22.3 Taxation

The tax calculations in the financial model are based on the current Peruvian tax laws. Tax deductions are used to adjust the project's gross income and determine the actual taxable income (see Table 22-2). Depreciation and mandatory workers profit-sharing are applied to the tax model as deductions.

Table 22-2: Royalties, Depreciation and Taxes

Royalties (*)	% operating income
Special Mining Tax IEM (*)	% operating income
Depreciation - Pre-production	Assumed ongoing operation can depreciate full pre-production expenses
Depreciation - Production	Distributed over the LOM based on annual production tonnage
Mandatory workers profit-sharing	8.0% operating income before taxes
Complementary Retirement Fund for Mining and Metallurgical Workers (FCJMM)	0.5% profits after mandatory workers profit-sharing
Income Tax	29.5% profits after FCJMM

(*) Actual rates depend on the operating margin (operating profit / net revenue).

Table 22-3 shows the royalties and taxes paid by the project over the LOM.

Table 22-3: Royalties, Depreciation and Taxes

Royalty / Tax	MUSD
Royalties	3.9
Special Mining Tax IEM	2.5
Mandatory workers profit-sharing	12.7
Complementary Retirement Fund for Mining and Metallurgical Workers (FCJMM)	0.7
Income Tax	42.7

22.4 Inflation

No escalation or inflation has been applied. All amounts are in real (constant) terms.

22.5 Closure Costs and Salvage Value

No closure costs or salvage value has been estimated.

22.6 Financing

The PEA analysis is based on 100% equity financing.

22.7 Economic Analysis

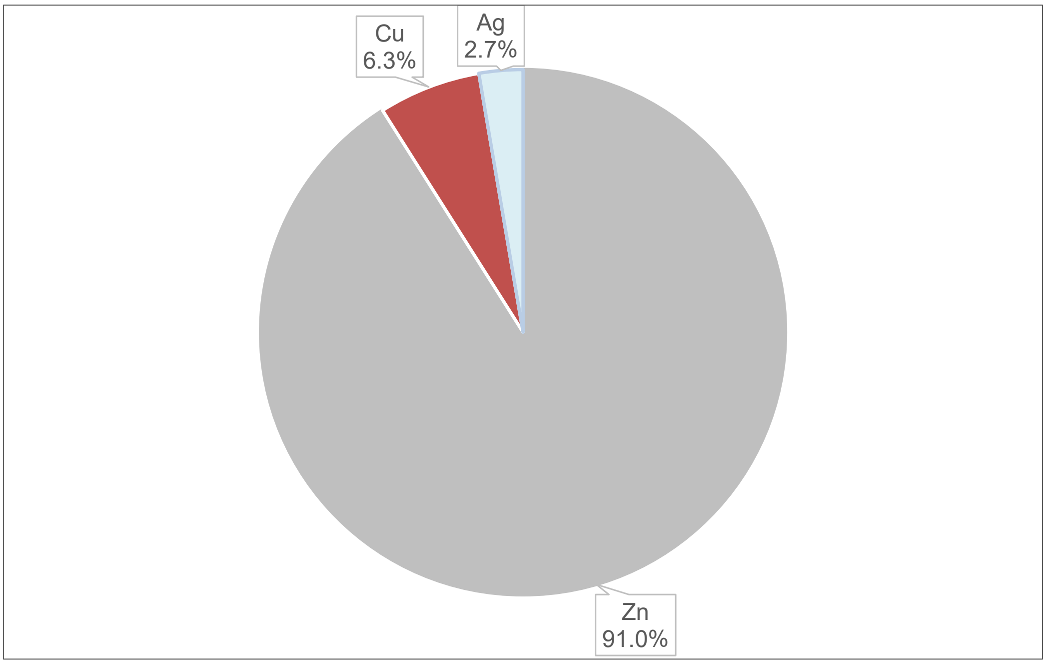
The Project is estimated to have LoM revenue totalling US$453.1 million using metals price assumptions shown in Table 19-1. Table 22-4 shows the project economic results.

Table 22-4: Project Evaluation Economic Results

Project Evaluation Economic Results	Value (MUSD)
Metal Revenue	
Zinc Revenue	416.5
Copper Revenue	26.2
Silver Revenue	10.4
Total Metal Revenue	**453.1**
Off-site Costs	
Treatment Charges	(64.5)
Freight Concentrate	(26.2)
Revenue Less by Product Costs	**388.6**
Revenue Less Off-site Costs	**362.4**
On-site Operating Costs	
Mining, Processing & G&A	(182.1)
Total On-site Operating Costs	**(182.1)**
Workers Mandatory Profit-Sharing	(12.7)
Operating Profit (EBITDA)	**167.6**
Royalties and Taxes	**(49.8)**
Capital Costs	
Initial Capital	(52.4)
Sustaining Capital	(15.6)
Total Capital Costs	**(68.0)**
Pre-Tax Metrics	
Free Cash Flow	99.6
NPV @ 6%	71.3
Payback Period (Years)	1.9
IRR Before Tax (%)	46.6
After-Tax Metrics	
Free Cash Flow	49.8
NPV @ 6%	31.2
Payback Period (Years)	2.6
IRR After Tax (%)	25.1

A breakdown of revenue by metals is shown in Figure 22-1.

Figure 22-1: Breakdown of Revenue by Metal



Source: DRA (2023).

A full LOM cash flow model is presented in Table 22-5.

Table 22-5: LOM Annual Cash Flow Model

		LOM	2023	2024	2025	2026	2027	2028	2029
Metal Prices									
Zn	US$/t	2,800	3,200	3,100	3,000	2,800	2,800	2,800	2,800
Cu	US$/t	9,013	8,723	8,253	9,597	9,921	9,002	9,002	9,002
Ag	US$/oz	22.00	21.84	23.25	24.50	24.50	22.00	22.00	22.00
Mill Feed	**t**	**3,846,563**			**539,827**	**900,000**	**900,000**	**900,000**	**606,736**
Zn	%	4.67			5.14	5.01	5.05	4.12	4.01
Cu	%	0.11			0.10	0.08	0.15	0.11	0.09
Ag	oz/t	0.26			0.33	0.30	0.36	0.16	0.14
Payable Value	**US$ 000**	**453,051**			**73,552**	**111,172**	**115,784**	**92,550**	**59,992**
Zn	US$ 000	416,525			68,158	103,375	104,200	85,011	55,780
Cu	US$ 000	26,161			3,437	4,738	8,413	6,170	3,403
Ag	US$ 000	10,365			1,958	3,059	3,170	1,369	809
Commercial Discounts	US$ 000	-64,487			-9,915	-16,044	-16,439	-13,364	-8,725
Sales Expenses	US$ 000	-26,193			-4,018	-6,487	-6,705	-5,441	-3,542
NSR	**US$ 000**	**362,371**			**59,620**	**88,641**	**92,640**	**73,745**	**47,725**
Operating Cost	US$ 000	-182,138			-31,270	-41,455	-39,647	-40,289	-29,476
Workers Participation	US$ 000	-12,659			-2,071	-3,330	-3,784	-2,276	-1,198
Operating Profit (EBITDA)	**US$ 000**	**167,575**			**26,279**	**43,855**	**49,210**	**31,180**	**17,051**
Royalties and Taxes	US$ 000	-49,846			-8,139	-13,130	-14,828	-8,965	-4,783
Capital Costs	US$ 000	**-67,961**	**-3,054**	**-49,299**	**-10,210**	**-5,397**			
Initial CapEx	US$ 000	-52,353	-3,054	-49,299					
Sustaining CapEx	US$ 000	-15,607			-10,210	-5,397			
Valuation Indicators									
Discount Factor	6.0%		1.00	0.94	0.89	0.84	0.79	0.75	0.70
Pre-Tax Cash Flow	**US$ 000**	**99,614**	**-3,054**	**-49,299**	**16,068**	**38,458**	**49,210**	**31,180**	**17,051**
NPV @ 6.0%	**US$ 000**	**71,327**							
Payback Period	**Years**	**1.9**							
IRR	**%**	**46.6**							
After-Tax Cash Flow	**US$ 000**	**49,768**	**-3,054**	**-49,299**	**7,929**	**25,328**	**34,381**	**22,215**	**12,268**
NPV @ 6.0%	**US$ 000**	**31,242**							
Payback Period	**Years**	**2.6**							
IRR	**%**	**25.1**							

22.8 Sensitivity Analysis

To assess the project value drivers, sensitivity analyses were performed for the NPV considering variations in total capital and operating costs, long-term metal prices, recoveries, and discount rate on the pre and after tax NPV.

The results of the NPV sensitivity analysis can be seen in Table 22-6, Table 22-7, Table 22-8, Table 22-9, Table 22-10, Table 22-11, and Table 22-12. Similarly, Figure 22-2, Figure 22-3, Figure 22-4, and Figure 22-5 show the pre-tax NPV sensitivities, whereas Figure 22-6, Figure 22-7, Figure 22-8, and Figure 22-9 present the corresponding after-tax sensitivities.

The project proved to be most sensitive to fluctuations in the Zn metal price and less sensitive to Zn recovery and changes in operating costs and initial capital costs.

Table 22-6: Zinc Price Sensitivity

Zinc Price (US$/t)	Pre-Tax NPV			After-Tax NPV		
	@ 6.0% (MUS$)	@ 8.0% (MUS$)	@ 10.0% (MUS$)	@ 6.0% (MUS$)	@ 8.0% (MUS$)	@ 10.0% (MUS$)
2,240.0	9.9	6.5	3.5	-10.4	-12.5	-14.3
2,520.0	40.6	35.1	30.2	10.5	7.0	3.9
2,800.0	**71.3**	**63.7**	**56.9**	**31.2**	**26.3**	**21.9**
3,080.0	102.1	92.4	83.6	51.7	45.4	39.7
3,360.0	132.9	121.1	110.4	71.7	64.0	57.1

Table 22-7: Zinc Recovery Sensitivity

Zinc Recovery (%)	Pre-Tax NPV			After-Tax NPV		
	@ 6.0% (MUS$)	@ 8.0% (MUS$)	@ 10.0% (MUS$)	@ 6.0% (MUS$)	@ 8.0% (MUS$)	@ 10.0% (MUS$)
78.3	42.2	36.6	31.6	11.6	8.0	4.9
83.7	56.8	50.2	44.2	21.5	17.2	13.4
89.0	**71.3**	**63.7**	**56.9**	**31.2**	**26.3**	**21.9**
94.3	85.9	77.3	69.6	41.0	35.4	30.4

Table 22-8: Discount Rate Sensitivity

Discount Rate	Pre-Tax NPV (MUS$)	After-Tax NPV (MUS$)
5.0%	75.4	33.9
6.0%	**71.3**	**31.2**
8.0%	63.7	26.3
10.0%	56.9	21.9
12.0%	50.7	17.9
15.0%	42.5	12.7

Table 22-9: Pre-Tax NPV Sensitivity – Capex, OpEx & Long-term Metal Prices

	-20% (MUS$)	-15% (MUS$)	-10% (MUS$)	-5% (MUS$)	Base Case (MUS$)	+5% (MUS$)	+10% (MUS$)	+15% (MUS$)	+20% (MUS$)
CapEx	83.8	80.7	77.5	74.4	**71.3**	68.2	65.1	62.0	58.9
OpEx	98.1	91.4	84.7	78.0	**71.3**	64.6	58.0	51.3	44.6
Ag Price	69.8	70.2	70.6	70.9	**71.3**	71.7	72.1	72.5	72.9
Zn Price	9.9	25.3	40.6	56.0	**71.3**	86.7	102.1	117.5	132.9
Cu Price	67.5	68.5	69.4	70.4	**71.3**	72.3	73.2	74.2	75.2

Table 22-10: Pre-Tax NPV Sensitivity – Metal Recoveries

	-12% (MUS$)	-9% (MUS$)	-6% (MUS$)	-3% (MUS$)	Base Case (MUS$)	+3% (MUS$)	+6% (MUS$)	+9% (MUS$)	+12% (MUS$)
Ag Recovery	70.2	70.5	70.8	71.1	**71.3**	71.6	71.9	72.1	72.4
Zn Recovery	42.2	49.5	56.8	64.0	**71.3**	78.6	85.9	93.2	100.5
Cu Recovery	69.3	69.8	70.3	70.8	**71.3**	71.8	72.3	72.8	73.3

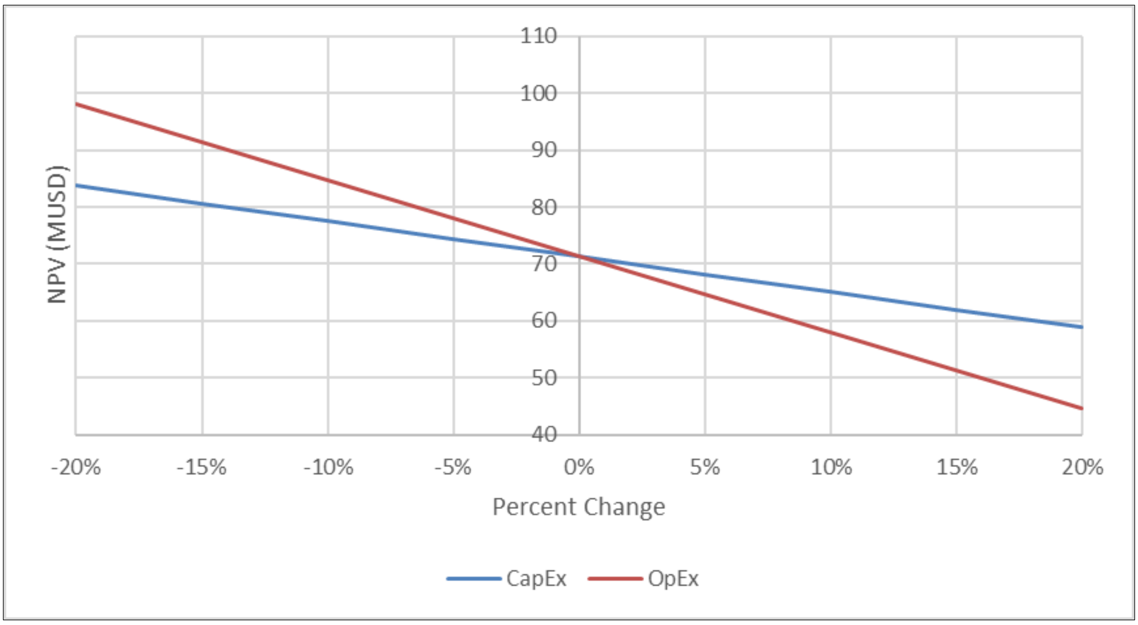
Table 22-11: After-Tax NPV Sensitivity – Capex, OpEx & Long-term Metal Prices

	-20% (MUS$)	-15% (MUS$)	-10% (MUS$)	-5% (MUS$)	Base Case (MUS$)	+5% (MUS$)	+10% (MUS$)	+15% (MUS$)	+20% (MUS$)
CapEx	42.8	39.9	37.1	34.2	**31.2**	28.3	25.4	22.5	19.6
OpEx	48.7	44.3	40.2	35.7	**31.2**	26.8	22.2	17.7	13.1
Ag Price	30.2	30.4	30.7	31.0	**31.2**	31.5	31.8	32.0	32.3
Zn Price	-10.4	0.1	10.5	20.9	**31.2**	41.5	51.7	61.6	71.7
Cu Price	28.7	29.3	29.9	30.6	**31.2**	31.9	32.5	33.1	33.7

Table 22-12: After-Tax NPV Sensitivity – Metal Recoveries

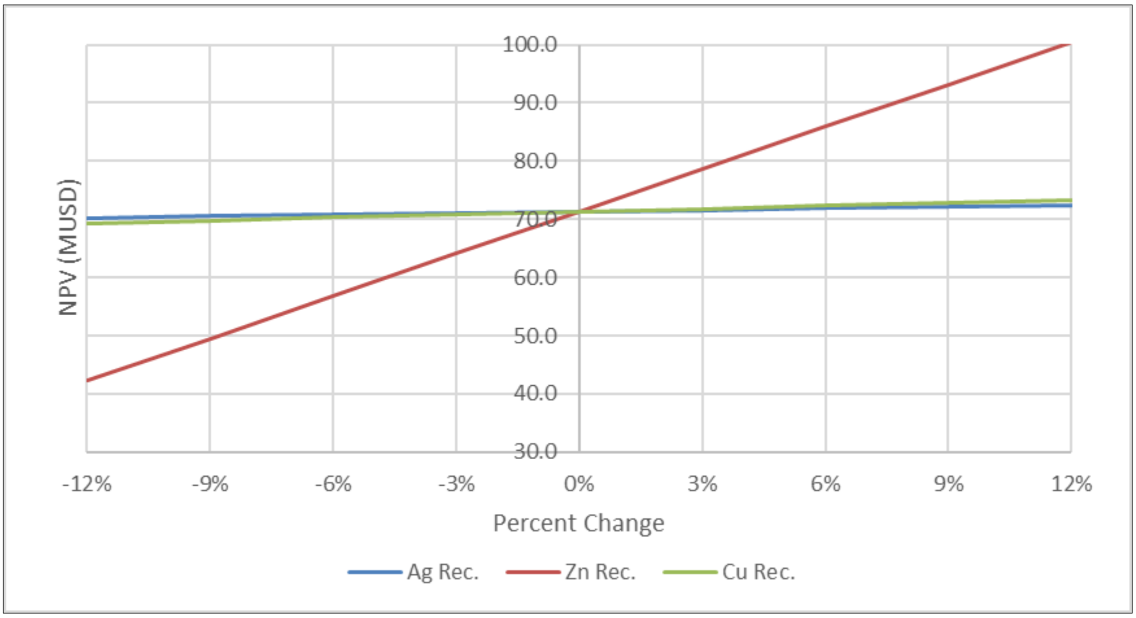
	-12% (MUS$)	-9% (MUS$)	-6% (MUS$)	-3% (MUS$)	Base Case (MUS$)	+3% (MUS$)	+6% (MUS$)	+9% (MUS$)	+12% (MUS$)
Ag Recovery	30.5	30.7	30.9	31.1	**31.2**	31.4	31.6	31.8	32.0
Zn Recovery	11.6	16.5	21.5	26.4	**31.2**	36.1	41.0	45.8	50.6
Cu Recovery	29.9	30.2	30.6	30.9	**31.2**	31.6	31.9	32.3	32.6

