Technical Report Summary on Cerro Pasco Complex Integration, Pasco Province, Peru

S-K 1300 Report

Nexa Resources S.A.

SLR Project No.: 233.065018.00001

Effective Date:

December 31, 2023

Signature Date:

March 27, 2024

Prepared by:

SLR Consulting (Canada) Ltd.
Nexa Resources S.A.

Making Sustainability Happen

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1.0 Executive Summary

1.1 Summary

SLR Consulting (Canada) Ltd.Nexa Resources S.A. (SLR) was retained by Nexa Resources S.A. (Nexa) to prepare a Technical Report Summary (TRS) on the integration of Nexa's El Porvenir and Atacocha mines into the Cerro Pasco Complex (Cerro Pasco or the Complex), located in Pasco Province, Peru. The purpose of this TRS is to support the disclosure of the Cerro Pasco Mineral Resource and Mineral Reserve estimates with an effective date of December 31, 2023. The Mineral Resource estimate for the Complex was prepared by Jerry Huaman Abalos, B.Geo., AusIMM CP(Geo), Corporate Mineral Resource Manager with Nexa and a Qualified Person (QP) for this TRS. This TRS conforms to United States Securities and Exchange Commission's (SEC) Modernized Property Disclosure Requirements for Mining Registrants as described in Subpart 229.1300 of Regulation S-K, Disclosure by Registrants Engaged in Mining Operations (S-K 1300) and Item 601 (b)(96) Technical Report Summary. SLR's qualified persons (QPs) visited the site from January 15 to 17, 2024. Nexa's QP, Jerry Huaman Abalos, B.Geo., AusIMM CP(Geo), visited the site over the same period.

The Complex consists of the El Porvenir underground zinc (Zn)-copper (Cu)-silver (Ag)-gold (Au) mine (El Porvenir Mine or El Porvenir) and the adjacent Atacocha (San Gerardo) open pit and Atacocha underground Zn-Pb-Ag mines (together Atacocha Mine or Atacocha).

Nexa, as Votorantim Metais Holding S.A. (VM Holding), acquired the El Porvenir Mine in 2010 when it acquired Compañía Minera Milpo S.A. (Milpo). The property is located in the central Andes mountains at an approximate elevation of 4,200 metres above sea level (MASL). El Porvenir commenced production in 1949 with Milpo as the operator. A gravity separation plant was built at the site in 1953, and a flotation plant was completed in 1979. The current production rate of 5,600 tonnes per day (tpd) at El Porvenir was achieved in 2014. In 2023, production at El Porvenir was 2.22 million tonnes (Mt) at grades of 2.86% Zn, 0.16% Cu, 1.37% Pb, 2.34 oz/t Ag, and 0.01 oz/t Au. Mining is carried out by sub-level stoping (SLS) and cut and fill (CAF) mining methods.

Milpo acquired the adjacent Atacocha Mine in 2008 and Nexa acquired Atacocha when it acquired Milpo in 2010. Atacocha is located approximately 16 km from the city of Cerro de Pasco at an altitude of approximately 4,050 MASL. The processing plant is located near the Huallaga River valley. The Atacocha mining unit commenced operation in the first decade of the 20th century producing Pb, Ag, Zn, and Cu ores. Mining at Atacocha was suspended in 2020 in response to COVID-19. When COVID-19 restrictions were lifted, mining resumed at the San Gerardo open pit mine. As of the end of 2023, Nexa has not resumed underground mining. In 2023, production at Atacocha was 1.40 Mt at grades of 0.77% Zn, 0.04% Cu, 0.93% Pb, 1.21 oz/t Ag, and 0.01 oz/t Au.

The El Porvenir Mine is 100% owned by Nexa Resources El Porvenir S.A.C. (Nexa El Porvenir), a 99.99%-owned subsidiary of Nexa Resources Peru S.S.A. (Nexa Peru). Nexa's resulting interest in the El Porvenir Mine is 83.48% that corresponds to the sum of Nexa's direct interest in Nexa Peru (0.18%) and indirect interest of Nexa in Nexa Peru (83.37%) through its controlled company Nexa Resources Cajamarquilla S.A. (99.916%), and the remaining 16.45% are floating shares.

The Atacocha Mine is 100% owned by Nexa Resources Atacocha S.A.A. (Nexa Atacocha). Nexa's resulting interest in the Atacocha Mine is 75.96% that corresponds to the sum of Nexa's direct interest in Nexa Peru (0.18%), and Nexa Peru's indirect interest in Nexa Atacocha

(90.999%) through its controlled company Nexa El Porvenir (99.99%), the remaining 9.001% are floating shares, and indirect participation of Nexa in Nexa Peru (83.37%) through its controlled company Nexa Resources Cajamarquilla S.A. (99.916%), and the remaining 16.45% are floating shares.

The integration project is intended to capture synergies between the two mining operations, resulting from their proximity and operational similarities, with the ore from both underground mines being processed in the El Porvenir treatment plant. The goal is to achieve cost and investment savings, thereby reducing the environmental footprint and extending the combined mine life of the two mines.

The integration project has been developed over the past several years. The first stage involved the administrative integration of both mines, which was completed in 2014. The second stage involved the integration of the tailings disposal system, which allowed the Atacocha plant to send tailings to the El Porvenir dam within the short term, thereby helping reduce the environmental footprint. The third stage, completed in 2016, involved the construction of a new energy transmission line with a 138 kilovolt (kV) connection that supplies both mines, replacing the prior 50 kV transmission lines. The development of a 3.5 km tunnel, connecting both underground mines and enabling exploration program in the Integration Zone between the mines, was part of the fourth stage, concluded in 2019.

In 2021, the modernization and debottleneck studies to evaluate the deepening of the mine and extension of the life of mine (LOM) for El Porvenir were postponed due to the prioritization of a capital allocation strategy and the reassessment of the integration with the Atacocha underground mine. In 2022, Nexa advanced the integration project with an optimization study of the integration of the El Porvenir and Atacocha underground mines by evaluating increasing the capacity of tailings and shaft and optimizing the processing plant, to potentially increase production and extend the LOM.

In 2023, Nexa continued to advance the integration project with technical studies to sustain and expand production, such as mine design and studies for the underground interconnection, shaft upgrade and engineering assessment of the plant, as well as key routes to improve capacity to provide a long-term solution for tailings disposal. A Front-End Loading (FEL) 3 study to increase El Porvenir hoisting was completed in Q1 2023 and a FEL3 tailings pumping system study was completed in early Q2 2023.

The integration plan includes:

- restarting and rehabilitation of the Atacocha underground mine,
- development of an approximately 2 km long connection tunnel (Tunnel 2900), linking Atacocha underground to the bottom of Picasso shaft in El Porvenir, allowing the production from both underground mines to be hoisted to feed the El Porvenir processing plant,
- Picasso shaft capacity expansion to support production and extraction at both underground mines,
- closure of the Atacocha processing plant, with the exhaustion of Atacocha open pit reserves, in 2027,
- a new tailing pumping and pipeline system to be built, that will allow tailings from El Porvenir to be sent to the Atacocha dam, bringing a long term solution for tailings, supporting the extension of the combined life of the two mines.

1.1.1 Conclusions

1.1.1.1 Geology and Mineral Resources

- The Mineral Resource estimate was prepared by Nexa. The resource estimate has been audited and accepted by the QP.
- Exclusive of Mineral Reserves, the estimated end of year 2023 (EOY2023) Measured and Indicated Mineral Resources attributable to Nexa comprise:
    - El Porvenir underground (83.48% attributable): 3.24 Mt at 3.29% Zn, 0.21% Cu, 62.2 g/t Ag, and 0.97% Pb containing 106.6 thousand tonnes (kt) of Zn, 6.8 kt of Cu, 6,485 koz of Ag, and 31.1 kt of Pb.
    - Atacocha underground (75.96% attributable): 2.71 Mt at 3.35% Zn, 0.33% Cu, 55.0 g/t Ag, and 0.94% Pb containing 90.8 kt of Zn, 9.0 kt of Cu, 4,792 koz of Ag, and 25.4 kt of Pb.
    - San Gerardo open pit (75.96% attributable): 4.31 Mt at 1.12% Zn, 29.8 g/t Ag, 0.89% Pb, and 0.22 g/t Au containing 48.4 kt Zn, 4,128 koz Ag, 38.4 kt Pb, and 31.1 koz Au.
- In addition, the El Porvenir EOY2023 Inferred Mineral Resources attributable to Nexa total 9.23 Mt at 3.83% Zn, 0.24% Cu, 82.9 g/t Ag, and 1.32% Pb.
- Atacocha EOY2023 Inferred Mineral Resources attributable to Nexa total 6.12 Mt at 4.09% Zn, 0.56% Cu, 77.3 g/t Ag, and 1.21% Pb for Atacocha underground, and 1.29 Mt at 1.27% Zn, 32.7 g/t Ag, 1.15% Pb, and 0.22 g/t Au for San Gerardo open pit.
- El Porvenir and Atacocha feature skarn and hydrothermal vein/breccia-style mineralization. El Porvenir also has stratabound deposits, while Atacocha has porphyry mineralization. Controls on mineralization are lithological, mineralogical, and structural.
- The El Porvenir and Atacocha database closure date was January 31, 2023. Between then and the effective date of this report, 252 drill holes and 1,727 channels were completed at El Porvenir and 32 channels and 18 DDH were completed at Atacocha. SLR does not consider this to have a material impact on the estimated Mineral Resources.
- Protocols for drilling, sampling, analysis, verification, and security meet industry standard practices. The drill hole database was verified by SLR and is suitable for Mineral Resource estimation.
- The Mineral Resource estimates are completed to industry standards using reasonable and appropriate parameters and are acceptable for conversion to Mineral Reserves.
- Nexa has defined several polymetallic prospects located near the deposits, which warrant additional exploration, including the Integration Zone between the El Porvenir and Atacocha underground mines.

1.1.1.2 Mining and Mineral Reserves

- The Cerro Pasco Complex consists of the El Porvenir underground mine, the Atacocha underground mine, and the San Gerardo open pit mine.
    - Production is currently from the San Gerardo mine, which feeds the Atacocha processing plant that has a nominal throughput of 4,400 tpd, and the El Porvenir

underground mine, which feeds the El Porvenir processing plant that has a nominal throughput of 6,500 tpd.

- The Atacocha underground mine was placed in care and maintenance in 2020 to focus all production at the San Gerardo open pit mine. Atacocha is planned to resume production in 2027 when the San Gerardo pit has reached the end of its mine life.
- The Atacocha Mine will be integrated with the El Porvenir Mine and both will feed the El Porvenir processing plant.

- The Mineral Reserve estimates were prepared by Nexa and reviewed and accepted by SLR.
  - On an 83.48% Nexa attributable ownership basis, El Porvenir underground Mineral Reserves total 12.2 Mt averaging 4.11% Zn, 0.23% Cu, 72.9 g/t Ag, and 1.20% Pb.
  - On a 75.96% Nexa attributable ownership basis, Atacocha underground Mineral Reserves total 4.3 Mt averaging 4.33% Zn, 0.40% Cu, 79.8 g/t Ag, and 1.34% Pb.
  - On a 75.96% Nexa attributable ownership basis, San Gerardo open pit Mineral Reserves total 3.3 Mt at an average grade of 0.99% Zn, 34.9 g/t Ag, 0.27 g/t Au, and 1.15% Pb.
- The assumptions, parameters, and methodology used to estimate Mineral Reserves meet industry standard practices and are appropriate for the style of mineralization and proposed mining methods.
- The underground mines are planned to be mined using CAF and SLS mining methods. Backfill in the form of unconsolidated backfill from waste development and hydraulic fill from tailings will be used for both mining methods.
- Underground mine design and support recommendations have been developed using industry standard geotechnical data and analysis methods.
- The dilution factors assumed for SLS are low when compared to surveyed stopes and planned designs reconciliation data provided by Nexa.
  - SLR has investigated the effect of higher dilution and notes that approximately 2% of the total Mineral Reserves would be impacted. This is not considered to be a material difference.
- Mining of the San Gerardo open pit is planned using conventional open pit mining methods with drill and blast operations using excavators and trucks.
- Open pit net smelter return (NSR) block value calculations are based on historical performance of the concentrator, historical operating costs and current smelter contracts.
- Open pit calculated block model NSR values are evaluated against the internal break-even value. Blocks classified as Measured or Indicated Mineral Resources with an NSR value above the internal break-even value are included in the Mineral Reserve.

1.1.1.3 Mineral Processing

El Porvenir

- The El Porvenir concentrator processed 2,220,011 tonnes of ore in 2023 with Cu, Pb, and Zn grades of 0.16%, 1.37% and 2.86% respectively. Recoveries to their respective concentrates were 10.1% Cu, 82.1% Pb, and 88.0% Zn.
- The head grades of Zn, Cu, Au, and Ag have been consistent for the period from 2018 through 2023, while Pb has increased from 0.98% to 1.37%. Pb, Ag, and Au recoveries have increased and the recovery of Ag and Au to the Pb concentrate has increased over the period. Cu grades and recoveries have decreased significantly over the period.
- The average head grades of Zn, Pb, and Cu during 2022 and 2023 were 2.83%, 1.36%, and 0.16%, respectively, and the recoveries of Zn, Pb, and Cu for the period were 87.49%, 81.65%, and 8.67%, respectively.
- Nexa began developing a geometallurgical model for El Porvenir in 2017. The objectives of the work were to develop a geometallurgical model able to predict the recovery of lead, zinc, copper, arsenic, and manganese, concentrate grades, as well as abrasiveness (abrasion index (Ai)) and hardness (Bond ball mill work index (BWi)), and therefore throughput, based on ore source within the deposit.
- Prior to the present Phase 6 study, five phases of geometallurgical studies were carried out. Identified risks include the presence of high-hardness material in intrusive materials and limestone, as well as high abrasiveness in sandstone and clastic materials.
- The potential penalty elements that should be monitored in the Cu Concentrate include As, Sb, Bi, Cd, and combined Pb+Zn. The potential penalty elements in the Pb concentrate are low lead concentrate grade, bismuth, and fluorine. The potential penalty elements in the Zn concentrate are copper and manganese.

Atacocha

- The Atacocha concentrator processed 1,397,192 tonnes of ore in 2023 with Pb and Zn grades of 0.93% and 0.77%, respectively. Recoveries to their respective concentrates were 85.7% Pb and 75.9% Zn.
- Head grades of ore being treated in the Atacocha concentrator have changed since the introduction of open pit ore in early 2016. Head grades of Zn have decreased from 1.8% to 0.77%, Cu has decreased from 0.11% to 0.04%, and Pb has decreased from 1.31% to 0.93% from 2016 to 2023. Since 2019, the copper grades have been too low to allow a separate copper concentrate to be produced.
- The average grades of Zn and Pb during 2022 and 2023 were 0.84% and 0.95%, respectively, and the recoveries of Zn and Pb for the period were 76.57% and 83.64%, respectively. The recoveries used for the cut-off grade and resource model at these grades were 70.44% for Zn and 84.06% for Pb, which compares well to the operating data for Pb, the Zn values being somewhat conservative.
- A metallurgical testing program was carried out to characterize the geometallurgical behaviour of the Atacocha San Gerardo ore according to the 2022-2023 mining plan.
- Prior to the present study, three phases of geometallurgical studies were carried out, increasing the available geometallurgical data progressively to reduce the risk in metallurgical predictions.

- Risks identified include the presence of high hardness and abrasive material in intrusive material and hydrothermal breccias, as well as areas of low Au recovery associated with Au disseminations in pyrite in mainly marble-type material.
- The potential penalty elements in the Pb concentrate are arsenic and fluorine. The potential penalty elements in the Zn concentrate are manganese, silica, and cadmium.

1.1.1.4 Infrastructure

Integration of Atacocha and El Porvenir

- The Cerro Pasco integration project aims to maximize the synergy of the Atacocha and El Porvenir mines.
- El Porvenir started in 1950 and is an operating underground mine with multiple accesses including a shaft (Picasso shaft) for ore and people transportation.
- Atacocha started in 1937 comprising an underground mine and an open pit mine. The open pit mine, San Gerardo is currently in operation, and the underground mine has been on care and maintenance since 2020.
- Access to Atacocha underground is by multiple surface tunnels, that are in good condition despite the production suspension.
- Atacocha is currently connected to El Porvenir through two active tunnels: at 4070 and 3300 levels, with traffic of heavy mine equipment, conventional trucks, and mining crews, linking Atacocha surface to El Porvenir underground.
- The integration plan comprises restarting of Atacocha underground, development of additional connections between El Porvenir and Atacocha, expand the Picasso shaft capacity, closure of the Atacocha processing plant in 2027, and construction of a new pipeline to pump El Porvenir mine tailings to the Atacocha tailing dam.
- A combination of transportation methods, including road access, aircraft via Huánuco, and rail to Cerro de Pasco are used to supply the Atacocha and Porvenir mines.
- Off-site infrastructure includes facilities for the transfer of concentrate from truck to rail at Cerro de Pasco to transport concentrate for export by train to the port of Callao. Mine access is via a 13 km dirt road northeast from Cerro de Pasco, and paved road from Lima to Cerro de Pasco (approximately 315 km).
- The main road from Lima to Cerro de Pasco is used for personnel transportation, supply of food, reagents, spare parts, mining supplies, and diesel fuel. Huánuco airport can be used for personnel transportation and emergency situations.
- The power supply for the Atacocha and El Porvenir mines comes from two sources: the national power grid via 50/13.8 kV main substations located near each of the mines and the La Candelaria Hydroelectric Plant, which consists of three turbines (0.5 MVA, 1.2 MVA, and 3.5 MVA), and is connected to the Atacocha and El Porvenir main substations by a 4.6 km long 50 kV transmission line.
- Power is generated at 4,660 kV at the La Candelaria Hydroelectric Plant. All other project loads are fed at 13.8 kV from the main substation through overhead power lines. These power lines are used to deliver power to various locations to support activities during operation of the Complex.

- The El Porvenir TSF receives tailings generated by both the El Porvenir and Atacocha concentrator plants. A portion of tailings is used for hydraulic backfill at El Porvenir. The El Porvenir TSF was originally constructed in the 1970s, and the current elevation of the dam crest is 4,066 MASL. The downstream toe is inferred from available plans to be at 3,920 MASL, resulting in a current dam height of 146 m.
- Nexa is planning to improve the water management system through construction of a perimeter channel (i.e., upstream water diversion) to intercept clean (non-contact water) surface runoff water before it flows into the TSF. Diverted water will be discharged downstream of the TSF in the Lloclla River gorge.

El Porvenir

- The El Porvenir site comprises an underground mine, TSF, waste rock stockpiles, an ore processing facility with associated laboratory and maintenance facilities, and maintenance buildings for underground and surface equipment.
- Additional facilities and structures include an office building, change house facilities, main shaft, ventilation shaft, backfill plant, explosives storage area, hydroelectric power generating plant, power lines and substation, fuel storage tanks, a warehouse and laydown area, and an accommodation camp.

Atacocha

- Atacocha site operations comprise an underground mine, open pit mine, and a process plant facility.
- Supporting on-site infrastructure include maintenance facilities; maintenance buildings for underground and surface equipment, laboratory, and tailings pumping station. Facilities and structures supporting operations include warehouses and laydown areas, offices, dry facilities, hydroelectric generating station, power lines and substation, fuel storage tanks, and accommodations camp.
- A network of site roads that are approximately 6 m wide and total 15 km in length are used by authorized mine personnel and equipment, including ore and waste haul trucks, concentrate haul trucks, support and light duty vehicles to provide access to on-site infrastructure.

1.1.1.5 Environment, Permitting, and Social Considerations

- No environmental issues were identified from the documentation available for review that could materially impact the ability to extract the Mineral Resources and Mineral Reserves. SLR understands that El Porvenir and Atacocha have the permits required to continue the mining operations in compliance with applicable Peruvian permitting requirements. Of note, expired authorizations under the renewal process do not interrupt the continuity of the operations (for example, the authorization for discharge of industrial effluent for El Porvenir has been filed by Nexa but it is pending approval by the environmental authority).
- Approval of environmental permits required for the Cerro Pasco Complex Integration is critical for its implementation. Nexa’s Environmental Management Superintendent for El Porvenir and Atacocha understands well the environmental permitting requirements and has developed a tracking matrix that identifies the key components of each permit, corrective actions to be implemented to be in compliance, and the status of implementation of each action. All action items are qualified according to a ranking of

criticality established (low, medium and high) for continuity of the operation. The matrix includes the planning for the future environmental permits required for implementation of the Cerro Pasco Complex Integration.

- The monitoring program at El Porvenir includes meteorology, air quality, non ionized radiation, noise, surface water quality, groundwater quality (only one location), spring water quality, effluent discharges, fauna and flora, and TSF physical stability. El Porvenir reports the results of its monitoring program to the authorities according to the frequency stated in the approved resolutions. SLR is not aware of any non-compliance issues raised by the authorities.
- The monitoring program at Atacocha includes effluent discharges, gas emissions, air quality, non-ionizing radiation, noise, surface water quality, groundwater quality, springs water quality, vibrations, soil quality, terrestrial biology (vegetation and wildlife) and aquatic biology, and TSF physical stability. Atacocha reports the results of its monitoring program to the authorities according to the frequency stated in the approved resolutions. SLR is not aware of any non-compliance issues raised by the authorities.
- Nexa utilizes an Integrated Dam Management System (referred to as SIGBar) for the El Porvenir TSF and the Atacocha TSF, which provides guidelines for document management, monitoring, evaluation, risk analysis, compliance with standards and legislation, training of personnel, operation of structures and other provisions.
- SLR's social review indicates that, at present, Nexa's operations at El Porvenir make a positive contribution to sustainability and community well-being. From the review and SLR's site visit, Nexa appears to have the necessary governance documents and tools to manage social risks associated with the Cerro Pasco Complex operations. A grievance mechanism and Community Relations Plans are in place and implemented by the social teams for each of El Porvenir and Atacocha.
- An independent technical evaluation of key components of the Cerro Pasco Complex Integration project completed in early 2024 by a third party did not find any fatal flaws. The evaluation included the TSFs, social risks and permitting. It resulted in a number of findings and recommendations to be considered by Nexa to derisk the Cerro Pasco Complex Integration project.
- Community discontent represents a future risk for the Cerro Pasco Complex operations. The Cerro Pasco Complex Integration project may increase expectations from the local communities in terms of contracting of local services, employment, training and community investment opportunities. The modification of the Environmental Impact Assessment required for Atacocha and El Porvenir imply processes of consultation and Citizen Participation, which could delay the approval process in the event of social disagreement.
- Although there is no written commitment from Nexa to ensure local procurement, the company retains services from local businesses and from contractors that employ local workforce.
- In 2023, Nexa experienced an increase in local hiring for El Porvenir and Atacocha. Nexa has declared local hiring commitments with eight local communities and has specific local hiring targets with two of them.
- Atacocha acquired rights to land from the community of Cajamarquilla via an agreement to construct tailings facilities and ancillary infrastructure. The agreement included various commitments and obligations, including financial compensation for rights to the land.

Atacocha also acquired and subsequently renewed a right-of-way agreement with the community of Ticlacayán associated with hydraulic infrastructure. Community agreements related to rights to land from the community have also been signed for El Porvenir with Comunidad San Francisco de Asís de Yarusyacán y Comunidad Cajamarquilla.

- Independent conceptual Mine Closure Plans have been developed for El Porvenir and Atacocha within the context of Peruvian legislation and are periodically updated. The most recent modification to the Mine Closure Plan for El Porvenir and update to the closure cost estimate was completed in 2020. The most recent modification to the Mine Closure Plan for Atacocha and update to the closure cost estimate was completed in 2022.

1.1.1.6 Capital and Operating Costs and Economics

- Capital and operating cost estimates were prepared based on historical operating performance and the current operating budget for 2024, and the forecasted cost estimates for the integration project. SLR considers these capital and operating cost estimates to be reasonable, provided the operation and production targets are realized.
- The LOM production schedule in the cash flow model, covering a 10-year mine life, is based on the December 31, 2023 Mineral Reserves.
- All costs in this report are expressed in Q4 2023 US dollars.
- The economic analysis at average LOM prices of US$1.24/lb Zn (US$2,741/t Zn), US$0.92/lb Pb (US$2,032/t Pb), US$3.54/lb Cu (US$7,809/t Cu), US$21.72/oz Ag, and US$1,798/oz Au, demonstrated that the Cerro Pasco Mineral Reserves are economically viable.
- On a 100% ownership basis, the pre-tax net present value (NPV) at a 7.22% base discount rate is US$364 million and the after-tax NPV at a 7.22% discount is US$162 million. The undiscounted pre-tax cash flow is US$568 million, and the undiscounted after-tax cash flow is US$290 million.
- There is good potential to extend the mine life through continued conversion of Inferred Resources, with improved economic results.

1.1.1.7 Risks

- Underground geotechnical risks:
    - The impact of faults on the stope stability and equivalent linear overbreak/slough (ELOS) have not been accounted for in the geotechnical empirical analyses. SLR has evaluated the potential underestimate of ELOS, however, dilution in areas affected by faults may increase compared to that currently anticipated. Mitigation can be applied by installing ground support in the faulted walls and/or by reducing the stope size in those locations, which would impact productivity rates. It is considered that this is a low-moderate risk and that these mitigations can be applied during production, so a change to the mine plan/schedule is not required at this stage.
    - The project is lacking a geotechnical block model. This is best practice and should be implemented. While its absence is considered a low risk, a geotechnical block model allows for a better understanding of the spatial distribution of the geotechnical

conditions and would assist in short-medium term mine planning (and also links back to the point on faults above).