Figure 22-2: Pre-Tax NPV Sensitivity – CapEx & OpEx



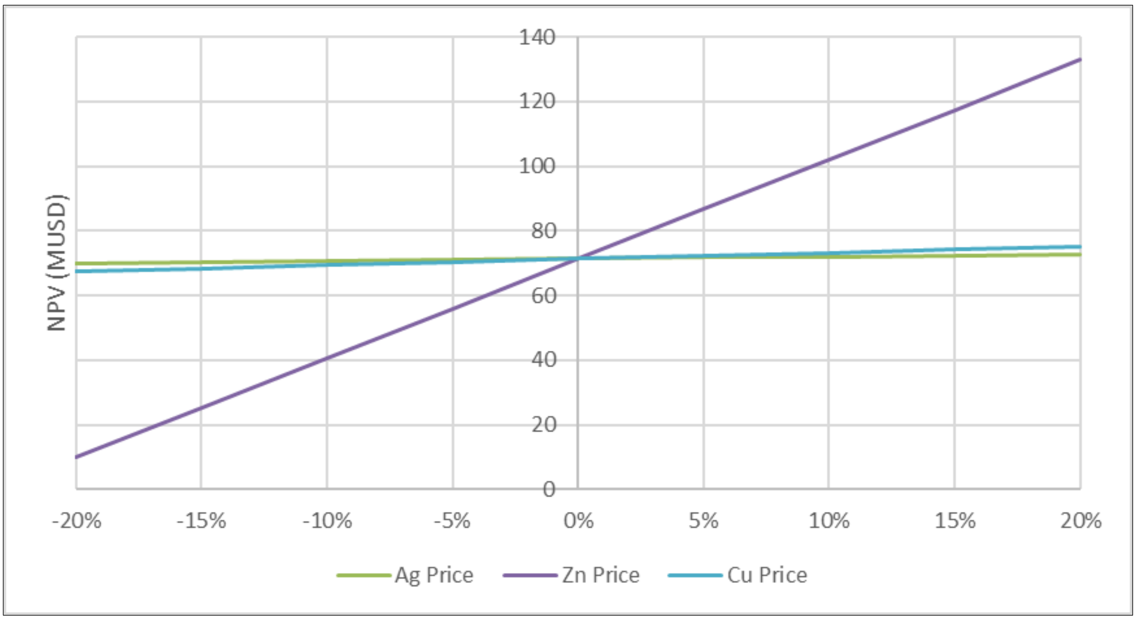
Source: DRA (2023).

Figure 22-3: Pre-Tax NPV Sensitivity – Recoveries



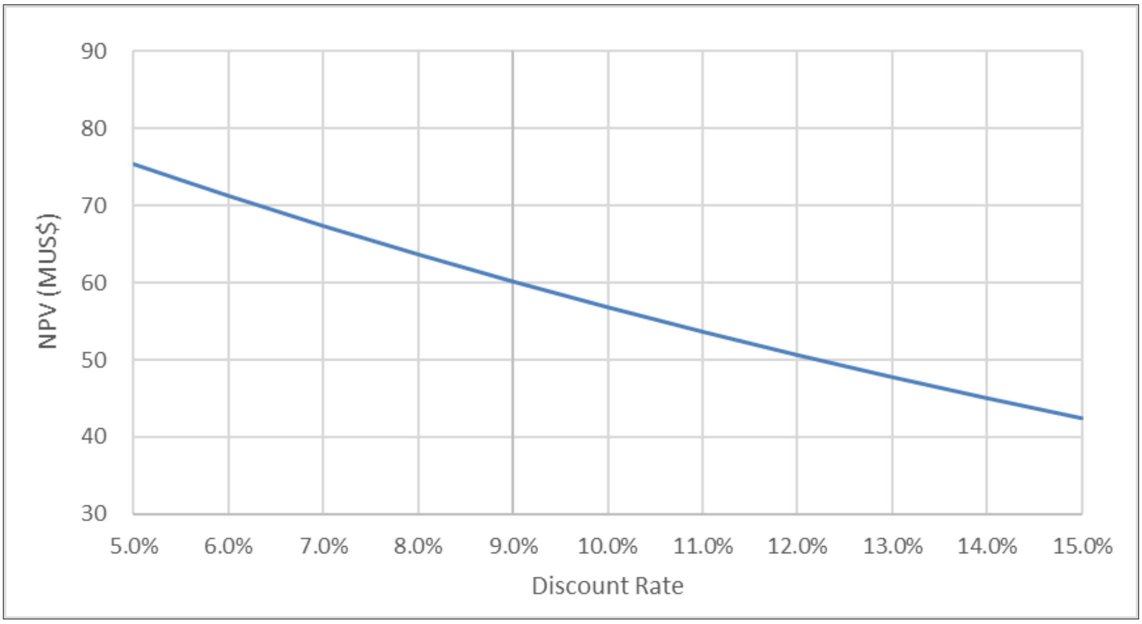
Source: DRA (2023).

Figure 22-4: Pre-Tax NPV Sensitivity – Long-term Metal Prices



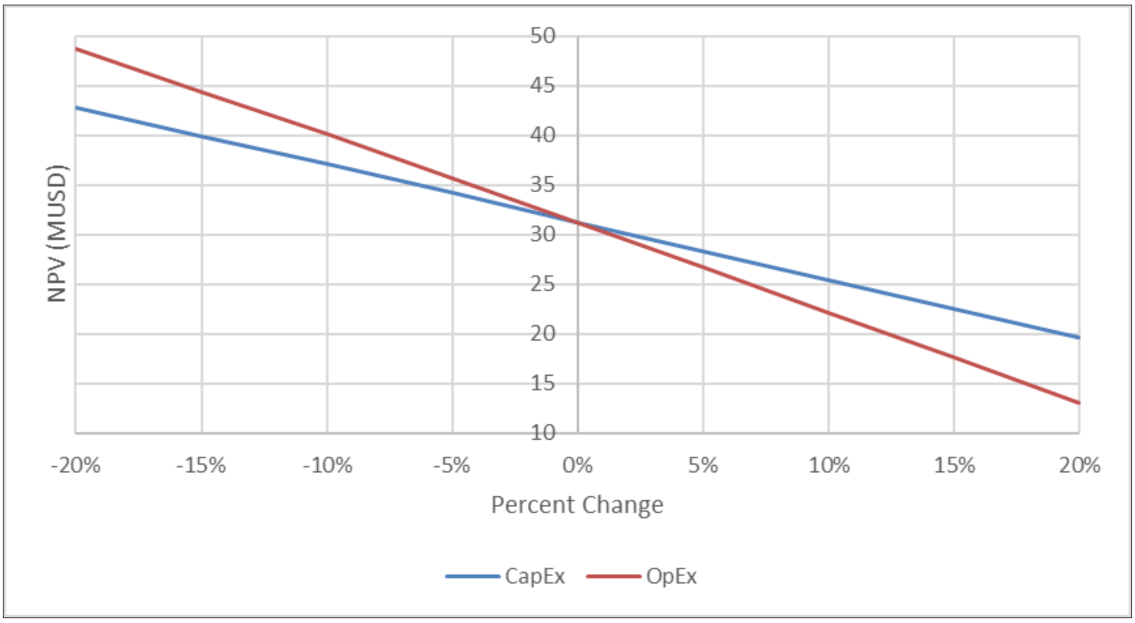
Source: DRA (2023).

Figure 22-5: Pre-Tax NPV Sensitivity – Discount Rate



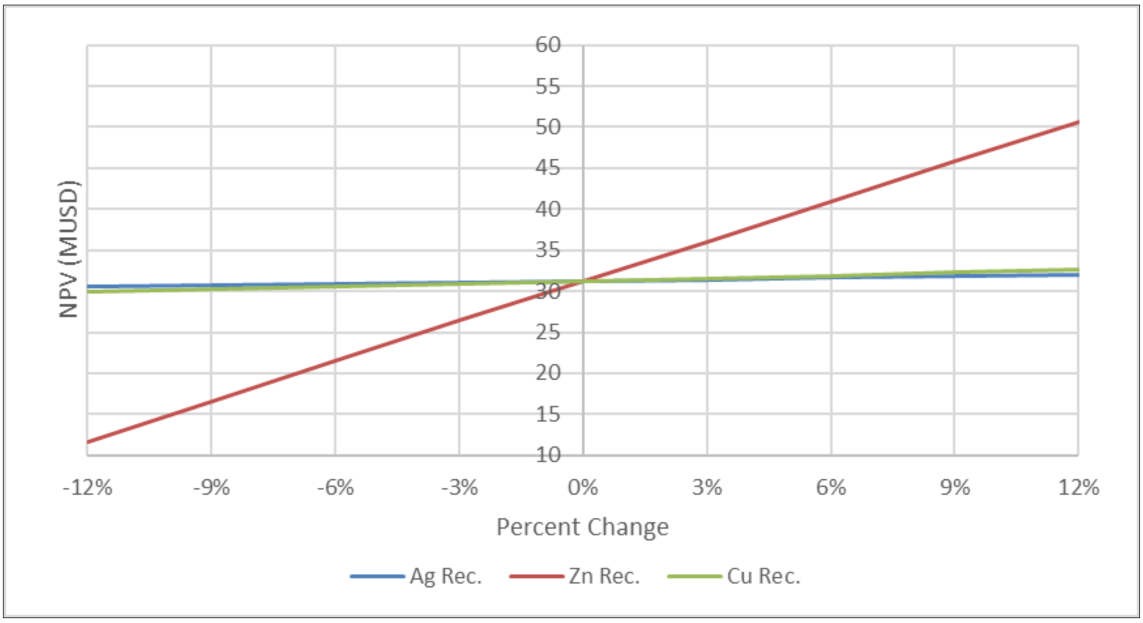
Source: DRA (2023).

Figure 22-6: After-Tax NPV Sensitivity – CapEx & OpEx



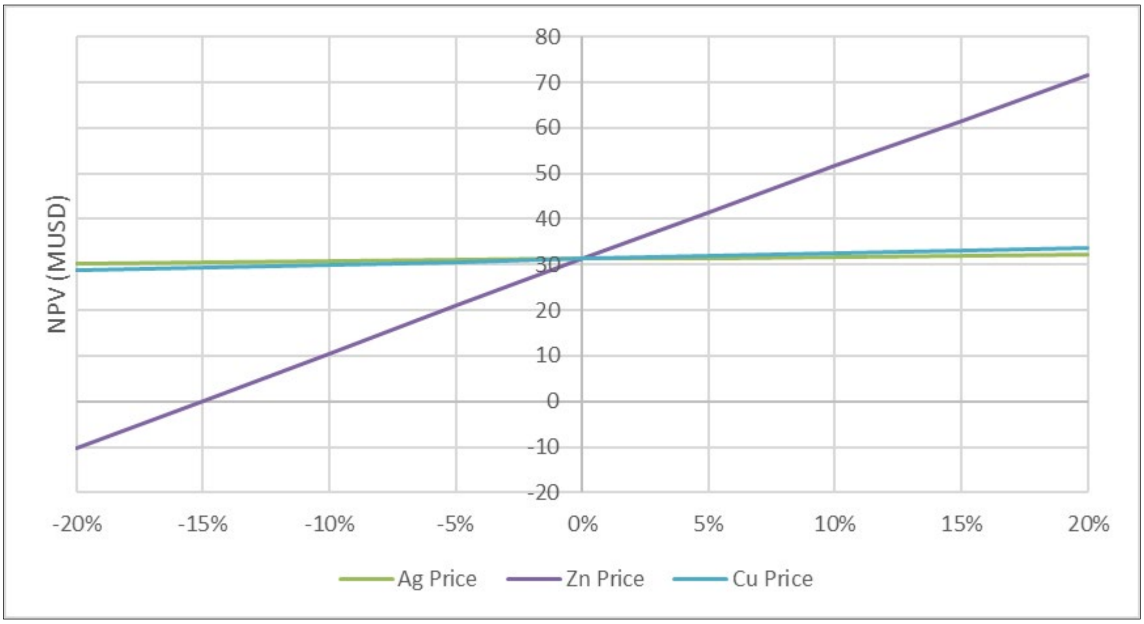
Source: DRA (2023).

Figure 22-7: After-Tax NPV Sensitivity – Recoveries



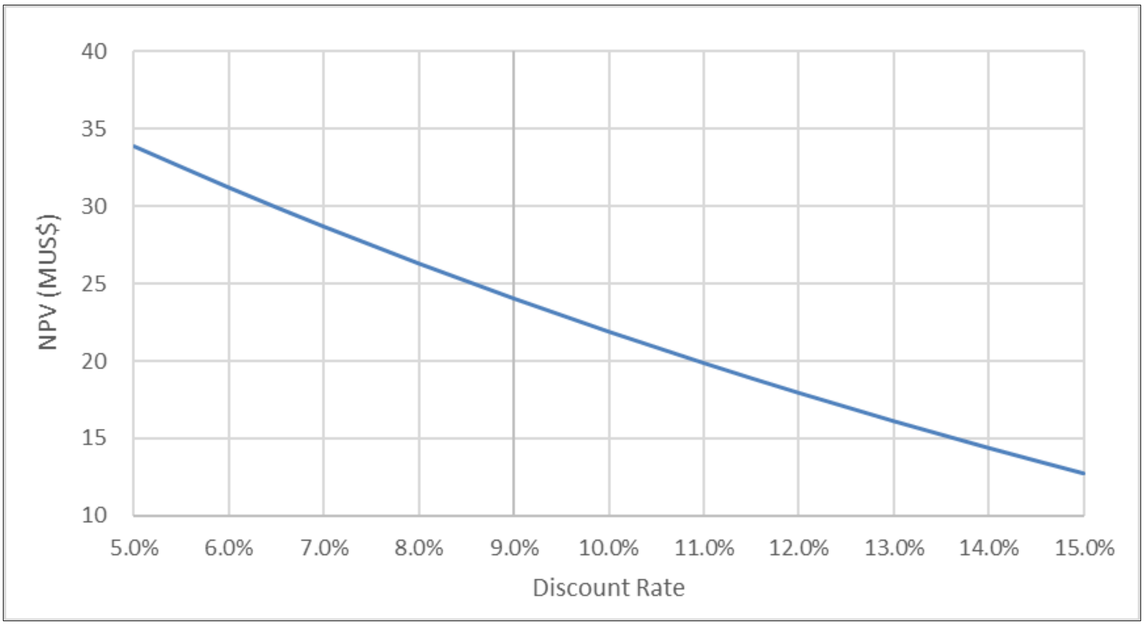
Source: DRA (2023).

Figure 22-8: After-Tax NPV Sensitivity – Long-term Metal Prices



Source: DRA (2023).

Figure 22-9: After-Tax NPV Sensitivity – Discount Rate



Source: DRA (2023).

22.9 Comments on Section 22

Under the assumptions made in this Technical Report, and based on the available data, the project shows positive economics. Using a 6% discount rate, the project has an after-tax NPV of US$31.2 million, an IRR of 25.1% and a payback period of 2.6 years. On the other hand, the project is most sensitive to the Zn price: a drop in 15% of the long-term Zn price (US$ 2,800/t) results in an after tax NPV close to zero.

23 ADJACENT PROPERTIES

The Eocene-Miocene metallogenic belt of central Peru contains numerous examples of carbonate-hosted, vein and skarn-type zinc-lead (silver, copper) deposits that are exposed at various elevations depending on the level of erosion. The Chungar Antiguo deposit, located 7.5 km north of the Santander property, is an example of a contact developed endo-skarn and exo-skarn deposit surrounding an intrusive body which takes the form of a lacolith. All deposit types are associated with deep-seated intrusive systems at greater depth.

The Compañia Minera Chungar Romina project (also referred to as Nuevo Santander) is located 2 km to the north of Santander´s eastern-most concessions. This comprises a pipe-type deposit similar to the Santander Pipe, but with lower grades (Table 23-1).

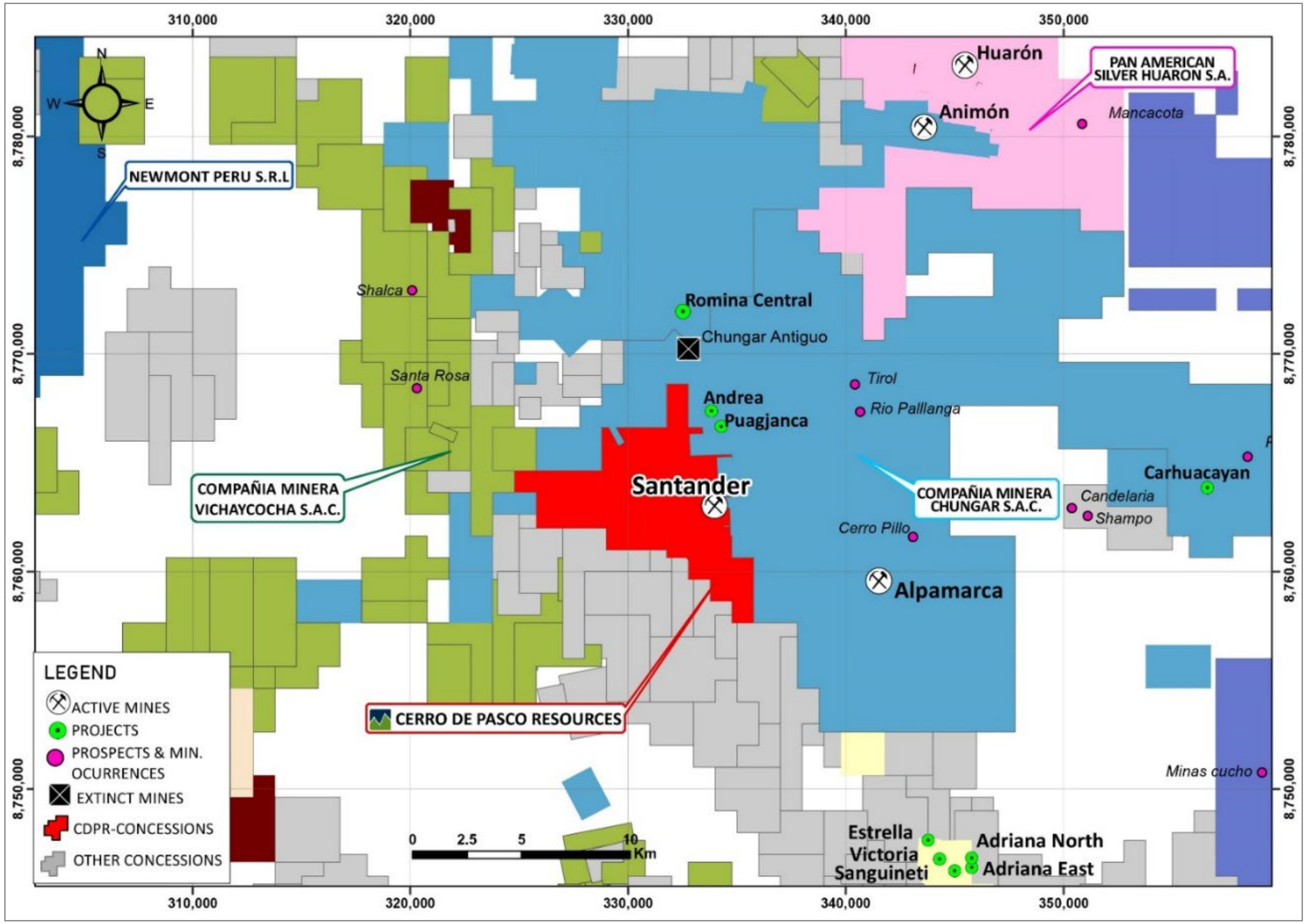
There are several smaller prospects and mineral showings within the same general area, including the Why Not prospect, also referred to as the Northwest Mine. These belong to the same fault-controlled anticlinal structure as the Santander Pipe and Puajanca deposits.

It can be seen from Figure 23-1 that CDPR's Santander concessions are mostly surrounded by other active exploration and mining companies. As a comparison, see the measured and indicated resources within the surrounding area, summarized in Table 23-1 with information sourced from Volcan Compañía Minera S.A.A., 2021 Annual Report (www.volcan.com.pe) and Pan American Silver Corp, 2021 Annual Report (www.panamericansilver.com).

Table 23-1: Adjacent properties - End-2021 declared Measured and Indicated Resources

Company	Deposit	Mt	Zn %	Pb %	Cu %	Ag oz/t	Location
Cia Minera Chungar	Romina project	10.6	4.8	2.6	0.1	1.2	2km North
Cia Minera Chungar	Animón mine	9.7	7.7	2.4	0.2	2.8	24 Km N-E
Cia Minera Chungar	Islay mine	2.8	1.8	0.8	0.0	4.8	16 km N-E
Cia Minera Chungar	Alpamarca mine	2.0	1.0	0.8	0.1	1.6	8 Km E-S-E
Pan American Silver	Huaron mine	4.4	2.9	1.6	0.5	5.1	25 Km N-E

Figure 23-1: Currently active exploration and mining concessions surrounding the Santander property



Source: CDPR (2022).

24 OTHER RELEVANT INFORMATION

The project schedule is presented and discussed in this section.

24.1 Project Schedule

The conceptual project schedule, shown in Figure 24 1, was prepared in conjunction with the CDPR team in charge of the project. It includes the following key milestones:

1. Approval of the second modification of the EIA;
2. Completion of the Magistral – Santander Pipe ramp;
3. Completion of the infill drilling program; and,
4. Dewatering and rehabilitation of the La Cuñada shaft.

The schedule indicates that the Santander Pipe mine is expected to be commissioned at the end of the second quarter of 2025.

It must be noted that the preparation of an interim mineral resource estimate at the end of 2023 has been considered so that CDPR is able to develop the corresponding mine plan, CapEx and OpEx estimates, and economic analysis. A positive economic analysis at that stage would allow CDPR to obtain the internal approval required to start working on the Santander mine dewatering, La Cuñada shaft rehabilitation, and Santander Pipe mine development.

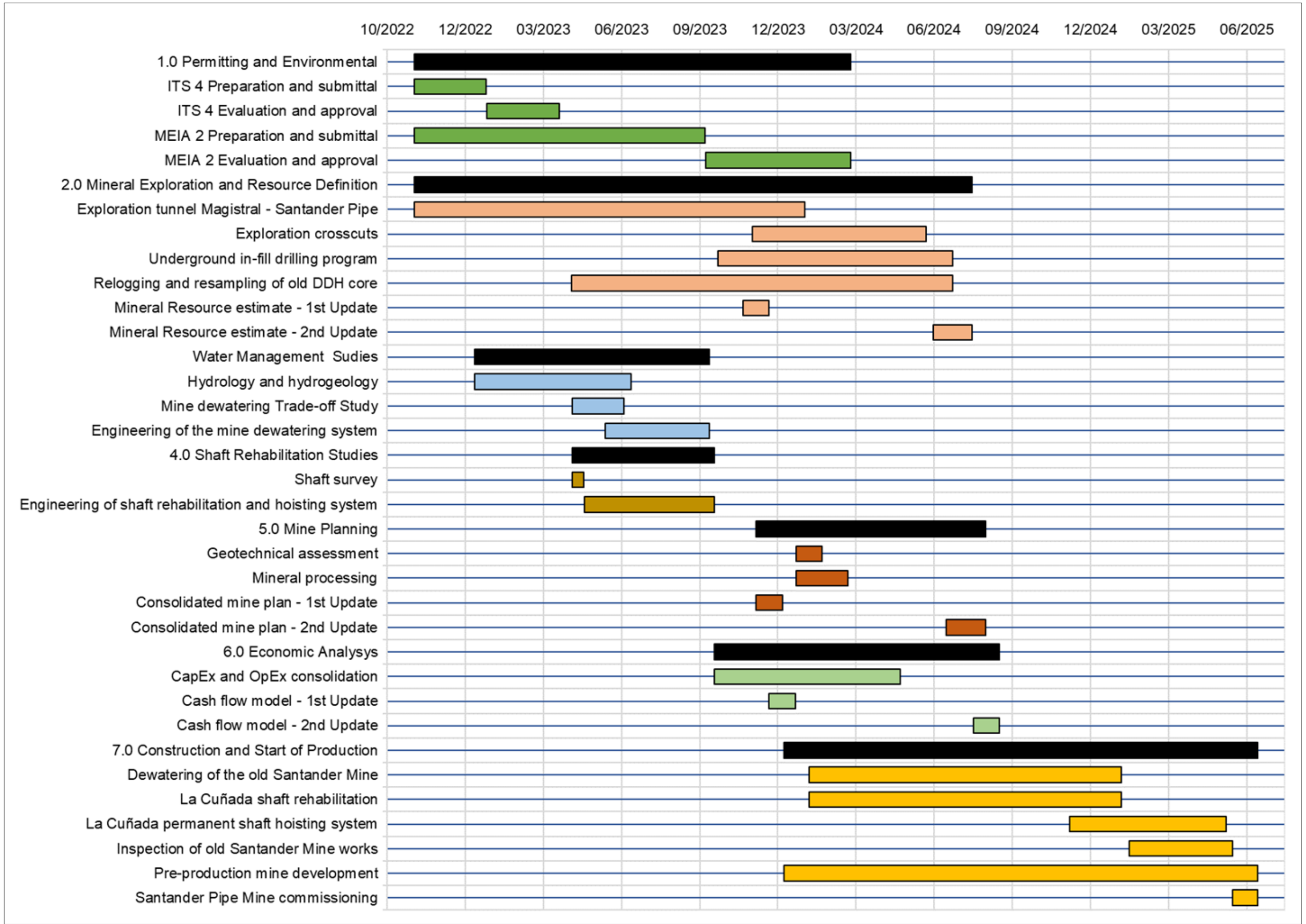
DRA considers the conceptual schedule feasible but challenging. There is very little slack, and unforeseen delays could affect the ability to meet the expected mine commissioning target date. It should be noted the following:

A. The key piece of the project´s critical path is the development of the Magistral – Santander Pipe ramp, since it will provide access for the infill drilling program that will support the upgrading of the mineral resources required to take the Santander Pipe project to the PFS/FS level.

B. Underground mine development is restricted by the progress in dewatering the old Santander mine.

C. The La Cuñada shaft rehabilitation and implementation plan depends on an early sourcing of a hoist system that meets the Santander Pipe requirements in terms of capacity and cost.

Figure 24-1: Project schedule



Source: CDPR (2023).

24.2 Risks and Opportunities

Significant risks were identified by DRA in the following areas:

1. Assumptions regarding the time and cost associated with dewatering the old Santander mine;
2. Sourcing the required hoisting system; and,
3. The conceptual project schedule.

Opportunities identified by DRA include the following:

A. Further investigation of the old mined areas in the Santander Pipe upper zone has the potential of significantly increasing the mineral resources in terms of quality and quantity.

B. The proposed crown pillar is tying up over 0.5 million tonnes of medium-grade mineral resources. CDPR should study mine sequencing options that could allow it to extract it safely.

C. The use of electrical mining equipment could lower mine ventilation requirements, impacting positively on the project´s CapEx and OpEx.

25 INTERPRETATIONS AND CONCLUSIONS

This work has included an update of the Santander Pipe mineral resource based on recommendations made in the previous NI 43-101 completed by DRA in January 2022. The objective of this report is not only to support CDPR´s proposal to re-open the Santander mine, but to consider what engineering studies will be necessary to support the proposal at a PFS level.

25.1 Introduction

Based on the review of data available for the Preliminary Economic Assessment (PEA) of the Santander Pipe project, the QP's have provided following interpretations and conclusions in their respective areas of expertise.

25.2 Mineral Tenure, Surface Rights, Royalties and Agreements

The CDPR mining concessions (the *Property*) comprise an irregular, north to northwest-trending block of 74 mining concessions covering a granted area of 6,453.52 ha for a total effective area of 4,829.89 ha which encompasses one beneficiation (processing) concession occupying 133.11 ha. All 74 concessions are registered under the name of CDPR as recorded in INGEMMET´s website and their registry of concessions in Geocatmin.

CDPR legal consultants (Rodrigo, Elias and Medrano) performed due diligence on the original 72 mining and one beneficiation concessions before CDPR entered into a share purchase agreement to acquire Trevali Peru S.A.C. (*Trevali*). Two additional concessions were granted during 2022, to the west of the original group.

Neither CDPR nor its subsidiaries hold title to any of the land within or surrounding the Santander concessions. It does, however own surface rights for areas encompassing the mine and associated infrastructure, previously negotiated by Trevali.

Producing mining companies are required to contribute in accordance with Modified Mining Royalty (MMR) levy on the quarterly sales revenues from metallic and non-metallic mineral resources. The rate varies between 2.0% - 8.4%, depending on operating margin. The MMR is deductible from the corporate income tax.

Under the terms of the share purchase agreement with Trevali, CDPR agreed to pay Trevali a Net Smelter Royalty (NSR) equal to 1.0% on all new deposits outside an NSR exclusion zone. The NSR royalty does not included the Magistral, Santander Pipe and Puajanca deposits or any other mineral occurrences within the exclusion zone.

A Life of Mine (LoM) off-take agreement exists between CDPR and Glencore, on all mineral mined from the Magistral deposits or extensions considering within a defined area, normalised to an elevation of 4200 masl. The Santander Pipe and other areas of interest on the property are not subject to the off-take agreement.

25.3 Geology and Mineral Resources

The Santander Property comprises the producing polymetallic Magistral mine, located in the west-central Andean mountains of Perú. The fully equipped mine complex encompasses the historically mined Santander Pipe deposit (initial open pit and later underground workings dated 1957-93). CDPR´s mining proposals include wider exploration of the entire property beyond the producing Magistral mine, which includes the dewatering of the Santander Pipe mine and the resumption of mining at greater depth.

The mine is located within the prolific Eocene-Miocene metallogenic belt of central Perú. Mineralization is interpreted to have occurred as a pre-lower Miocene Quechua I compressive event and is predominantly hosted by shelf carbonates and other sedimentary rocks of Late Triassic, Jurassic, and Cretaceous age, and by volcanic and intrusive rocks mainly of Neogene age. Mineralization occurs as three discrete areas within the property:

i. The Magistral CRD associated deposits which include MN, MC, and MS orebodies as well as Fátima, MCN, and Oyón mineralised lenses.

ii. Skarn-type mineralization within the Santander intrusive pipe, where deep drilling indicates that the mineralization continues in depth below the last producing levels mined in 1992, as well as to the north and south where the skarns surround a steep anticlinal structure which strikes towards the Puajanca occurrence 2 km to the north.

iii. The Puajanca deposit which crops out at surface and where preliminary exploration carried out by the previous operators indicates low grade skarn mineralization with a potential for open pitting.

25.3.1 *Santander Pipe Deposit and Related Mineralization*

Lyall Consult of Santiago, Chile carried out an independent revision and update of the Mineral Resources for the Santander Pipe deposits for DRA, effective as of 30th June 2022 (Table 25-1). This estimate incorporated modifications to the interpreted mineralization, and an NSR cut-off of US $40/t. The NSR values were calculated from the block estimates using a Zn price of US $3,000/t, Pb price of US $2,200/t, and an Ag price of US $25/oz.

Table 25-1: Mineral Resource Statement, Santander Pipe Deposit

Elevation Zone	Category	Tonnes ('000)	Zn %	Pb %	Ag g/t	Cu %
Between 4,020 and 3,885	Indicated	1,656	7.50	0.030	15.60	0.11
	Inferred	-				
Below 3,885	Indicated	1,569	6.34	0.003	11.20	0.23
	Inferred	1,779	5.95	0.013	7.90	0.15
Total	**Indicated**	**3,225**	**6.94**	**0.017**	**13.50**	**0.17**
	Inferred	**1,779**	**5.95**	**0.013**	**7.90**	**0.15**

This estimate comprises CDPR´s main asset, second to the currently producing Magistral mine.

Indicated mineral resources between the 4,020 and 3,885 levels comprises 2+ years of production at 2,500 t/d, with a further 2 + years below the 3,885 level.

Upside potential beyond this resource is summarized as:

A. Recovery of similar grade remnant blocks and pillars above the 4020 Level (old mined areas in the Upper Zone).

B. Continued exploration of the deep skarn formations which were drilled to the north of the Santander Pipe deposit during 2022, mostly below the 3885 horizon.

Access to (2) above has already started by developing a 1.7 km exploration tunnel to the south from the Magistral mine. Although further drilling of (2) may eventually lead to a resource estimate, this newly found occurrence is currently seen by DRA as being further away from production than the Santander Pipe resources and potential mineral above the 4020 level. This therefore puts a priority on dewatering the Santander Pipe mine as soon as possible.

25.4 Further Exploration

Geological studies and exploration needed to support the on-going Santander Pipe mine project is summarized in the following subsections of this report.

25.4.1 Relogging and Resampling of Old Santander Pipe drillholes

As part of on-going work at Santander, CDPR completed the re-logging and resampling of 31 old drillholes, which are located in the Upper Zone of the Santander Pipe. The drillholes were logged, sampled, and assayed following the standard procedures adopted by CDPR's Geology team, SGS-Santander on site Lab, and ALS External Lab.