- San Gerardo open pit risks:
  - Pit slope design outside of the domain sectors was assumed to be 45 degrees for design, this assumption is considered low risk based on the wall height of the north and west satellite pits.
  - Open pit mining operating costs are defined as constant values for mine planning. However, there is a variable component associated with the haulage distance of the open pit mining costs that requires a truck haulage distance forecast in the LOM plan. There is a low risk that the estimated mining cost will increase over the LOM due to increased truck haulage distances.
- Process risks:
  - There is a risk of lower metal grades and recoveries than planned and the recovery of deleterious elements in the concentrates that may draw penalties.
  - The potential penalty elements in the Pb concentrate are arsenic and fluorine. The potential penalty elements in the Zn concentrate are manganese, silica, and cadmium.
  - Geometallurgical testing has identified the presence of high-hardness material in intrusive materials and limestone, as well as high abrasiveness in sandstone and clastic materials may result in increased operating power and wear material consumption and costs.
  - Geometallurgical work has identified areas of low Au recovery associated with Au disseminations in pyrite in mainly marble-type material.
- Infrastructure risks:
  - The age of the current infrastructure and the cost of maintenance is a moderate risk.
  - Cost and schedule risk for the design and construction of integration infrastructure including the new tailing pumping station and pipeline from El Porvenir to the Atacocha TSF.
- Risks associated with environmental permitting and community relations:
  - The modifications to the Environmental Impact Assessment (EIA) required for both El Porvenir and Atacocha as part of the Cerro Pasco Complex Integration project involve a period of review and approval by the environmental authority. There is a high level of uncertainty associated with the actual duration of the review and approval period due to staffing issues at the National Service of Environmental Certification for Sustainable Investments (SENACE for its acronym in Spanish) and adjustments to its review and approval processes. As a mitigation measure, Nexa has included additional time in its permitting schedule for the Cerro Pasco Complex Integration project to carry a contingency for the permitting process.
  - Community discontent represents a future risk for the Cerro Pasco Complex operations since it can lead to blockades and in turn could result in operation interruptions and reputational damage. There is precedent for such conflict given that blockades organized by communities have taken place in the past and, as recently as last year (2023), led to short suspensions of operations. As mitigation measures, Nexa is mainly working towards addressing and closing commitments

with the communities in a more efficient manner, and is revisiting its social management approach to be more proactive in preventing potential issues or addressing them early to avoid escalation.

1.1.2 Recommendations

1.1.2.1 Geology and Mineral Resources

1. Investigate if capping levels should be applied based on high-grade and low grade domains for Zn, Pb, Cu, and Ag for some domains of San Gerardo open pit.
2. Fine-tune the estimation workflow and dynamic anisotropy angles calculation to minimize visual grade artifacts observed in some domains (such as “de2” for El Porvenir and “sge” for Atacocha UG). Consider utilizing hangingwall, footwall, and reference surface data to refine local angle precision, alongside auxiliary dip and dip direction charts to identify and rectify any inconsistencies.
3. Consider incorporating the blast hole samples to define the Long Term Model (LTM) mineralization boundaries given that the Grade Control Model (GCM) performs systematically better than the LTM for the San Gerardo open pit.
4. Increase the number of density samples to allow more accurate block density estimates.
5. Adjust the density estimation methodology to only interpolate where supported by sufficient samples.
6. Improve the Mineral Resource classification post-processing, aiming to clean up the remaining isolated blocks of Measured or Indicated classification, such as in the domain “vcn32” of El Porvenir.
7. Investigate relaxing the maximum of two composites per drill hole restriction in domain extremities and sparsely drilled areas.
8. For the Mineral Resource classification, consider excluding drilling intersections that are sub-parallel to tabular mineralized domains as they significantly reduce drill hole spacing calculations in an artificial manner.
9. Use the production data to monitor the selected drill spacing for the minor continuity zones to determine if sufficient confidence is provided to support detailed mine planning, as these domains show less grade and geological continuity.
10. In future models, incorporate a structural model to help properly define the estimation trends.
11. Improve the field duplicate rates of channels by revising the sampling protocol of duplicates in channels.
12. Increase the frequency of monitoring Inspectorate El Porvenir laboratory (Inspectorate EP) results on a batch basis to preliminarily identify and address instances of failure that may require re-analysis.
13. Keep monitoring CRMs and other controls to prevent and/or mitigate trends, biases, or other issues which may require sample re-analysis. Continue with periodic external checks across laboratories to ensure the primary laboratory's performance remains satisfactory.

14 Ensure all the samples analyzed by ALS are re-assayed using the relevant analytical method when exceeding the detection limit (i.e., samples >10,000 ppm Zn), to prevent few instances detected of incomplete results in the assay database.

15 Investigate and address sample discrepancies identified during the data verification process, particularly those related to Au values. These discrepancies, however, are minor and have negligible impact on the overall assessment.

16 Maintain standardization of the format and database structure.

17 Complete the 2024 exploration program, consisting of an 8,500 m drill program to explore new targets and continue with advanced exploration. The 2024 exploration program budget is approximately US$2.1 million.

18 Improve the reconciliation between the underground production volumes and the mineralization wireframes, to better understand the differences between the along-strike mineralization, and to better quantify the proportion of the discrepancy resulting from the opportunistic mining of ore from across-strike structures.

19 To better define mineralized extents, consider completing closer spaced exploration and infill drilling ahead of production, including at orientations better designed to intercept across-strike mineralized structures.

1.1.2.2 Mining and Mineral Reserves

1. Review the underground mine designs and mining sequence and incorporate sill pillars where required.
2. Continue underground geotechnical data capture, specifically seismic monitoring around pillars between stopes.
3. Develop an underground geotechnical block model to better spatially define the geotechnical variation.
4. Re-appraise stope stability and ELOS using an updated empirical method, such as the Villaescusa approach, which updates the Potvin approach, particularly the stress factor (A) for the underground.
5. Assess the impact of faults on the stope stability and ELOS, such as using the approach developed by Suorineni, which applies a fault factor to the analyses depending on the intersection geometry between the faults and the planned stope walls for the underground.
6. Implement reconciliation analysis between underground designed stopes and surveyed mined-out stopes to estimate overbreak and underbreak quantities to better define dilution and mining recovery factors.
7. Apply external underground dilution factors as ELOS during the optimization process to capture dilution grade.
8. Develop grade control practices particularly for planned underground SLS stopes to minimize dilution due to orebody irregularities.
9. Add a yearly truck haulage distance forecast to the open pit LOM plan.

1.1.2.3 Mineral Processing

1. Investigate the addition of instrumentation and process controls to both El Porvenir and Atacocha concentrators including a SCADA system to retrieve and store process data to support daily operations and planning.
2. Continue with the geometallurgical program at El Porvenir and Atacocha.
3. Perform a geological assessment of the Au association to galena and Au associated with pyrite based on deposit genesis and geometallurgical test results for San Gerardo.
4. Carry out a geological assessment for San Gerardo to identify areas associated with oxides in Phase 2 of mining, which represent a risk to the recovery of Pb, Zn, and Au.
5. Evaluate the behaviour of low recovery material near upcoming mining phases in the San Gerardo pit.
6. Perform recovery studies by size with plant feed material to quantify losses in recoveries of valuable metals by size fraction in both mines.
7. The steel consumption estimation model for El Porvenir was derived in 2018, based on circuit data and operating variables reported by Nexa to date. Update these models by incorporating the operational changes made to date in the grinding circuits of both El Porvenir and Atacocha concentrators.

1.1.2.4 Infrastructure

1. Place priority on the ongoing maintenance of older site infrastructure including piping, electrical, roads, and buildings.
2. Remove abandoned infrastructure such as old pipelines as it is replaced by new, to facilitate future maintenance.

1.1.2.5 Environment, Permitting, and Social Considerations

1. Track closely the action items identified for obtention of new permits and renewal of expired permits required for the Cerro Pasco Complex Integration project and follow up on the status of progress regularly to prevent possible delays in the submission of permitting applications. There is a level of uncertainty regarding the amount of time required by the authorities for review and approval of permitting applications. In order to mitigate the risk of delayed approval, initiate the first steps of the approval process for the main permits as early as possible (for example, the engineering design and the baseline field work).
2. Due to uncertainty regarding the potential for acid generation of the waste rock, geochemical evaluation (including static and kinetic geochemical testing on waste rock samples) should be carried out prior to the next Atacocha dam raise (not permitted yet), and prior to closure to inform closure planning and water quality predictions for post-closure. Carry out additional static and kinetic geochemical testing on waste rock and tailings samples to confirm or revise the geochemical characterization. Robust water quality monitoring should continue during operations to verify compliance with the national environmental standards and the appropriateness of the waste rock disposal and water management procedures that are in place.
3. Expand the groundwater quality monitoring program at El Porvenir to include additional stations for collection of groundwater quality samples (and subsequent analysis). At a

minimum, consideration should be given to the installation of one station upstream of the El Porvenir TSF.

4 Consider conducting a Dam Safety Review (DSR) for El Porvenir TSF and the Atacocha TSF in support of mining operation and ore processing in future years, and in order to finalize the detailed mine closure plan prior to moving into the closure stage.

5 The following recommendations are proposed for the Atacocha TSF:

   a) Develop TARPs for the piezometers for inclusion in the OMS manual and monitoring plan.

   b) Capacity assessments of the TSF completed on a bi annual basis with topographic and bathymetric surveys.

   c) Complete long term geochemical kinetic testing of the tailings.

   d) Monitor the water quality from the TSF subsurface drains.

6 The same recommendations listed above are proposed for the El Porvenir TSF. In addition, implement a groundwater monitoring program at the El Porvenir TSF to determine levels of metals and sulphates. Monitoring stations should be implemented both upstream and downstream of the El Porvenir TSF.

7 Implement a water balance for ongoing operations to be updated by Mine personnel using meteorological and water monitored data on a regular basis (at least monthly). The water balance is an important tool to track trends and conduct short term predictions through simulation of variable operating and/or climatic scenarios to support decision making associated with tailings pond operation (e.g., maintaining adequate freeboard at all times).

8 Develop an integrated water balance that reflects the interaction between the El Porvenir and Atacocha operations from a water balance perspective to identify and predict possible scenarios of interruption of mine operations due to water management issues and/or dam safety concerns (e.g., not maintaining adequate dam freeboard).

9 El Porvenir and Atacocha have significant social commitments as the needs and expectations of local communities/stakeholders are high. Managing commitments requires an adequate tracking tool and implementation plan to honour commitments. SLR recommends that Nexa considers adopting a robust tracking tool to track commitments and allocate adequate resources to use it and keep it up to date, including an escalation process for overdue commitments. This action will avoid mismanagement of commitments, prevent potential conflicts, and demonstrate Nexa’s efforts to maintain good relationships with host communities.

10 Review the current social area of influence for both El Porvenir and Atacocha to confirm or update its delineation in case new local communities or Indigenous communities should be added (e.g., Anexo Joraoniyoc, which belongs to Comunidad Campesina de San Francisco de Asis de Yarusyacan for the Atacocha mine site). This is a key action to identify potential impacts and develop social management plans for the newly added communities in the revised area of influence. The determination of the social area of influence is a dynamic matter that requires regular review. SLR understands that Nexa is already planning to review the current social area of influence and it held a meeting on this topic with the environmental authority as one of the initial steps.

1.2 Economic Analysis

The economic analysis contained in this TRS is based on the Cerro Pasco Complex Mineral Reserves on a 100% basis, economic assumptions, and capital and operating costs provided by Nexa corporate finance and technical teams and reviewed by SLR.

All costs are expressed in Q4 2023 US dollars. Unless otherwise indicated, all costs in this section are expressed without allowance for escalation, currency fluctuation, or interest.

A summary of the key criteria is provided below.

1.2.1 Economic Criteria

1.2.1.1 Physicals

- Mine life: 10 years (between 2024 and 2033).
  - Atacocha Open Pit: 4 years (between 2024 and 2027)
  - Atacocha and El Porvenir Underground: 10 years (between 2024 and 2033)
- LOM production plan (on a 100% ownership basis) as summarized in Table 1-2.
- LOM processing of 24.70 Mt, grading 3.61% Zn, 1.22% Pb, 0.23% Cu, 67.76 g/t Ag, and 0.06 g/t Au.
  - Atacocha Plant (open pit material): 4.38 Mt, grading 0.99% Zn, 1.15% Pb, 0.03% Cu, 34.94 g/t Ag, and 0.27 g/t Au
  - El Porvenir Plant (underground material): 20.32 Mt, grading 4.17% Zn, 1.24% Pb, 0.28% Cu, 74.83 g/t Ag, and 0.02 g/t Au
- LOM total contained metal: 891 kt Zn, 302 kt Pb, 57.5 kt Cu, 53.8 Moz Ag, and 50.6 koz Au.
- LOM average metallurgical recoveries:
  - Atacocha Plant: 78.5% Zn, 83.0% Pb, 0% Cu, 3.3% Ag in Zn, 76.7% Ag in Pb, and 67.2% Au in Pb.
  - El Porvenir Plant: 89.0% Zn, 79.5% Pb, 14.3% Cu, 15.2% Ag in Zn, 66.4% Ag in Pb, 29.4% Au in Pb, 2.0% Ag in Cu, 8.6% Au in Cu.
- LOM realized metal payables (%) of: 84.0% Zn, 94.3% Pb, 95.0% Cu, 84.0% Ag, and 77.1% Au.
- LOM payable metal of: 663 kt Zn, 228 kt Pb, 7.6 kt Cu, 37.6 Moz Ag, and 23.4 koz Au.

1.2.1.2 Revenue

- All revenues are received in US$.
- Revenue is estimated based on the following LOM weighted average metal prices derived from Nexa's Internal Projection forecasts: US$1.24/lb Zn (US$2,741/t Zn), US$0.92/lb Pb (US$2,032/t Pb), US$3.54/lb Cu (US$7,809/t Cu), US$21.72/oz Ag, and US$1,798/oz Au.
- Total gross revenue from concentrates of US$3,000 million.

- Net Revenue includes the benefit of Cerro de Pasco's zinc concentrate processed at Nexa's Cajamarquilla (CJM) zinc refinery in Peru. This integration with Nexa's internal refinery provides the benefit of additional US$94.66/t Zn premium selling price, and zinc smelting at cost (rather than at commercial third-party terms).
- Transportation, Treatment, and Refining charges as defined in Table 1-1:

Table 1-1: Transportation, Treatment, and Refining Charge Assumptions

Transportation, Treatment and Refining Charges	Units	LOM Average
Transportation - Zn Concentrate Integrated - UG	US$/t conc	46.65
Transportation - Zn Concentrate Integrated - OP	US$/t conc	45.52
Transportation - Pb Concentrate - UG	US$/t conc	45.21
Transportation - Pb Concentrate - OP	US$/t conc	43.86
Transportation - Cu Concentrate - UG	US$/t conc	39.21
TC Zn Concentrate - EP Plant (UG)	US$/t conc	310.56
TC Zn Concentrate - ATA Plant (OP)	US$/t conc	317.37
TC Pb Concentrate - EP Plant (UG)	US$/t conc	138.23
TC Pb Concentrate - ATA Plant (OP)	US$/t conc	183.94
TC Cu at Cu Concentrate	US$/t conc	195.21
RC Cu at Cu Concentrate	US$/t conc	50.00
RC Ag at Cu Concentrate	US$/oz	0.50
RC Au at Cu Concentrate	US$/oz	8.00
RC Ag at Pb Concentrate	US$/oz	1.50
RC Au at Pb Concentrate	US$/oz	10.00
RC Ag at Zn Concentrate	US$/oz	-

- There are no third-party royalties applicable to the Cerro Pasco Complex operations.
- Net revenue after selling costs and royalties of US$2,774 million.
- Average net smelter return of US$137/t processed.
- Revenue is recognized at the time of production.

1.2.1.3 Costs

- Mine life: 10 years.
- El Porvenir sustaining capital (excluding closure costs) over the LOM totals US$400 million.
- Atacocha sustaining capital (excluding closure costs) over the LOM totals US$222 million.
- El Porvenir concurrent reclamation between 2024 and 2033 of $7.9 million.
- El Porvenir mine closure costs between 2034 and 2037 of $14.6 million.

- El Porvenir post-closure costs between 2038 and 2042 of $2.3 million.
- Atacocha concurrent reclamation between 2025 and 2033 of $16.2 million.
- Atacocha open pit mine closure costs between 2029 and 2032 of $5.0 million.
- Atacocha underground mine closure costs between 2034 and 2037 of $35.1 million.
- Atacocha post-closure costs between 2038 and 2042 of $2.8 million.
- Total average unit operating costs of US$56.69/t ore processed.
  - Open pit mining operating costs: US$3.33 /t mined (or US$19.52/t processed).
  - Underground mining operating costs: US$39.25/t mined (or US$39.25/t processed)
  - Processing operating costs – Atacocha: US$13.29/t ore processed
  - Processing operating costs – El Porvenir: US$12.47/t ore processed.
  - General and administrative (G&A) – Atacocha open pit: US$11.85/t ore processed
  - G&A – El Porvenir underground: US$7.56/t ore processed.
- LOM site operating costs of $1,400 million.
- Other off-site operating costs: US$2.44/t ore processed.
- Costs were estimated considering an exchange rate of S/.3.67:US$1.00.

1.2.1.4 Taxation and Royalties

- Corporate income tax rate in Peru is 29.50%.
- Special Mining Tax Contribution (IEM) varies over the LOM between 2% and 3.6% based on the marginal rate.
- Government Mining Tax Royalty varies over the LOM between 1% and 4% based on the marginal rate.
- Employees' profit sharing participation: 8%.
- There are no third-party royalties applicable to the Cerro Pasco Complex.
- SLR has relied on Nexa's taxation model for calculation of taxes applicable to the cash flow.

1.2.2 Cash Flow Analysis

SLR prepared a LOM unlevered after-tax cash flow model to confirm the economics of the Cerro Pasco Complex over the LOM (between 2024 and 2033). Economics have been evaluated using the discounted cash flow method by considering LOM production at a 100% basis, annual processed tonnages, and gold and silver grades. The associated process recoveries, metal prices, operating costs, treatment, refining and selling charges, sustaining capital costs, and reclamation and closure costs, and taxes and government royalties were also considered.

The base discount rate assumed in this TRS is 7.22% as per Nexa's corporate guidance, based on Weighted Average Cost of Capital (WACC) analysis. Discounted present values of annual cash flows are summed to arrive at the Cerro Pasco Base Case NPV.

The economic analysis at average LOM prices of US$1.24/lb Zn (US$2,741/t Zn), US$0.92/lb Pb (US$2,032/t Pb), US$3.54/lb Cu (US$7,809/t Cu), US$21.72/oz Ag, and US$1,798/oz Au, confirmed that the Cerro Pasco Complex Mineral Reserves are economically viable.

The pre-tax NPV at a 7.22% base discount rate is US$364 million and the after-tax NPV at a 7.22% discount is US$162 million. The undiscounted pre-tax cash flow is US$568 million, and the undiscounted after-tax cash flow is US$290 million.

The annual after-tax cash flow summary is presented in Table 1-2.

Table 1-2: Annual After-Tax Cash Flow Summary

Summary Cash Flow	Units	Total LOM
Production		
LOM	years	10
OP Production	**000 tonnes**	**4,380**
Au grade	g/t	0.27
Ag Grade	g/t	34.94
Cu Grade	%	0.03%
Pb Grade	%	1.15%
Zn Grade	%	0.99%
UG Production	**000 tonnes**	**20,316**
Au grade	gr/t	0.02
Ag Grade	gr/t	74.83
Cu Grade	%	0.28%
Pb Grade	%	1.24%
Zn Grade	%	4.17%
Concentrate Production		
Cu Concentrate	dmt	40,433
Pb Concentrate	dmt	462,461
Zn Concentrate	dmt	1,573,707
Recovered Metal		
Au	oz	30,364
Ag	oz	44,782,850
Cu	tonnes	8,022
Pb	tonnes	242,046
Zn	tonnes	788,995
Metal Prices		
LOM weighted average - Au	US$/oz	1,798
LOM weighted average - Ag	US$/oz	21.72

Summary Cash Flow	Units	Total LOM
LOM weighted average - Cu	US$/tonne	7,809
LOM weighted average - Pb	US$/tonne	2,032
LOM weighted average - Zn	US$/tonne	2,741
Cash Flow		
Gross Revenue	US$ million	3,000
Transport / TC-RC Charges	US$ million	(242)
Royalties	US$ million	-
Net Revenue	US$ million	2,758
Other Revenues & Compensations	US$ million	12
Operating Costs		
OP Mining Costs	US$ million	(85)
UG Mining Costs	US$ million	(797)
Processing Costs - Atacocha	US$ million	(58)
Processing Costs - El Porvenir	US$ million	(266)
G&A	US$ million	(206)
Other Costs	US$ million	(60)
Operating Cash Flow	US$ million	1,298
Capital Costs		
Direct Capital Costs	US$ million	-
Sustaining and Expansion Capital Costs – Atacocha	US$ million	(222)
Sustaining and Expansion Capital Costs - El Porvenir	US$ million	(400)
Reclamation & Closure - Atacocha	US$ million	(59)
Reclamation & Closure - El Porvenir	US$ million	(25)
Change Working Capital	US$ million	(24)
Pre-Tax Net Cash Flow	**US$ million**	**568**
Taxes - Income Tax	US$ million	(178)
Taxes - Workers' Participation	US$ million	(52)
Taxes - Special Mining Tax & Mining Royalty	US$ million	(47)
After-Tax Cashflow	**US$ million**	**290**
Project Economics		
Pre-Tax		
Pre-tax NPV at 7.22%	**US$ million**	**364**
After-Tax		

Summary Cash Flow	Units	Total LOM
After-Tax NPV at 7.22%	**US$ million**	**162**

1.2.2.1 Sensitivity Analysis

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities:

- Metal prices
- Head grades
- Metallurgical recoveries
- Operating costs
- Capital costs (Sustaining and Closure)

After-tax $NPV_{7.22\%}$ sensitivities over the base case have been calculated for -20% to +20% for head grade, -5% to +5% for overall recoveries, -20% to +20% for metal prices, and -10% to +15% for operating and capital costs variations to determine Cerro Pasco's most sensitive parameter.

The sensitivity analysis at Cerro Pasco shows that the after-tax NPV at a 7.22% base discount rate is most sensitive to metal prices, head grade, and metallurgical recoveries, followed by operating costs and capital costs.

1.3 Technical Summary

1.3.1 Property Description

The Complex is located in Peru's Central Andes region at an elevation of approximately 4,050 MASL to 4,200 MASL. It is situated in the districts of San Francisco de Asís de Yarusyacán and Yanacancha, in the province and department of Pasco. El Porvenir and Atacocha are located 13 km and 16 km north of the city of Cerro de Pasco, respectively, which is located approximately 315 km by road from the national capital, Lima, when travelling by the Carretera Central and the La Oroya-Huánuco highway.

El Porvenir's coordinates are 10°36'36" S, 76°12'37" W (Latitude/Longitude decimals -10.6100, -76.2102), and approximately 367600m E, 8826850m N using Universal Transverse Mercator (UTM) WGS84 datum Zone 18S. Atacocha's coordinates are 10°34'37" S, 76°11'26" W (Latitude/Longitude decimals -10.5769, -76.1906), and approximately 367160m E, 88304000m N using the UTM WGS84 Zone 18S. The mines are located approximately 3.5 km from each other.

El Porvenir consists of underground Zn, Pb, Ag, and Cu mining operations, producing Cu, Pb, and Zn concentrates via conventional crushing, grinding, and flotation at the El Porvenir processing plant. Atacocha consists of the San Gerardo Zn, Pb, Au, and Ag open pit mining operation and the Atacocha underground Zn, Pb, Cu, and Ag mining operation. Ore is sent to the Atacocha processing plant, which generates Pb, Cu, and Zn concentrates via conventional crushing, grinding, and sequential flotation. Cu and Pb concentrates are sold to traders and delivered by road and rail to Callao (approximately 270 km by road) for shipping overseas, while Zn concentrate is transported by road and rail to Nexa's Cajamarquilla Zn refinery.

1.3.2 Land Tenure

El Porvenir consists of 25 mining concessions covering an area of 4,846.68 ha and one beneficiation concession covering an area of 323.79 ha. As of December 31, 2023, the concessions are held in the name of Nexa El Porvenir, Nexa Atacocha, Nexa Peru, and S.M.R.L. CMA No. 54 (50% Nexa El Porvenir and 50% Nexa Atacocha).

Atacocha consists of 147 mineral concessions covering an area of 2,872.47 ha and one beneficiation concession covering an area of 413.23 ha. As of December 31, 2023, the Atacocha concessions are held in the name of Nexa Atacocha, Nexa Peru, and Nexa El Porvenir.

For El Porvenir, all annual fees applicable to the mineral concessions and beneficiation concessions have been paid in full as of the effective date of the report. These totalled US$14,540.07 and US$4,803.41, respectively, in 2023.

For Atacocha, all annual fees applicable to the mineral concessions and beneficiation concessions have been paid in full as of the effective date of the report. These totalled US$8,617.43 and US$3,716.58, respectively, in 2023.

In 2023, penalties were paid to Instituto Geológico, Minero y Metalúrgico (INGEMMET) of the Peruvian Government, totalling US$4,215.97 for El Porvenir and US$3,829.16 for Atacocha, since minimum required levels of production or exploration expenditures were not met.

1.3.3 History

Under previous operators, the Atacocha and El Porvenir Mines have operated since 1936 and 1949, respectively.

Compañía Minera Milpo S.A. (Milpo), the operator of El Porvenir at the time, acquired the Atacocha Mine in 2008.

In 2010, the current operator, Nexa (then VM Holding), gained control of Milpo and its assets, including El Porvenir and Atacocha. In 2014, Nexa began integrating the El Porvenir and Atacocha operations, including administration, the TSFs, the electrical power supply, and mineral processing. VM Holding changed its corporate name to Nexa Resources S.A. in 2017, accompanied by initial public offerings on the New York Stock Exchange and Toronto Stock Exchange.

El Porvenir’s operations were interrupted from March 10, 2020 to May 15, 2020, due to the COVID-19 pandemic. Although the San Gerardo open pit remains operational, the Atacocha underground mine did not resume operations after the mandatory restriction period imposed by the Peruvian Government was lifted in June 2020.

Between 1950 and 2023, El Porvenir produced 60.1 Mt treated ore, while Atacocha produced 21.6 Mt treated ore between 2009 and 2023. Production data for Atacocha prior to 2009 is unavailable.

1.3.4 Geological Setting, Mineralization, and Deposit

The El Porvenir and Atacocha deposits are situated in the Pasco region of the Western Cordillera of the Andes, within the Eocene-Miocene Polymetallic and Miocene Au-Ag Epithermal Belts.

At El Porvenir, the stratigraphic units of primary interest are the Pucará and the Goyllarisquizga groups. The Goyllarisquizga Group outcrops in the area of the deposit comprising quartz rich sandstone, corresponding to the Goyllarisquizga Formation. Sandstones vary from quartz arenite to arkose, with an argillaceous to siliceous matrix. Above the 4000 Level, the lithology and stratification are well defined and easy to recognize. Below the 4000 Level, strong alteration of the original rock has formed siliceous breccias and massive silica where it is still possible to recognize quartz grains and in few places the stratification. Intrusive rocks within the property are variably porphyritic dacite to quartz diorite with hornblende and biotite phenocrysts. The Milpo-Atacocha fault is a major structural feature in the region, which can be traced for nearly 15 km from Yarusyacán in the north to Carmen Chico in the south.

At Atacocha, the stratigraphic units of primary interest are the Chambará, Aramachay, and Condorsinga formations, as well as other undifferentiated limestone units of the Pucará Group, the Goyllarisquizga Formation, and stratigraphically overlying basalt layers. The deposit is structurally controlled and the Milpo-Atacocha Fault divides the property into two structural domains; the western San Gerardo Sector, and the eastern Santa Bárbara Sector.

Mineralization at El Porvenir and Atacocha is generally characterized as a skarn, intermediate sulphidation epithermal vein/breccia-style, while El Porvenir also has stratabound mineralization in the Goyllarisquizga Formation, and Atacocha also has porphyry mineralization. Skarn related alteration at Atacocha includes silica- wollastonite, garnet, silica, and pyrite-argillic alteration. Silica-sericite-argillic alteration is associated with hydrothermal mineralization. Phyllic alteration made of sericite, quartz, pyrite, and intense A- and B-types quartz veinlets stockwork is generally associated with porphyry mineralization.

1.3.5 Exploration

Nexa's exploration program is based on an integrated strategy of geological and structural interpretation, combined with remote sensing for alteration and magnetic patterns and anomalies.

As of December 31, 2023, a total of 5,683 drill holes totalling 944,070 m and 19,074 channel samples totalling 129,075 m have been completed at El Porvenir.

As of December 31, 2023, a total of 5,206 drill holes totalling 895,504 m, and 69,154 channel samples totalling 262,171 m have been completed at Atacocha.

Exploration at El Porvenir and Atacocha is generally conducted simultaneously with underground development, which involves diamond core drilling, and channel sampling following underground drifting. Geological mapping is completed on paper and digitized for incorporation into three dimensional (3D) models to aid future exploration and mine development planning. Although 35 reverse circulation (RC) drill holes have been completed at Atacocha, drilling is generally diamond coring (DDH).

Grade control at San Gerardo OP is completed with blast holes, although this data is not directly incorporated in the Mineral Resource estimate.

Magnetic surveys correlate with the intrusives, which is an important tool for determining prospective areas for the generation of new targets.

Short-term exploration targets include the upper levels (above 3,300 MASL) of the Integration Zone between El Porvenir and Atacocha, the eastern side of the Santa Bárbara stock at 3,300 MASL and below, and the upper levels (above 3,300 MASL) of San Gerardo.

Six brownfield exploration projects were defined (Machcan, Curiajasha, Longreras, Manuel 05 and Pique Estrella, La Churca, and La Quinua Chicrin Corridor), based on surface mapping, remote sensing, and geophysics.

Exploration activities for 2023 included 16 exploration diamond drill holes (DDH) for a total of 9,321 m. The drilling programs focused on the extensions of Integration Zone in 3300-3790-4050 Levels, and Porvenir Sur drilling from 3600 Level.

The exploration work planned for the Pasco Complex in 2024 involves a budget of $2.61 million, and includes 8,500 m of diamond drilling, focused on extending known mineralization within the Integration Zone, drilling from 3300 Level, and VAM, DL, and Porv 9 from 3790 Level.

1.3.6 Mineral Resource Estimates

Mineral Resources have been classified in accordance with the definitions for Mineral Resources in S-K 1300, which are consistent with Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM (2014) definitions).

The El Porvenir and Atacocha database closure date was January 31, 2023. Between then and the effective date of this report, 252 DDH and 1,596 channels were completed at El Porvenir and 18 DDH and 32 channels were completed at the San Gerardo open pit at Atacocha. No drilling or channel data was gathered within the underground portion of Atacocha between the database closure and the effective date of this report. The QP reviewed the additional drilling and channel data for El Porvenir and San Gerardo and is of the opinion that it does not have a material impact on the estimated Mineral Resources.

The Mineral Resource estimates were completed using Datamine Studio RM and Leapfrog Geo software. Wireframes for geology and mineralization were constructed in Leapfrog Geo based on geology sections, assay results, lithological information, pit mapping, and structural data.

Assays were capped to various levels based on exploratory data analysis and then composited to one metre lengths at El Porvenir and two metre lengths at Atacocha. Wireframes were filled with blocks and sub-celling at wireframe boundaries.

Blocks were interpolated with grades using ordinary kriging (OK) and inverse distance cubed (ID^3) interpolation algorithms, with the final block grades at Atacocha assigned according to an evaluation of the OK and ID^3 estimates, including comparison with a nearest neighbour (NN) estimate. Final grades as El Porvenir used the ID^3 results. Block estimates were validated using industry standard validation techniques. Classification of blocks used distance-based and mineralization continuity criteria.

Mineral Resources at El Porvenir and Atacocha underground are reported within optimized underground reporting shapes generated in Deswik Stope Optimizer (DSO) software and satisfying minimum mining width. At El Porvenir, NSR cut-off values of US$67.04/t were used for the SLS Upper Zone, US$63.98/t for the SLS Intermediate Zone, US$63.77/t for the SLS Lower Zone, and US$65.21/t for the SLS Mine Deepening Zone. NSR cut-off values of US$69.04/t were used for the CAF Upper Zone, US$66.25/t for the CAF Intermediate Zone, US$65.77/t for the CAF Lower Zone, and US$67.21/t for the CAF Mine Deepening Zone. At Atacocha, NSR cut-off values of US$71.07/t for CAF stopes, and US$69.00/t for SLS stopes, and continuity criteria.

Mineral Resources at the San Gerardo open pit are reported within a preliminary pit shell generated in Datamine NPV Scheduler software package at a reporting NSR cut-off value of US$22.44/t. The sub-blocked model for the San Gerardo open pit was re-blocked to the selective mining unit (SMU) prior to reporting Mineral Resources.

The QP is of the opinion that any issues relating to all relevant technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work.

The Cerro Pasco Complex EOY2023 Mineral Resources are summarized in Table 1-3 and Table 1-4 on a Nexa attributable ownership basis and 100% ownership basis, respectively.

Table 1-3: Summary of Cerro Pasco Complex Mineral Resource Estimate (Nexa Attributable Ownership Basis) – December 31, 2023

Mine	Category	Tonnage (Mt)	Grade					Contained Metal				
			Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Au (g/t)	Zn (kt)	Cu (kt)	Ag (koz)	Pb (kt)	Au (koz)
Total Cerro Pasco	Measured	2.72	2.37	0.13	43.7	0.92	0.10	64.2	3.6	3,815	25.0	8.4
	Indicated	7.55	2.40	0.16	47.7	0.93	0.09	181.5	12.3	11,586	70.2	22.7
	Total Measured + Indicated	**10.27**	**2.39**	**0.15**	**46.7**	**0.93**	**0.09**	**245.8**	**15.9**	**15,401**	**95.2**	**31.1**
	Inferred	16.65	3.73	0.34	76.9	1.27	0.02	620.5	56.4	41,175	210.8	9.1

Notes:

1. The definitions for Mineral Resources in S-K 1300 were followed for Mineral Resources which are consistent with CIM (2014) definitions.
2. Mineral Resources are reported on a Nexa attributable ownership basis, 83.48% for El Porvenir and 75.96% for Atacocha.
3. Mineral Resources are estimated at the following NSR cut-off values, calculated based on the LOM costs:
   - El Porvenir UG: varies by mining method from US$63.77/t to US$67.04/t for SLS, and from US$65.77/t to US$69.04/t for CAF, with an average of US$66.04/t.
   - Atacocha UG: US$69.00/t for SLS and US$71.07/t for CAF
   - Atacocha OP: US$ 22.44/t
4. Mineral Resources are estimated using average long-term metal prices of Zn: US$3,218.90/t (US$1.46/lb), Cu: US$8,820.05/t (US$4.00/lb), Ag: US$24.35/oz, Pb: US$2,300.33/t (US$1.04/lb), and Au: US$1,875.57/oz.
5. Metallurgical recoveries are based on historical processing data:
   - El Porvenir UG: Zn (89.2%), Pb (80.0%), Cu (14.6%), and Ag (77.5%)
   - Atacocha UG: Zn (89.3%), Pb (80.0%), Cu (15.7%), and Ag (77.5%)
   - Atacocha OP: Zn (70.4%), Pb (84.0%), Ag (75.8%), and Au (65.5%)
6. Bulk density is assigned based on rock type and averages:
   - El Porvenir UG: 3.13 t/m^3
   - Atacocha UG: 3.53 t/m^3
   - Atacocha OP: 2.76 t/m^3
7. The minimum thickness for underground resource reporting panels is 4 m for CAF and 3 m for SLS. For open pit resource reporting, the minimum height is 6 m.
8. Mineral Resources were depleted according to actual production as of September 30, 2023, and forecast production to the effective date of December 31, 2023.
9. Mineral Resources are exclusive of Mineral Reserves.
10. There are no Cu grades estimated for Atacocha OP and no Au grades estimated for Atacocha UG and El Porvenir UG. This has reduced the Cu and Au average grades for the total Cerro Pasco tonnes.
11. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
12. Mineral Resources are constrained within optimized underground reporting shapes for El Porvenir and Atacocha UG and an optimized reporting pit shell for Atacocha OP.
13. Numbers may not add due to rounding.

Table 1-4: Summary of Cerro Pasco Complex Mineral Resource Estimate (100% Ownership Basis) – December 31, 2023

Mine	Category	Tonnage (Mt)	Grade					Contained Metal				
			Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Au (g/t)	Zn (kt)	Cu (kt)	Ag (koz)	Pb (kt)	Au (koz)
Total Cerro Pasco	Measured	3.51	2.34	0.13	43.4	0.92	0.10	82.3	4.6	4,900	32.3	11.0
	Indicated	9.62	2.38	0.16	47.2	0.93	0.10	228.6	15.5	14,604	89.3	29.9
	Total Measured + Indicated	**13.13**	**2.37**	**0.15**	**46.2**	**0.93**	**0.10**	**310.9**	**20.1**	**19,504**	**121.6**	**40.9**
	Inferred	20.82	3.72	0.34	76.6	1.26	0.02	774.9	71.6	51,289	263.1	12.0

Notes:

1. The definitions for Mineral Resources in S-K 1300 were followed for Mineral Resources which are consistent with CIM (2014) definitions.
2. Mineral Resources are reported on a 100% ownership basis.
3. Mineral Resources are estimated at the following NSR cut-off values, calculated based on the LOM costs:
   - El Porvenir UG: varies by mining method from US$63.77/t to US$67.04/t for SLS, and from US$65.77/t to US$69.04/t for CAF, with an average of US$66.04/t.
   - Atacocha UG: US$69.00/t for SLS and US$71.07/t for CAF
   - Atacocha OP: US$ 22.44/t
4. Mineral Resources are estimated using average long-term metal prices of Zn: US$3,218.90/t (US$1.46/lb), Cu: US$8,820.05/t (US$4.00/lb), Ag: US$24.35/oz, Pb: US$2,300.33/t (US$1.04/lb), and Au: US$1,875.57/oz.
5. Metallurgical recoveries are based on historical processing data:
   - El Porvenir UG: Zn (89.2%), Pb (80.0%), Cu (14.6%), and Ag (77.5%)
   - Atacocha UG: Zn (89.3%), Pb (80.0%), Cu (15.7%), and Ag (77.5%)
   - Atacocha OP: Zn (70.4%), Pb (84.0%), Ag (75.8%), and Au (65.5%)
6. Bulk density is assigned based on rock type and averages:
   - El Porvenir UG: 3.13 t/m^3
   - Atacocha UG: 3.53 t/m^3
   - Atacocha OP: 2.76 t/m^3
7. The minimum thickness for underground resource reporting panels is 4 m for CAF and 3 m for SLS. For open pit resource reporting, the minimum height is 6 m.
8. Mineral Resources were depleted according to actual production as of September 30, 2023, and forecast production to the effective date of December 31, 2023.
9. Mineral Resources are exclusive of Mineral Reserves.
10. There are no Cu grades estimated for Atacocha OP and no Au grades estimated for Atacocha UG and El Porvenir UG. This has reduced the Cu and Au average grades for the total Cerro Pasco tonnes.
11. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
12. Mineral Resources are constrained within optimized underground reporting shapes for El Porvenir and Atacocha UG and an optimized reporting pit shell for Atacocha OP.
13. Numbers may not add due to rounding.

1.3.7 Mineral Reserve Estimates

Mineral Reserve estimates for the El Porvenir and Atacocha mines were developed by Nexa and adopted by the SLR QPs.

The El Porvenir and Atacocha underground Mineral Reserves were developed using Deswik's mining software. Stope designs were prepared using a stope optimization tool and were run using Measured and Indicated Mineral Resources and cut-off values for each mining method. NSR calculation takes into account metal prices, which are based on a 10 year forecast average, metallurgical recoveries, and commercial terms for concentrate sales. Cut-off values were estimated from 2022 actual costs.

Development designs were applied to connect the resulting stopes to existing development. Stope designs were reviewed to exclude shapes found to be isolated, low grade, or within areas with poor ground stability. Stope and development designs were fully scheduled in an appropriate LOM plan and applied to a discounted cash flow model. The Mineral Reserve estimate has demonstrated economically viable extraction.

For San Gerardo open pit Mineral Reserves, different nested pits were evaluated by Nexa using the NPV Scheduler software package from Datamine, which employs the Lerchs-Grossmann pit optimization algorithm. A pit shell was selected for reserve pit design based on a revenue factor of 0.90 of the prices from a set of shells generated using only Measured and Indicated Mineral Resources. NSR block value calculations were based on historical performance of the concentrator and current smelter contracts. Calculated block model NSR values were evaluated against the internal break-even value. Blocks classified as Measured or Indicated Mineral Resources with an NSR value above the internal break-even value were included in the Mineral Reserve. The open pit Mineral Reserve estimates support an open pit LOM production plan of approximately four years before the Atacocha underground mine starts production in 2027.

Table 1-5 and Table 1-6 summarize the Mineral Reserve estimates for the El Porvenir and Atacocha mines on a Nexa attributable ownership basis and 100% ownership basis, respectively.

Table 1-5: Summary of Cerro Pasco Complex Mineral Reserve Estimate (Nexa Attributable Basis) – December 31, 2023

Category	Tonnage (Mt)	Grade					Contained Metal					Recoveries				
		Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Au (g/t)	Zn (kt)	Cu (kt)	Ag (koz)	Pb (kt)	Au (koz)	Zn (%)	Cu (%)	Ag (%)	Pb (%)	Au (%)
Proven	6.02	3.30	0.20	68.4	1.29	0.06	198.6	12.3	13,221	77.6	11.5	87.8	15.0	77.3	80.9	65.5
Probable	13.84	3.78	0.24	67.9	1.19	0.04	523.5	32.9	30,226	164.7	17.4	88.6	15.0	77.4	80.5	65.5
Total	**19.86**	**3.64**	**0.23**	**68.0**	**1.22**	**0.05**	**722.1**	**45.2**	**43,447**	**242.4**	**28.9**	**88.4**	**15.0**	**77.4**	**80.6**	**65.5**

Notes:

1. The definitions for Mineral Reserves in S-K 1300 were followed for Mineral Reserves which are consistent with CIM (2014) definitions.
2. Mineral Reserves are reported on an 83.48% and 75.96% Nexa attributable ownership basis for El Porvenir and Atacocha, respectively.
3. El Porvenir and Atacocha UG Mineral Reserves are estimated at break-even NSR cut-off values between US$63.77/t and US$69.00/t processed for SLS and between US$65.77/t and US$71.07/t processed for CAF depending on the mining zone. A number of marginal stopes with marginal NSR cut-off values between US$39.86/t and US$45.09/t processed for SLS and between US$41.86/t and US$47.16/t processed for CAF are included in the estimate.
4. Atacocha OP Mineral Reserves are estimated at an NSR cut-off of US$16.21/t.
5. Mineral Reserves are estimated using average long term prices of Zn: US$2,799.04/t (US$1.27/lb); Cu: US$7,669.61/t (US$3.48/lb); Ag: US$21.17/oz; Pb: US$2,000.29 /t (US$0.91/lb); and Au: US$1,630.93/oz.
6. Metallurgical recoveries are accounted for in the NSR calculations based on historical processing data and are variable as a function of head grade.
    - El Porvenir : Zn (89.2%), Pb (80.0%), Cu (14.6%), and Ag (77.5%)
    - Atacocha UG: Zn (89.3%), Pb (80.0%), Cu (15.7%), and Ag (77.5%),
    - Atacocha OP: Zn (70.4%), Pb (84.0%), Ag (75.8%), and Au (65.5%)
7. A minimum mining width of 4.0 m was used for SLS stopes and 5.0 m for CAF stopes.
8. A dilution equivalent linear overbreak/slough (ELOS) of 1.0 m and a dilution factor of 10% is added to CAF stopes and SLS stopes respectively.
9. A mining recovery factor of 95% is applied to CAF and 85% is applied to SLS stopes.
10. No mining dilution was applied to Atacocha OP and a 100% mining recovery was assumed.
11. There are no Cu grades estimated for Atacocha OP and no Au grades estimated for Atacocha UG and El Porvenir UG. This has reduced the Cu and Au average grades for the total Cerro Pasco tonnes.
12. Numbers may not add due to rounding.

Table 1-6: Summary of Cerro Pasco Complex Mineral Reserve Estimate (100%) – December 31, 2023

Category	Tonnage (Mt)	Grade					Contained Metal					Recoveries				
		Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Au (g/t)	Zn (kt)	Cu (kt)	Ag (koz)	Pb (kt)	Au (koz)	Zn (%)	Cu (%)	Ag (%)	Pb (%)	Au (%)
Proven	7.53	3.26	0.20	68.0	1.29	0.06	245.5	15.3	16,468	97.2	15.2	87.7	15.0	77.3	80.9	65.5
Probable	17.16	3.76	0.24	67.6	1.19	0.04	645.5	40.9	37,330	204.5	22.9	88.5	15.1	77.4	80.6	65.5
Total	**24.70**	**3.61**	**0.23**	**67.8**	**1.22**	**0.05**	**891.0**	**56.1**	**53,797**	**301.7**	**38.1**	**88.3**	**15.1**	**77.4**	**80.7**	**65.5**

Notes:

1. The definitions for Mineral Reserves in S-K 1300 were followed for Mineral Reserves which are consistent with CIM (2014) definitions.
2. Mineral Reserves are reported on a 100% Nexa attributable ownership basis. Nexa owns 83.48% of El Porvenir and 75.96% of Atacocha.
3. El Porvenir and Atacocha UG Mineral Reserves are estimated at break-even NSR cut-off values between US$63.77/t and US$69.00/t processed for SLS and between US$65.77/t and US$71.07/t processed for CAF depending on the mining zone. A number of marginal stopes with marginal NSR cut-off values between US$39.86/t and US$45.09/t processed for SLS and between US$41.86/t and US$47.16/t processed for CAF are included in the estimate.
4. Atacocha OP Mineral Reserves are estimated at an NSR cut-off of US$16.21/t.
5. Mineral Reserves are estimated using average long term prices of Zn: US$2,799.04/t (US$1.27/lb); Cu: US$7,669.61/t (US$3.48/lb); Ag: US$21.17/oz; Pb: US$2,000.29 /t (US$0.91/lb); and Au: US$1,630.93/oz.
6. Metallurgical recoveries are accounted for in the NSR calculations based on historical processing data and are variable as a function of head grade.
    - El Porvenir : Zn (89.2%), Pb (80.0%), Cu (14.6%), and Ag (77.5%)
    - Atacocha UG: Zn (89.3%), Pb (80.0%), Cu (15.7%), and Ag (77.5%),
    - Atacocha OP: Zn (70.4%), Pb (84.0%), Ag (75.8%), and Au (65.5%)
7. A minimum mining width of 4.0 m was used for SLS stopes and 5.0 m for CAF stopes.
8. A dilution equivalent linear overbreak/slough (ELOS) of 1.0 m and a dilution factor of 10% is added to CAF stopes and SLS stopes respectively.
9. A mining recovery factor of 95% is applied to CAF and 85% is applied to SLS stopes.
10. No mining dilution was applied to Atacocha OP and a 100% mining recovery was assumed.
11. There are no Cu grades estimated for Atacocha OP and no Au grades estimated for Atacocha UG and El Porvenir UG. This has reduced the Cu and Au average grades for the total Cerro Pasco tonnes.
12. Numbers may not add due to rounding.

The QPs are not aware of any risk factors associated with, or changes to, any aspects of the modifying factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate with the exception of the impacts of faults on the equivalent linear overbreak/slough (ELOS) that have not been accounted for in the geotechnical empirical analyses for the underground mines. SLR has estimated the impact of an increase in ELOS/dilution, and has reduced the Mineral Reserve by 2%.

1.3.8 Mining Methods

1.3.8.1 Atacocha and El Porvenir Underground Mines

The current Atacocha processing plant is being fed by the San Gerardo open pit mine which is scheduled to reach its end of mine life in 2027. Once the pit is depleted, operations at the Atacocha underground mine will be re-started. The underground mine will be integrated with the El Porvenir underground mine, with both mines feeding the El Porvenir processing plant. The Atacocha processing plant and mine site will be shut down and all operations will be transferred to the El Porvenir mine site. As part of the integration plan, a 1,750 m connection ramp between the two mines will be driven on the 2900 Level. The ramp will connect to a system of ore raises and haulage ramps at Atacocha and to the shaft loading pocket at El Porvenir.

Ore from El Porvenir is predominantly mined using overhand CAF mining method, which accounts for approximately 80% of total production. SLS makes up the remainder of ore production. SLS will be increasingly used over the LOM particularly when the veins are steeply dipping. SLS accounts for approximately 55% of ore production over the LOM. The same mining methods were used at Atacocha before the mine closure in 2020 and will continue to be used over the planned LOM.

The ore produced in the CAF and SLS stopes is transported to and dumped in ore passes by load haul dump units (LHD). These ore passes extend to the 2,900 track haulage level where the ore is pulled from chutes and loaded onto mine cars. The mine cars dump at an ore pass grizzly, and the ore is transferred to the shaft's loading pocket on the 2500 Level. From there, the ore is loaded onto skips and hoisted via the shaft to the ore dump. After being discharged at the dump, the ore is transferred to the underground primary crusher. Crushed ore is transported to the processing plant via a conveyor in an inclined drift.

Geotechnical analyses for the underground stope and ground support used a combination of empirical and 2D/3D numerical modelling, based upon core logging, rock testing results, and stress measurements from site.

1.3.8.2 Atacocha (San Gerardo) Open Pit Mine

The open pit is a conventional open pit mining method with drill and blast operations using excavators and trucks operating on bench heights of six metres. The mining contractor provides operators, equipment, and ancillary facilities required for the mining operation.

Mill feed material produced by San Gerardo is hauled to the ore pass to the east of the pit that reports to the 3600 Level of Atacocha underground, where it is trammed by locomotive and rail car to the Atacocha plant. Waste is hauled to the San Gerardo waste dump, which is adjacent to the Atacocha TSF dam.

The open pit Mineral Reserve estimates support an open pit LOM production plan of approximately four years before the underground mine starts production in 2027. Total material mined is limited to 10 million tonnes per annum (Mtpa), or approximately 27 ktpd.

1.3.9 Processing and Recovery Methods

1.3.9.1 El Porvenir

El Porvenir processing plant is located adjacent to the mine at an altitude of 4,100 MASL to 4,200 MASL. The concentrator has an ore processing capacity of approximately 2.37 Mtpa. The El Porvenir concentrator processed 2,220,011 tonnes of ore in 2023. El Porvenir copper and lead concentrates are sold to traders and delivered by road and rail to Callao (approximately 270 km by road) for shipping overseas, while zinc concentrate is transported by road and rail to Nexa's Cajamarquilla zinc refinery east of Lima. El Porvenir is approximately 315 km from Lima by road. The current LOM plan continues to 2028. Processing consists of conventional crushing, grinding, and flotation to produce separate copper, lead, and zinc concentrates.

Tailings are cycloned and the coarse fraction is used for mine backfill, which constitutes approximately 35% of tailings produced. Water from tailings dewatering is returned to the process. Overflow from the cyclones containing the fine tailings is deposited in the conventional TSF adjacent to the mine and processing plant. Tailings can be discharged at various points in the TSF by means of valved discharge points on the tailings line. Clarified water discharged from the TSF joins natural water flows.

Make-up water is supplied from various streams around the TSF, as well as the Carmen Chico River, approximately 3.2 km south of the processing facility.

El Porvenir lead and zinc concentrates are generally clean and do not attract penalty charges for deleterious elements. The copper concentrate attracts penalties due to elevated arsenic, antimony, bismuth, and lead plus zinc content (approximately 15% combined). The penalty charges are approximately US$8.00/dry metric tonne (dmt).

1.3.9.2 Atacocha

The Atacocha concentrator processes ore from the San Gerardo open pit mine. The average daily processing rate is approximately 4,200 tonnes. The Atacocha concentrator processed 1,397,192 tonnes of ore in 2023.

The Atacocha concentrator utilizes a conventional crushing, grinding, and sequential flotation scheme to produce lead and zinc concentrates. A flash-flotation step is included in the grinding circuit that recovers lead at a grade sufficiently high to report directly to the final lead concentrate. Low copper grades resulted in a discontinuation of copper concentrate production in 2020. The majority of gold and silver report to the lead concentrate.

The zinc concentrate is transported to the Cajamarquilla zinc refinery near Lima, while the copper and lead concentrates are sold to concentrate traders.

1.3.10 Infrastructure

1.3.10.1 El Porvenir

The El Porvenir infrastructure consists of the following facilities:

- Approximately 6,500 tpd underground mine

- A 2.2 Mtpa processing plant with associated laboratory and maintenance facilities
- Power plant
- Access roads
- Offices and warehouses
- Accommodations
- Waste rock facilities
- Temporary ore stockpiles
- Hydraulic backfill plant
- TSF

The power supply for the El Porvenir Mine comes from two sources, the national power grid and the La Candelaria Hydroelectric Plant.

Raw water is sourced from Tingovado Creek, as well as from other creeks around the TSF. Fresh water supply is obtained from the Carmen Chico River, approximately 3.2 km south of the processing facility.

The EL Porvenir TSF receives tailings generated by both El Porvenir and Atacocha processing plants. A portion of tailings is used for hydraulic backfill at El Porvenir. The TSF was originally constructed in the 1970s, and the current elevation of the dam crest is 4,064 MASL and the dam height is approximately 140 m.

Waste rock from the underground operations is either used as backfill underground or stockpiled on surface. If waste rock is brought to surface in the future, it will be deposited in a designated area near the secondary TSF embankment southwest of the concentrator plant area.

1.3.10.2 Atacocha

Site operations comprise an underground mine, open pit mine, and a process plant facility. Supporting on-site infrastructure include maintenance facilities; maintenance buildings for underground and surface equipment, laboratory, and tailings pumping station. Facilities and structures supporting operations include warehouses and laydown areas, offices, dry facilities, hydroelectric generating station, power lines and substation, fuel storage tanks, and accommodation camp. The site has well developed systems in place for water supply and distribution, including fresh water and fire suppression water, sewage collection and disposal, and communications. A network of site roads that are approximately six metres wide and total 15 km in length are used by authorized mine personnel and equipment, including ore and waste haul trucks, concentrate haul trucks, and support and light duty vehicles to provide access to on-site infrastructure.