When comparing old CMS and re-assaying results, differences in Zn and Cu grades, and significant dispersion amongst Pb and Ag grades have been observed, and the cause for such variances is not currently understood. DRA considers that it is essential that this re-logging and resampling program is continued as a matter of priority.

Furthermore, DRA has observed that the Geological Team is under-manned, and that current geological procedures should be reviewed and improved upon where necessary.

25.4.2 The Geological Model

As the engineering studies progress to more detailed prefeasibility and feasibility studies, DRA believes that there are significant opportunities to improve quality control aspects and the geological model (details are included in subsections 11.4.5 and 14.8.1). QA/QC on assaying should be reviewed and reported on a regular basis. Geological modeling of the mineralized envelopes should include interpreted sections representing geological controls such as lithological boundaries, bedding angles, structure, alteration, and mineralization.

25.4.3 Exploration Drilling Priorities

25.4.3.1 The Santander Pipe mine

Having concluded that the current Santander Pipe deposit resources comprise CDPR´s priority asset beyond the Magistral mine, DRA also concludes that further drilling will be required to satisfy the following objectives:

1 Infill stope definition drilling to upgrade Indicated Resources to Measured Resources.

2 Infill drilling sufficient to upgrade Inferred Resources to Indicated Resources, and

3 Step-out drilling to delineate extensions to the current Inferred Resources.

The positional accuracy required in relation to infill and stope definition drilling has to be carried out as close to the target as possible. It cannot be practically carried out from surface because of the presence of mined out voids and the great depth of drilling required. Furthermore, such accuracy cannot be provided from one singular crosscut access currently being started from the Magistral mine.

CDPR needs to consider that such drilling has to be carried out from many positions, the planning for which has to be included in the next phase of technical studies.

25.4.3.2 The "Pipe North" area

CDPR has already elected to access this area where drilling during 2022 has intersected a continuation of skarn mineralization to the north of the Santander Pipe (Figure 10-3 and Figure 10-4 refer). A tunnel is being mined southwards from the Magistral mine, and with a view to eventually linking this tunnel with the Santander Pipe mine once it has been dewatered. This tunnel will provide closer access for exploring this whole target area with much shorter drill holes.

DRA geologists have also noted that during the process of reviewing satellite and geophysical imagery of this general area, there is a circular geomorphological feature filled with scree material (Figure 10-3) located close to the north of the *Pipe North* area. Given that the Santander Pipe is not the only pipe-like deposit to be found in this mining district, it is postulated that this scree material may be hiding a similar feature to the Santander Pipe underneath. If economic mineralization were to be confirmed beneath this location, mining from surface would be the easier option in terms of time and cost.

25.5 Water Management Studies

Given that the only available information on inflow and pumping requirements comprises anecdotal information relating to the old Santander Pipe mine, DRA concludes that a comprehensive set of studies is required to quantify the expected groundwater inflows and pumping requirements.

25.6 Mining

25.6.1 *Old Santander Mine Dewatering*

Realizing the mineral resources of the Santander Pipe, CDPR´s main asset, requires the dewatering and refurbishment of the old Santander mine in order to recover access to these resources, which will then require further exploration to demonstrate economic certainty.

The dewatering of the old Santander mine via the ongoing exploration tunnel from the Magistral Mine to the Santander Pipe is not considered a safe option by DRA. Connecting the two mines underground can only be carried out once the Santander mine has been dewatered. DRA concludes that the only safe, time and cost-effective way of dewatering the Santander mine is via the 510.2 m deep La Cuñada shaft, and for the following reasons:

i. The old Santander mine was equipped with an essential alternative egress route which can be recovered and refurbished level by level as the mine workings are dewatered.

ii. The only safe way to dewater this mine is to pump down the water, level by level to ensure that no pockets of water remain trapped above any working position. Dewatering the mine from underground is not a guaranteed safe dewatering option when there is the possibility of water remaining trapped within shallower mine workings.

iii. The location, dimensions, inclinations, and conditions of the old underground ramp system are not well recorded, and any justification for connecting a ramp access from surface has not yet been demonstrated.

iv. While it has already been recognised that the old Santander mine is at a depth that requires an alternative rock hoisting facility, it has not yet been determined whether this might be through a second shaft or via a ramp (from surface or connected to the Magistral mine).

v. The only practical way to upgrade the Santander Pipe´s Indicated Mineral Resources to Measured Mineral Resources, and upgrade Inferred Mineral Resources to Indicated Mineral Resources, is to drill from underground positions which allow accuracy of the infill and stope definition drilling required.

25.6.2 *La Cuñada Shaft Rehabilitation*

Further studies at a higher level are required to determine the current shaft condition, and to quantify the engineering works and supplies for its dewatering and rehabilitation. Such studies include a complete survey of the shaft and adjacent areas (main levels, loading pockets, etc.); shaft rehabilitation plan, ideally to be executed simultaneously with mine dewatering; and, the design of the hoisting system. As noted in subsection 16.7, the current mineral resources of the Santander Pipe do not justify installing a brand-new hoisting system. Being the highest CapEx item of the project, the viability of the next phase of the study depends to a large extent on the ability to find a used system that matches the needs of the Santander Pipe.

25.6.3 Mining Method

The use of the UBC methodology for mining method selection resulted in sublevel stoping, cut and fill and room and pillar as the most suitable methods for the Santander Pipe. Several scenarios were developed with these mining methods, both for the Upper and Lower zones, and sublevel stoping resulted in the best combination of potentially minable resources, NSR and stope dimensions/number of stopes.

25.6.4 Minable Resources LOM Production Plan

Table 25-2 shows the minable resource included in the base case for this study.

Table 25-2: Base case minable resource

Tonnes	Zn %	Pb %	Ag g/t	Cu %	NSR US$/t
3,779,012	4.71	0.01	8.10	0.11	90.06

The LOM production program is presented in Table 25-3.

Table 25-3: LOM production plan

Description	Total	2024	2025	2026	2027	2028	2029
Stopes and Sublevels (t)	3,846,564	0.00	539,827	900,000	900,000	900,000	606,736
NSR ($/t)	89.25	0.00	97.99	94.72	98.70	78.21	75.72
Zn (%)	4.67	0.00	5.14	5.01	5.05	4.12	4.01
Pb (%)	0.01	0.00	0.02	0.01	0.01	0.00	0.00
Ag (g/t)	8.05	0.00	10.12	9.44	11.08	4.93	4.30
Cu (%)	0.11	0.00	0.10	0.08	0.15	0.11	0.09

Due to the preliminary nature of this PEA, it must be noted that the mineral being considered in the LOM production plan comprises Mineral Resources, and as such these are too geologically speculative to be categorized as Mineral Reserves, and there is no certainty that the PEA will result in an operating mine. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

25.6.5 Mine Ventilation

The air requirement for a 2,500-t/day operation is 454,300 cfm, which will be covered by the fresh air inflow of 477,300 cfm.

To meet the air coverage target, three ventilation raises are required, one for fresh air inflow and two for exhaust air outflow, each 3.10 m in diameter and 2,215 m in total length. In addition, two 250,000 cfm fans, 9.2" H2O of total pressure and 500 HP of motor power each are required.

25.6.6 Mine Drainage

The Santander Pipe mine dewatering system, in the production stage, must be independent of the Magistral mine. Magistral installed pumping capacity is limited to a maximum flow rate of 650 l/s.

The design flow rate for the dewatering system of the Santander Pipe mine operation was assumed to be 200 l/s based on information from the Magistral mine drainage system, where 215 l/s and 174 l/s are pumped through Secondary Stations Level 4160-1 and Level 4090-2, respectively. This conceptual design also considered the historical pumping rate of 2,500 gallons/minute, equivalent to 158 l/s, at the old Santander Mine operation. A hydrogeological study must be carried out in the next phase of the project to confirm the expected water inflows at the Santander Pipe.

25.7 Mineral Recovery and Processing

Metallurgical tests were conducted for the Santander Pipe Lower Zone only which included analytical assaying, mineralogy, abrasion indices, bond work indices, and bench scale flotation testwork. Initial testwork results showed successful production of a saleable copper concentrate at 70% recovery and at a copper grade of 21% and a separate zinc concentrate at a recovery of 89% and zinc grade of 51%.

Minor modifications will be required to the existing Santander Processing Plant in order to produce the copper concentrates and will involve retrofitting equipment to the existing lead flotation circuit. A horizontal regrind ball mill and ancillary equipment will need to be added to regrind copper rougher concentrates prior to the cleaner flotation stages. A horizontal vibrating screen will also need to be installed prior to the rougher flotation stage.

25.8 Infrastructure

All surface infrastructure is in place at the adjacent Magistral mine, and there is no need for new infrastructure to support current production. However, new surface infrastructure will be needed in relation to dewatering and restarting mining operations in relation to the Santander Pipe.

There is adequate space close to the La Cuñada shaft, to position and construct all engineering and services structures and access, as well as all supporting buildings needed both at the dewatering stage and when the Santander Pipe mine is brought back into production.

Evaluating and designing the shaft servicing requirements will be part of the PFS studies that are needed to support this project.

25.9 Environmental Permitting

CDPR is currently in the process of drafting the second modification of its detailed environmental impact assessment study (Second MEIA-d or MEIA2) of the Santander Mining Unit. This study was initiated in 2019, but due to the pandemic it was put on hold. CDPR requested to SENACE on May 24, 2022, the monitoring of the preparation of the MEIA-d and submitted on October 19, 2022, the request for approval of the Citizen Participation Plan (CPP) for the review of compliance with admissibility requirements of the application for approval by the environmental authority (refer to Section 20). This study will have to be updated to include the working area around the La Cuñada shaft and any links this might have with existing infrastructure. It will also have to include the proposed continued use of the 4380 drainage level and a surface discharge point.

CDPR can probably use what will be the 5th Supportive Technical Report (ITS) which should be planned and programmed as soon as possible. The main objective of the ITS will be to certify the approval of reopening the La Cuñada shaft for dewatering, rehabilitation and exploration purposes, and with the eventual aim of connecting the Santander Pipe mine with the Magistral mine.

25.10 CapEx and OpEx Estimates

The capital cost and operating cost estimates were prepared with an expected accuracy range of +50% /- 35% accuracy of actual costs (Class 5 AACE estimate). Base pricing is in the fourth quarter of 2022 US dollars, with no allowances for inflation or escalation beyond that time.

25.10.1 CapEx Estimate

The capital cost estimate is presented in Table 21-1, and comprises US$ 52.4 million of Initial CapEx and US$ 15.6 million of Sustaining CapEx, for an approximate total of US$68.0 million of CapEx. Capital costs include the direct costs for project execution, as well as the indirect costs associated with design, construction and commissioning. Indirect project capital costs include third party consultants and construction facilities and services. Percentage factors were based on DRA's experience with similar projects that were used to determine indirect project costs, based on the project direct costs.

25.10.2 OpEx Estimate

Estimated LOM mine operating costs totalling US$99.503 million were based on the preliminary Santander Pipe mine plan developed for this project, as well as its equipment requirements and workforce requirements. These assume that a contractor would develop and operate the mine. This would decrease initial capital costs, make use of an experienced labour force, most of which is currently working at the adjacent Magistral mine, and reduce the time to develop and prepare the mine. It is expected that, given the competitive nature of the mine contractor sector in Peru, this would result in lower operating costs, and similar to those CDPR is achieving at the Magistral mine.

Mine operating costs include all the supplies, parts, and labour costs associated with mine supervision, operation, and equipment maintenance. The required mining equipment fleets and workforce were estimated based on industry standards and current operating practices at the Magistral mine. The estimated mining operating costs were developed from unit rates quoted by the current contractors operating at the mine.

25.11 Preliminary Economic Analysis

The economic analysis contained in this report is based, in part, on Inferred Mineral Resources, and is preliminary in nature. Inferred Mineral Resources are considered too geologically speculative to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. There is no certainty that economic forecasts on which this PEA is based will be realized.

Nevertheless, under the assumptions made in this Technical Report, and based on the available data, the project shows positive economics. Using a 6% discount rate, the project has an after-tax NPV of US$31.2 million, an IRR of 25.1% and a payback period of 2.6 years. On the other hand, the project is most sensitive to the Zn price: a drop in 15% of the long-term Zn price (US$ 2,800/t) results in an after tax NPV close to zero.

25.12 Project Schedule

The current project schedule (see Figure 24-1) includes the following key milestones: approval of the modification of the EIA; completion of the Magistral – Santander Pipe ramp; completion of the infill drilling program; and, dewatering and rehabilitation of the La Cuñada shaft. The schedule indicates that the Santander Pipe mine would be commissioned at the end of the second quarter of 2025.

The preparation of an interim mineral resource estimate, mine plan, CapEx and OpEx estimates, and the corresponding economic analysis have been included in the project schedule to allow CDPR to obtain the internal approval required to commence the early stages of mine dewatering, shaft rehabilitation, and mine development.

The schedule is considered feasible but does not leave much room for unforeseen delays. The La Cuñada shaft rehabilitation and implementation plan depends on an early sourcing of a hoist system that meets the Santander Pipe requirements. Equally critical is the development of the Magistral – Santander Pipe ramp, which will provide access for the infill drilling program that will support the next phase of the project.

25.13 Summary

Other than that, which has already been disclosed in this technical report, DRA is not aware of any other significant risks and uncertainties that could reasonably affect the reliability or confidence of the preliminary technical conclusions, estimates and assumptions made within this report.

26 RECOMMENDATIONS

DRA´s recommendations are based upon the interpretation and conclusions made in Section 25 of this report, which have been discussed with CDPR in relation to their preliminary plans as needed to support CDPR's proposal to dewater and reopen the Santander Pipe mine and develop a PFS-level study to determine the options for dewatering and rehabilitating the La Cuñada shaft and bringing the Santander Pipe deposit back into production.

26.1 Geology and Exploration

DRA in collaboration with CDPR recommends the following to strengthen geological support:

1 To improve manning levels and training of the current Geology Team.

2 To review all current geological procedures and implement improvements where necessary.

3 To put a priority on re-logging and resampling all old drill holes.

4 To make improvements to the QA/QC support and to report on QA/QC results on a regular basis.

5 To constantly review and update geological interpretations as new information is added to the geology database.

6 To constantly review and update the geological modelling as new interpretations are made.

7 To report on drill hole results (single holes or groups of holes) on a regular basis.

8 To report on geological progress on a monthly and annual basis.

Exploration planning specifically related to upgrading mineral resource estimates for the Santander Pipe deposit should use the geological model to plan the following drilling from within the dewatered mine:

A. Accurate drilling of infill and stope definition drilling in order to convert indicated mineral resources to the measured category and inferred mineral resources to the indicated mineral resources, and sufficient to convert mineral resources to mineral reserves.

B. Step-out drilling beyond inferred mineral resources to include further drilling of the Pipe North area of exploration with the objective of extending the mineral resource base as far as possible.

C. To drill one or more "scout" drill holes in the geomorphological anomaly indicated on Figure 10-3.

26.2 Water Management Studies

CDPR's plan in relation to this component is three-fold, as described in the following subsections.

26.2.1 Hydrology and Hydrogeology Studies

As of the end of 2022, CDPR is completing a bidding process to start a study that will model and evaluate the hydrology and hydrogeology in relation to the deepening of the Magistral Mine, carrying out exploration in the wide area between the two mines, and the Santander Pipe mine. This study will build upon the site-wide hydrology and hydrogeology study carried out by ENMODEL, in 2019.

The scope for this study comprises: piezometer installation, surface and groundwater quality analyses, hydrological modelling with stream flow and weather records, groundwater inventory, hydrogeochemical analyses on surface and groundwater samples, hydrogeological conceptual model, and groundwater numerical modelling.

The main deliverables will be the steady-state calibrated groundwater numerical model, and the transient-state numerical model that simulates a consolidated plan for the Magistral mine, the Santander Pipe mine and the exploration area between the two mines, and to obtain estimates of groundwater inflows into the mine workings.

26.2.2 Mine Dewatering Trade-off Study

This item comprises a mine dewatering trade-off of the consolidated mine plan, with special focus on the Santander Pipe. The study will evaluate various alternatives to dewater the Santander Pipe in advance of the La Cuñada shaft rehabilitation and to integrate this dewatering system to the Magistral Mine. This study will use inputs from the hydrology and hydrogeological study described in subsection 26.2.1.

This study includes the necessity of an inspection of the drainage (4,380 m) level once this is no longer being used for discharge of Magistral mine water. Pumping to this level will have significant lower cost compared to pumping the full height to surface.

26.2.3 Engineering of the Selected Mine Dewatering System

This item comprises the engineering of the mine dewatering system that is selected from the trade-off study. The engineering will include two broad components, the initial dewatering to rehabilitate and access the Santander Shaft, and the LoM dewatering system for the Santander Pipe operation.

26.3 Mining

26.3.1 Mine Access

DRA recommends to complete a detailed mine access trade-off study. Key inputs for this study are the mineral resource estimate, the La Cuñada shaft rehabilitation plan, and budgetary quotes for used hoisting systems. Depending on the PFS/FS-level mineral resource estimate, as well as on the success in exploring additional targets in the area (e.g., Pipe North), the mine access study may have to consider the possibility of sinking or raise-boring another shaft and keep La Cuñada for ventilation purposes.

26.3.2 La Cuñada Shaft Rehabilitation

DRA recommends carrying out a comprehensive survey of the shaft using downhole survey tools sufficient to confirm that the shaft is open at depth, and to gauge its free dimension. If deemed necessary by the specialists, the survey could be carried out through the two hoisting compartments. The survey would provide valuable information for the drainage of the old Santander Mine, as well as for planning the rehabilitation of the shaft.

DRA recommends a shaft rehabilitation and hoisting system design comprising engineering design required to rehabilitate the La Cuñada shaft, and acquire and commission a hoisting system. This will use the results from the shaft survey and the mine dewatering engineering and will include geotechnical analyses and ground support requirements. The main deliverables are engineering designs, detailed CapEx estimates, and a scheduled installation plan.

26.3.3 Mine Development

The current mine development plan can be improved by carrying out more detailed scheduling that matches the mining sequence and spreads horizontal and vertical development more evenly over the LOM. This has the potential of having a positive impact on the economics of the project.

26.3.4 Mine Planning

A consolidated production plan and economic analysis (Santander Pipe and Magistral mines, and the exploration area in between) needs to be developed, which schedules the afore-mentioned studies in relation to current production and depleting mineral reserves in the Magistral mine. The consolidated plan should consider the need to provide further samples of the different skarn mineral styles that are being encountered within the exploration of the Santander Pipe mine and the extension of a skarn front to the north (the so-called Pipe North area).

DRA recommends the development of scenarios with top-down and bottom-up mining sequences in order to produced optimized mine plans that take into account ventilation and mine drainage needs.

26.4 Mineral Recovery and Processing

Further work will have to be carried out including:

D. Completing a representative sample selection from both the Upper and Lower Zones of the Santander Pipe and create sufficient sample to enable the completion of a PFS level metallurgical testwork program;

E. Confirming the metallurgical and geometallurgical characteristics of the Upper Zone mineralization during the PFS testwork program. A section of the Upper Zone the deposit was mined and processed prior to the old Santander Mine closing in 1992.

F. Improving the characterization of the various components of the in-depth Santander Pipe deposit as well as determining its metallurgical and physical variability with increasing depth; and,

G. Achieving the confidence level required for the completion of a PFS level design including any capital and operating costs for the processing of the deposit.

26.5 Other

Permitting studies in relation to re-opening the Santander Pipe mine, installing new infrastructure and services, and the possibility for pumping to the 4380 drainage level must be carried out.

Studies will also be required in relation to current and future tailings dam designs. It should be noted that dam heights are higher than the La Cuñada Shaft collar and the connected old Santander open pit.

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To accompany the Report entitled "NI 43-101 Technical Report – Cerro de Pasco Resources Preliminary Economic Assessment - Santander Pipe Deposit, Huaral, Lima, Peru" with an effective date of January 31, 2023 and issued on April 11, 2023 (the "Technical Report") prepared for Cerro de Pasco Resources Inc. ("CDPR" or the "Company")

I, Martin Mount, MSc CGeol CEng., Lima, Peru, do hereby certify that:

1. I am an independent Senior Mining Geologist and Project Engineer with an office at Avenida 28 de Julio 842-A, Miraflores, Lima, contracted to assist DRA Americas Peru in the preparation of the above-named report;

2. I have an MSc in Mining Geology with "distinction" from the Camborne School of Mines, Cornwall, UK, dated 1995;

3. I am a Licensed Chartered Geologist registered with the Geological Society of London (Fellowship No. 16658) and a Licensed Chartered Engineer registered with the Institute of Materials, Metals and Mining (Fellowship No. 47566).

4. I have worked in the Mining Industry continuously for more than 50 years.

5. My relevant work experience includes:

   - Many years of mine exploration, mine project development, and mining experience, for numerous metallic commodities, clients and employers, in the capacities of Mine Geologist, Chief Geologist, Technical Services Manager, Assistant Mine Manager, and as a Technical Director.

   - Management of numerous studies and projects of varying complexity, involving multi-disciplinary engineering teams for projects in gold, base metals, and other metallic commodities.

   - Participant and author of various NI 43-101 and JORC Code Technical Reports.

6. I have read the definition of "qualified person" set out in the NI 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that, by reason of my education, affiliation with professional associations, and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of NI 43-101.

7. I am independent of the Company applying all the tests in Section 1.5 of NI 43-101.

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8. I am responsible for the preparation of Sections 6 to 10, 23, 24 and 27, and portions of Sections 1, 4, 5, 25, and 26, and for overall report compilation.

9. For health reasons I was unable to visit the property that is the subject to the Technical Report, although I am familiar with the mines and prospects in the surrounding area, and have visited the Santander mine previously.

10. I have had prior involvement with the property that is the subject of the Technical Report.

    - QP for "Cerro de Pasco Resources - NI 43-101 and Resource Estimate Update for Santander Mine Magistral and Pipe Deposits, Huaral, Department of Lima, Peru", prepared by DRA, with an effective date of December 31, 2021, and issued on January 24, 2022.

11. I have read NI 43-101, and the sections of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101.

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

Dated this 11th day of April 2023

"Original Signed and Sealed"

Martin Mount
Senior Mining Geologist

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I, Graeme Lyall, Santiago, Chile, do hereby certify that:

1. I am Principal Consulting Geologist at Lyall Consult SpA with an office at Guay Guay 58, Colina, Santiago, Chile.
2. I graduated with a BSc. in Geology from the University of Edinburgh in 1990.
3. I am a Fellow Member of the Australian Institute of Mining and Metallurgy (AusIMM Membership Number 224791).
4. I have worked as a Geologist in the Mining and Metals industry continuously since my graduation from university.
5. My relevant work experience includes over 30 years working in the mining industry in exploration, geological modelling and mineral resource estimation in multiple deposit types spanning porphyries, epithermals, intrusion related, orogenic, paleoplacer, and laterites amongst others, and different commodities including, precious, base metals and industrial minerals.
6. I have read the definition of "qualified person" set out in the NI 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that, by reason of my education, affiliation with a professional association, and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of NI 43-101.
7. I am independent of the Company applying all the tests in Section 1.5 of NI 43-101.
8. I am responsible for the preparation of Sections 11, 12, and 14, and contributed to Sections 1, 25, and 26.
9. I visited the Santander property between the 13th and the 17th of December of 2021.
10. I have had prior involvement with the property that is the subject of the Technical Report.
    - QP responsible for Mineral Resources in "Cerro de Pasco Resources - NI 43-101 and Resource Estimate Update for Santander Mine Magistral and Pipe Deposits, Huaral,

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Department of Lima, Peru", prepared by DRA, with an effective date of December 31, 2021, and issued on January 24, 2022.

11. I have read NI 43-101 and the sections of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101.

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

Dated this 11th day of April 2023

"Original Signed and Sealed"

Graeme Lyall
Principal Consulting Geologist
Lyall Consult SpA

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I, Javier Aymachoque do hereby certify that:

1. I am an independent consultant with an office at Los Ficus 320-201, San Isidro, Lima 15073, Peru, contracted to assist DRA Americas Peru in the preparation of the above-named report.

2. I graduated with a Bachelor of Science Degree in Mining from Universidad Nacional de Ingeniería, Lima, Peru, dated 2001.

3. I am a Registered Member of The Australasian Institute of Mining and Metallurgy, MAusIMM CP (Min) - 317666).

4. I have worked in the Mining Industry continuously for more than 20 years.

5. My relevant work experience includes:

    - Many years of mine engineering, mine project construction, mine project development, and mining experience, for numerous metallic commodities, clients and employers, in the capacities of Senior Mine Engineer, Mine Planning Superintendent, Technical Services Superintendent, Assistant Mine Manager, Technical Director, and as an Innovation and Technology Director.

    - Management of numerous studies and projects of varying complexity, involving multi-disciplinary engineering teams for projects in base metals, gold. silver, and nonmetallic commodities.

6. I have read the definition of "qualified person" set out in the NI 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that, by reason of my education, affiliation with professional associations, and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of NI 43-101.

7. I am independent of the Company applying all the tests in Section 1.5 of NI 43-101.

8. I am responsible for the preparation of Sections 18, 19, 20, and 21 and portions of Sections 1, 24, 25, and 26.

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9. I visited the Santander property between the 13th and the 16th of December of 2021.

10. I have had prior involvement with the property that is the subject of the Technical Report.

    - QP for "Cerro de Pasco Resources - NI 43-101 and Resource Estimate Update for Santander Mine Magistral and Pipe Deposits, Huaral, Department of Lima, Peru", prepared by DRA, with an effective date of December 31, 2021, and issued on January 24, 2022.

11. I have read NI 43-101, and the sections of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101.

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

Dated this 11th day of April 2023

"Original Signed and Sealed"

Javier Aymachoque
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I, Pete Ferreira, FSAIMM, Pr.Eng, B.Sc. (Eng) Mining, University of the Witwatersrand Johannesburg, South Africa, do hereby certify that:

1. I am Principal Mining Engineer, DRA South Africa with an office in Woodmead, South Africa.
2. I graduated from the University of the Witwatersrand, South Africa with a Bachelor of Science (Eng) in Mining in 1978.
3. I am a registered Fellow Member of the South African Institute of Mining and Metallurgy (FSAIMM) membership #20148.
4. I am a registered professional engineer with ECSA (Engineering Council of South Africa and membership # 860542
5. I have worked as a Mining Engineer in various capacities since my graduation from university in 1978.
6. My relevant work experience includes:
    - More than 40 years of experience in the mining industry, including 15 years in underground mine management, 12 years in various capacities with underground drilling and mine services companies, 6 years as the CEO of a major mining equipment manufacturer, and 11 years as a mining consultant;
    - Pioneering flat raise boring as well as classified backfill on Western Deep Levels Mines;
    - Mining in all commodities and travelling the world on projects and technical presentations and consultation;
    - NI 43-101 Report for project Hammerhead, Anglo American Platinum Bokoni Mine.
7. I have read the definition of "qualified person" set out in the NI 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that, by reason of my education, affiliation with a professional association, and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of NI 43-101.

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8. I am independent of the Company applying all the tests in Section 1.5 of NI 43-101.

9. I am responsible for the preparation of Section 16, and portions of Sections 1, 25, and 26.

10. I did not visit the property on that is the subject to the Technical Report.

11. I have not had prior involvement with the property that is the subject of the Technical Report.

12. I have read NI 43-101 and the sections of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101.

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

Dated this 11th day of April 2023

PFerreira

Pete Ferreira (Apr 11, 2023 07:50 GMT+2)

Apr 11, 2023

"Original Signed and Sealed"

Pete Ferreira, FSAIMM
Principal Mining Engineer
DRA South Africa

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CERTIFICATE OF QUALIFIED PERSON

To accompany the Report entitled “NI 43-101 Technical Report – Cerro de Pasco Resources Preliminary Economic Assessment - Santander Pipe Deposit, Huaral, Lima, Peru” with an effective date of January 31, 2023 and issued on April 11, 2023 (the "Technical Report") prepared for Cerro de Pasco Resources Inc. (“CDPR” or the “Company”)

I, David Frost, FAusIMM, B. Met Eng, Toronto, Ontario, do hereby certify that:

1. I am Vice President Process Engineering, DRA Global Limited with an office at 20 Queen Street West, 29th Floor, Toronto, Ontario, Canada M5H 3R3.

2. I graduated from the Royal Melbourne Institute of Technology (RMIT), Melbourne, Australia with a Bachelor of Metallurgical Engineering in Metallurgy in 1993.

3. I am a registered Fellow Member of the Australian Institute of Mining and Metallurgy (FAusIMM) membership #110899.

4. I have worked as a Metallurgist and Process Engineer in various capacities since my graduation from university in 1993.

5. My relevant work experience includes:

   - 30 years of experience, 15 years in process plant operations including the operation of complex flotation flowsheets and 15 years in process plant flowsheet design;

   - Polymetallic flotation test work sample selection, program management and flowsheet design for multiple projects; and

   - Participant and author of several NI 43-101 Technical Reports inclusive of polymetallic flowsheets.

6. I have read the definition of “qualified person” set out in the NI 43-101 – Standards of Disclosure for Mineral Projects (“NI 43-101”) and certify that, by reason of my education, affiliation with a professional association, and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of NI 43-101.

7. I am independent of the Company applying all the tests in Section 1.5 of NI 43-101.

8. I am responsible for the preparation of Sections 13, 17, and portions of Sections 1, and 25 to 26.

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9. I did not visit the property that is the subject of the Technical Report.

10. I have not had prior involvement with the property that is the subject of the Technical Report.

11. I have read NI 43-101 and the sections of the Technical Report for which I am responsible and have been prepared in compliance with NI 43-101.

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

Dated this 11th day of April 2023

"Original Signed and Sealed"

David Frost, FAusIMM, B. Met Eng
Vice President – Process Engineering
DRA Global Limited

APPENDIX A - LOCATION OF DRILL HOLES DRILLED BY CMS IN THE SANTANDER PIPE

Year	Hole ID	Coordinates - UTM, WGS84, Zone 18S			Azimuth (°)	Angle (°)	End Depth (m)
		East (m)	North (m)	Elevation (masl)			
1983	4020-Exp-1	334,241.76	8,762,524.39	4,021.25	353.33	0.00	19.23
1984	4020-Exp-14	334,245.19	8,762,659.08	4,022.00	345.94	3.37	18.87
1984	4020-Exp-15	334,244.87	8,762,656.06	4,020.00	327.62	2.43	20.47
1984	4020-Exp-18	334,400.00	8,762,830.00	4,000.00	0.00	0.00	18.44
1983	4020-Exp-19	334,153.44	8,762,617.69	4,022.40	63.42	1.38	31.78
1984	4020-Exp-8	334,254.82	8,762,585.91	4,021.45	39.42	2.60	27.95
1993	4020I-1W	334,209.02	8,762,573.41	4,021.09	265.92	0.01	38.29
1983	4020J-1W-A	334,250.33	8,762,583.66	4,021.43	271.51	0.17	30.25
1984	4020J-1W-B	334,186.19	8,762,595.22	4,022.19	269.41	1.32	19.08
1983	4020J-2E	334,254.96	8,762,583.84	4,021.48	93.57	2.17	10.92
1984	4020J-35W	334,255.47	8,762,583.42	4,020.67	270.00	-34.15	65.91
1984	4020J-36E	334,158.86	8,762,585.14	4,021.34	90.04	-44.32	64.08
1985	4020J-42E	334,159.06	8,762,585.17	4,021.73	88.32	-20.79	60.99
1984	4020J-44W	334,256.12	8,762,583.42	4,020.66	268.99	-54.10	110.95
1985	4020J-45E	334,158.39	8,762,585.15	4,021.28	91.26	-69.54	99.82
1984	4020J-46W	334,174.28	8,762,583.40	4,021.75	270.71	2.49	27.56
1984	4020J-47W	334,207.01	8,762,583.25	4,022.47	271.45	19.98	65.33
1984	4020K-1W	334,150.85	8,762,613.36	4,021.74	271.72	2.54	27.84
1984	4020K-44W	334,267.76	8,762,603.41	4,020.75	269.75	-35.40	77.01
1984	4020K-45W	334,268.78	8,762,603.41	4,020.78	270.00	-56.40	125.70
1985	4020K-47W	334,269.14	8,762,603.40	4,020.77	267.05	-74.57	133.12
1984	4020L-19W	334,126.16	8,762,633.39	4,022.91	270.00	2.00	7.72
1984	4020L-20E	334,132.16	8,762,633.39	4,022.91	90.00	2.00	7.87
1985	4020L-21E	334,133.09	8,762,633.34	4,024.12	90.69	0.31	33.93
1985	4020L-59E	334,147.69	8,762,623.16	4,021.91	85.61	1.89	37.49
1985	4020L-62W	334,222.15	8,762,623.22	4,022.68	267.56	1.90	24.43
1985	4020L-63W	334,222.53	8,762,623.22	4,021.98	267.36	-39.50	50.98
1984	4020M-1W	334,243.00	8,762,652.63	4,022.25	272.34	1.34	37.44
1984	4020M-2E	334,253.23	8,762,652.59	4,022.20	89.04	1.26	11.84
1985	4020M-35W	334,131.32	8,762,643.40	4,025.85	269.76	1.08	17.78
1985	4020M-36E	334,136.07	8,762,643.37	4,026.03	91.63	1.67	39.55
1985	4020M-46W	334,258.74	8,762,643.37	4,021.28	263.57	-49.17	113.44
1984	4020N-30W	334,213.73	8,762,673.33	4,022.41	268.60	0.16	36.53
1984	4020N-38W	334,241.01	8,762,663.26	4,022.60	268.70	1.12	48.36
1986	4020N-39W	334,248.16	8,762,663.39	4,021.58	270.45	-33.47	85.06
1986	4020N-40W	334,248.96	8,762,663.35	4,021.47	271.71	-54.67	72.69
1986	4020N-41W	334,249.49	8,762,663.36	4,021.35	274.48	-74.55	102.31
1985	4020N-42E	334,141.10	8,762,663.39	4,027.85	89.89	-9.02	31.34
1985	4020N-42W	334,137.44	8,762,663.41	4,028.08	269.71	0.83	27.81
1985	4020N-43W	334,206.77	8,762,663.31	4,022.86	270.04	-44.38	37.34