Power supply for Atacocha comes from three sources, Electroandes, a power supplier located in Paragsha, via a 30 km long 50 kV transmission line, Chaprin Hydro, a hydroelectric generating station with a total capacity of 5.26 MW via a 15 km long 50 kV transmission line, and the Marcopampa hydroelectric generating station with a total capacity of 1.1 MW via a five kilometre long 50 kV transmission line.

Waste rock from the San Gerardo open pit is disposed of in the Atacocha waste dump, which is adjacent to and downstream of the Atacocha TSF. The Atacocha TSF has capacity for expansion to accommodate tailings production over the LOM.

1.3.11 Market Studies

The principal commodities produced at El Porvenir and Atacocha mines, Zn, Pb, Cu, Ag, and Au, are freely traded, at prices and terms that are widely known, so that prospects for sale of any Nexa production are virtually assured.

The final sale products for El Porvenir processing plant (for all underground material processed between years 2024 and 2033) are copper, lead, and zinc concentrates. El Porvenir copper and lead concentrates are sold to traders and delivered by road and rail to Callao, which is approximately 270 km by road, for shipping overseas. Zinc concentrate is transported by road and rail to Nexa's Cajamarquilla zinc refinery near Lima as per Nexa's internal planning. Over the LOM Zn concentrate represents 60% of El Porvenir's gross revenue, while Pb concentrate and Cu concentrate represent 37% and 3%, respectively.

The final sales products for the Atacocha processing plant (for open pit material processed between years 2024 and 2027) are lead concentrate and zinc concentrate. Over the LOM of the Atacocha plant Pb concentrate represents 73% of Atacocha's gross revenue, while Zn concentrate represents 27% of Atacocha's gross revenue.

Over the LOM for the Cerro Pasco Complex, considering production from both El Porvenir and Atacocha plants, the gross revenue, broken down by metal sold, is as follows: zinc 54%, lead 16%, copper 2%, silver 27%, and gold 1%

Market information is based on the industry scenario analysis prepared by Nexa's Market Intelligence team for years 2022 and 2023 based on information sourced from different banks and independent financial institutions, economy and politics research groups, and metals consultants.

Metal prices for the economic analysis have been forecasted by Nexa's Market Intelligence team based on market information sourced by banks and financial institutions.

In terms of material contracts to run the operation, Nexa has negotiated with different known traders (such as Glencore, Trafigura, Humon, and IXM) the sale of their copper and lead concentrates. In addition to concentrate sales, Nexa has numerous contracts with suppliers for the majority of the operating activities at El Porvenir and Atacocha mine sites, such as underground mine development contractors, material transport, drilling, loading and hauling services, plant maintenance, laboratory services, suppliers for consumables, reagents, maintenance, and general services to support the mine operations.

1.3.12 Environmental Studies, Permitting and Plans, Negotiations, or Agreements with Local Individuals or Groups

Various EIAs and supporting technical reports have been submitted to the regulatory authorities to identify potential environmental effects resulting from project activities for the construction, operation, and closure stages. The monitoring program implemented at the El Porvenir Mine includes monitoring of meteorology, air quality, non-ionizing radiation, noise, surface water quality, springs water quality, effluent discharges, fauna and flora, and physical stability of the tailings dam. The monitoring program implemented at the Atacocha Mine includes effluent discharges, gas emissions, air quality, non-ionizing radiation, noise, surface water quality, groundwater quality, springs water quality, vibrations, soil quality, terrestrial biology (vegetation and wildlife), and aquatic biology. The results of the monitoring program are reported to the Peruvian authorities quarterly.

El Porvenir and Atacocha hold a number of environmental permits and authorizations in support of the current operations. The permits are Directorial Resolutions issued by the Peruvian authorities upon approval of mining environmental management instruments filed by the mining companies. Nexa maintains an up-to-date record of the legal permits obtained to date. Additional permits will be required in the future for implementation of the Cerro Pasco Complex Integration project.

According to the annual report for 2022 issued by Nexa, the company seeks to create a positive legacy in host communities and maintain a constant and close dialogue with them, working towards building a positive relationship with stakeholders. Nexa's ESG strategy is built around nine Environment, Social and Governance pillars.

A social baseline description, assessment of socio-economic impacts, and identification of mitigation/enhancement measures have been carried out for both El Porvenir and Atacocha to mitigate negative impacts and maximize positive benefits of the mines. These components are generally consistent with social impact assessment practices. Community Relations Plans have been developed for El Porvenir and Atacocha as part of the EIAs outlining objectives, strategies, and specific indicators for social programs. Nexa has a permanent information office dedicated to receiving, managing, and addressing complaints, claims, questions, and information requests from the communities. SLR understands that Nexa has implemented a grievance mechanism for receiving local community questions, concerns, and complaints. Nexa has also developed a communications program to facilitate the interaction with the communities.

According to the annual report for 2023 issued by Nexa Peru, one of the key risks for the Cerro Pasco Complex operations to be managed and mitigated is social conflict with communities within the area of influence, which has the potential to result in blockades, project delays, and/or reputational damage.

A conceptual Mine Closure Plan was approved in 2007 for the El Porvenir Mine components within the context of the Peruvian legislation and has subsequently been amended or updated four times. A conceptual Mine Closure Plan was approved in 2007 for the Atacocha Mine components within the context of the Peruvian legislation and has subsequently been amended or updated five times. The Mine Closure Plan addresses temporary, progressive, and final closure actions, and post closure inspection and monitoring. A closure cost estimate was developed and included in the Mine Closure Plan. The total financial assurance for progressive closure, final closure, and post closure is calculated by Nexa according to the Peruvian regulations (Supreme Decree D.S. N° 262-2012-MEM/DM).

1.3.13 Capital and Operating Cost Estimates

El Porvenir and Atacocha are operating mines, and therefore all capital costs are categorized as sustaining.

Sustaining capital costs have been estimated by Nexa based on historical and actual costs, plus the estimated capital costs for the underground development, infrastructure, and equipment required to complete the Cerro Pasco Complex integration. Based on the SLR QP's review, the sustaining capital costs are estimated to the equivalent of an Association for the Advancement of Cost Engineering (AACE) Class 2 estimate with an accuracy range of -10% to +15%. All costs are expressed in Q4 2023 US dollars.

The summary breakdown of the estimated sustaining capital costs required to achieve the Mineral Reserve LOM production are presented in Table 1-7.

Table 1-7: Sustaining Capital Costs Summary – Cero Pasco Complex

Cost Component	Value (US$ millions)
El Porvenir Mine Development	166
El Porvenir Processing Plant Improvements	19
El Porvenir Mining Equipment	17
El Porvenir Infrastructure	48
El Porvenir Tailings Storage Facilities	132
El Porvenir Other Projects / Assets Sustaining Capital	18
Atacocha Mine Development	137
Atacocha Processing Plant Improvements	3
Atacocha Mining Equipment	6
Atacocha Infrastructure	22
Atacocha Tailings Storage Facilities	35
Atacocha Other Projects / Assets Sustaining Capital	20
Total Sustaining Capital Costs	**622**

Notes: Sum of individual values may not match total due to rounding.

The operating costs were estimated based on the actual operating expenditures and current operating budget for both El Porvenir and Atacocha mines, and the forecasted operating costs, considering the operating synergies once the integration process is completed.

The operating expenses estimated for mining, processing, and G&A activities to support the production of the Cerro Pasco Mineral Reserves over the LOM are summarized in Table 1-8.

Table 1-8: Operating Costs Estimate – Cerro Pasco Complex

Cost Component	LOM Total (US$ millions)	Average Annual[1,2] (US$ millions)	LOM Average (US$/t milled)
Atacocha Plant (Open Pit material) [1]			
Open Pit Mining (Atacocha Open Pit)	85	21	19.52
Processing – Atacocha Plant	58	15	13.29
G&A – Open Pit	52	13	11.85
El Porvenir Plant (Underground material) [2]			
Underground Mining (El Porvenir & Atacocha)	797	86	39.25
Processing – El Porvenir Plant	266	28	13.07
G&A – Underground	154	16	7.56
Combined Site Operating Costs	**1,412**	**152**	**57.18**

Notes:

1. For open pit fully operational years (2024 – 2027)
2. For underground fully operational years (2025 – 2032)
3. Sum of individual values may not match total due to rounding.

2.0 Introduction

SLR Consulting (Canada) Ltd. (SLR) was retained by Nexa Resources S.A. (Nexa) to prepare a Technical Report Summary (TRS) on the integration of Nexa's El Porvenir and Atacocha mines into the Cerro Pasco Complex (Cerro Pasco or the Complex), located in Pasco Province, Peru. The purpose of this TRS is to support the disclosure of the Cerro Pasco Mineral Resource and Mineral Reserve estimates with an effective date of December 31, 2023. The Mineral Resource estimate for the Complex was prepared by Jerry Huaman Abalos, B.Geo., AusIMM CP(Geo), Corporate Mineral Resource Manager with Nexa and a Qualified Person (QP) for this TRS. This TRS conforms to United States Securities and Exchange Commission's (SEC) Modernized Property Disclosure Requirements for Mining Registrants as described in Subpart 229.1300 of Regulation S-K, Disclosure by Registrants Engaged in Mining Operations (S-K 1300) and Item 601 (b)(96) Technical Report Summary.

Nexa is a publicly traded company on the Toronto Stock Exchange (TSX) and the New York Stock Exchange (NYSE). Nexa is a reporting issuer in all provinces and territories of Canada and is under the jurisdiction of the Ontario Securities Commission.

Nexa is a large-scale, low-cost, integrated Zn producer with over 60 years of experience developing and operating mining and smelting assets in Latin America. Nexa has a diversified portfolio of polymetallic mines (Zn, Pb, Cu, Ag, and Au) and also greenfield projects at various stages of development in Brazil and Peru. In Brazil, Nexa owns and operates three underground mines, Vazante and Morro Agudo (Zn and Pb), and Aripuanã (Zn, Pb, Cu, Au, and Ag). It also operates two zinc smelters in Brazil (Três Marias and Juiz de Fora). In Peru, Nexa operates the Cerro Pasco Complex, which includes the El Porvenir (Zn, Pb, Cu, and Ag) and Atacocha (Zn, Cu, Pb, Au, and Ag) mines, and the Cerro Lindo (Zn, Cu, Pb, and Ag) Mine, as well as the Cajamarquilla zinc smelter near Lima. Nexa's development projects in Peru include Magistral, Shalipayco, Florida Canyon (JV with Solitario), Hilarión, and Pukaqaqa. .

The El Porvenir Mine is 100% owned by Nexa Resources El Porvenir S.A.C. (Nexa El Porvenir), a 99.99%-owned subsidiary of Nexa Resources Peru S.S.A. (Nexa Peru). Nexa's resulting interest in the El Porvenir Mine is 83.48% that corresponds to the sum of Nexa's direct interest in Nexa Peru (0.18%) and indirect interest of Nexa in Nexa Peru (83.37%) through its controlled company Nexa Resources Cajamarquilla S.A. (99.916%), and the remaining 16.45% are floating shares.

The Atacocha Mine is 100% owned by Nexa Resources Atacocha S.A.A. (Nexa Atacocha). Nexa's resulting interest in the Atacocha Mine is 75.96% that corresponds to the sum of Nexa's direct interest in Nexa Peru (0.18%), and Nexa Peru's indirect interest in Nexa Atacocha (90.999%) through its controlled company Nexa El Porvenir (99.99%), the remaining 9.001% are floating shares, and indirect participation of Nexa in Nexa Peru (83.37%) through its controlled company Nexa Resources Cajamarquilla S.A. (99.916%), and the remaining 16.45% are floating shares.

The integration project is intended to capture synergies between the two mining operations, resulting from their proximity and operational similarities, with the ore from both underground mines being processed in the El Porvenir treatment plant. The goal is to achieve cost and investment savings, thereby reducing the environmental footprint and extending the combined mine life of the two mines.

The integration project has been developed over the past several years. The first stage involved the administrative integration of both mines, which was completed in 2014. The second stage involved the integration of the tailings disposal system, which allowed the Atacocha plant to send tailings to the El Porvenir dam within the short term, thereby helping reduce the environmental footprint. The third stage, completed in 2016, involved the construction of a new energy transmission line with a 138 kilovolt (kV) connection that supplies both mines, replacing the prior 50 kV transmission lines. The development of a 3.5 km tunnel, connecting both underground mines and enabling exploration program in the Integration Zone between the mines, was part of the fourth stage, concluded in 2019.

In 2021, the modernization and debottleneck studies to evaluate the deepening of the mine and extension of the life of mine (LOM) for El Porvenir were postponed due to the prioritization of a capital allocation strategy and the reassessment of the integration with the Atacocha underground mine. In 2022, Nexa advanced the integration project with an optimization study of the integration of the El Porvenir and Atacocha underground mines by evaluating increasing the capacity of tailings and shaft and optimizing the processing plant, to potentially increase production and extend the LOM.

In 2023, Nexa continued to advance the integration project with technical studies to sustain and expand production, such as mine design and studies for the underground interconnection, shaft upgrade and engineering assessment of the plant, as well as key routes to improve capacity to provide a long-term solution for tailings disposal. A Front-End Loading (FEL) 3 study to increase El Porvenir hoisting was completed in Q1 2023 and a FEL3 tailings pumping system study was completed in early Q2 2023.

The integration plan includes:

- restarting and rehabilitation of the Atacocha underground mine,
- development of an approximately 2 km long connection tunnel (Tunnel 2900), linking Atacocha underground to the bottom of Picasso shaft in El Porvenir, allowing the production from both underground mines to be hoisted to feed the El Porvenir processing plant,
- Picasso shaft capacity expansion to support production and extraction at both underground mines,
- closure of the Atacocha processing plant, with the exhaustion of Atacocha open pit reserves, in 2027,
- a new tailing pumping and pipeline system to be built, that will allow tailings from El Porvenir to be sent to the Atacocha dam, bringing a long term solution for tailings, supporting the extension of the combined life of the two mines.

2.1 Site Visits and QPs

SLR’s QPs visited the site from January 15 to 17, 2024. Nexa’s QP, Jerry Huaman Abalos, B.Geo., AusIMM CP(Geo), visited the site over the same time period.

During the site visit, the QPs inspected the open pit and underground operations, the processing plants, and the tailings facilities and held discussions with Nexa Perú personnel.

Jerry Huaman Abalos, the geologist QP for this TRS, visited the open pit and underground operations, examined drill holes and mineralized open pit and underground mineralized exposures, reviewed interpreted plans and sections, core logging, sampling, quality assurance and quality control (QA/QC), modelling procedures for long-term and grade control purposes, and discussed the geological setting of the deposit as well as the geological interpretations, mineralization control and mine geology procedures with the El Porvenir and Atacocha mine geology staff.

The SLR mining engineer QP visited the open pit and underground operation and discussed parameters for Mineral Reserve estimation with El Porvenir and Atachocha mine staff.

The SLR metallurgist QP visited the Atacocha and El Porvenir process facilities including the office facilities, underground crushing and conveying, concentrators, tailings pumping station, electrical substations, and laboratories.

The SLR environmental QP visited the tailings disposal facilities at El Porvenir and Atacocha and some components of the water management infrastructure. The QP had discussions with Nexa Perú personnel responsible for environmental management and community relations activities.

Table 2-1 lists the QPs' responsibilities for this TRS.

Table 2-1: QP Responsibilities

Qualified Person	Responsibilities
SLR Consulting (Canada) Ltd. (the SLR QPs)	Sections 1.1.1.2 to 1.1.1.7, 1.1.2.2 to 1.1.2.5, 1.2, 1.3.7 to 1.3.13, 2, 10, 12 to 19, 21, 22.2 to 22.7, 23.2 to 23.5, 25, and relevant references in Section 24.
Jerry Huaman Abalos, B.Geo., AusIMM CP(Geo), Corporate Mineral Resource Manager, Nexa	Sections 1.1.1.1, 1.1.2.1, 1.3.1 to 1.3.6, 3 to 9, 11, 20, 22.1, 23.1, and relevant references in Section 24.

2.2 Sources of Information

During the preparation of this TRS, discussions were held with personnel from Nexa:

- Filipe Fonseca Silva, Management and Strategy Manager, Nexa
- Jose Antonio Lopes, Corporate Mineral Resource Manager, Nexa
- Jerry H. Abalos, Corporate Mineral Resource Manager, Nexa Peru
- Vitor Teixeira De Aguilar, Technical Services Manager, Nexa
- Paulo Henrique Araujo Calazans, Mining Engineer, Nexa
- José Cayetano, Environmental Management Superintendent, Nexa
- Carlos Quiñones, Social Management Superintendent, Nexa
- Alder Osorio, El Porvenir Social Management Manager, Nexa
- Daniel Saenz, Corporate Resource Geologist, Nexa Peru
- Wilfredo Astete, Processing General Manager
- Fernando Villanova, Corporate Geologist, Nexa
- Cecilia Pastor, Land and Mineral Rights Manager, Nexa Peru
- Magaly Bardales Rojas, Corporate Legal Counsel, Nexa Peru
- Renato Piazzon, Legal Counsel, Nexa Peru

Previously, SLR (which now includes Roscoe Postle Associates Inc. [RPA]) has been involved in the preparation of National Instrument 43-101 Technical Reports for both the Atacocha (RPA, 2019) and El Porvenir (SLR, 2021) mines and an S-K 1300 TRS for the El Porvenir Mine (SLR, 2021).

The documentation reviewed, and other sources of information, are listed at the end of this TRS in Section 24.0 References.

2.3 List of Abbreviations

Units of measurement used in this TRS conform to the metric system. All currency in this TRS is US dollars (US$) unless otherwise noted.

μ	micron
μg	microgram
a	annum
A	ampere
bbl	barrels
Btu	British thermal units
°C	degree Celsius
C$	Canadian dollars
cal	calorie
cfm	cubic feet per minute
cm	centimetre
cm^2	square centimetre
d	day
dia	diameter
dmt	dry metric tonne
dwt	dead-weight ton
°F	degree Fahrenheit
ft	foot
ft^2	square foot
ft^3	cubic foot
ft/s	foot per second
g	gram
G	giga (billion)
Gal	Imperial gallon
g/L	gram per litre
Gpm	Imperial gallons per minute
g/t	gram per tonne
gr/ft^3	grain per cubic foot
gr/m^3	grain per cubic metre
ha	hectare
hp	horsepower
hr	hour
Hz	hertz
in.	inch
in^2	square inch
J	joule
k	kilo (thousand)
kcal	kilocalorie
kg	kilogram
km	kilometre
km^2	square kilometre
km/h	kilometre per hour
kPa	kilopascal
kVA	kilovolt-amperes
kW	kilowatt
kWh	kilowatt-hour
L	litre
lb	pound
L/s	litres per second
m	metre
M	mega (million); molar
m^2	square metre
m^3	cubic metre
MASL	metres above sea level
m^3/h	cubic metres per hour
mi	mile
min	minute
μm	micrometre
mm	millimetre
mph	miles per hour
MVA	megavolt-amperes
MW	megawatt
MWh	megawatt-hour
oz	Troy ounce (31.1035g)
oz/st, opt	ounce per short ton
ppb	part per billion
ppm	part per million
psia	pound per square inch absolute
psig	pound per square inch gauge
RL	relative elevation
s	second
st	short ton
stpa	short ton per year
stpd	short ton per day
t	metric tonne
tpa	metric tonne per year
tpd	metric tonne per day
US$	United States dollar
USg	United States gallon
USgpm	US gallon per minute
V	volt
W	watt
wmt	wet metric tonne
wt%	weight percent
yd^3	cubic yard
yr	year

3.0 Property Description

3.1 Location

The Complex is located in Peru's Central Andes region at an elevation of approximately 4,050 MASL to 4,200 MASL. It is situated in the districts of San Francisco de Asís de Yarusyacán and Yanacancha, in the province and department of Pasco (Figure 3-1).

El Porvenir and Atacocha are located 13 km and 16 km north of the city of Cerro de Pasco, which is located approximately 315 km by road from the national capital, Lima, when travelling by the Carretera Central and the La Oroya-Huánuco highway. El Porvenir's coordinates are 10°36'36" S, 76°12'37" W (Latitude/Longitude decimals -10.6100, -76.2102), and approximately 367,600m E, 8,826,850m N using Universal Transverse Mercator (UTM) WGS84 datum Zone 18S. Atacocha's coordinates are 10°34'37" S, 76°11'26" W (Latitude/Longitude decimals -10.5769, -76.1906), and approximately 367,160m E, 8,830,400m N using the UTM WGS84 Zone 18S. The mines are located approximately 3.5 km of each other.

Figure 3-1: Location Map

Source: SLR, 2023.

3.2 Mineral Rights in Peru

3.2.1 Mineral Concessions

According to Peruvian General Mining Law (the Law):

1. Mineral concessions grant their holder the right to explore, develop, and mine metallic or non-metallic minerals located within their internal boundaries.
2. A mineral claim is an application to obtain a mineral concession. Exploration, development, and exploitation rights are obtained once the title to the concession has been granted, except in those areas that overlap with priority claims or priority mining concessions. Upon completion of the title procedure, resolutions awarding title must be recorded with the Public Registry to create enforceability against third parties and the Peruvian State.
3. Mineral rights are separate from surface rights. They are freely transferable.
4. A mineral concession by itself does not authorize the titleholder to carry out exploration or exploitation activities, but rather the titleholder must first:
   a) Obtain approval from the Culture Ministry of the applicable archaeological declarations, authorizations, or certificates.
   b) Obtain the environmental certification issued by the competent environmental authority, subject to the rules of public participation.
   c) Obtain permission for the use of land (i.e., obtain surface rights) by agreement with the owner of the land or the completion of the administrative easement procedure, in accordance with the applicable regulation.
   d) Obtain the applicable governmental licences, permits, and authorizations, according to the nature and location of the activities to be undertaken.
   e) Carry out consultations with Indigenous Peoples under the Culture Ministry, should there be any communities affected by potential exploitation of the mineral concession, as per International Labour Organization (ILO) Convention 169.
5. Mineral rights holders must comply with the payment of an annual fee equal to $3.00/ha, on or before June 30 of each year.
6. Holders of mineral concessions must meet a Minimum Annual Production Target or a Minimum Annual Investment before a statutory deadline. When such deadline is not met, a penalty must be paid as described below:
   a) Mineral concessions must meet a statutory Minimum Annual Production Target of 1 Tax Unit (Unidad Impositiva Tributaria, or UIT) per hectare per year for metallic concessions, within a statutory term of ten years from the title date. The applicable penalty is 2% of the Minimum Annual Production Target per hectare per year as of the 11th year until the 15th year. Starting in the 16th year and until the 20th year, the applicable penalty is 5% of the Minimum Annual Production Target per year and starting in the 21st year until the 30th year, the applicable penalty is 10% of the Minimum Annual Production Target per year. After the 30th year, if the Minimum Annual Production Target is not met, the mining concession will lapse automatically.

7 Mineral concessions may not be revoked as long as the titleholder complies with the Good Standing Obligations according to which mineral concessions will lapse automatically if any of the following events take place.

a) The annual fee is not paid for two consecutive years.

b) The applicable penalty is not paid for two consecutive years.

c) A concession expires if it does not reach the minimum production in Year 30 and cannot justify the non-compliance up to five additional years due to reasons of force majeure described in the current legislation.

8 Agreements involving mineral rights (such as an option to acquire a mining lease or the transfer of a mineral concession) must be formalized through a deed issued by a public notary and must be recorded with the Public Registry to create enforceability against third parties and the Peruvian State.

3.2.2 Beneficiation Concessions

According to Peruvian General Mining Law (the Law):

1 The beneficiation concession grants the right to use physical, chemical, and physical-chemical processes to concentrate minerals or purify, smelt, or refine metals.

2 As from the year in which the beneficiation concession was requested, the holder shall be obliged to pay the Mining Concession Fee in an annual amount according to its installed capacity, as follows:

a) 350 tpd or less: 0.0014 of one UIT per tpd.

b) from more than 350 tpd to 1,000 tpd: 1.00 UIT

c) from 1,000 tpd to 5,000 tpd: 1.5 UIT

d) for every 5,000 tpd in excess: 2.00 UIT

Note. “tpd” refers to the installed treatment capacity. In the case of expansions, the payment that accompanies the application is based on the increase in capacity.

3.3 Land Tenure

The QPs rely upon a legal opinion provided by Nexa regarding ownership information (Bardales Rojas, 2024).

El Porvenir consists of 25 mining concessions covering an area of 4,846.68 ha and one beneficiation concession covering an area of 323.79 ha. As of December 31, 2023, the concessions are held in the name of Nexa El Porvenir, Nexa Atacocha, Nexa Peru, and S.M.R.L. CMA No. 54 (50% Nexa El Porvenir and 50% Nexa Atacocha).

Atacocha consists of 147 mineral concessions covering an area of 2,872.47 ha and one beneficiation concession covering an area of 413.23 ha. As of December 31, 2023, the Atacocha concessions are held in the name of Nexa Atacocha, Nexa Peru, and Nexa El Porvenir.

The titles of all mineral concessions have been granted and duly recorded in the Public Registry. The UTM coordinates of these mineral concessions, which determine their location within the official grid, have been recorded in the Mining Cadaster.

None of the concessions are in urban expansion areas, protected natural areas, or archaeological sites.

The mineral concessions for El Porvenir are tabulated in Table 3-1 and for Atacocha in Table 3-3. The beneficiation concessions for El Porvenir are tabulated in Table 3-2 and for Atacocha in Table 3-4.

Mineral rights maps are provided in Figure 3-2 and Figure 3-3 for El Porvenir and Atacocha, respectively.