Year	Hole ID	Coordinates - UTM, WGS84, Zone 18S			Azimuth (°)	Angle (°)	End Depth (m)
		East (m)	North (m)	Elevation (masl)			
1985	4020N-44E	334,140.89	8,762,663.37	4,027.15	90.09	-44.73	56.08
1985	4020N-44W	334,138.25	8,762,663.43	4,029.79	272.26	53.00	20.68
1978	4050I-18W	334,254.86	8,762,572.69	4,154.04	275.00	2.00	47.14
1979	4060-43N	334,244.96	8,762,499.49	4,064.15	359.00	2.00	30.61
1980	4060-51N-E	334,222.30	8,762,595.44	4,064.08	29.73	0.51	17.63
1981	4060I-28E	334,174.76	8,762,563.39	4,063.85	91.09	39.02	84.28
1980	4060I-72W	334,225.08	8,762,563.62	4,064.25	270.37	0.29	77.67
1983	4060J-28E	334,161.89	8,762,583.36	4,063.67	89.02	-25.55	67.82
1980	4060J-39W	334,223.27	8,762,583.40	4,064.25	268.10	4.10	71.73
1980	4060J-40E	334,254.29	8,762,583.45	4,064.05	88.85	0.77	22.10
1980	4060J-41W	334,223.22	8,762,583.41	4,063.75	268.22	-19.33	90.27
1982	4060J-42W	334,249.37	8,762,583.24	4,063.49	271.74	-50.41	74.06
1980	4060J-53W	334,219.26	8,762,593.39	4,064.60	270.53	-0.19	38.51
1980	4060J-54E	334,223.60	8,762,593.37	4,064.59	90.13	0.17	20.93
1984	4060K-2E	334,140.55	8,762,613.49	4,063.89	88.73	-34.92	54.66
1981	4060K-35E	334,166.25	8,762,603.54	4,064.24	89.26	3.05	37.16
1981	4060K-37E	334,166.25	8,762,603.51	4,063.86	89.26	-28.00	27.10
1981	4060K-38W	334,267.21	8,762,603.35	4,064.31	268.85	-36.39	77.52
1982	4060K-39E-A	334,130.01	8,762,613.49	4,064.69	96.45	3.00	8.03
1982	4060K-39E-B	334,131.77	8,762,603.85	4,064.27	90.59	-33.46	88.06
1982	4060K-40E	334,131.13	8,762,603.92	4,063.95	85.49	-64.22	73.96
1981	4060K-40W	334,145.06	8,762,603.49	4,064.61	273.36	2.27	23.88
1981	4060K-41W	334,162.79	8,762,603.52	4,064.55	267.47	2.52	7.57
1984	4060K-42E	334,127.43	8,762,603.91	4,064.07	89.53	-50.63	121.77
1983	4060K-43E	334,127.00	8,762,603.92	4,063.75	89.76	-73.13	180.31
1980	4060K-66W	334,228.73	8,762,603.46	4,064.54	269.91	-12.22	14.15
1980	4060K-67E	334,244.65	8,762,602.28	4,064.63	82.05	0.96	45.44
1980	4060L-46W	334,224.67	8,762,623.46	4,064.85	274.65	-7.94	35.38
1980	4060L-47E	334,239.19	8,762,623.34	4,065.81	89.75	38.80	37.69
1980	4060L-48E	334,239.64	8,762,623.33	4,065.10	89.53	1.43	45.31
1980	4060L-49W	334,224.68	8,762,623.47	4,064.02	271.94	-38.69	13.41
1981	4060L-50E	334,164.67	8,762,623.37	4,064.73	88.56	4.19	23.88
1982	4060L-52W	334,270.76	8,762,623.39	4,064.40	271.19	-26.15	77.29
1982	4060L-53W	334,275.88	8,762,623.58	4,063.90	271.20	-49.88	125.15
1982	4060L-54W	334,276.35	8,762,623.57	4,063.80	270.87	-68.96	200.20
1981	4060L-55W	334,138.07	8,762,623.46	4,064.67	269.27	2.45	16.41
1981	4060L-56W	334,160.56	8,762,623.59	4,064.64	270.50	2.00	8.00
1982	4060L-57E	334,175.30	8,762,633.33	4,064.74	90.43	0.50	9.40
1982	4060L-57W	334,276.73	8,762,623.57	4,063.83	272.05	-83.92	250.98
1982	4060L-58E	334,175.30	8,762,633.33	4,064.81	45.16	3.05	10.16
1983	4060L-58W	334,276.45	8,762,623.50	4,063.92	267.87	-76.13	336.30
1985	4060L-61V	334,136.40	8,762,623.34	4,063.84	0.00	-90.00	366.88
1981	4060M-33W	334,261.09	8,762,643.50	4,063.91	271.62	-31.88	77.22

Year	Hole ID	Coordinates - UTM, WGS84, Zone 18S			Azimuth (°)	Angle (°)	End Depth (m)
		East (m)	North (m)	Elevation (masl)			
1981	4060M-34W	334,262.30	8,762,643.48	4,064.02	270.58	-53.62	99.01
1981	4060M-35W	334,138.12	8,762,643.51	4,065.44	268.99	3.44	13.13
1976	4060M-36E	334,142.14	8,762,643.60	4,064.76	88.66	4.01	22.05
1981	4060M-36E-A	334,142.11	8,762,643.64	4,064.97	83.10	3.49	40.87
1982	4060M-38E	334,134.37	8,762,643.42	4,064.15	88.83	-33.94	65.25
1983	4060M-39E	334,133.56	8,762,643.43	4,063.75	87.56	-54.78	107.19
1983	4060M-40E	334,130.35	8,762,643.37	4,064.14	89.29	-76.88	106.22
1980	4060M-48E	334,227.92	8,762,643.35	4,066.00	268.50	40.00	33.12
1980	4060M-49E	334,227.82	8,762,643.41	4,065.14	91.50	0.00	44.98
1980	4060M-50W	334,219.44	8,762,643.43	4,064.91	270.74	-7.31	35.58
1980	4060M-51W	334,219.66	8,762,643.40	4,064.49	268.12	-35.00	34.01
1982	4060N-28E	334,136.96	8,762,673.33	4,064.59	89.49	-1.17	39.06
1982	4060N-29W	334,132.66	8,762,673.31	4,064.83	270.92	1.88	11.38
1986	4060N-31E	334,175.82	8,762,673.97	4,064.56	87.40	-42.57	15.04
1982	4060N-32E	334,138.19	8,762,664.07	4,063.75	91.43	-46.94	61.26
1985	4060N-33E	334,166.09	8,762,663.39	4,063.98	87.92	-49.39	29.77
1981	4060N-34W	334,134.32	8,762,663.34	4,064.49	268.40	2.41	10.29
1982	4060N-35E	334,138.73	8,762,663.35	4,065.66	90.29	-6.28	33.10
1980	4060N-55E	334,219.39	8,762,663.92	4,065.17	90.78	5.23	36.29
1980	4060N-58W	334,213.24	8,762,663.69	4,066.30	273.49	5.83	42.32
1985	4060O-53W	334,208.41	8,762,683.53	4,065.50	269.01	-32.93	86.97
1985	4060O-54E	334,158.40	8,762,683.95	4,063.85	79.11	-32.95	87.68
1980	4060O-62E	334,213.51	8,762,683.45	4,066.42	90.24	0.00	26.16
1979	4100I-34W	334,253.07	8,762,571.88	4,103.55	273.00	-2.50	17.50
1979	4100I-35E	334,265.74	8,762,572.45	4,104.08	90.00	-1.00	15.09
1979	4100I-36W	334,173.26	8,762,565.14	4,104.01	266.00	4.00	26.29
1979	4100I-40E	334,233.63	8,762,571.96	4,104.89	88.05	-38.40	47.37
1978	4100I-66W	334,217.30	8,762,563.37	4,104.38	269.82	22.88	67.67
1978	4100I-67W	334,217.27	8,762,563.36	4,103.56	269.63	-15.03	73.56
1978	4100I-68W	334,217.27	8,762,563.36	4,102.98	269.63	-38.00	89.03
1979	4100I-69W	334,264.64	8,762,563.69	4,103.37	275.79	-35.82	123.60
1979	4100I-70W	334,228.01	8,762,562.89	4,102.00	271.00	0.50	38.23
1979	4100I-71E	334,269.51	8,762,563.39	4,102.00	92.00	0.00	15.32
1978	4100J-30W	334,215.47	8,762,583.23	4,104.02	266.05	2.63	61.11
1978	4100J-31W	334,215.66	8,762,583.24	4,103.60	266.47	-23.15	79.55
1978	4100J-32W	334,216.70	8,762,583.32	4,102.87	266.88	-41.05	91.72
1979	4100J-33W-A	334,247.86	8,762,593.07	4,104.46	275.00	0.00	19.58
1979	4100J-33W-B	334,265.85	8,762,583.39	4,103.23	269.49	-41.52	134.24
1979	4100J-34E	334,173.67	8,762,583.41	4,103.30	89.66	-42.23	121.54
1979	4100J-37E	334,232.21	8,762,583.38	4,105.03	89.28	20.86	39.95
1979	4100J-38E	334,232.22	8,762,583.34	4,105.03	91.13	40.76	46.15
1979	4100J-39E	334,231.76	8,762,583.90	4,106.84	75.68	37.63	46.96
1978	4100J-3E	334,232.43	8,762,583.09	4,103.89	68.72	-1.40	41.71

Year	Hole ID	Coordinates - UTM, WGS84, Zone 18S			Azimuth (°)	Angle (°)	End Depth (m)
		East (m)	North (m)	Elevation (masl)			
1979	4100J-41W	334,258.55	8,762,594.73	4,103.43	269.72	-41.14	83.13
1980	4100K-1W	334,247.73	8,762,613.41	4,104.33	265.21	-39.80	67.44
1978	4100K-25E	334,217.70	8,762,571.30	4,103.81	90.00	2.50	19.13
1979	4100K-32W	334,241.74	8,762,603.60	4,103.83	279.00	1.00	15.60
1979	4100K-36W	334,241.76	8,762,603.14	4,103.68	275.90	-34.67	50.06
1979	4100K-37W	334,158.51	8,762,614.39	4,104.26	264.00	4.00	21.77
1978	4100K-61W	334,213.79	8,762,603.49	4,104.19	267.88	3.45	80.49
1978	4100K-62W	334,214.26	8,762,603.53	4,103.65	269.15	-28.55	117.32
1978	4100K-63W	334,258.54	8,762,603.44	4,103.04	269.52	-37.58	50.55
1979	4100K-64E	334,166.90	8,762,603.55	4,103.37	89.76	-38.17	140.13
1979	4100K-65E	334,166.91	8,762,603.56	4,103.96	89.75	-11.00	27.38
1981	4100L-104E-A	334,073.97	8,762,623.53	4,103.63	89.28	-53.00	186.74
1980	4100L-104E-B	334,074.39	8,762,623.56	4,103.78	89.72	-35.00	135.66
1982	4100L-104E-C	334,073.97	8,762,623.53	4,103.63	89.29	-69.85	145.49
1980	4100L-104V	334,073.11	8,762,623.56	4,103.77	0.00	-90.00	130.45
1980	4100L-1W	334,242.88	8,762,633.33	4,102.97	269.77	-44.60	69.29
1979	4100L-30W	334,207.14	8,762,633.53	4,103.77	268.00	0.50	27.25
1979	4100L-31E	334,212.01	8,762,633.86	4,103.67	91.00	1.00	19.94
1978	4100L-41W	334,252.61	8,762,623.42	4,103.22	268.11	-34.67	87.17
1979	4100L-43V	334,203.02	8,762,623.09	4,102.83	0.00	-90.00	56.34
1978	4100L-44W	334,198.85	8,762,623.25	4,103.40	269.25	-26.55	81.41
1978	4100L-45W	334,200.14	8,762,623.33	4,103.15	269.87	-54.73	102.49
1980	4100M-1W	334,242.97	8,762,653.35	4,103.22	269.01	42.01	70.99
1978	4100M-24W	334,200.02	8,762,643.41	4,104.40	275.21	2.42	39.09
1978	4100M-25W	334,200.02	8,762,643.42	4,103.76	270.21	-20.00	80.57
1978	4100M-26E	334,217.23	8,762,643.36	4,103.49	89.93	-39.70	71.37
1981	4100M-27W	334,153.06	8,762,643.42	4,103.77	270.13	-1.99	30.30
1979	4100M-28E	334,244.83	8,762,641.69	4,103.24	267.17	-31.29	146.41
1979	4100M-28W	334,202.97	8,762,652.60	4,103.66	272.00	3.50	30.76
1981	4100M-29E	334,159.22	8,762,643.41	4,103.23	90.00	-22.21	34.95
1981	4100M-29E-B	334,159.22	8,762,643.41	4,103.23	90.00	-22.20	17.98
1980	4100N-1W	334,240.40	8,762,671.35	4,103.55	268.68	-45.89	67.18
1978	4100N-25W	334,199.79	8,762,663.48	4,104.45	273.10	2.27	65.46
1978	4100N-26W	334,195.93	8,762,673.31	4,103.81	271.00	3.50	36.88
1978	4100N-27E	334,200.85	8,762,673.93	4,103.78	88.00	2.00	39.37
1979	4100N-27W	334,241.64	8,762,663.15	4,103.74	268.58	-30.65	69.49
1979	4100N-29W	334,241.67	8,762,663.15	4,103.41	268.60	-44.02	92.46
1979	4100N-30E	334,244.46	8,762,662.89	4,103.45	90.00	-16.00	6.81
1979	4100N-44W	334,158.96	8,762,675.59	4,103.75	305.00	3.00	21.51
1979	4100N-45E	334,162.26	8,762,677.99	4,103.75	50.00	2.00	29.87
1979	4100N-46W	334,158.76	8,762,675.99	4,103.45	288.00	4.00	35.36
1978	4100N-53W	334,199.97	8,762,663.46	4,103.89	273.91	-29.15	99.34
1980	4130-49E	334,196.26	8,762,633.89	4,143.75	270.00	0.00	4.39

Year	Hole ID	Coordinates - UTM, WGS84, Zone 18S			Azimuth (°)	Angle (°)	End Depth (m)
		East (m)	North (m)	Elevation (masl)			
1980	4130L-50E	334,196.26	8,762,633.89	4,143.75	90.00	-15.00	25.55
1979	4140-39E	334,157.01	8,762,653.39	4,143.50	87.00	4.00	21.44
1977	4140I-13E	334,228.81	8,762,563.37	4,143.54	90.00	2.00	27.66
1977	4140I-24E	334,182.94	8,762,562.55	4,142.64	91.89	-29.65	100.91
1977	4140I-25E	334,182.32	8,762,562.55	4,142.66	89.14	-45.00	124.18
1977	4140I-56W	334,218.94	8,762,563.39	4,143.63	270.05	9.07	46.30
1977	4140I-57E	334,206.07	8,762,563.51	4,143.85	90.53	19.08	46.35
1978	4140I-64E	334,206.10	8,762,563.54	4,142.88	90.19	-21.77	77.17
1978	4140I-65W	334,256.97	8,762,563.51	4,142.95	272.44	-27.60	116.46
1977	4140J-14E	334,224.38	8,762,585.42	4,143.51	84.52	1.50	34.44
1977	4140J-15W	334,208.05	8,762,582.38	4,143.45	268.90	1.00	51.38
1977	4140J-26E	334,223.90	8,762,585.38	4,142.56	84.67	-40.00	68.83
1978	4140J-27E	334,198.97	8,762,583.38	4,142.52	88.41	-42.97	103.02
1977	4140J-29W	334,208.45	8,762,582.40	4,142.60	269.33	-36.00	83.36
1978	4140J-6W	334,250.27	8,762,583.38	4,144.59	270.80	33.22	40.82
1978	4140J-7W	334,244.94	8,762,583.37	4,144.43	270.50	23.02	73.71
1977	4140K-16E	334,218.60	8,762,603.87	4,143.62	89.70	1.00	31.75
1977	4140K-17W	334,204.18	8,762,602.56	4,143.63	270.63	4.00	57.76
1978	4140K-32E	334,171.62	8,762,602.27	4,142.91	92.40	-26.38	121.87
1977	4140K-33E	334,170.87	8,762,602.30	4,142.99	92.54	-41.83	151.77
1977	4140K-34W	334,204.03	8,762,602.56	4,142.96	269.83	-31.00	77.80
1977	4140K-58W	334,203.55	8,762,603.34	4,145.25	269.06	29.78	52.20
1977	4140K-59E	334,218.20	8,762,603.37	4,144.49	88.73	39.58	42.19
1977	4140K-60E	334,218.75	8,762,603.39	4,143.03	88.21	-27.98	54.99
1977	4140L-18E	334,212.08	8,762,623.41	4,144.19	90.38	3.55	35.89
1977	4140L-18W	334,243.94	8,762,623.19	4,143.10	271.67	-25.87	131.95
1977	4140L-19W	334,204.28	8,762,623.40	4,143.50	269.67	-4.88	70.13
1978	4140L-20E	334,185.33	8,762,623.30	4,143.52	90.78	-16.70	102.49
1978	4140L-38E	334,164.81	8,762,623.41	4,142.85	89.31	-24.68	108.81
1978	4140L-39E	334,164.15	8,762,623.38	4,142.74	93.50	-40.00	172.19
1977	4140L-40W	334,244.33	8,762,623.29	4,142.87	279.43	-36.85	164.21
1977	4140L-40W-A	334,244.58	8,762,623.15	4,142.88	270.49	-40.20	171.53
1978	4140L-7E	334,185.18	8,762,623.30	4,144.41	90.58	27.93	80.37
1977	4140M-20E	334,203.17	8,762,645.11	4,143.86	87.28	6.53	41.45
1977	4140M-21W	334,198.73	8,762,644.89	4,143.93	267.45	2.63	64.19
1978	4140M-22W	334,175.69	8,762,644.27	4,144.73	271.06	33.15	47.07
1978	4140M-23W	334,175.47	8,762,643.94	4,143.09	271.06	-27.27	61.19
1979	4140M-38E	334,173.26	8,762,653.39	4,143.44	87.00	3.00	18.97
1978	4140M-42E	334,179.59	8,762,644.29	4,143.36	89.82	-18.50	80.64
1978	4140M-43E	334,179.48	8,762,644.30	4,143.01	88.92	33.20	108.61
1978	4140M-44E	334,157.37	8,762,643.39	4,142.78	89.92	-44.90	176.02
1978	4140M-67E	334,179.40	8,762,644.27	4,144.29	90.72	23.43	75.06
1977	4140N-22E	334,197.97	8,762,666.44	4,143.80	87.27	1.43	33.86

Year	Hole ID	Coordinates - UTM, WGS84, Zone 18S			Azimuth (°)	Angle (°)	End Depth (m)
		East (m)	North (m)	Elevation (masl)			
1977	4140N-23W	334,194.31	8,762,665.33	4,143.84	267.73	2.28	56.85
1978	4140N-24E	334,177.87	8,762,664.88	4,143.81	86.25	-17.90	73.46
1979	4140N-40E	334,157.76	8,762,672.89	4,143.50	85.00	5.00	10.57
1979	4140N-41W	334,153.76	8,762,672.89	4,143.34	270.00	7.00	17.68
1978	4140N-49E	334,178.25	8,762,664.85	4,143.20	88.71	-34.07	92.28
1978	4140N-50E	334,154.92	8,762,663.43	4,142.54	84.67	-42.92	146.94
1977	4140N-51W	334,194.45	8,762,665.30	4,143.20	267.12	-31.90	81.28
1977	4140N-R1	334,194.72	8,762,670.19	4,143.61	344.68	2.38	54.10
1977	4140N-R2	334,196.77	8,762,669.88	4,143.62	17.17	1.47	36.88
1977	4140N-R3	334,193.53	8,762,666.86	4,143.79	298.37	0.90	46.58
1977	4140O-55W	334,222.08	8,762,683.80	4,144.51	270.23	2.88	28.24
1978	4140O-56E	334,155.71	8,762,679.87	4,143.21	89.51	-18.43	94.36
1978	4140O-57E	334,155.58	8,762,679.83	4,142.90	89.51	-29.63	97.10
1978	4140O-58E	334,155.16	8,762,679.85	4,142.74	89.51	-42.80	127.05
1978	4140O-59W	334,221.64	8,762,683.48	4,143.17	268.23	-37.97	120.65
1978	4140O-60E	334,156.07	8,762,679.90	4,144.44	89.75	18.89	82.09
1978	4140O-61W	334,220.91	8,762,683.44	4,143.26	272.58	-23.98	103.53
1977	4140OP-54W	334,221.35	8,762,692.56	4,144.58	273.10	-1.80	67.26
1978	4150-10W	334,216.54	8,762,657.91	4,153.89	271.50	2.00	33.55
1978	4150-11E	334,220.51	8,762,657.99	4,154.03	88.00	2.50	23.98
1978	4150-12W	334,216.20	8,762,637.84	4,154.01	270.00	1.00	27.74
1978	4150-13E	334,236.20	8,762,633.41	4,154.58	73.00	3.50	12.80
1978	4150-14W	334,232.69	8,762,632.46	4,154.49	256.00	1.50	9.40
1978	4150-15W	334,243.31	8,762,613.63	4,154.28	270.00	1.50	32.56
1978	4150-16E	334,248.73	8,762,603.41	4,154.04	93.50	0.00	10.01
1978	4150-17W	334,247.93	8,762,593.28	4,154.31	270.50	1.50	32.49
1978	4150-20W	334,165.76	8,762,613.79	4,154.65	275.00	4.00	26.11
1978	4150-24W	334,155.51	8,762,628.99	4,154.45	268.00	4.00	16.56
1978	4150-6E	334,216.56	8,762,693.39	4,153.75	92.00	1.00	8.31
1978	4150-8E	334,218.27	8,762,673.40	4,153.64	88.50	1.00	18.36
1978	4150-9W	334,214.23	8,762,673.33	4,153.64	270.00	1.50	17.27
1978	4150M-20E-A	334,229.06	8,762,644.83	4,154.32	90.28	15.00	19.96
1978	4150M-47W	334,215.12	8,762,643.29	4,154.40	270.68	17.68	76.00
1978	4150N-21W	334,174.76	8,762,673.39	4,154.57	270.00	2.00	24.79
1978	4150N-22E	334,181.26	8,762,672.89	4,154.64	92.00	3.00	20.11
1978	4150N-62E	334,218.90	8,762,663.56	4,154.15	91.05	0.42	26.14
1978	4150N-68W	334,215.45	8,762,663.65	4,154.45	271.15	14.33	62.03
1978	4150O-23W	334,171.56	8,762,686.99	4,154.74	306.00	4.00	12.01
1978	4150O-7W	334,212.76	8,762,693.39	4,153.75	271.00	1.00	46.15
1979	4160-42E	334,189.76	8,762,591.39	4,162.59	65.00	0.00	35.28
1978	4160J-19W	334,179.36	8,762,593.69	4,162.58	268.00	2.00	18.29
1980	4160J-47E	334,205.76	8,762,594.39	4,163.75	90.00	1.00	14.71
1980	4160J-48E	334,205.76	8,762,594.39	4,163.81	90.00	-15.00	33.17

Year	Hole ID	Coordinates - UTM, WGS84, Zone 18S			Azimuth (°)	Angle (°)	End Depth (m)
		East (m)	North (m)	Elevation (masl)			
1977	4180-4140	334,400.00	8,762,820.00	4,000.00	0.00	0.00	39.88
1978	4180-5E	334,178.96	8,762,671.99	4,181.75	89.00	-20.00	45.77
1977	4180I-1E	334,239.76	8,762,568.09	4,182.65	81.75	3.00	24.56
1977	4180I-1W	334,216.83	8,762,563.45	4,182.68	271.05	2.00	18.36
1977	4180I-2E	334,239.56	8,762,568.09	4,181.95	80.92	-35.00	32.89
1977	4180I-2W	334,217.06	8,762,563.39	4,182.05	268.22	-35.00	49.35
1977	4180I-3E	334,239.66	8,762,568.09	4,183.35	81.75	35.00	25.12
1977	4180I-3W	334,216.76	8,762,563.39	4,183.65	271.05	35.00	38.56
1977	4180I-4E	334,239.26	8,762,568.69	4,182.75	45.42	3.00	30.33
1977	4180I-63W	334,233.93	8,762,563.28	4,181.82	275.23	-44.00	33.10
1977	4180J-1W	334,219.22	8,762,583.41	4,182.95	269.60	3.82	45.21
1977	4180J-2E	334,225.13	8,762,583.47	4,181.75	0.00	-34.00	40.36
1977	4180J-2W	334,219.24	8,762,583.41	4,182.44	0.00	-18.20	50.22
1977	4180J-3E	334,400.00	8,762,810.00	4,000.00	0.00	0.00	34.37
1977	4180J-3E-A	334,229.66	8,762,583.37	4,182.79	89.90	-10.93	33.53
1977	4180J-3W	334,219.33	8,762,583.38	4,183.63	268.57	34.30	47.75
1977	4180J-4E	334,229.65	8,762,583.34	4,183.73	92.07	25.45	38.76
1977	4180K-1E	334,233.83	8,762,603.34	4,183.24	90.15	2.07	20.45
1977	4180K-1W	334,218.27	8,762,603.37	4,183.30	270.47	1.45	68.22
1977	4180K-1W-A	334,218.33	8,762,603.38	4,183.96	269.55	24.37	55.83
1977	4180K-7W	334,238.15	8,762,603.35	4,182.01	268.84	-44.62	46.02
1977	4180L-1E	334,227.47	8,762,623.23	4,183.22	90.17	2.18	31.22
1977	4180L-1W	334,222.30	8,762,623.20	4,183.34	269.20	1.02	80.67
1977	4180L-2E	334,228.57	8,762,623.21	4,182.30	90.97	-39.00	40.28
1977	4180L-2W	334,222.19	8,762,623.21	4,182.99	268.63	-20.76	95.40
1977	4180L-3E	334,228.22	8,762,623.23	4,183.85	88.45	39.00	51.38
1977	4180L-R1	334,222.42	8,762,623.72	4,183.33	295.63	2.00	82.37
1977	4180L-R2	334,223.17	8,762,626.09	4,183.31	328.33	1.00	89.59
1977	4180M-10W	334,167.36	8,762,642.71	4,183.09	271.21	2.58	29.44
1977	4180M-9E	334,181.15	8,762,643.36	4,183.08	87.94	-6.68	60.73
1977	4180M-9E-A	334,181.10	8,762,643.35	4,183.95	90.71	23.57	18.31
1977	4180N-11E	334,172.78	8,762,663.59	4,183.43	89.32	6.00	55.55
1977	4180N-11E-A	334,172.59	8,762,663.58	4,183.92	88.97	23.30	46.76
1977	4180N-11W	334,166.99	8,762,663.49	4,183.19	268.19	2.12	4.37
1978	4180N-4E	334,178.96	8,762,671.99	4,182.35	89.00	1.00	27.03
1977	4180N-61E	334,172.83	8,762,663.57	4,182.99	89.32	-19.48	71.42
1977	4180O-73W	334,208.38	8,762,683.81	4,183.12	272.72	-24.52	59.97
1977	4180O-74W	334,208.19	8,762,683.82	4,183.76	272.09	2.27	46.66
1977	4210K-6W	334,255.97	8,762,602.90	4,208.83	265.50	-24.75	30.81
1976	4220M-1W	334,190.67	8,762,643.24	4,221.99	268.90	-50.00	68.99
1990	4340K-101E	334,244.22	8,762,600.87	4,345.75	90.65	-36.18	35.36
1984	Exp-12	334,217.57	8,762,610.86	4,022.09	272.54	0.00	60.02
1984	Exp-16	334,234.89	8,762,631.43	4,022.39	251.84	3.41	8.03

Year	Hole ID	Coordinates - UTM, WGS84, Zone 18S			Azimuth (°)	Angle (°)	End Depth (m)
		East (m)	North (m)	Elevation (masl)			
1984	Exp-17	334,235.19	8,762,636.22	4,022.51	279.86	3.92	14.63
1983	Exp-2	334,237.69	8,762,552.51	4,021.76	339.54	2.00	5.84
1985	Exp-20	334,135.37	8,762,647.13	4,026.60	46.03	0.00	12.09
1985	Exp-21	334,132.57	8,762,647.67	4,026.76	350.15	1.78	24.99
1985	Exp-22	334,227.04	8,762,618.73	4,021.99	303.69	1.41	6.68
1985	Exp-23	334,227.07	8,762,617.81	4,021.94	276.30	1.41	12.98
1983	Exp-3	334,239.76	8,762,553.19	4,021.95	355.00	2.00	3.28
1983	Exp-4	334,241.80	8,762,552.25	4,021.76	19.97	2.00	2.74
1983	Exp-5	334,237.57	8,762,552.81	4,022.56	329.98	2.00	15.34
1983	Exp-6	334,241.79	8,762,552.08	4,022.50	24.85	2.00	3.22
1983	Exp-7	334,239.76	8,762,553.19	4,022.75	355.00	2.00	1.95
1976	L4220W-1E	334,200.22	8,762,623.39	4,221.96	89.93	-23.78	66.17
1976	L4220W-1W	334,196.58	8,762,623.35	4,221.74	269.88	-45.78	92.81
1976	M4220W-1E	334,194.46	8,762,643.30	4,222.45	88.62	-20.48	52.78
1976	M4220W-2E	334,194.37	8,762,643.28	4,221.91	88.85	-45.00	70.05
1976	N-4220_E-1W	334,221.28	8,762,663.40	4,224.62	272.87	63.48	47.88
1976	N-4220_E-2W	334,220.18	8,762,663.40	4,223.60	271.22	18.97	48.46
1976	N-4220_E-3W	334,220.51	8,762,663.43	4,222.35	272.13	24.15	80.82
1976	N-4220_W-1E	334,400.00	8,762,800.00	4,000.00	0.00	0.00	54.48
1976	N-4240_E-1E	334,198.39	8,762,663.39	4,242.30	88.85	29.15	25.53
1973	S-1	334,365.24	8,761,742.65	4,474.95	55.00	-42.00	167.74
1973	S-3	333,978.01	8,762,803.31	4,482.72	70.00	-45.00	372.67
1993	Superficie-1	334,091.37	8,762,458.22	4,485.22	0.00	-90.00	39.62
1993	Superficie-2	334,058.88	8,762,517.27	4,472.60	0.00	-90.00	38.56
1979	Taladro-guia	334,245.26	8,762,547.39	4,000.00	0.00	0.00	22.96
1993	Taladro-guia_4060-52N-W	334,240.76	8,762,601.99	4,064.05	330.00	2.00	37.87

Source: CDPR (2022).

APPENDIX B - LOCATION OF DRILL HOLES DRILLED BY TREVALI IN THE SANTANDER PIPE

Year	Hole ID	Coordinates - UTM, WGS84, Zone 18S			Azimuth (°)	Angle (°)	End Depth (m)	Downhole Survey R/G	Core Sizes	Photos Yes/No
		East (m)	North (m)	Elevation (masl)						
2011	SAN-0166	334,165.94	8,762,834.63	4,478.97	169.00	-48.00	405.90	UNK Single	HQ/NQ/BQ	Yes
2011	SAN-0168	334,166.58	8,762,834.57	4,479.03	165.90	-42.00	348.50	UNK Multi	HQ/NQ	Yes
2011	SAN-0169	334,039.97	8,762,814.76	4,478.22	135.50	-42.40	420.65	UNK Multi	HQ/NQ	Yes
2011	SAN-0192	334,164.04	8,762,839.06	4,478.62	170.20	-59.00	314.15	UNK Multi	HQ/NQ	Yes
2011	SAN-0193	333,896.78	8,762,527.29	4,481.59	70.00	-69.30	625.95	UNK Multi	HQ	Yes
2017	SAN-0223-17	333,822.26	8,762,636.36	4,480.60	90.45	-58.54	405.40	UNK Multi	HQ	Yes
2017	SAN-0224-17	333,885.02	8,762,448.13	4,483.94	56.03	-68.61	900.80	UNK Multi	HQ	Yes
2017	SAN-0225-17	333,823.38	8,762,636.61	4,481.37	78.04	-63.00	835.40	UNK Multi	HQ	Yes
2017	SAN-0225B-17	333,823.38	8,762,636.61	4,481.37	78.04	-63.00	829.10	UNK Multi	HQ/NQ	Yes
2017	SAN-0225C-17	333,823.38	8,762,636.61	4,481.37	78.04	-63.00	806.30	UNK Multi	HQ/NQ	Yes
2017	SAN-0226-17	334,124.65	8,762,908.25	4,475.93	158.75	-52.56	379.40	UNK Multi	HQ	Yes
2017	SAN-0226B-17	334,124.65	8,762,908.25	4,475.93	158.75	-52.56	474.50	UNK Multi	HQ/NQ	Yes
2017	SAN-0228-17	334,153.44	8,762,448.30	4,478.49	19.38	-76.61	602.20	UNK Multi	HQ/NQ	Yes
2017	SAN-0228B-17	334,153.44	8,762,448.30	4,478.49	19.38	-76.61	1,516.00	UNK Multi	HQ/NQ	Yes
2018	SAN-0225D-18	333,823.38	8,762,636.61	4,481.37	78.04	-63.00	859.50	UNK Multi	HQ/NQ	Yes
2018	SAN-0225E-18	333,823.38	8,762,636.61	4,481.37	78.04	-63.00	970.30	UNK Multi	HQ/NQ	Yes
2018	SAN-0225F-18	333,823.38	8,762,636.61	4,481.37	78.04	-63.00	827.50	UNK Multi	HQ/NQ	Yes
2018	SAN-0225G-18	333,823.38	8,762,636.61	4,481.37	78.04	-63.00	863.00	Deviflex Multi	HQ/NQ	Yes
2018	SAN-0228C-18	334,153.44	8,762,448.30	4,478.49	19.38	-76.61	874.30	UNK Multi	HQ/NQ	Yes
2018	SAN-0228D-18	334,153.44	8,762,448.30	4,478.49	19.38	-76.61	895.50	UNK Multi	NQ	Yes
2018	SAN-0228E-18	334,153.44	8,762,448.30	4,478.49	19.38	-76.61	866.30	UNK Multi	NQ	Yes
2018	SAN-0234-18	334,203.17	8,762,971.11	4,500.11	116.57	-55.42	607.60	Deviflex Multi	HQ/NQ	Yes
2018	SAN-0236-18	334,396.65	8,762,515.27	4,512.46	302.14	-81.41	856.30	Deviflex Multi	HQ/NQ	Yes