Table 3-1: El Porvenir Mineral Concessions

No	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Fee (US$)	2023 Penalty (US$)	2023 Total Paid (US$)
1	010000515L	ACUMULACION EL PORVENIR	NEXA RESOURCES EL PORVENIR S.A.C.	Acumulación D.M. Titulada	03/04/1877	P-11248335	5,040.79	4,600.52	13,801.55	0.00	13,801.55
2	010000116L	ACUMULACION EL PORVENIR 1	NEXA RESOURCES EL PORVENIR S.A.C.	Acumulación D.M. Titulada	25/01/2016	P-11242512	7.99	7.99	23.96	0.00	23.96
3	04010149X01	C.M.A. Nº 55	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	04/06/1955	P-02016190	1.00	1.00	3.00	0.00	3.00
4	04002731X01	KITTY	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	24/02/1906	P-02010298	6.00	5.99	17.98	0.00	17.98
5	04010070X01	ATACOCHA Nº 1	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	09/11/1954	P-20000404	2.77	1.60	4.79	0.00	4.79
6	04013393X01	CARLITOS	NEXA RESOURCES EL PORVENIR S.A.C.	D.M. Titulado D.L. 109	04/05/1987	P-20002989	20.00	20.00	60.00	48.64	108.64
7	04013362X01	PUCAYACU	NEXA RESOURCES EL PORVENIR S.A.C.	D.M. Titulado D.L. 109	17/06/1986	P-20002923	36.00	36.00	108.00	87.56	195.56
8	04005441X01	ANGELICA SEGUNDA	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	06/11/1915	P-02005830	2.00	2.00	5.99	48.58	54.57

No	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Fee (US$)	2023 Penalty (US$)	2023 Total Paid (US$)
9	04010249X01	ATACOCHA Nº 2	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	09/12/1955	P-02014333	2.99	2.77	8.30	67.26	75.56
10	04010074X01	C.M.A. Nº 41	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	13/11/1954	P-02013928	66.00	65.91	197.72	1,602.99	1,800.71
11	04010073X01	C.M.A. Nº 42	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	11/11/1954	P-02013917	3.00	3.00	8.99	72.86	81.85
12	04010071X01	C.M.A. Nº 43	NEXA RESOURCES ATACOCHA S.A.A. – Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	10/11/1954	P-02010565	5.00	4.99	14.98	121.45	136.43
13	04010072X01	C.M.A. Nº 44	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	11/11/1954	P-02013919	8.00	7.99	23.97	194.30	218.27
14	04010063X02	C.M.A. Nº 45	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	13/11/1954	P-02014009	24.00	23.97	71.90	582.91	654.81
15	04005426X01	ITHACA	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	07/10/1915	P-02010173	4.00	3.99	11.98	79.90	91.88
16	04002471X01	KATHLEEN	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	03/06/1905	P-02010553	6.00	5.99	17.98	119.84	137.82

No	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Fee (US$)	2023 Penalty (US$)	2023 Total Paid (US$)
17	04005356X01	LA TUNDA	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	28/10/1935	P-02010176	6.00	5.99	17.98	119.84	137.82
18	04005383X01	MANUEL NUMERO DOS	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	19/06/1915	P-02005462	8.00	7.99	23.97	194.33	218.30
19	04005372X01	MELBOURNE	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	27/05/1915	P-02010281	12.00	11.98	35.95	239.69	275.64
20	04005505X01	TRALEE	NEXA RESOURCES ATACOCHA S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	23/02/1916	P-02010297	2.00	2.00	5.99	39.95	45.94
21	04012874X01	C.M.A. Nº 95	NEXA RESOURCES ATACOCHA S.A.A. / NEXA RESOURCES PERU S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	07/12/1978	P-20000331	4.00	3.96	11.89	96.38	108.27
22	04012875X01	C.M.A. Nº 96	NEXA RESOURCES ATACOCHA S.A.A. / NEXA RESOURCES PERU S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	07/12/1978	P-20000332	4.00	3.99	11.98	97.15	109.13
23	010079393	MACAPATA	NEXA RESOURCES PERU S.A.A. - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 708	27/05/1993	P-20004829	100.00	14.08	42.23	342.42	384.65

No	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Fee (US$)	2023 Penalty (US$)	2023 Total Paid (US$)
24	04010148X01	C.M.A. Nº 54	S.M.R.L. CMA Nº 54 - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	04/06/1955	P-11105479	2.00	2.00	5.99	39.94	45.93
25	04012134X01	DEMASIA AM-Nº 1	S.M.R.L. CMA Nº 54 - Assigned to Nexa Resources El Porvenir	D.M. Titulado D.L. 109	13/03/1973	P-20001500	1.00	1.00	3.00	19.97	22.97
Totals							**5,374.53**	**4,846.68**	**14,540.07**	**4,215.97**	**18,756.04**

Note: Exchange rate: 3.782 Peruvian Nuevo Sol per US$

Table 3-2: El Porvenir Beneficiation Concession

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	2023 Annual Fee (Peruvian Nueva Sol)	2023 Total Paid (US$)
1	P000000613	ACUMULACION AQUILES 101	NEXA RESOURCES EL PORVENIR S.A.C.	Planta de Beneficio	21/06/2013	P-11209158	323.79	18,166.50	4,803.41
Totals							**323.79**	**18,166.50**	**4,803.41**

Note: Exchange rate: 3.782 Peruvian Nuevo Sol per US$

Table 3-3: Atacocha Mineral Concessions

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
1	010000216L	ACUMULACION ATACOCHA 1	NEXA RESOURCES ATACOCHA S.A.A.	Acumulación D.M. Titulada	25/01/2016	P-11246469	43.94	43.94	131.81	0.00	131.81
2	04009516X01	AGUSTIN	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	07/06/1951	P-02013182	4.00	3.99	11.98	0.00	11.98
3	04007683X01	ALICIA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	27/07/1927	P-02003967	4.00	4.00	11.99	0.00	11.99
4	04012577X01	AMERICA DEL SUR	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	06/06/1979	P-20004303	20.00	19.97	59.90	0.00	59.90
5	04005440X01	ANGELICA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	06/11/1915	P-02005828	6.00	5.99	17.98	0.00	17.98
6	04008194X01	ANITA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	17/12/1935	P-02010141	12.00	11.98	35.95	0.00	35.95
7	04005504X01	ANTRIM	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	23/02/1916	P-02010284	2.00	2.00	5.99	0.00	5.99
8	04007294X01	ARDA TROYA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	05/05/1924	P-02010189	3.45	3.60	10.81	0.00	10.81
9	04010250X01	ATACOCHA Nº 3	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	09/12/1955	P-02014140	4.89	4.91	14.72	0.00	14.72

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
10	04010501X01	ATACOCHA Nº 4	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	19/06/1957	P-02014782	1.93	1.69	5.06	0.00	5.06
11	04010502X01	ATACOCHA Nº 5	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	19/06/1957	P-02013944	1.75	1.70	5.11	0.00	5.11
12	04008462X01	C.M.A. Nº 1	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	10/10/1939	P-02010140	4.00	4.00	11.99	0.00	11.99
13	04009575X01	C.M.A. Nº 12	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	20/10/1951	P-02013903	100.00	99.87	299.61	0.00	299.61
14	04009757X01	C.M.A. Nº 13	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	24/04/1952	P-02013942	25.00	24.97	74.90	0.00	74.90
15	04009758X01	C.M.A. Nº 14	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	24/04/1952	P-02013971	21.00	20.97	62.92	0.00	62.92
16	04009759X01	C.M.A. Nº 15	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	24/04/1952	P-02014165	100.00	99.87	299.61	0.00	299.61
17	04009760X01	C.M.A. Nº 16	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	24/04/1952	P-02014115	40.00	39.95	119.84	0.00	119.84
18	04009837X01	C.M.A. Nº 17	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	11/08/1952	P-02014006	1.00	1.00	3.00	0.00	3.00
19	04009838X01	C.M.A. Nº 18	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	11/08/1952	P-02013989	2.00	2.00	5.99	0.00	5.99

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
20	04009839X01	C.M.A. Nº 19	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	11/08/1952	P-02014005	2.00	2.00	5.99	0.00	5.99
21	04008508X01	C.M.A. Nº 2	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	27/04/1940	P-02009998	8.00	7.99	23.97	0.00	23.97
22	04009825X01	C.M.A. Nº 20	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	11/07/1952	P-02014839	56.00	55.92	167.76	0.00	167.76
23	04009826X01	C.M.A. Nº 21	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	11/07/1952	P-02014328	16.00	15.98	47.94	0.00	47.94
24	04009908X01	C.M.A. Nº 24	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	29/01/1953	P-02014002	36.00	35.95	107.85	0.00	107.85
25	04009909X01	C.M.A. Nº 25	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	29/01/1953	P-02014110	3.00	3.00	8.99	0.00	8.99
26	04009912X01	C.M.A. Nº 26	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	11/02/1953	P-02013931	1.00	1.00	3.00	0.00	3.00
27	04010002X01	C.M.A. Nº 28	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	22/05/1954	P-02013246	80.00	79.90	239.71	0.00	239.71
28	04010003X01	C.M.A. Nº 29	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	22/05/1954	P-02013174	18.00	17.98	53.93	0.00	53.93
29	04009168X01	C.M.A. Nº 3	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	16/12/1947	P-02010179	36.00	35.95	107.86	0.00	107.86

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
30	04010004X01	C.M.A. Nº 30	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	22/05/1954	P-02014189	200.00	199.74	599.22	0.00	599.22
31	04010004X02	C.M.A. Nº 31	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	22/05/1954	P-02014004	104.00	103.85	311.55	0.00	311.55
32	04010063X01	C.M.A. Nº 32	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	04/11/1954	P-02014026	170.00	169.78	509.33	0.00	509.33
33	04009169X01	C.M.A. Nº 4	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	16/12/1947	P-02010150	30.00	29.96	89.88	0.00	89.88
34	04010218X01	C.M.A. Nº 40	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014023	2.00	2.00	5.99	0.00	5.99
35	04010076X01	C.M.A. Nº 46	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	20/11/1954	P-02014003	96.00	95.86	287.59	0.00	287.59
36	04010116X01	C.M.A. Nº 48	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	14/02/1955	P-02011771	3.00	3.00	8.99	0.00	8.99
37	04010358X01	C.M.A. Nº 49	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	13/08/1956	P-02013916	40.00	39.94	119.83	0.00	119.83
38	04009170X01	C.M.A. Nº 5	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	16/11/1947	P-02010000	10.00	9.99	29.96	0.00	29.96
39	04010132X01	C.M.A. Nº 50	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	29/04/1955	P-02014008	8.00	7.99	23.97	0.00	23.97

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
40	04010133X01	C.M.A. Nº 51	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	29/04/1955	P-02014007	1.00	1.00	3.00	0.00	3.00
41	04010359X01	C.M.A. Nº 52	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	13/08/1956	P-02014091	3.00	3.00	8.99	0.00	8.99
42	04010360X01	C.M.A. Nº 53	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	13/08/1956	P-02014131	1.00	1.00	3.00	0.00	3.00
43	04009171X01	C.M.A. Nº 6	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	16/12/1947	P-01010147	8.00	7.99	23.97	0.00	23.97
44	04010219X01	C.M.A. Nº 61	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014268	18.00	17.98	53.93	0.00	53.93
45	04010220X01	C.M.A. Nº 62	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014167	3.00	3.00	8.99	0.00	8.99
46	04010222X01	C.M.A. Nº 64	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014332	10.00	9.99	29.96	0.00	29.96
47	04010229X01	C.M.A. Nº 65	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014341	10.00	9.99	29.96	0.00	29.96
48	04010224X01	C.M.A. Nº 66	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014157	12.00	11.98	35.95	0.00	35.95
49	04010225X01	C.M.A. Nº 67	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014521	6.00	5.99	17.98	0.00	17.98

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
50	04010226X01	C.M.A. Nº 68	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014118	3.00	3.00	8.99	0.00	8.99
51	04010227X01	C.M.A. Nº 69	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014147	16.00	15.98	47.94	0.00	47.94
52	04009315X01	C.M.A. Nº 7	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	09/06/1949	P-02011772	54.00	53.93	161.79	0.00	161.79
53	04010228X01	C.M.A. Nº 70	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02013990	2.00	2.00	5.99	0.00	5.99
54	04010229X02	C.M.A. Nº 71	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014344	2.00	2.00	5.99	0.00	5.99
55	04010230X01	C.M.A. Nº 72	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014265	2.00	2.00	5.99	0.00	5.99
56	04010231X01	C.M.A. Nº 73	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014178	2.00	2.00	5.99	0.00	5.99
57	04010232X01	C.M.A. Nº 74	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014179	1.00	1.00	3.00	0.00	3.00
58	04010233X01	C.M.A. Nº 75	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/11/1955	P-02014190	10.00	9.99	29.96	0.00	29.96
59	04010235X01	C.M.A. Nº 77	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	25/11/1955	P-02014116	4.00	3.99	11.98	0.00	11.98

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
60	04010236X01	C.M.A. Nº 78	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	25/11/1955	P-02014169	1.00	1.00	3.00	0.00	3.00
61	04010311X01	C.M.A. Nº 79	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	23/05/1956	P-02010274	4.00	3.99	11.98	0.00	11.98
62	04009317X01	C.M.A. Nº 8	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/06/1949	P-02011770	16.00	15.98	47.94	0.00	47.94
63	04010312X01	C.M.A. Nº 80	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	23/05/1956	P-02014342	2.00	2.00	5.99	0.00	5.99
64	04010313X01	C.M.A. Nº 81	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	23/05/1956	P-02013168	1.00	1.00	3.00	0.00	3.00
65	04010314X01	C.M.A. Nº 82	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	23/05/1956	P-02014122	4.00	3.99	11.98	0.00	11.98
66	04010316X01	C.M.A. Nº 83	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	25/05/1956	P-02014121	2.00	2.00	5.99	0.00	5.99
67	04010317X01	C.M.A. Nº 84	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	25/05/1950	P-02013237	1.00	1.00	3.00	0.00	3.00
68	04010318X01	C.M.A. Nº 85	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	25/05/1956	P-02014335	5.00	4.99	14.98	0.00	14.98
69	04010320X01	C.M.A. Nº 86	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	18/06/1956	P-02013238	18.00	17.98	53.93	0.00	53.93

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
70	04001032X01	C.M.A. Nº 87	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	18/06/1956	P-02013235	6.00	6.01	18.04	0.00	18.04
71	04010322X01	C.M.A. Nº 88	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	18/06/1956	P-02014132	4.00	3.99	11.98	0.00	11.98
72	04010323X01	C.M.A. Nº 89	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	18/06/1956	P-02014024	3.00	3.00	8.99	0.00	8.99
73	04009316X01	C.M.A. Nº 9	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/06/1949	P-02009985	6.00	5.99	17.98	0.00	17.98
74	04010344X01	C.M.A. Nº 90	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	07/07/1956	P-02014030	36.00	35.95	107.86	0.00	107.86
75	04010345X01	C.M.A. Nº 91	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	07/07/1956	P-02014031	4.00	4.00	11.99	0.00	11.99
76	04010346X01	C.M.A. Nº 92	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	07/07/1956	P-02014119	2.00	2.00	5.99	0.00	5.99
77	04010347X01	C.M.A. Nº 93	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	07/07/1956	P-02014017	1.00	0.62	1.85	0.00	1.85
78	04010906X01	C.M.A. Nº 94	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	01/12/1960	P-20000405	12.00	11.98	35.95	0.00	35.95
79	04012507X01	C.M.A. Nº 97	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	07/12/1978	P-20000333	2.00	2.00	5.99	0.00	5.99

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
80	04008218X01	CANTABRIA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/09/1915	P-02010552	6.00	5.99	17.98	0.00	17.98
81	04008335X01	CARLOS CHINO	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	05/06/1937	P-02003965	6.00	5.99	17.98	0.00	17.98
82	04007322X01	CARMEN	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	23/12/1924	P-02003971	2.00	2.00	5.99	0.00	5.99
83	04009644X01	CARMEN ROSA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	22/12/1951	P-02007797	4.00	3.99	11.98	0.00	11.98
84	04010284X01	CARMEN ROSA Nº 2	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	12/03/1956	P-02013169	2.00	2.00	5.99	0.00	5.99
85	04009210X01	CARMENCITA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	02/06/1948	P-02007000	2.00	2.00	5.99	0.00	5.99
86	04005459X01	CAVEL	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	17/12/1915	P-02006247	3.99	3.42	10.27	0.00	10.27
87	04009528X01	CHAMACO	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	21/06/1951	P-02007804	60.00	59.92	179.77	0.00	179.77
88	04010332X01	CIPRIANO CUATRO	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	28/06/1956	P-02013236	0.52	0.50	1.49	0.00	1.49
89	04010331X01	CIPRIANO DOS	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	28/06/1956	P-02013175	1.57	1.48	4.45	0.00	4.45

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
90	04008683X01	CIPRIANO PRIMERO	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	23/02/1942	P-02003974	4.00	3.99	11.96	0.00	11.96
91	04010330X01	CIPRIANO UNO	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	28/06/1956	P-02013173	0.80	0.80	2.40	0.00	2.40
92	04003312X01	COLQUIMARCA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	06/09/1907	P-02010327	0.90	0.90	2.70	0.00	2.70
93	04005371X01	CRISTINA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	27/05/1915	P-02005618	42.00	41.94	125.83	0.00	125.83
94	04010670X01	DEMASIA ATACOCHA Nº 6	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	11/05/1959	P-02013832	0.26	0.26	0.77	0.00	0.77
95	04010671X01	DEMASIA ATACOCHA Nº 7	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	11/05/1959	P-20001140	2.04	2.01	6.04	0.00	6.04
96	04010672X01	DEMASIA ATACOCHA Nº 8	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	11/05/1959	P-02013904	1.52	1.51	4.54	0.00	4.54
97	04005461X01	DEWAR	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	07/12/1915	P-02010504	4.24	3.94	11.82	0.00	11.82
98	04007291X01	DORA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	05/03/1924	P-02010236	20.00	19.97	59.92	0.00	59.92
99	04006984X01	EL PORVENIR	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	01/09/1921	P-02003970	10.00	9.99	29.96	0.00	29.96

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
100	04000425X01	ESTRELLA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	18/10/1901	P-02010178	8.00	7.99	23.97	0.00	23.97
101	04007292X01	FRANK	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	05/05/1924	P-02010145	2.00	2.00	5.99	0.00	5.99
102	04009460X01	JUAN ANTONIO	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	03/01/1951	P-02013167	6.00	6.00	17.99	0.00	17.99
103	04008684X01	JUAN MANUEL	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	23/02/1942	P-02003976	4.00	3.99	11.98	0.00	11.98
104	04005502X01	KILKENNY	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	15/02/1916	P-02010146	50.00	49.93	149.79	0.00	149.79
105	04005548X01	LA PRADERA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	01/03/1916	P-02004216	12.00	11.98	35.95	0.00	35.95
106	04007289X01	LIBERTAD	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	05/03/1924	P-02010200	8.00	7.99	23.97	0.00	23.97
107	04007283X01	LIZANDRO	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	14/04/1924	P-02003964	8.00	7.99	23.97	0.00	23.97
108	04005382X01	MANUEL NUMERO UNO	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	19/06/1915	P-02006191	18.00	17.98	53.93	0.00	53.93
109	04005432X01	MANUEL SEGUNDO	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	16/10/1915	P-02006197	6.22	5.79	17.38	0.00	17.38

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
110	04009209X01	MARIA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	02/06/1948	P-02007001	6.00	5.99	17.98	0.00	17.98
111	04009461X01	MARIA CECILIA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	03/01/1951	P-02015793	10.00	9.99	29.96	0.00	29.96
112	04009517X01	MARUJA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	07/06/1951	P-02007796	3.00	2.92	8.76	0.00	8.76
113	04004256X01	MIGUEL	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	30/05/1911	P-02006190	2.00	2.00	5.99	0.00	5.99
114	04008270X01	MILAGROS	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	30/11/1936	P-02007004	8.00	7.93	23.80	0.00	23.80
115	04005578X01	MULL	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	08/04/1916	P-02010177	4.74	4.45	13.35	0.00	13.35
116	04005577X01	NELL	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	08/04/1916	P-02010168	12.00	11.98	35.95	0.00	35.95
117	04008183X01	OLVIDADA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	08/11/1935	P-02010289	0.34	0.33	0.98	0.00	0.98
118	04008219X01	PACO	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	07/05/1936	P-02010296	2.00	2.00	5.99	0.00	5.99
119	04007281X01	PALMIRA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	01/05/1924	P-02003972	16.00	15.98	47.94	0.00	47.94

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
120	04007293X01	PHOENIX	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	05/05/1924	P-02009999	2.54	2.41	7.23	0.00	7.23
121	010125494	PORVENIR 62	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 708	10/03/1994	P-11030784	1,000.00	358.96	1,076.87	0.00	1,076.87
122	010125594	PORVENIR 63	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 708	10/03/1994	P-11030789	1,000.00	184.52	553.57	0.00	553.57
123	010373394A	PORVENIR 66A	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 708	21/06/1994	P-11030775	100.00	0.28	0.85	0.00	0.85
124	010683595	PORVENIR 69	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 708	06/03/1995	P-11031070	100.00	0.53	1.59	0.00	1.59
125	04009527X01	PRECAUCION Nº 3	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	21/06/1951	P-02007793	1.00	1.00	3.00	0.00	3.00
126	04007684X01	PRECAUCION NUMERO UNO	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	27/07/1927	P-02003966	2.00	2.00	5.99	0.00	5.99
127	04005802X01	PURISIMA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	09/04/1917	P-02003977	16.00	15.98	47.94	0.00	47.94
128	04009078X01	RICARDO	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	13/11/1946	P-02003973	8.00	7.99	23.97	0.00	23.97
129	04010305X01	ROBERTO	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	16/05/1956	P-02015851	0.08	0.08	0.25	0.00	0.25

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
130	04007283X02	SANTA CESILIA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	01/03/1924	P-02003975	4.00	3.99	11.98	0.00	11.98
131	04005401X01	SEGUNDA DOCENA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	26/07/1915	P-02009700	4.00	3.99	11.98	0.00	11.98
132	04005373X01	SIDNEY	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	27/05/1915	P-02010170	6.00	5.99	17.98	0.00	17.98
133	04005368X01	SOCAVON CHERCHERE	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	27/05/1915	P-02010174	8.00	7.99	23.97	0.00	23.97
134	04009244X01	SOL DE PLATA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	25/10/1948	P-02010167	18.00	17.98	53.93	0.00	53.93
135	04005402X01	TERCERA DOCENA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	26/07/1915	P-02010169	6.00	5.99	17.98	0.00	17.98
136	04005350X01	TIGER	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	03/05/1915	P-02005063	30.00	29.96	89.88	0.00	89.88
137	04007290X01	TRES MOSQUETEROS	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	05/05/1924	P-02010188	16.00	15.98	47.94	0.00	47.94
138	04008217X01	VASCONIA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	07/12/1907	P-20000406	2.00	2.00	5.99	0.00	5.99
139	04004780X01	VIOLETA SEGUNDA	NEXA RESOURCES ATACOCHA S.A.A.	D.M. Titulado D.L. 109	27/01/1913	P-02007634	12.00	11.98	35.95	0.00	35.95

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
140	04005427X01	AZTEC	NEXA RESOURCES PERU S.A.A. - Assigned to Nexa Resources Atacocha	D.M. Titulado D.L. 109	11/10/1915	P-02004921	2.00	2.00	5.99	0.00	5.99
141	04005428X01	CROW	NEXA RESOURCES PERU S.A.A. - Assigned to Nexa Resources Atacocha	D.M. Titulado D.L. 109	11/10/1915	P-02006258	17.55	15.58	46.75	0.00	46.75
142	04005460X01	CURIE	NEXA RESOURCES PERU S.A.A. - Assigned to Nexa Resources Atacocha	D.M. Titulado D.L. 109	07/12/1915	P-02007248	1.13	1.14	3.42	0.00	3.42
143	04005366X01	LA FLOR DE ATACOCHA	NEXA RESOURCES PERU S.A.A. - Assigned to Nexa Resources Atacocha	D.M. Titulado D.L. 109	27/05/1915	P-02004495	6.00	5.99	17.98	0.00	17.98
144	04012661X01	PORVENIR 29	NEXA RESOURCES PERU S.A.A. - Assigned to Nexa Resources Atacocha	D.M. Titulado D.L. 109	22/10/1979	P-20000337	9.00	9.53	28.60	0.00	28.60
145	04012666X01	PORVENIR 34	NEXA RESOURCES PERU S.A.A. - Assigned to Nexa Resources Atacocha	D.M. Titulado D.L. 109	22/10/1979	P-20000357	8.00	7.99	23.96	0.00	23.96
146	04009221X01	PORVENIR CUATRO	NEXA RESOURCES PERU S.A.A. - Assigned to Nexa Resources Atacocha	D.M. Titulado D.L. 109	16/08/1948	P-02006696	24.00	23.97	71.91	0.00	71.91
147	010125694A	PORVENIR 64A	NEXA RESOURCES EL PORVENIR S.A.C. - Assigned to	D.M. Titulado D.L. 708	10/03/1994	P-11199132	500.00	157.43	472.30	3,829.16	4,301.46

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	Available Area (ha)	2023 Annual Fee (US$)	2023 Annual Penalty (US$)	2023 Total Payment (US$)
			Nexa Resources Atacocha								
Totals							**4,877.38**	**2,872.47**	**8,617.43**	**3,829.16**	**12,446.59**

Note: Exchange rate: 3.782 Peruvian Nuevo Sol per US$

Table 3-4: Atacocha Beneficiation Concession

No.	Concession Code	Concession Name	Title Holder	Status	Date	Public Registry Record	Granted Area (ha)	2023 Annual Fee (Peruvian Nueva Sol)	2023 Total Payment (US$)
1	P0100471	CHICRIN Nº 2	NEXA RESOURCES ATACOCHA S.A.A.	Planta de Beneficio	8/05/1970	P-02016586	413.2300	14,058.00	3,716.58
Totals								**14,058.00**	**3,716.58**

Note: Exchange rate: 3.782 Peruvian Nuevo Sol per US$

Figure 3-2: El Porvenir Mineral Rights

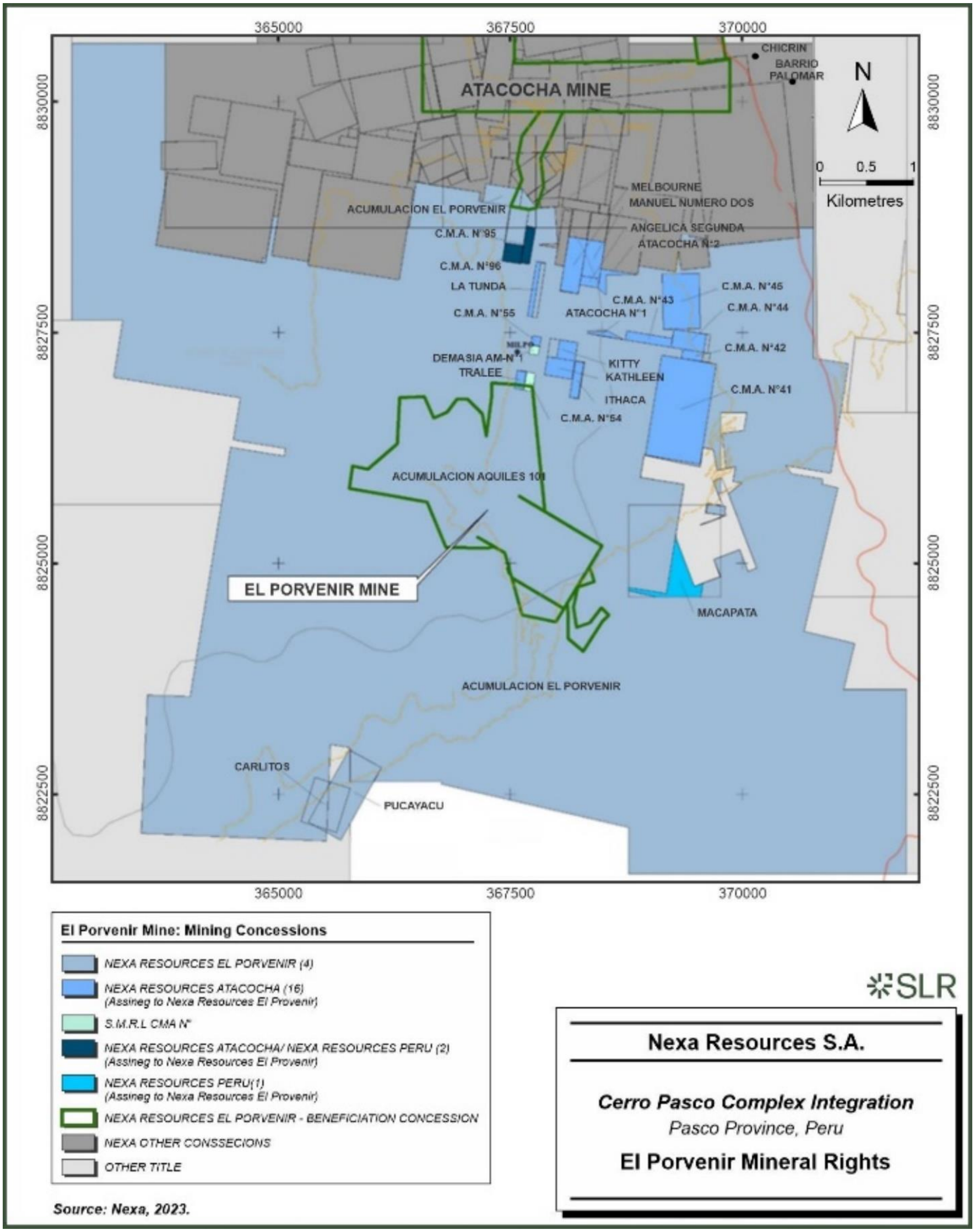
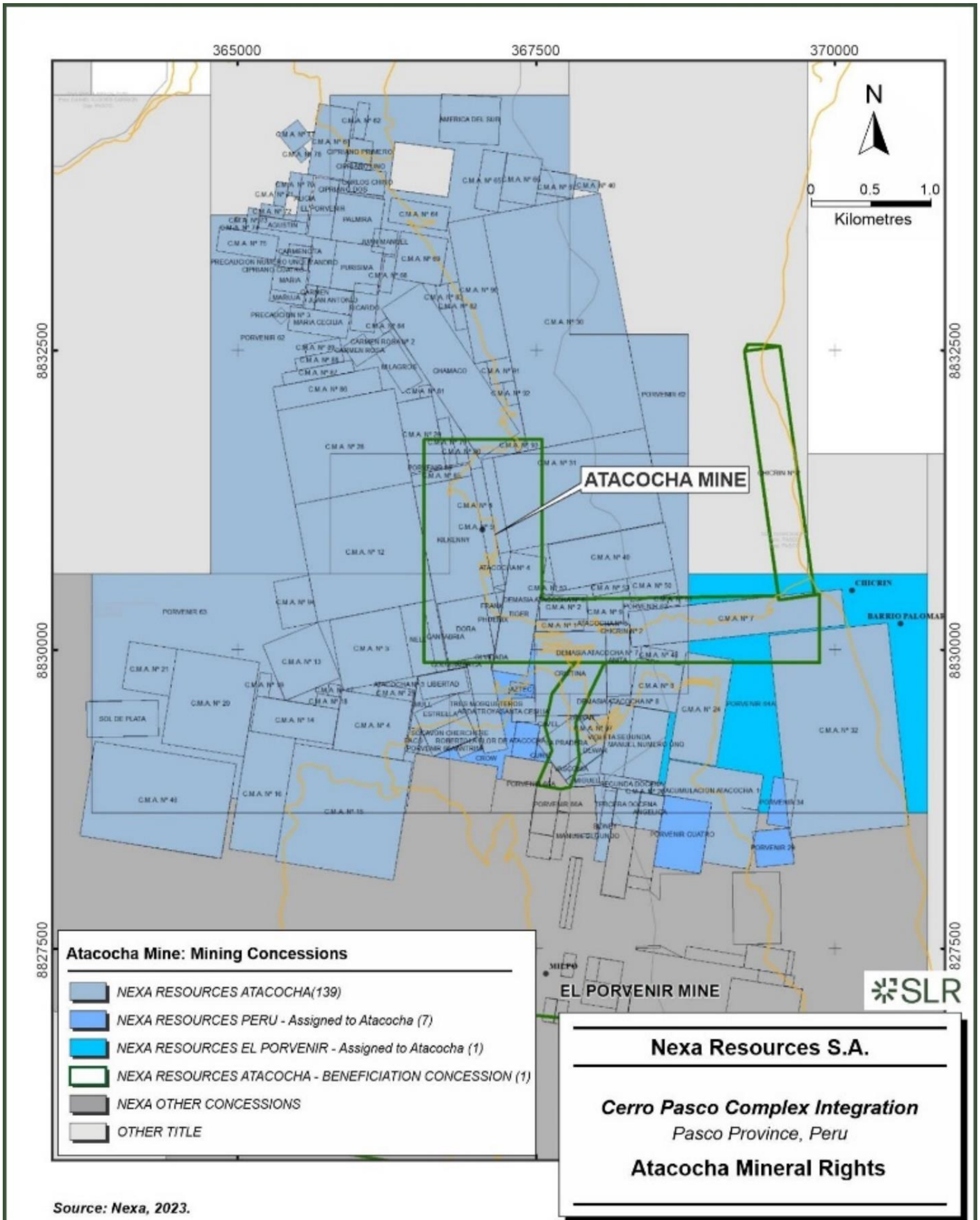


Figure 3-3: Atacocha Mineral Rights



Source: Nexa, 2023.

3.4 Annual Fees

3.4.1 Fees

For El Porvenir, all annual fees applicable to the mineral concessions and beneficiation concessions have been paid in full as of the effective date of the report. These totalled US$14,540.07 and US$4,803.41, respectively, in 2023 (Table 3-1 and Table 3-2).

For Atacocha, all annual fees applicable to the mineral concessions and beneficiation concessions have been paid in full as of the effective date of the report. These totalled US$8,617.43 and US$3,716.58, respectively, in 2023 (Table 3-3 and Table 3-4).

3.4.2 Penalties

Some of the mineral concessions have been subject to penalties, payable to INGEMMET of the Peruvian Government, since the minimum required levels of production or exploration expenditures were not met. The minimum annual production is equal to a UIT per granted hectare. The minimum annual investment is the penalty to be paid multiplied by 10.

All penalties applicable to the El Porvenir mineral concessions comprising the mine have been paid as indicated in Table 3-1. The penalties on concessions included in UEA El Porvenir (Nos. 1 through 5 in Table 3-1) are not due because the Minimum Annual Production Target was met for these concessions. The payment of 2023 penalties for the remaining concessions was US$4,215.97.

All penalties applicable to the Atacocha mineral concessions comprising the mine have been paid as indicated in Table 3-3. The penalties on concessions included in the UEA Atacocha (Nos. 1 through 146 in Table 3-3) are not due because the Minimum Annual Production Target was met for these concessions. The payment of 2023 penalties for the remaining concessions was US$3,829.16.

The penalty amounts shown for these concessions represent the annual amounts that would be payable if the Minimum Annual Production Target was not met.

3.4.3 Recorded Liens and Encumbrances

Pursuant to the information gathered from the Public Registry, there are the following encumbrances:

- Assignment agreement (2006). Concessions assigned to Nexa El Porvenir and Nexa Atacocha as listed in Table 3-1 and Table 3-3.

3.4.4 Royalties

According to an agreement signed on July 14, 2010, the portions of El Porvenir listed in Table 3-5 are subject to royalty payments to Moraima Zevallos and others. These are calculated according to 1.5% NSR of the mineral value of the produced ore:

Table 3-5: El Porvenir Royalties Payable to Moraima Zevallos and Others

Vertice	East	North
A	370,079.14	8,826,116.63
B	370,232.12	8,826,235.63
C	370,261.09	8,826,416.07
D	370,608.06	8,826,360.35
E	370,354.60	8,824,781.89
F	369,762.67	8,824,876.94
G	369,806.62	8,825,150.60
H	369,993.94	8,825,222.05
I	369,922.72	8,825,408.77
J	370,202.79	8,825,515.59
K	370,293.61	8,825,277.49
L	370,386.97	8,825,313.10

Note: PSAD56 UTM Zone 18S (EPSG:24878)

According to a lease agreement signed on January 2, 2006, twenty of the El Porvenir mineral concessions are subject to royalty payments to Nexa Atacocha (Table 3-6), while seven of the Atacocha concessions are subject to royalty payments to Nexa Resources El Porvenir (Table 3-7). In each case, these are calculated according to the mineral value of the produced ore (Table 3-8).

Table 3-6: El Porvenir Concessions Subject to Atacocha Royalty Payments

No.	Concession Code	Concession Name	Title Holder	Public Registry Record
1	04010149X01	C.M.A. Nº 55	Payable to Nexa Resources Atacocha	P-02016190
2	04002731X01	KITTY	Payable to Nexa Resources Atacocha	P-02010298
3	04010070X01	ATACOCHA Nº 1	Payable to Nexa Resources Atacocha	P-20000404
4	04005441X01	ANGELICA SEGUNDA	Payable to Nexa Resources Atacocha	P-02005830
5	04010249X01	ATACOCHA Nº 2	Payable to Nexa Resources Atacocha	P-02014333
6	04010074X01	C.M.A. Nº 41	Payable to Nexa Resources Atacocha	P-02013928
7	04010073X01	C.M.A. Nº 42	Payable to Nexa Resources Atacocha	P-02013917
8	04010071X01	C.M.A. Nº 43	Payable to Nexa Resources Atacocha	P-02010565
9	04010072X01	C.M.A. Nº 44	Payable to Nexa Resources Atacocha	P-02013919
10	04010063X02	C.M.A. Nº 45	Payable to Nexa Resources Atacocha	P-02014009
11	04005426X01	ITHACA	Payable to Nexa Resources Atacocha	P-02010173
12	04002471X01	KATHLEEN	Payable to Nexa Resources Atacocha	P-02010553
13	04005356X01	LA TUNDA	Payable to Nexa Resources Atacocha	P-02010176
14	04005383X01	MANUEL NUMERO DOS	Payable to Nexa Resources Atacocha	P-02005462
15	04005372X01	MELBOURNE	Payable to Nexa Resources Atacocha	P-02010281
16	04005505X01	TRALEE	Payable to Nexa Resources Atacocha	P-02010297
17	04012874X01	C.M.A. Nº 95	50% Payable to Nexa Resources Atacocha	P-20000331
18	04012875X01	C.M.A. Nº 96	50% Payable to Nexa Resources Atacocha	P-20000332
19	04010148X01	C.M.A. Nº 54	Payable to S.M.R.L. CMA Nº 54 (accionariado: 50% Atacocha /50% El Porvenir)	P-11105479
20	04012134X01	DEMASIA AM-Nº 1	Payable to S.M.R.L. CMA Nº 54 (accionariado: 50% Atacocha /50% El Porvenir)	P-20001500

Table 3-7: Atacocha Concessions Subject to El Porvenir Royalty Payments

No.	Concession Code	Concession Name	Title Holder	Public Registry Record
1	04005427X01	AZTEC	Payable to Nexa Resources El Porvenir	P-02004921
2	04005428X01	CROW	Payable to Nexa Resources El Porvenir	P-02006258
3	04005460X01	CURIE	Payable to Nexa Resources El Porvenir	P-02007248
4	04005366X01	LA FLOR DE ATACOCHA	Payable to Nexa Resources El Porvenir	P-02004495
5	04012661X01	PORVENIR 29	Payable to Nexa Resources El Porvenir	P-20000337
6	04012666X01	PORVENIR 34	Payable to Nexa Resources El Porvenir	P-20000357
7	04009221X01	PORVENIR CUATRO	Payable to Nexa Resources El Porvenir	P-02006696

Table 3-8: Royalty Percentages

Royalty	Mineral Value
7%	Up to US$40/t
8%	US$40/t to US$50/t
10%	US$50/t to US$60/t
12%	US$60/t to US$70/t
13%	US$70/t to US$80/t
15%	US$80/t to US$100/t
18%	Above US$100/t

3.5 Surface Rights and Easements

According to the General Mining Law and related legislation, surface rights are independent of mineral rights.

The law requires that the holder of a Mining Concession reach either an agreement with the landowner before starting relevant mining activities (i.e., exploration, exploitation, etc.) or the completion of the administrative easement procedure, in accordance with the applicable regulation.

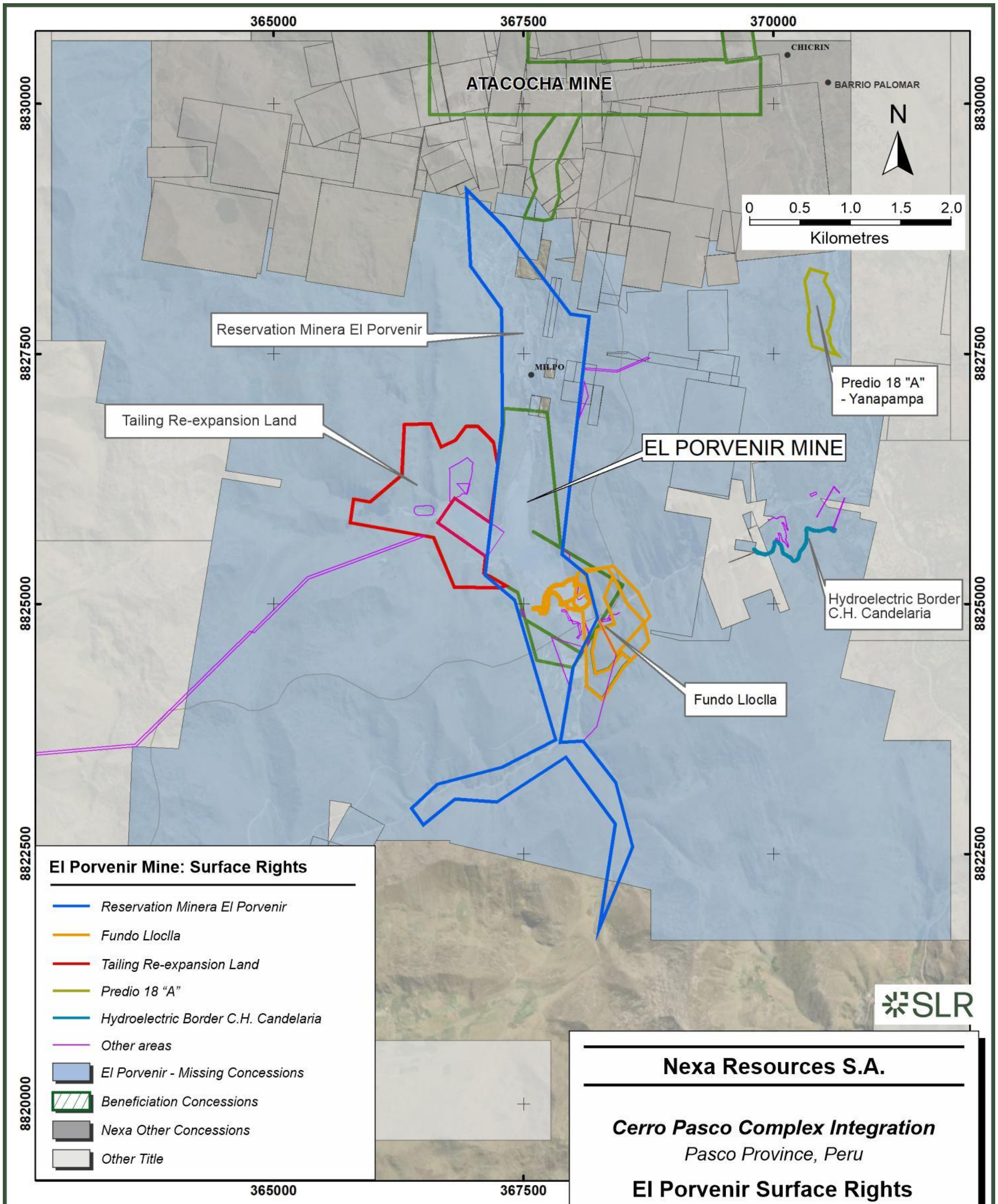
Surface property is acquired through the transfer of ownership by agreement of the parties (derivative title), or by acquisitive prescription of domain (original title).

Temporary rights to use and/or enjoy derived powers from a surface property right may be obtained through usufruct and easement rights.

The El Porvenir Mine has 30 related surface rights, with key rights shown in Figure 3-4.

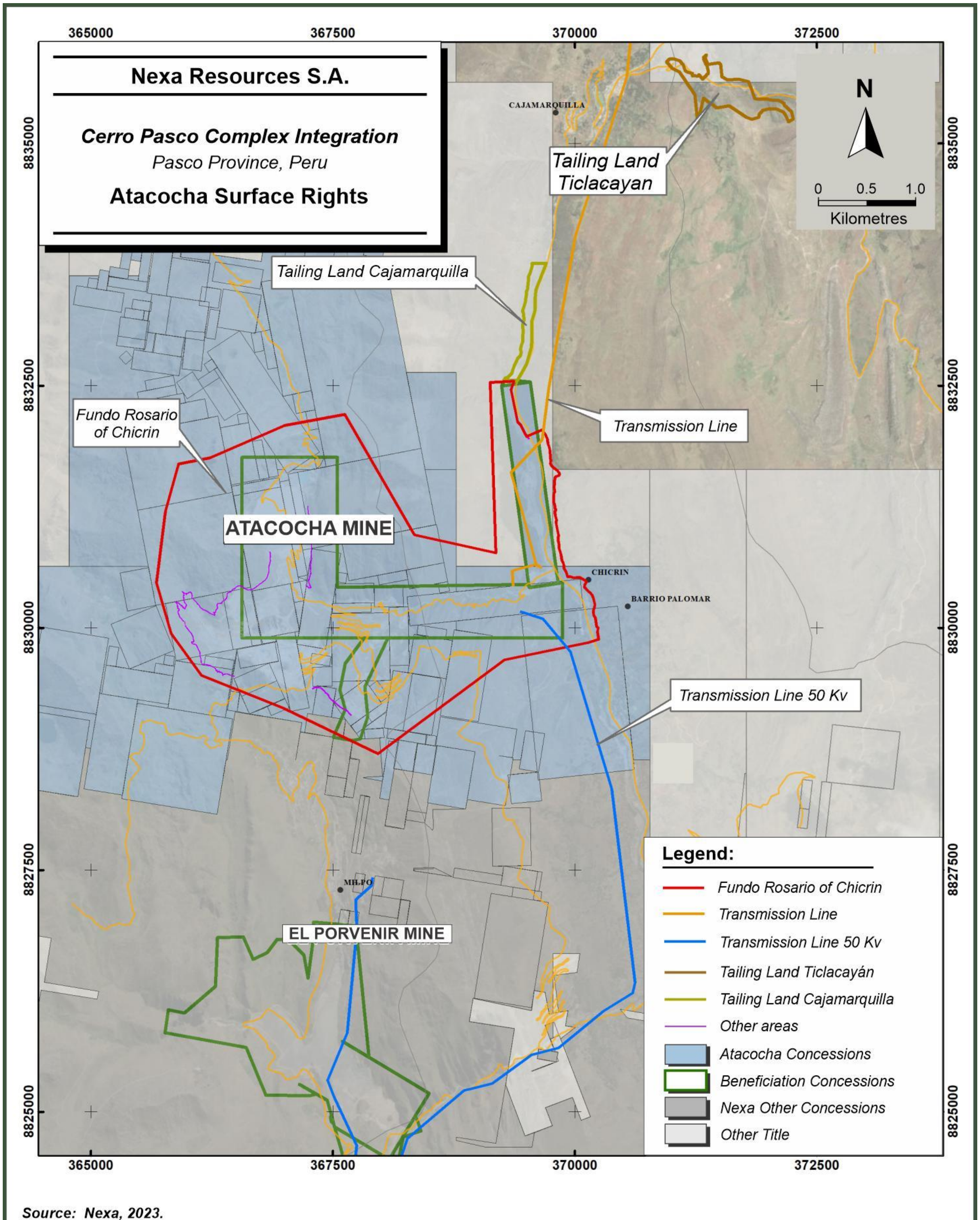
The Atacocha Mine has 18 related surface rights, with key rights shown in Figure 3-5.

Figure 3-4: El Porvenir Surface Rights



Source: Nexa, 2023.

Figure 3-5: Atacocha Surface Rights



Source: Nexa, 2023.

3.6 Required Permits and Status

This subsection details the material Governmental Consents required to carry out the operation in compliance with applicable Peruvian laws and regulations. These material Governmental Consents correspond to those permits, licences, authorizations, etc., issued by the applicable governmental authorities, which entitle Nexa Peru to build the components and/or perform the activities that are critical and typical to a mining operation. These components/activities may include: (i) mining activities and related facilities; (ii) beneficiation plant and related activities; (iii) water supply; (iv) effluent discharge and related facilities; (v) use of explosives; and (vi) power supply.

As of December 31, 2023, Nexa El Porvenir and Nexa Atacocha have continued to be in total compliance with their environmental obligations and successfully obtained and/or renewed their main permits and authorizations.

The main consents for El Porvenir are tabulated in Table 3-9.

Table 3-9: El Porvenir Main Government Consents

No.	Government Consent	Resolution	Approval Date
Environmental Certification			
1	Adaptation and Environmental Management Program	Directorate Resolution No. 23-97-EM/DGM	17/01/1997
2	Modification of the Adaptation and Environmental Management Program – Candelaria Power Station	Directorate Resolution 28-1997-EM/DGM	23/01/1997
3	El Porvenir Environmental Impact Assessment	Directorate Resolution 379-2001-EM/DGAA	26/11/2001
4	First amendment to El Porvenir Environmental Impact Assessment (expansion of processing capacity to 5,500 tpd).	Directorate Resolution 271-2011-MEM/AAM	02/09/2011
5	Second amendment to El Porvenir Environmental Impact Assessment (expansion of processing capacity to 7,500 tpd).	Directorate Resolution 203-2012-MEM/AAM	25/06/2012
6	EIA for the power supply components (transmission power line).	Directorate Resolution 110-2013-MEM/AAM	17/04/2013
7	Technical Report to Directorate Resolution 110-2013- MEM/AAM (Optimized the design of the power transmission line).	Directorate Resolution 159-2014-MEM-DGAAM	02/04/2014
8	Technical Report to Directorate Resolution 203-2012- MEM/AAM (integrate the tailings disposals from the Atacocha Mine and the Operation).	Directorate Resolution 526-2014-MEM-DGAAM	20/10/2014
9	Second Technical Report to Directorate Resolution 110-2013-MEM/AAM (Optimized the design of the power transmission line).	Directorate Resolution 271-2015-MEM-DGAAM	09/07/2015

No.	Government Consent	Resolution	Approval Date
10	Technical Report for 9,000 tpd expansion	Directorate Resolution 319-2017-SENACE-DCA	24/10/2017
11	Technical Report for modifications of ancillary components	Directorate Resolution 058-2018-SENACE-PE/DEAR	13/12/2018
12	Technical Report for modification of the 9,000 tpd expansion and tailings pipe connection to Atacocha	Directorate Resolution 051-2020-SENACE-PE/DEAR	10/03/2020
13	Seventh Technical Report for modifications of ancillary components	Directorate Resolution 00036-2021-SENACE-PE/DEAR	04/03/2021
14	Eight Technical Report (Optimized the tailings pipe connection to Atacocha and other ancillary components)	Directorate Resolution	08/02/2024
Mine Closure Plan			
1	El Porvenir Mine Closure Plan.	Directorate Resolution 166-2009-MEM/AAM	17/60/2009
2	First Amendment to the Mine Closure Plan.	Directorate Resolution 286-2011-MEM/AAM	15/09/2011
3	Updated Mine Closure Plan	Directorate Resolution 034-2013-MEM/AAM	30/01/2013
4	Second Amendment to the Mine Closure Plan.	Directorate Resolution 277-2016-MEM-DGAAM	15/09/2016
5	Third Amendment to the Mine Closure Plan.	Directorate Resolution 034-2021-MINEM-DGAAM	20/02/2021
Beneficiation Plant and Tailing Storage Facilities			
1	Beneficiation Concession Title.	Directorate Resolution 1058-1965	31/12/1965
2	Authorization to operate the beneficiation plant with 2,000 tpd capacity.	Resolution 180-79- EM/DCFM	01/10/1979
3	Beneficiation Concession Titles “AQUILES 104” (tailings disposal over 18 ha).	Directorate Resolution 280-97-EM/DGM	12/08/1997
4	Beneficiation Concession Titles “AQUILES 103” (tailings disposal over 48 ha).	Directorate Resolution 281-97-EM/DGM	12/08/1997
5	Authorization to operate the beneficiation plant at 2,850 tpd.	S/N-99-EM-DGM/DPDM	03/03/1999
6	Authorization to operate the beneficiation plant at 4,000 tpd.	Auto Directorial 113-2004- MEM-DGM/DPM	08/03/2004
7	Authorization to operate the tailing deposit “El Porvenir” to a height of 4,043 MASL	Resolution 356-2010-MEM	07/04/2010