Year	Hole ID	Coordinates - UTM, WGS84, Zone 18S			Azimuth (°)	Angle (°)	End Depth (m)	Downhole Survey R/G	Core Sizes	Photos Yes/No
		East (m)	North (m)	Elevation (masl)						
2019	SAN-0225H-19	333,823.38	8,762,636.61	4,481.37	78.04	-63.38	845.30	Gyro Multi	NQ	Yes
2019	SAN-0225I-19	333,823.38	8,762,636.61	4,481.37	78.04	-63.38	1,159.10	UNK Multi	NQ	Yes
2019	SAN-0237-19	333,884.32	8,762,447.22	4,484.19	64.85	-84.74	995.90	Reflex Multi	HQ/NQ	Yes
2019	SAN-0240-19	334,067.92	8,763,044.93	4,500.74	167.72	-74.54	901.10	Reflejo Multi	HQ/NQ	Yes
2019	SAN-0241-19	333,883.88	8,762,445.59	4,484.62	55.79	-74.25	967.60	Reflejo Multi	HQ/NQ	Yes
2019	SAN-0241B-19	333,883.88	8,762,445.59	4,484.62	55.79	-74.25	937.80	Reflex Multi	HQ/NQ	Yes
2019	SAN-0241C-19	333,883.88	8,762,445.59	4,484.62	55.79	-74.25	935.20	Reflex Multi	HQ/NQ	Yes
2019	SAN-0242-19	334,269.04	8,762,794.46	4,484.16	235.15	-85.18	909.40	Reflex Multi	HQ/NQ	Yes
2019	SAN-0242B-19	334,269.04	8,762,794.46	4,484.16	235.15	-85.18	938.10	Reflex Multi	HQ/NQ	Yes
2019	SAN-0243-19	334,396.45	8,762,515.78	4,514.70	306.51	-85.95	984.20	Reflex Multi	HQ/NQ	Yes
2019	SAN-0243B-19	334,396.45	8,762,515.78	4,514.70	306.51	-85.95	923.60	TruShot Multi	HQ/NQ	Yes
2019	SAN-0244-19	333,881.95	8,762,447.39	4,483.91	76.51	-72.37	991.10	Reflex Multi	HQ/NQ	Yes
2020	SAN-0241D-20	333,883.88	8,762,445.59	4,484.62	55.79	-74.25	979.10	TruShot Multi	NQ/BQ	Yes
2020	SAN-0241E-20	333,883.88	8,762,445.59	4,484.62	55.79	-75.00	938.00	Reflex Multi	NQ/BQ	Yes
2020	SAN-0243C-20	334,396.45	8,762,515.78	4,514.70	306.51	-85.95	937.20	Gyro Multi	NQ	Yes
2020	SAN-0243D-20	334,396.45	8,762,515.78	4,514.70	306.51	-85.95	740.70	Gyro Multi	NQ	Yes
2020	SAN-0248-20	334,271.00	8,762,795.00	4,480.00	235.00	-81.00	223.30	Gyro Multi	HQ/NQ	Yes
2020	SAN-0249-20	334,070.00	8,763,046.00	4,504.00	168.00	-85.00	167.40	Gyro Multi	HQ	Yes

Source: CDPR (2022).

APPENDIX C - LOCATION OF DRILL HOLES DRILLED BY TREVALI AND CDPR NORTH OF THE SANTANDER PIPE

Year	Project	Hole ID	Coordinates - UTM, WGS84, Zone 18S			Azimuth (°)	Angle (°)	End Depth (m)	Downhole Survey R/G	Core Sizes	Photos Yes/No
			East (m)	North (m)	Elevation (masl)						
2010	Blanquita	SAN-0146	333,495.71	8,763,017.88	4,548.87	66.15	-61.40	218.75	UNK Multi	HQ	Yes
2011	Blanquita	SAN-0181	333,435.67	8,763,002.65	4,570.99	87.39	-69.50	206.00	UNK Multi	HQ/NQ	Yes
2011	Blanquita	SAN-0183	333,491.39	8,763,022.46	4,548.39	95.98	-78.80	337.20	UNK Multi	HQ	Yes
2017	Blanquita	SAN-0227-17	333,900.29	8,763,057.93	4,496.68	263.27	-47.00	485.00	UNK Multi	HQ	Yes
2019	Blanquita	SAN-0245-19	333,901.16	8,763,057.35	4,495.91	279.25	-44.83	963.50	Reflex Multi	HQ/NQ	Yes
2019	Blanquita	SAN-0246-19	333,736.29	8,763,376.31	4,529.67	266.95	-49.70	945.90	TruShot	HQ/NQ	Yes
2020	Blanquita	SAN-0247-20	333,736.08	8,763,376.53	4,529.95	277.99	-39.58	684.20	Gyro Multi	HQ/NQ	Yes
2020	Blanquita	SAN-0250-20	333,741.31	8,763,392.09	4,530.61	252.10	-72.06	1,990.30	TSTN	HQ/NQ	Yes
2021	Blanquita	SAN-0261-21	333,834.42	8,762,682.67	4,480.00	261.00	-57.10	482.40	Gyro Multi	HQ	Yes
2022	Blanquita	SAN-0270-22	333,833.40	8,762,677.02	4,480.71	260.96	-60.98	654.80	Gyro Multi	HQ	Yes
2022	Blanquita	SAN-0272-22	333,831.90	8,762,679.82	4,480.94	271.51	-54.55	508.20	Gyro Multi	HQ	Yes
2022	Blanquita	SAN-0274-22	333,839.66	8,762,679.10	4,480.80	245.78	-57.87	487.60	Gyro Multi	HQ	Yes
2022	Blanquita	SAN-0276-22	333,708.45	8,762,387.43	4,512.29	40.68	-75.35	424.70	Gyro Multi	HQ	Yes
2022	Blanquita	SAN-0277-22	333,835.40	8,762,681.20	4,480.88	241.50	-69.91	562.70	Gyro Multi	HQ	Yes
2022	Blanquita	SAN-0279-22	333,839.00	8,762,679.00	4,480.00	236.68	-45.83	308.40	Gyro Multi	HQ	Yes
2020	S. Pipe Anticline	SAN-0247B-20	333,736.08	8,763,376.53	4,529.95	276.92	-39.39	775.00	Gyro Multi	NQ	Yes
2021	S. Pipe Anticline	SAN-0251-21	333,736.97	8,763,387.97	4,531.19	60.38	-76.29	947.00	TSTN	HQ	Yes
2022	M.Sur	MS-0270-22	333,062.44	8,763,672.08	4,106.37	129.00	-5.83	810.85	Gyro Multi	HQ/NQ	Yes
2022	S.Pipe	SAN-0280-22	334,442.37	8,762,167.37	4,485.18	73.02	-80.92	860.80	Gyro Multi	HQ	Yes
2022	S.Pipe	SAN-0281-22	334,442.51	8,762,166.39	4,485.07	265.68	-86.82	780.00	Gyro Multi	HQ	Yes
2022	S.Pipe	SAN-0282-22	333,902.39	8,763,134.20	4,505.87	77.42	-81.90	797.40	Gyro Multi	HQ	Yes
2022	S.Pipe	SAN-0283-22	333,902.74	8,763,134.30	4,506.18	76.13	-72.98	887.80	Gyro Multi	HQ	Yes
2022	S.Pipe	SAN-0284-22	333,899.71	8,763,196.84	4,512.64	69.51	-83.95	720.30	Gyro Multi	HQ	Yes
2022	S.Pipe	SAN-0285-22	333,899.77	8,763,196.84	4,512.91	72.10	-81.70	730.60	Gyro Multi	HQ	Yes

Year	Project	Hole ID	Coordinates - UTM, WGS84, Zone 18S			Azimuth (°)	Angle (°)	End Depth (m)	Downhole Survey R/G	Core Sizes	Photos Yes/No
			East (m)	North (m)	Elevation (masl)						
2022	S.Pipe	SAN-0286-22	333,921.36	8,763,084.39	4,499.78	76.08	-81.19	726.00	Gyro Multi	HQ	Yes
2022	S.Pipe	SAN-0287-22	333,828.68	8,763,888.07	4,712.96	233.11	-86.80	781.70	Gyro Multi	HQ	Yes
2022	S.Pipe	SAN-0288-22	333,848.99	8,763,247.39	4,517.69	66.99	-82.95	701.20	Gyro Multi	HQ	Yes
2022	S.Pipe	SAN-0289-22	334,011.00	8,762,910.00	4,480.00	55.46	-83.96	740.10	Gyro Multi	HQ	Yes
2022	S.Pipe	SAN-0290-22	333,823.74	8,763,328.47	4,525.61	78.42	-81.20	755.30	Gyro Multi	HQ	Yes

Source: CDPR (2022).

APPENDIX D – MINING CONTRACTOR BUDGETARY QUOTE

Lima, febrero 22, 2023

Señores **Cerro de Pasco Resources del Perú** (CDPR):

De acuerdo con su solicitud del día 21 de febrero, remitimos a ustedes esta cotización de referencia para costos de desarrollo, operación, y servicios de mina. Estos costos se estiman con base en los precios unitarios de referencia para la Unidad Minera Santander ("UM Santander"), los cuáles se incluyen en el Anexo de esta cotización. Allí se sustentan los precios por actividad, equipos, materiales, y recursos en general.

La Tabla 1, Tabla 2, y Tabla 3 presentan el resumen de los precios unitarios de referencia para los desarrollos horizontales, las labores de producción, y el acarreo de material. Estos precios aplican para las métricas del proyecto Santander Pipe que fueron proporcionadas por CDPR (Tabla 4 y Tabla 5), considerando los siguientes ratios operativos:

- Desarrollos horizontales = 440 – 580 m/mes
- Desarrollos verticales = 30 – 150 m/mes
- Producción de tajos y subniveles = 45,000 – 75,000 t/mes

Se resalta que ésta es una cotización de referencia y que no tiene efectos legales o contractuales entre CDPR y Martínez Contratistas e Ingeniería (MCEISA).

Cordialmente,

Martin

FRANCISCO MARTINEZ

SUB GERENTE GENERAL MCEISA

Oficina Principal
Jr. Cajamarquilla 627 Urb. Azcarrunz,
SJL, Lima-Perú
Teléfono: (01) 458-2841 (Central) / Celular: 983 725 643
Web: http://www.mceisa.com

Tabla 1. Resumen de precios unitarios para desarrollos horizontales

Labor	Sección	Explosivo	Unidad	PU Avance (US$/m)	PU Avance + Sostenimiento (No-Producción) (US$/m)(1)	PU Avance + Sostenimiento (Producción) (US$/m)(2)
Rampa (-)	5 X 4 Jumbo 1 B Scoop 6.0 Yd3	Emulsión + Anfo	m lineal	707.45	1,449.71	1,397.89
Rampa (-)	5 X 4 Jumbo 1 B Scoop 6.0 Yd3	Emulsión	m lineal	730.33	1,472.59	1,420.76
Horizontal	4.5 X 4.5 Jumbo 1 B Scoop 6.0 Yd3	Emulsión + Anfo	m lineal	692.79	1,435.05	1,383.22
Horizontal	4.5 X 4.5 Jumbo 1 B Scoop 6.0 Yd3	Emulsión	m lineal	714.52	1,456.78	1,404.96
Horizontal	4 X 4 Jumbo 1 B Scoop 6.0 Yd3	Emulsión + Anfo	m lineal	620.50	1,319.36	1,274.94
Horizontal	4 X 4 Jumbo 1 B Scoop 6.0 Yd3	Emulsión	m lineal	640.52	1,339.39	1,294.97

Notas:

(1) Considera instalación de pernos helicoidales, malla, y 5cm de shotcrete; no considera el costo de los servicios (energía, bombeo) ni el desate, estos ítems se computan con alquileres por horas y días (ver Anexo).

(2) Considera instalación de pernos split sets, malla, y 5cm de shotcrete; no considera el costo de los servicios (energía, bombeo) ni el desate, estos ítems se computan con alquileres por horas y días (ver Anexo).

MCEISA
MARTINEZ CONTRATISTAS E INGENIERIA S.A.

Proyecto Santander Pipe

Cotización de Referencia: Operación Minera

Tabla 2. Resumen de precios unitarios para trabajos de producción

Labor	Tipo	Relleno	Unidad	PU (US$/unidad)
Tajeo	Mecanizado	Detrítico	Tm	6.29
Desquinche	Mecanizado		m^3	23.28
Chimenea 3.0 X 3.0	Long hole		m lineal	687.86
Chimenea 2.1 X 2.1	Long hole		m lineal	540.98
Relleno Detrítico			m^3 suelto	4.82

Tabla 3. Resumen de precios unitarios para acarreo de material

Acarreo	Unidad	PU (US$/t)
0.00 Km < = D < = 0.50 Km	t	0.85
0.51 Km < = D < = 1.00 Km	t	1.01
1.01 Km < = D < = 1.50 Km	t	1.16
1.51 Km < = D < = 2.00 Km	t	1.32
2.01 Km < = D < = 2.50 Km	t	1.48
2.51 Km < = D < = 3.00 Km	t	1.64
3.01 Km < = D < = 3.50 Km	t	2.13
3.51 Km < = D < = 4.00 Km	t	2.32
4.01 Km < = D < = 4.50 Km	t	2.51
4.51 Km < = D < = 5.00 Km	t	2.69
5.01 Km < = D < = 5.50 Km	t	2.88
5.51 Km < = D < = 6.00 Km	t	3.07
6.01 Km < = D < = 6.50 Km	t	3.25
6.51 Km < = D < = 7.00 Km	t	3.44
7.01 Km < = D	t	3.63

Tabla 4. Plan de desarrollos del proyecto Santander Pipe

Description	Total	2024	2025	2026	2027	2028	2029
	m	m	m	m	m	m	m
Pumping station	130	51	39	40	0	0	0
Loading chamber	408	228	85	96	0	0	0
Service raise	562	305	79	178	0	0	0
Ventilation raise	2,161	1,451	496	213	0	0	0
Canteen	36	18	18	0	0	0	0
Explosives magazine	77	50	0	27	0	0	0
Ramps	3,267	1,880	704	684	0	0	0
Refuge	107	61	24	22	0	0	0
Sublevel	7,580	336	4,695	2,550	0	0	0
Drawpoint	4,910	2,031	1,239	1,640	0	0	0
Crosscut to RB raise	1,491	1,089	121	282	0	0	0
Total development	20,729	7,500	7,500	5,732	0	0	0
Description	Total	2024	2025	2026	2027	2028	2029

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Web: http://www.mceisa.com

	m	m	m	m	m	m	m
Non-Production Development	13,149	7,164	2,805	3,181	0	0	0
Production Development	7,580	336	4,695	2,550	0	0	0
Total	20,729	7,500	7,500	5,731	0	0	0
Work Type	Total	2024	2025	2026	2027	2028	2029
	m	m	m	m	m	m	m
Horizontal Development	18,007	5,743	6,924	5,339	0	0	0
Vertical Development	2,723	1,756	575	391	0	0	0
Total	20,730	7,499	7,499	5,730	0	0	0

Tabla 5. Plan de producción del proyecto Santander Pipe

Description	Total	2024	2025	2026	2027	2028	2029
Stopes and Sublevels (t)	3,846,564	0	539,827	900,000	900,000	900,000	606,736
NSR ($/t)	89.25	0	97.99	94.72	98.7	78.21	75.72
Zn (%)	4.67	0	5.14	5.01	5.05	4.12	4.01
Pb (%)	0.01	0	0.02	0.01	0.01	0	0
Ag (g/t)	8.05	0	10.12	9.44	11.08	4.93	4.3
Cu (%)	0.11	0	0.1	0.08	0.15	0.11	0.09
Upper Zone (t)	1,509,887	0	376,849	698,100	434,938	0	0
NSR ($/t)	106.71	0	102.55	99.45	121.99	0	0
Zn (%)	5.67	0	5.47	5.3	6.43	0	0
Pb (%)	0.02	0	0.02	0.02	0.02	0	0
Ag (g/t)	11.02	0	10.36	10.3	12.74	0	0
Cu (%)	0.08	0	0.07	0.07	0.11	0	0
Lower Zone (t)	2,336,677	0	162,978	201,900	465,062	900,000	606,736
NSR ($/t)	77.97	0	87.45	78.38	76.93	78.21	75.72
Zn (%)	4.03	0	4.38	4.04	3.75	4.12	4.01
Pb (%)	0	0	0	0	0	0	0
Ag (g/t)	6.14	0	9.56	6.46	9.52	4.93	4.3
Cu (%)	0.13	0	0.18	0.13	0.19	0.11	0.09