No.	Government Consent	Resolution	Approval Date
8	Authorization to operate the beneficiation plant at 4,700 tpd.	Resolution 206-2011- MEM-DGM/V	23/06/2011
9	Authorization to operate additional components for the beneficiation plant without extending the processing capacity.	Resolution 37-2012- MEM-DGM/V	18/01/2012
10	Authorization to operate the beneficiation plant at 5,600 tpd.	Resolution 235-2013- MEM-DGM/V	31/05/2013
11	Beneficiation concession “ACUMULACION AQUILES 101” (Accumulate beneficiations concessions “AQUILES 104” and “AQUIES 103”)	Directorate Resolution 178-2013-MEM/DGM	04/07/2013
12	Authorization to construct the tailing deposit “El Porvenir” to a height of 4,115 MASL	Resolution 429-2013-MEM-DGM/V	15/11/2013
13	Authorization to operate the tailings deposit “El Porvenir” at a height of 4,047 MASL and extend the area of such beneficiation concession to a total of 323.7932.	Resolution 612-2015- MEM/DGM	12/06/2015
14	Authorization to operate additional components that integrate the tailings disposal from Atacocha Mine and the Operation into the tailings deposit “El Porvenir”.	Resolution: 251-2015- MEM-DGM/V	19/06/2015
15	Authorization to operate the beneficiation plant at 6,70 tpd.	Resolution 597-2015- MEM-DGM/V	03/12/2015
16	Authorization to operate additional components for the beneficiation plant without extending the processing capacity.	Resolution 635-2015- MEM-DGM/V	12/12/2015
17	Authorization to operate the tailing deposit “El Porvenir” to a height of 4,048.5 MASL	Resolution 0499-2016-MEM-DGM/V	18/08/2016
18	Authorization to operate the tailing deposit “El Porvenir” to a height of 4,056 MASL	Resolution 828-2017-MEM-DGM/V	25/09/2017
19	Authorization to increase the tailing deposit “El Porvenir” to a height of 4,060 MASL	Resolution 0498-2019-MINEM-DGM/V	07/10/2017
20	Authorization to increase the tailing deposit “El Porvenir” to a height of 4,062 MASL	Resolution 0155-2022-MEM-DGM	26/04/2022
21	Authorization to increase the tailing deposit “El Porvenir” to a height of 4,064 MASL	Resolution 0278-2023-MINEM-DGM/V	25/05/2023
22	Approval of extension of the Beneficiation Concession area by 53.90 ha	Directorate Resolution	22
Water Abstraction, Transportation and Usage Facilities			

No.	Government Consent	Resolution	Approval Date
1	License to use surface water from the rivers “Lloclla”, “Yanacachi”, “Chuncana” and “Tulluraica” for energetic purposes.	Directorate Resolution 86-2016-ANA/AAAHUALLAGA	11/02/2016
2	Update to the Licence to use surface water from the ravines “Pucayacu - Huarmipuquio” and “Pucayacu - Carmen Chico” for mining purposes due to title holder name change	Directorate Resolution 322-2019-ANA/AAAHUALLAGA-ALA ALTO HUALLAGA	03/10/2019
Effluent Discharge to the Environmental			
1	Authorization to discharge treated industrial effluents to rivers “Huallaga” and “Lloclla”.	Directorate Resolution 192-2019-ANA-DGCRH	15/11/2019
Power Generation and Transmission Lines			
1	Authorization to generate electricity for 1936 kW in the hydroelectric plant “Candelaria”.	Ministerial Resolution 395-93-EM/DGE	31/12/1993
2	Authorization to auto-generate electricity in the thermoelectric plant “Milpo”.	Ministerial Resolution 394-93-EM/DGE	31/12/1993
3	Authorization to generate electricity for 3 187,50 kW in the hydroelectric plant “Candelaria”.	Supreme Resolution 541-98-EM/VME	03/11/1998
4	Power transmission concession for the 50 kV Power Transmission Line - Hydroelectric Plant “Candelaria” - S.E. N° 3 at El Porvenir Mine.	Supreme Resolution 75-2010-EM	25/11/2010
5	Approve the transfer of the power transmission concession to Nexa Resources El Porvenir	Supreme Resolution 004-2015-EM	06/03/2015
6	Power transmission concession for the 138 kV Power Transmission Line – Paragsha II - S.E. Milpo and 50 kV Power Transmission Line S.E. Milpo – V1C	Ministerial Resolution 361-2016-MEM/DM	31/08/2016
Use of Explosives			
1	Authorization to operate an underground magazine - Explosives	Management Resolution 01500-2023-SUCAMEC/GEPP	02/02/2024
2	Authorization to operate an underground magazine - Accessories	Management Resolution 01369-2023-SUCAMEC/GEPP	16/02/2024
3	Authorization to operate an underground magazine - Accessories	Management Resolution 01368-2023-SUCAMEC/GEPP	05/02/2024
4	Authorization to use and acquire explosives for UEA Milpo No. 1	Management Resolution 950-2023-SUCAMEC/GEPP	08/03/2024

The main consents for Atacocha are tabulated in Table 3-10.

Table 3-10: Atacocha Main Consents

No.	Government Consent	Resolution	Approval Date
Environmental Certification			
1	Adaptation and Environmental Management Program	Directorate Resolution No. 89-97-EM/DGM	06/03/1997
2	Environmental Impact Assessment – Tailing deposit Vaso Cajamarquilla	Directorate Resolution 234-2005-MEM/DGAAM	08/06/2005
3	Environmental Impact Assessment – Tailing deposit Vaso Atacocha	Directorate Resolution 361-2007 MEM/AAM	30/10/2007
4	First amendment to Atacocha Environmental Impact Assessment (Expansion of processing capacity to 5,000 tpd)	Directorate Resolution 284-2012 MEM/AAM	05/09/2012
5	Environmental Impact Assessment for the transmission power line 50 kV S.E. El Porvenir – S.E. Nueva Chicrín	Directorate Resolution 347-2013 MEM AAM	13/09/2013
6	Technical Report (Optimized open-pit mining exploitation)	Directorate Resolution 170-2014 MEM-DGAAM	10/04/2014
7	Second Technical Report (Tailings disposal modification)	Directorate Resolution 527-2014-MEM-DGAAM	20/10/2014
8	Detailed Technical Memorandum	Directorate Resolution 243-2016-MEM-DGAAM	11/08/2016
9	Second amendment to Atacocha Environmental Impact Assessment	Directorate Resolution 119-2018 SENACE-JEF/DEAR	21/08/2018
10	Second Technical Report to integrate the tailings disposals from Atacocha Mine into the tailings deposit El Porvenir	Directorate Resolution 00028-2020-SENACE-PE/DEAR	10/02/2020
11	Third Technical Report for modifications of ancillary components	Directorate Resolution 0092-2021-SENACE-PE/DEAR	21/06/2021
Mine Closure Plan			
1	Atacocha Mine Closure Plan.	Directorate Resolution 198-2009-MEM/AAM	08/07/2009
2	First Amendment to the Mine Closure Plan.	Directorate Resolution 139-2012-MEM/AAM	03/05/2012
3	Updated Mine Closure Plan	Directorate Resolution 387-2012-MEM/AAM	22/11/2012
4	Second Amendment to the Mine Closure Plan.	Directorate Resolution 098-2016-MEM-DGAAM	04/04/2016
5	Third Amendment to the Mine Closure Plan.	Directorate Resolution	09/10/2020

No.	Government Consent	Resolution	Approval Date
		136-2020-MEM-DGAAM	
6	Fourth Amendment to the Mine Closure Plan.	Directorate Resolution 0278-2022-MINEM-DGAAM	29/09/2022
Beneficiation Plant and Tailing Storage Facilities			
1	Beneficiation Concession Title	Resolution 192-74-DGM/DC	02/10/1974
2	Authorization to operate the beneficiation plant at 3,500 tpd.	Resolution 400-2000-EM-DGM/DPDM	28/11/2000
3	Authorization to construct the tailing deposit “Vaso Atacocha”	Resolution 1139-2007-MEM-DGM/V	15/11/2007
4	Authorization to construct the tailing deposit “Vaso Atacocha” to a height of 4,081 MASL	Resolution 001-2008-MEM-DGM/V	04/01/2008
5	Authorization to operate the tailing deposit “Vaso Atacocha” and extend the area of such beneficiation concession	Resolution 892-2008-MEM-DGM	21/02/2008
6	Authorization to construct the tailing deposit “Vaso Atacocha” to a height of 4,081 MASL (Second Stage)	Resolution 689-2008-MEM-DGM/V	18/11/2008
7	Authorization to operate the tailing deposit “Vaso Atacocha” to a height of 4,081 MASL (Second Stage)	Resolution 860-2009-MEM-DGM/V	03/11/2009
8	Authorization to construct the tailing deposit “Vaso Atacocha” to a height of 4,093 MASL	Resolution 996-2009-MEM-DGM/V	23/12/2009
9	Authorization to operate the beneficiation plant at 4,380 tpd	Resolution 411-2010-MEM-DGM/V	08/11/2010
10	Authorization to operate the tailing deposit “Vaso Atacocha” to a height of 4,090.50 MASL	Resolution 021-2011- MEM-DGM/V	18/01/2011
11	Authorization to operate additional components for the beneficiation plant without extending the processing capacity	Resolution 191-2011-MEM-DGM/V	24/06/2011
12	Authorization to construct the tailing deposit “Vaso Atacocha” to a height of 4,097 MASL	Resolution 266-2011-MEM-DGM/V	02/08/2011
13	Authorization to operate additional components for the beneficiation plant without extending the processing capacity	Resolution 326-2011-MEM-DGM/V	25/08/2011
14	Authorization to operate the tailing deposit “Vaso Atacocha” to a height of 4,097 MASL	Resolution 063-2012-MEM-DGM/V	21/02/2012
15	Authorization to construct the tailing deposit “Vaso Atacocha” to a height of 4,105 MASL	Resolution 092-2012-MEM-DGM/V	15/03/2012

No.	Government Consent	Resolution	Approval Date
16	Authorization to operate additional components for the beneficiation plant without extending the processing capacity	Resolution 137-2013- MEM-DGM/V	25/03/2013
17	Authorization to operate additional components for the beneficiation plant without extending the processing capacity	Resolution 207-2013- MEM-DGM/V	10/05/2013
18	Authorization to construct the tailing deposit "Vaso Atacocha" to a height of 4,105 MASL	Resolution 263-2013-MEM-DGM/V	31/05/2013
19	Authorization to operate additional components for the beneficiation plant without extending the processing capacity	Resolution 137-2013-MEM-DGM-V	25/03/2013
20	Authorization to operate additional components for the beneficiation plant without extending the processing capacity	Resolution 207-2013-MEM-DGM-V	10/05/2013
21	Authorization to operate the tailing deposit "Vaso Atacocha" to a height of 4,105 MASL	Resolution 236-2013-MEM-DGM-V	31/05/2013
22	Authorization to construct the tailing deposit "Vaso Atacocha" to a height of 4,128 MASL	Resolution 375-2013-MEM-DGM-V	19/09/2013
23	Authorization to construct components that integrate the tailings disposals from Atacocha Mine into the tailings deposit "El Porvenir".	Resolution 594-2014-MEM-DGM-V	31/12/2014
24	Authorization to operate components that integrate the tailings disposals from Atacocha Mine into the tailings deposit "El Porvenir".	Resolution 267-2015-MEM-DGM-V	03/07/2015
25	Authorization to construct the beneficiation plant at 5,000 tpd	120-2016-MEM-DGM-V	04/04/2016
26	Authorization to operate the beneficiation plant at 4,600 tpd	754-2016-MEM-DGM-V	22/11/2016
27	Authorization to construct the tailing deposit "Vaso Atacocha" to a height of 4,110 MASL	0210-2016-MEM-DGM/V	04/05/2016
28	Authorization to operate the beneficiation plant at 4,600 tpd (Part I) and additional components	0754-2016-MEM-DGM/V	22/11/2016
29	Authorization to operate "Glory Hole"	1158-2017-MEM-DGM/V	18/12/2017
30	Authorization to construct the tailing deposit "Vaso Atacocha" to a height of 4,110 MASL in four stages.	00064-2018-MEM-DGM/V	01/02/2019
31	Authorization to operate the tailing deposit "Vaso Atacocha" to a height of 4,110 MASL	0249-2019-MEM-DGM/V	23/05/2019
32	Authorization to construct the tailing deposit "Vaso Atacocha" to a height of 4,128 MASL in four stages.	238-2020-MEM-DGM/V	08/09/2020
33	Authorization to operate the tailing deposit "Vaso Atacocha" to a height of 4,126 MASL	0437-2021-MINEM-DGM/V	15/11/2021

No.	Government Consent	Resolution	Approval Date
Water Abstraction, Transportation and Usage Facilities			
1	Licence to use surface water from the “Atoghuarco” stream for domestic purposes	Administrative Resolution 082-2006-AG-DRA-P/ATDRP	02/02/2006
2	Licence to use surface water from the “Huallpaguaja” ravine for domestic purposes	Administrative Resolution 012-2006-AG-DRA-P/ATDRP	03/04/2006
3	License to use surface water from “Centro de Explotación Minera” and “Ñahualpum” Lake for domestic purposes	Administrative Resolution 021-99-CTARP-DRA/INRENA-ATDRP	12/03/1999
4	Licence to use surface water for mining purposes – Don Paco Tunnel	Administrative Resolution 519-2019-ANA-AAA HUALLAGA	01/07/2019
5	Licence to use surface water for mining purposes – Huallaga River and Ñahualpum Lake	Directorate Resolution 470-2019-ANA/AAA-HUALLAGA	03/09/2019
6	Licence to use surface water for energetic purposes – Huallaga River	Administrative Resolution 019-99-CTARP-DRA/INRENA/ATDRP	12/03/1999
7	Licence to use surface water for energetic purposes – Huallaga River (Marcopampa Sector)	Directorate Resolution 522-2019-ANA/AAA-HUALLAGA	02/10/2019
Effluent Discharge to the Environmental			
1	Wastewater Discharge Permit – Domestic Effluents	Directorate Resolution 303-2016-ANA-DGCRH	30/12/2016
2	Industrial Wastewater Discharge Permit – Industrial Effluents	Directorate Resolution 179-2019-ANA-DGCRH	14/10/2019
Power Generation and Transmission Lines			
1	Hydroelectric Power concession for hydroelectric power plant “Marcopampa”	Supreme Resolution 66	07/11/1956
2	Hydroelectric Power concession for hydroelectric power plant “Chaprín”	Supreme Resolution 67	07/11/1956
3	Authorization to generate electricity in the hydroelectric power plant “Chaprín”.	Ministerial Resolution 313-94-EM/DGE	05/07/1994
4	Authorization to generate electricity for 1,936 kW in the hydroelectric plant “Marcopampa”.	Ministerial Resolution 014-95-EM/DGE	20/01/1995
5	Power transmission concession for the 50 kV Power	Supreme Resolution 016-96-EM	02/04/1996
	Transmission Line – S.E.Paragsha – S.E. Chicrín – C.H. Chaprín – S.E. Atacocha		

No.	Government Consent	Resolution	Approval Date
6	Authorization to extending the capacity - Transmission Line “S.E.Nueva Chicrín”	Ministerial Resolution 152-2008-MEM-DGM/V	05/02/2008
Use of Explosives			
1	Authorization to operate an underground magazine - Explosives	Management Resolution 1022-2022-SUCAMEC/GEPP	26/01/2024
2	Authorization to operate an underground magazine - Accessories	Management Resolution 2085-2023-SUCAMEC/GEPP	12/06/2023
3	Authorization to operate an underground magazine - Silos	Management Resolution 3036-2023-SUCAMEC/GEPP	21/08/2023
4	Authorization to use and acquire explosives for UEA Atacocha	Management Resolution 00897-2023-SUCAMEC/GEPP	06/03/2024

3.7 Other Significant Factors and Risks

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

4.0 Accessibility, Climate, Local Resources, Infrastructure and Physiography

4.1 Accessibility

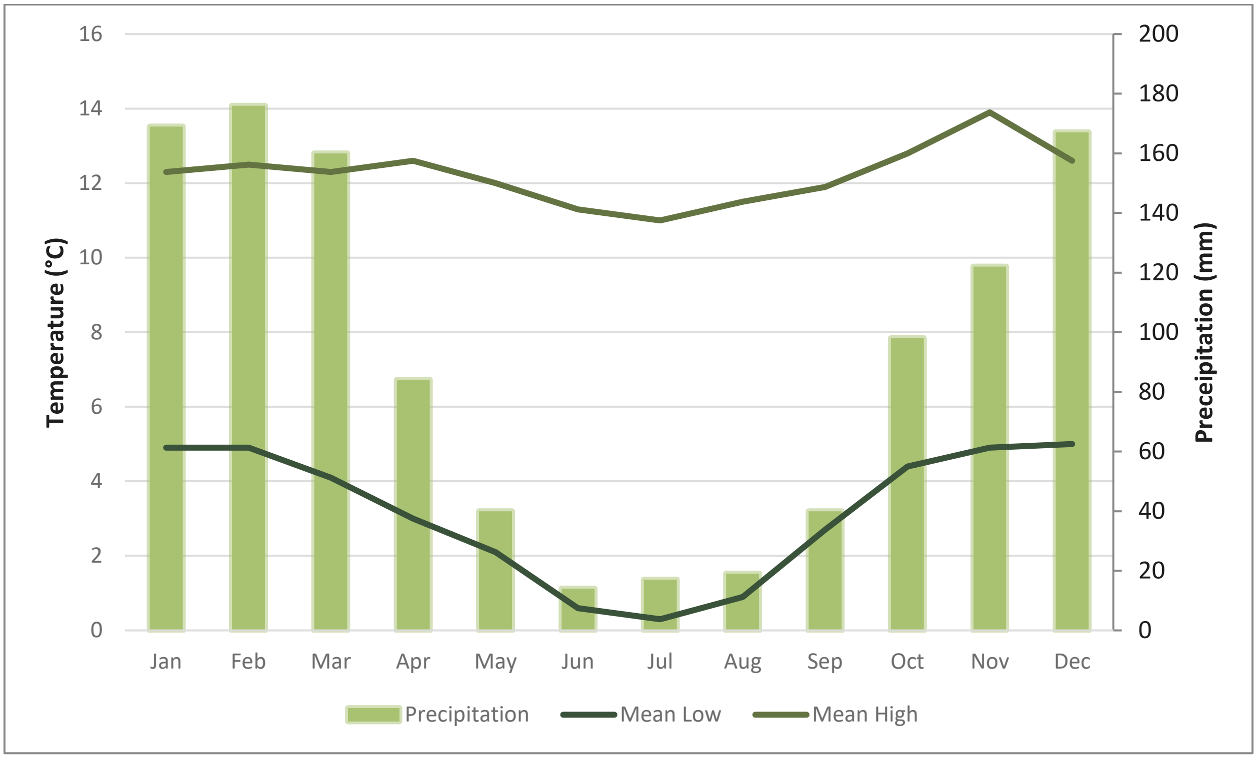
El Porvenir and Atacocha are located approximately 13 km and 16 km northeast of the city of Cerro de Pasco, respectively. Cerro de Pasco is situated approximately 315 km from Lima, the national capital, when travelling via the Carretera Central and La Oroya-Huanuco highways, which are paved roads. Alternatively, Highway 20A provides a shorter drive from Lima but is mostly unpaved.

The nearest airport to the Complex is Alférez FAP David Figueroa Fernandini Airport (HUU) which is located approximately 130 km to the north of the Complex, just outside of Huanuco. Two regional airlines provide daily flights between the airport and Lima. From the city of Huánuco access is via the Carretera Central highway to the town of Chicrin (at km 324). From the town of Chicrin, an approximately 4.5 km long unpaved road provides access to Atacocha. El Porvenir is accessed by the same unpaved road from Chicrin after approximately 15 km.

4.2 Climate

The climate at Cerro Pasco is cold and humid and is generally typical of the Central Andes Mountain Region, where elevations exceed 4,000 MASL. The area has an ET Köppen climate classification, corresponding to Polar Tundra (Weather-Atlas.com, 2024). The temperature is relatively uniform throughout the year, ranging from approximately 0°C to +14°C (Figure 4-1). Precipitation in the region totals approximately 1,100 mm annually, mainly falling during the rainy season from November to March; conversely the months of June to August are mostly dry. Snowfall occurs at any time of the year, most commonly at dawn. Relative humidity is uniform throughout the year averaging between 72% and 82%. Mining operations are not affected by the climate and are carried out year-round.

Figure 4-1: Mean Monthly Temperature Range and Mean Precipitation



Source: Weather-Atlas.com, 2024

4.3 Local Resources

Various services including temporary and permanent accommodations and medical services are available at the city of Cerro de Pasco, which has a population of approximately 60,000. A greater range of general services are available at Huánuco, which has a population of approximately 190,000. Most supplies used in the mining operation are delivered by truck from Lima.

Raw water is supplied from various creeks. Fresh water is obtained from the Carmen Chico River.

4.4 Infrastructure

The Complex infrastructure consists of the following facilities:

- Power from the national power grid and the La Candelaria Hydroelectric Plant
- Tailings from Atacocha and Porvenir will be combined in the Atacocha TSF
- Atacocha and Porvenir mines to be connected underground allowing production from both mines to be delivered to the Porvenir concentrator for processing.
- El Porvenir:
  - Approximately 6,000 tpd underground mine

- A 6,500 tpd, 2.37 million tonnes per annum (Mtpa) processing plant with associated laboratory and maintenance facilities
- Access roads
- Offices and warehouses
- Accommodations
- Waste rock facilities
- Temporary ore stockpiles
- Hydraulic backfill plant
- Porvenir tailings storage facility

- Atacocha:
  - 2,740 tpd underground mine to be processed at the El Porvenir plant concentrator
  - 4,400 tpd San Gerardo open pit (including Satellite East and Satellite West open pits) to be processed at the Atacocha concentrator.
  - 4,400 tpd, 1.68 Mtpa, Atacocha processing plant with associated laboratory and maintenance facilities
  - Atacocha waste dump
  - Atacocha tailings storage facility
  - Temporary ore stockpile
  - Topsoil stockpile
  - Sediment pond
  - San Felipe and Chicrín camps
  - Closed waste dumps (3600, 3900, 4000)
  - Inactive tailings storage facilities in closure (Chicrín Antiguo, Chicrín Actual, Cajamarquilla, Titlacayán, Malauchaca)

Additional information on infrastructure is provided in Section 15.

4.5 Physiography

El Porvenir and Atacocha are located in a glacial valley with rugged mountains in the central highland of Perú, in the Western Cordillera. There are three geomorphological zones in the Complex area: the Puna surface, the Cordilleran Zone, and the Periglacial Valleys Zone. The elevation at El Porvenir is approximately 4,200 MASL. Atacocha is located at approximately 4,050 MASL. The Atacocha processing plant is located in the Huallaga River valley, surrounded by rugged hills/mountains, at an elevation of approximately 3,600 MASL. El Porvenir's TSF, processing plant, and other buildings are located at the valley's base. A creek running through the valley drains into the Huallaga River further downstream at the village of La Quinua. Topographical relief consists of deep, long, narrow valleys with steep slopes. Some rivers cross through the area and have moderate slopes and some scattered peaks. The main valley has a general inclination from south to north.

5.0 History

5.1 Ownership History

In 1936, Compañia Minera Atacocha S.A.A. (Minera Atacocha) was formed to explore, develop, and exploit Cu-Pb-Zn deposits in the Atacocha area, with the Atacocha Mine commencing operations that year. Early work focused on developing the San Ramon tunnel to exploit veins on the 4000 Level. A hydroelectric plant and the first processing plant were built in 1936. The Atacocha flotation plant in Chicrín was built in 1952, with construction of the 3600 Level to a length of 2,700 m completed in the same year, which allowed a new main level of access and transportation to underground work, while facilitating the extraction and transportation of the mineral to the new concentrate plant located in Chicrín.

El Porvenir Mine began operating as a small-scale artisanal mine in 1949, with Compañíá Minera Milpo S.A. (Milpo) incorporated the same year to operate it. Exploration was conducted simultaneously with underground development and included geological mapping, diamond core drilling, and channel sampling (SRK, 2017). No documentation on exploration is available prior to 2006.

Milpo conducted exploration and development work in Atacocha from 1949 onwards, with most exploration consisting of diamond drilling conducted simultaneously with underground development and channel sampling following drifting. Prior to 1997, only a small quantity of sporadic drilling was completed and no channel sampling was documented prior to 2001.

A gravity separation plant was built at El Porvenir in 1953, and a flotation plant was completed in 1979. The mine's output increased steadily over the decades, attaining its current production rate of approximately 5,600 tpd in 2014.

Milpo acquired the Atacocha Mine in 2008.

In 2010, Nexa, then VM Holding, gained control of Milpo and its assets, including El Porvenir and Atacocha. In 2014, VM Holding began integrating the El Porvenir and Atacocha operations, including administration infrastructure, the TSFs, the electrical power supply, and mineral processing. VM Holding changed its corporate name to Nexa Resources S.A. in 2017, accompanied by initial public offerings on the New York Stock Exchange and Toronto Stock Exchange.

El Porvenir's operations were interrupted from March 10, 2020 to May 15, 2020, due to the COVID-19 pandemic. Although the San Gerardo open pit remains operational, the Atacocha underground mine did not resume operations after the mandatory restriction period imposed by the Peruvian Government was lifted in June 2020.

5.2 Exploration and Development History

Table 5-1 summarizes the history of the Complex.

Table 5-1: History of Cerro Pasco Complex

Year	Work Description
1936	Atacocha Mine commences operation under Minera Atacocha Construction of a hydroelectric plant and the first processing plant.

Year	Work Description
1939	The El Porvenir site is granted June 30, 1939 through Resolución Jefatural N° 076-88-EM-DGM/JRMCP.
1949	El Porvenir began operating as a small-scale artisanal mine. Milpo was incorporated on April 6, 1949, by founders Mr. Aquiles Venegas, Mr. Amador Nycander, Mr. Ernesto Baertl, Mr. Manuel Montori, and Mr. Luis Cáceres P.
1952	Construction of the Atacocha flotation plant in Chicrín. Construction of the 3600 Level to a length of 2,700 m.
1953	Milpo built a gravity separation plant at El Porvenir, which had a capacity 54,000 t/month. The plant was expanded several times until 1978.
1979	Construction of the flotation plant at El Porvenir was completed, capacity 1,800 tpd.
1997	A new mineralized zone called Porvenir Nueve was discovered.
1999	Production at El Porvenir increased to 3,000 tpd.
2008	Milpo acquired the Atacocha Mine.
2010	VM Holding S.A. (now Nexa) gained control of Milpo and its assets, including El Porvenir.
2012	El Porvenir's production increased to 5,600 tpd.
2013	VM Holding S.A. initiated the process of integrating the Atacocha and El Porvenir mines, forming the Cerro Pasco Complex.
2014	The 1st stage integration was initiated, which consisted of integrating the administrative functions of the two operations.
2015	The 2nd stage integration was initiated, which consisted of integrating TSFs of Atacocha and El Porvenir.
2016	The 3rd stage integration was initiated, which consisted of integrating the electric power supply of the two mines.
2017	VM Holding S.A. changed its name to Nexa. The integration process continued: The two underground mines were connected by a drift allowing an exploration program to proceed in the integration area.
2018	Nexa implemented the Avoca version of the sub-level stoping (SLS) mining method at El Porvenir. Discovery of the Sara Deposit, in which the mineralization occurs in sandstone.
2019	The tailings dam level was increased to the 4,060 MASL elevation, which extended it useful life by an additional five years. The Avoca/SLS mining method contributed to 6% of El Porvenir's total production. Nexa initiated a program called the Nexa Way Experience (La Manera Nexa Experience) aiming to optimize organizational performance through autonomous work groups and employee self-management.
2020	The Nexa Way Experience program continued and, at El Porvenir, focused on lowering costs by reducing shotcrete consumption. El Porvenir's operations were halted from March 18 to May 15 due to the COVID-19 pandemic. Operations were reinitiated with the application procedures and sanitary controls to prevent the spread of the contagion. Operations at the Atacocha underground mine were not resumed following the mandatory restriction period from the Peruvian Government was lifted in June 2020.

5.3 Past Production

Past production at the El Porvenir Mine is summarized in Table 5-2. Past production at the Atacocha Mine is summarized in Table 5-3.

Table 5-2: El Porvenir Past Production

Year	Treated Ore Tonnage (t)	Average Ore Grade				
		Au (oz/t)	Ag (oz/t)	Pb (%)	Zn (%)	Cu (%)
2003	1,313,346	-	3.51	2.45	7.69	-
2004	1,342,451	-	2.21	1.41	7.61	-
2005	1,395,991	-	2.44	1.64	6.87	-
2006	1,390,940	-	2.51	1.68	6.1	-
2007	1,333,313	-	1.9	1.19	5.31	-
2008	1,389,947	-	1.6	0.88	4.23	-
2009	1,712,188	-	1.3	0.68	4.07	-
2010	1,712,188	-	1.23	0.6	4.04	-
2011	1,742,129	-	1.23	0.54	4	-
2012	1,898,901	-	1.13	0.48	4.04	-
2013	1,943,490	-	1.37	0.82	3.48	-
2014	2,107,212	-	1.49	0.88	3.39	-
2015	2,106,519	0.02	1.75	0.93	3.21	0.17
2016	2,154,152	0.01	1.94	0.98	3.22	0.14
2017	1,834,511	0.02	2.05	1.04	2.86	0.13
2018	2,149,928	0.01	1.92	0.98	3.04	0.15
2019	2,120,765	0.02	2.08	1.01	2.92	0.15
2020	1,502,618	0.01	2	0.93	2.65	0.17
2021	2,077,591	0.01	2.1	1.08	2.83	0.19
2022	2,111,961	0.01	2.46	1.34	2.8	0.16
2023	2,220,011	0.01	2.34	1.37	2.86	0.16

Table 5-3: Atacocha Past Production

Year	Treated Ore Tonnage (t)	Average Ore Grade				
		Au (oz/t)	Ag (oz/t)	Pb (%)	Zn (%)	Cu (%)
2003	1,211,200	0.02	4.58	3.53	5.79	0.33
2004	1,237,184	0.01	4.76	3.25	5.24	0.32
2005	1,241,967	0.01	4.57	3.45	5.00	0.31
2006	1,264,387	0.01	2.57	1.66	4.96	0.27
2007	1,304,279	0.01	2.15	1.19	4.77	0.35
2008	1,260,388	0.01	1.60	0.98	5.14	0.27
2009	1,424,995	0.01	1.2	0.72	4.7	0.26
2010	1,537,390	0.01	1.24	0.72	4.26	0.24
2011	1,540,647	0.01	1.39	0.73	3.37	0.27
2012	1,455,482	0.01	1.27	0.76	3.43	0.22
2013	1,480,429	0.01	1.4	0.79	3.34	0.24
2014	1,540,713	0.01	1.48	0.89	2.74	0.2
2015	1,431,315	0.01	1.54	1.1	2.4	0.16
2016	1,487,390	0.02	1.73	1.31	1.8	0.11
2017	1,506,830	0.02	1.43	1.22	1.42	0.09
2018	1,551,470	0.02	1.42	1.18	1.43	0.1
2019	1,505,428	0.01	1.52	1.3	1.43	0.08
2020	1,065,363	0.01	1.39	1.15	1.2	0.05
2021	1,271,107	0.01	1.01	0.82	0.88	0.03
2022	1,353,681	0.01	1.05	0.97	0.89	0.03
2023	1,397,192	0.01	1.21	0.93	0.77	0.04

6.0 Geological Setting, Mineralization, and Deposit

This section is largely based upon geological descriptions within Nexa internal El Porvenir and Atacocha reports (Nexa, 2023a and Nexa, 2023b).

6.1 Regional Geology

The South American Platform is mainly composed of metamorphic and igneous complexes from the Archean/Proterozoic era and constitutes the continental interior of South America. The Platform was consolidated during late Proterozoic to early Paleozoic times in the Brasilian/Pan-African orogenic cycle during which the union of different continents and micro-continents with the closure of several ocean basins led to the formation of the supercontinent Gondwana. Archaean and Proterozoic rocks are exposed in three main shield areas within the framework of the Neoproterozoic folding strips (Guiana, Central Brazil, and Atlantic Shields). The western continental margin of the South American Plate developed from approximately Neoproterozoic to early Paleozoic times and constitutes a convergent margin, along which the eastward subduction of the Pacific oceanic plates takes place under the South American plate. Through this process, the Andean Range was developed. The eastern margin of the South American Plate forms a divergent margin more than 10,000 km long, which developed as a result of the separation of the South American Plate and the African Plate from the Mesozoic through the opening of the South Atlantic and the rupture of Gondwana. The northern and southern margins of the South American Plate developed along transform faults in transient tectonic regimes due to the collision of the South American Plate with the Caribbean and Scottish plates. The South American Plate reveals a long and complex geological history (Engler, 2009).

Most of the stratigraphy, tectonics, magmatism, volcanism, and mineralization in Peru is spatially and genetically related to the evolution of the Andean Cordillera off the western coast of South America. The mountain range was formed by actions related to important events (for example subduction) that have continued to the present since approximately the Cambrian (Peterson, 1999) or the late Precambrian (Clark et al., 1990; Benavides-Cáceres, 1999). The formation of the Andean Cordillera is, however, the result of a narrower period extending from the Triassic to the present when the division of the African and South American continents formed the Atlantic Ocean. Two periods of this subsequent subduction activity have been identified (Benavides-Cáceres, 1999): Mariana-type subduction from the late Triassic to the late Cretaceous; and Andean-type subduction from the late Cretaceous to the present.

The geology of Peru, from the Peru-Chile trench in the Pacific to the Brazilian Shield, is defined as three main parallel regions, from west to east: the Andean Antearco, the high Andes, and the Andean Antepaís Basin. All three regions were formed during the Meso-Cenozoic evolution of the central Andes. The property is located within the high Andes region. A simplified geological and structural map of Peru is shown in Figure 6-1.

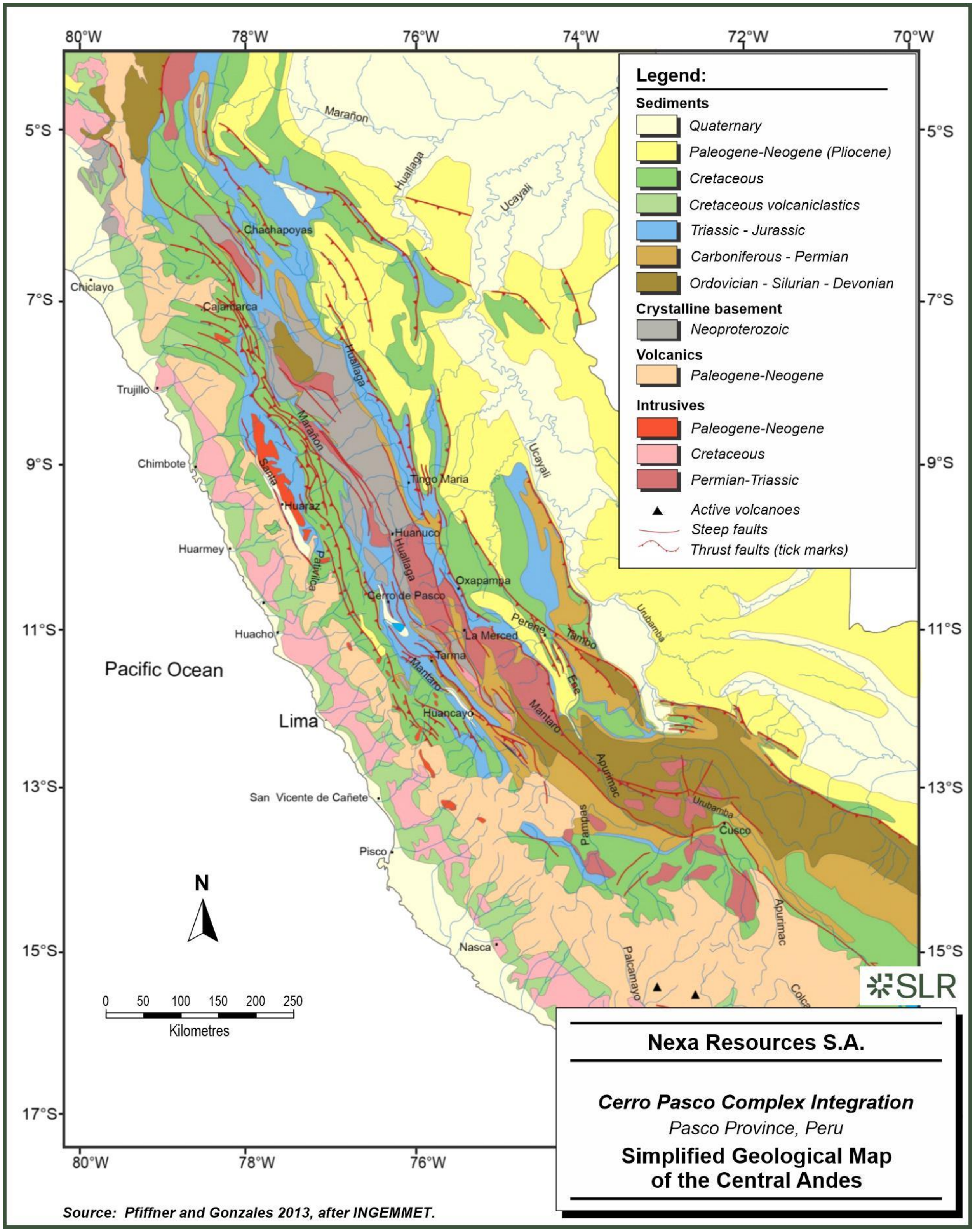
The Andes can be divided into three sections, from west to east:

- The Western Cordillera is formed by rocks of the Mesozoic-Tertiary age, dominated by the coastal batholith, which consists of multiple intrusions with ages ranging from the Lower Jurassic to the Upper Eocene. The belt is up to 65 km wide and 1,600 km long and extends in a sub-parallel direction from the Pacific coast to Ecuador and Chile. El Porvenir is located within the Western Cordillera.
- The Altiplano is a high plain with internal drainage located at an average elevation of almost 4,000 m, slightly below the average altitudes of the Western and Eastern

Cordillera. It is 150 km wide and 1,500 km long, stretching from the north of Argentina to the south of Peru.

- The Eastern Cordillera forms a plateau 4,000 m high and 150 km wide. During the Cenozoic era, the arch has risen forming the Eastern Cordillera. Stratigraphically, the zone of the high Andes is composed, from west to east, of an intra-arch channel, a deep basin, a continental shelf, and the Marañón metamorphic complex (the Marañón complex). In general, the formations are progressively older from west to east, spanning from the mid-Tertiary to the Neoproterozoic-Paleozoic.

Figure 6-1: Simplified Geological Map of the Central Andes



Source: Pfiffner and Gonzales 2013, after INGEMMET.

6.2 Local Geology

The Complex is situated in the Pasco region of the Western Cordillera of the Andes, within the Eocene-Miocene Polymetallic and Miocene Au-Ag Epithermal Belts.

6.2.1 Stratigraphy

The oldest rocks in the region are part of the Excelsior Formation (Devonian), comprising metamorphosed siliciclastic sediments or phyllite and quartzite.

The Upper Permian-Middle Triassic Mitu Group comprises clastic and volcanic sediments, including red sandstone, shale, and minor conglomerate. At the base of the Mitu Group there is a polymictic conglomerate unit which is approximately 45 m thick. Conglomerate clasts are sub-angular, comprising shale, phyllite, quartzite, and minor limestone. The conglomerate matrix is a well cemented, fine grained, reddish sandy material. Thin, grey to reddish siltstone layers are also present, and exhibit laminar stratification. The middle part of the Mitu Group comprises sequences of fine grained, reddish sandstone, with cross-stratification and interbedded with polymictic conglomerate layers. The Mitu Group was deposited during the Late Hercynian Tectonic Phase (based on the fossil record, and radiometric age dating). An angular unconformity exists between the underlying Excelsior Formation and overlying Mitu Group. The sediment package has accumulated with increasing thickness to the east, locally up to approximately 2,000 m, thinning to possibly as little as 100 m thickness in areas.

The Norian-Toarcian Pucará Group was deposited in the Pucará Basin, a north-northwest trending trough associated with a transtensional shear zone accommodating rifting and sinistral movement, on the Mitu Group with an erosional and angular unconformity. The Pucará Group is dominated by carbonate platform sequences which were primarily deposited in a shallow water environment during the first marine progression of the Andean Orogenic Cycle from the Upper Triassic to Lower Jurassic. The Pucará comprises interbedded grey to black limestone, dolostone, and shale with varying thicknesses of up to 60 cm, and is sub-divided into three formations: Chambará, Aramachay, and Condorsinga (Mégard, 1968).

The Norian to Rhaetian Chambará Formation overall comprises massive, grey to pale limestone beds with some layers containing chert nodules, and horizons of grey to beige calcareous siltstone with variable oxides and red shale. Thicknesses vary from approximately 600 m to over 3,000 m. This formation is further sub-divided into stratigraphic units at the project scale.

The Hettangian to Sinemurian Aramachay Formation is characterized by dark grey bituminous calcareous shales and limestone beds over 15 cm thick. This formation was deposited in a deeper-water environment.

The Sinemurian to Toarcian Condorsinga Formation comprises beige to grey, thin to massive, interbedded limestone and dolostone. The thicknesses vary from approximately 500 m to over 1,500 m.

The Hauterivian to Aptian Goyllarisquizga Group, composed of siliciclastic sediments, vary from 150 m to 600 m thick and was deposited during the Lower Cretaceous with an erosional and angular unconformity over the Pucará Group during the Lower Cretaceous. Variable and discontinuous units of conglomerate, chert, and/or shale with carbonaceous fragments occur at the base of this group, which correlates with the Chimú Formation. A sequence of approximately 40 m thick comprising bitumen-bearing siltstone, with carbonaceous layers and laminar stratification is located above the Chimú Formation. Continuing up in the stratigraphic sequence is a section approximately 25 m thick comprising medium grain, reddish sandstone with thin micro-conglomerate layers, alternating with white sandstone further up in the sequence. These sequences correlate with the Santa and Carhuaz formations. The majority of the Goyllarisquizga Group comprises cross-bedded grey to white, medium to coarse grained, quartz-rich sandstone, approximately 90 m thick or more, which correlates with the Farrat Formation. Over one metre thick limestone units are present locally in the upper parts of this formation. Thin terrestrial red beds and basalt layers one to two metres thick may be interbedded near the upper contact.

A discontinuous, predominantly basaltic flow occurs in the Goyllarisquizga Group. Thin, red beds of sandstone and shale occur within the basalt unit.

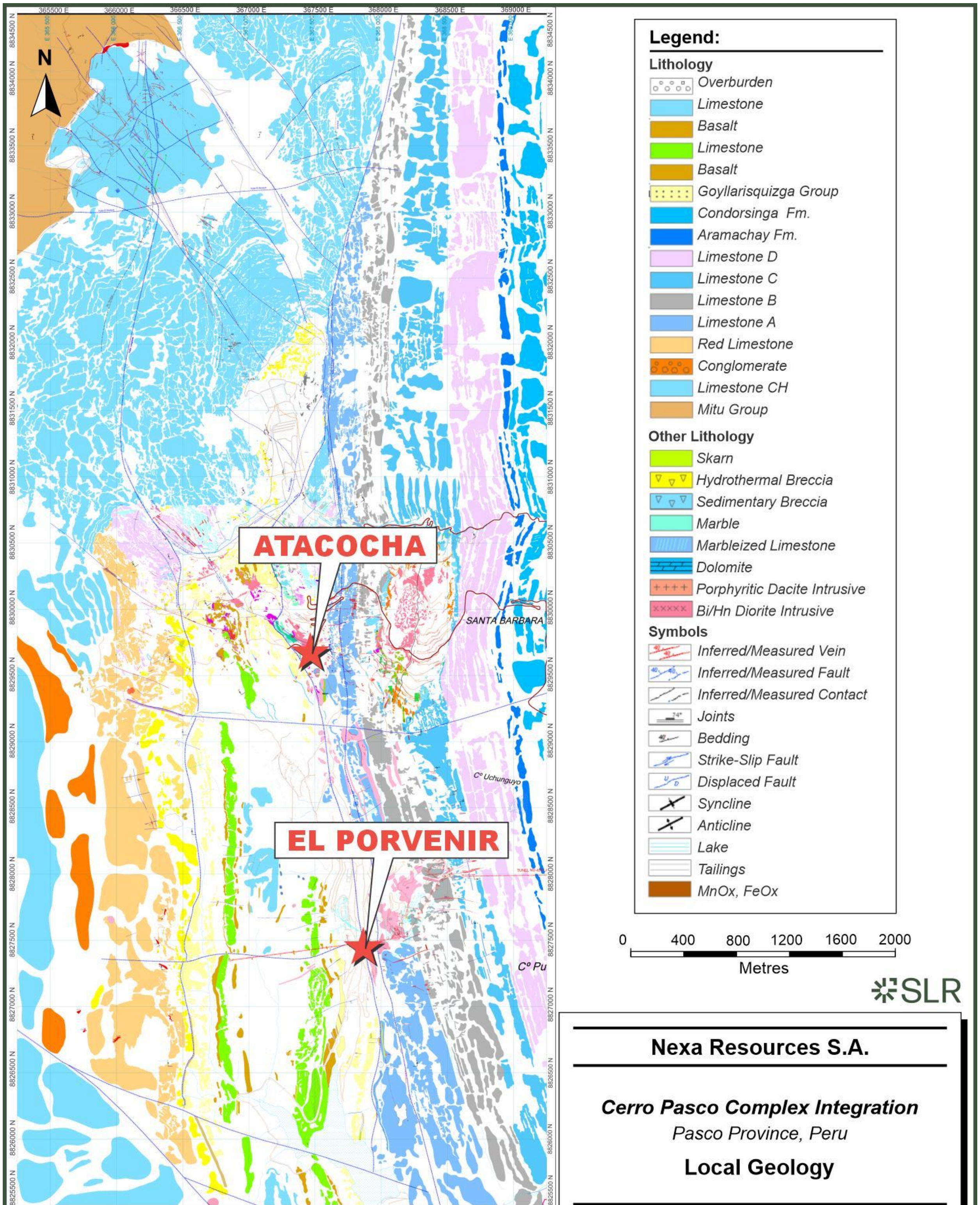
The equivalent Machay and Chicrín formations comprise of approximately 250 m of massive to thinly interbedded grey calcareous sandstone, grey to brown marly limestone, grey calcareous conglomerate with clasts of fine to muddy sandstone, and fine-grained red sandstone. These rocks were deposited onto the basalt flows during the Middle Cretaceous.

Another unit of predominantly basalt flows with thin beds of red sandstone and shale was unconformably deposited on top of the Machay/Chicrín Formation.

The Upper Eocene Pocobamba Formation comprises breccias with sub-angular to sub-rounded limestone clasts derived from the Pucará Formation; sub-divided into the Cacuán and Shuco members. The Pocobamba Formation was deposited as debris in a continental environment.

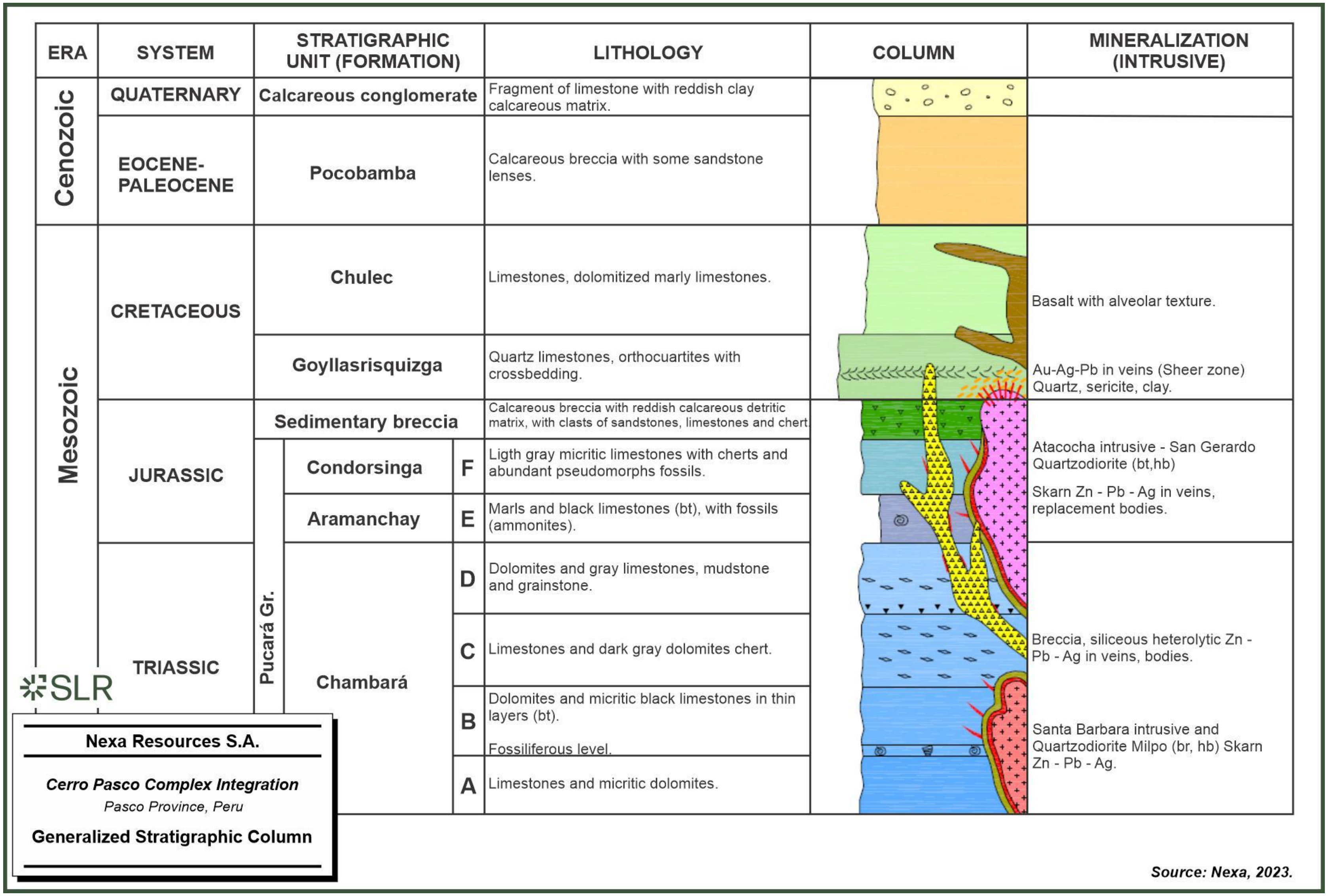
Figure 6-2 illustrates the local geology. The regional stratigraphic column is shown in Figure 6-3.

Figure 6-2: Local Geology



Source: Nexa, 2023.

Figure 6-3: Generalized Stratigraphic Column



6.2.2 Intrusive Rocks

Two generations of magmatism are recognized in the region, including the Milpo-Atacocha-Vinchos (29 Ma to 26 Ma) and Cerro de Pasco-Colquijirca (16 Ma to 10 Ma) belts (Cobeñas, 2008, and references therein). Both magmatic belts are oriented north-northeast to south-southwest, approximately parallel to the Andean trend.

The Milpo-Atacocha-Vinchos intrusive rocks are characterized as small hypabyssal stocks (less than one square kilometre), dikes, and sills of granodiorite (dacite) to diorite and tonalite composition and occur within high-K Calc-Alkaline Series and Shoshonitic Series. These intrusive rocks generally exhibit a porphyritic texture with plagioclase as the dominant mineral forming the matrix, and variable phenocrysts of quartz, hornblende, biotite, and pyroxenes. The matrix comprises fine-grained quartz and feldspar-plagioclase.

Magmatic emplacement occurred during the Oligocene based on two K-Ar age dates of porphyritic granodioritic samples with partially carbonate and sericite altered plagioclase (29.3±2.5 Ma and 25.9±1.5 Ma) (Soler and Bonhomme, 1988). Recently, 12 intrusive rocks samples from the El Porvenir and Atacocha areas were analyzed by U-Pb geochronology at the University of Tasmania and provided age dates of intrusive crystallization from 28.58 ± 0.38 Ma to 30.11 ± 0.23 Ma.

Intrusives in the region exhibit an elongate geometry, trending north-south to northwest-southeast, parallel to the regional fold axis, and are mostly spatially associated with the Milpo-Atacocha fault, suggesting an apparent structural control on magmatic emplacement.

Metamorphic contact aureoles are variably formed around these intrusive bodies. The most intense contact aureole is recognized in the Atacocha area, where Pucará Group rocks are completely silicified with pyrite impregnations for up to 200 m.

The Cerro de Pasco-Colquijirca volcanic to sub-volcanic intrusive rocks are characterized by dacitic, trachytic, and monzonitic composition. Texture varies from porphyritic to aphanitic. Composition is dominated by quartz and plagioclase, with lesser amphiboles, biotite, and K-feldspar. Age dating from the Cerro de Pasco, Marcapunta, and Yanamate complexes reveals ages ranging from 16 Ma to 10 Ma.

6.2.3 Structure

Regional tectonics during the Mesozoic and Cenozoic are collectively referred to as the Andean Cycle which comprises multiple sedimentation and deformational events. The Andean Cycle is sub-divided into at least seven deformational phases (Ellison et al., 1989):

- Peruana (Upper Cretaceous).
- Incaica (Paleogene/Eocene).
- Quechua 1 (early Oligocene).
- Quechua 2 (late Oligocene to early Miocene).
- Quechua 3 (middle Miocene).
- Quechua 4 (late Miocene).
- Quechua 5 (late Miocene).

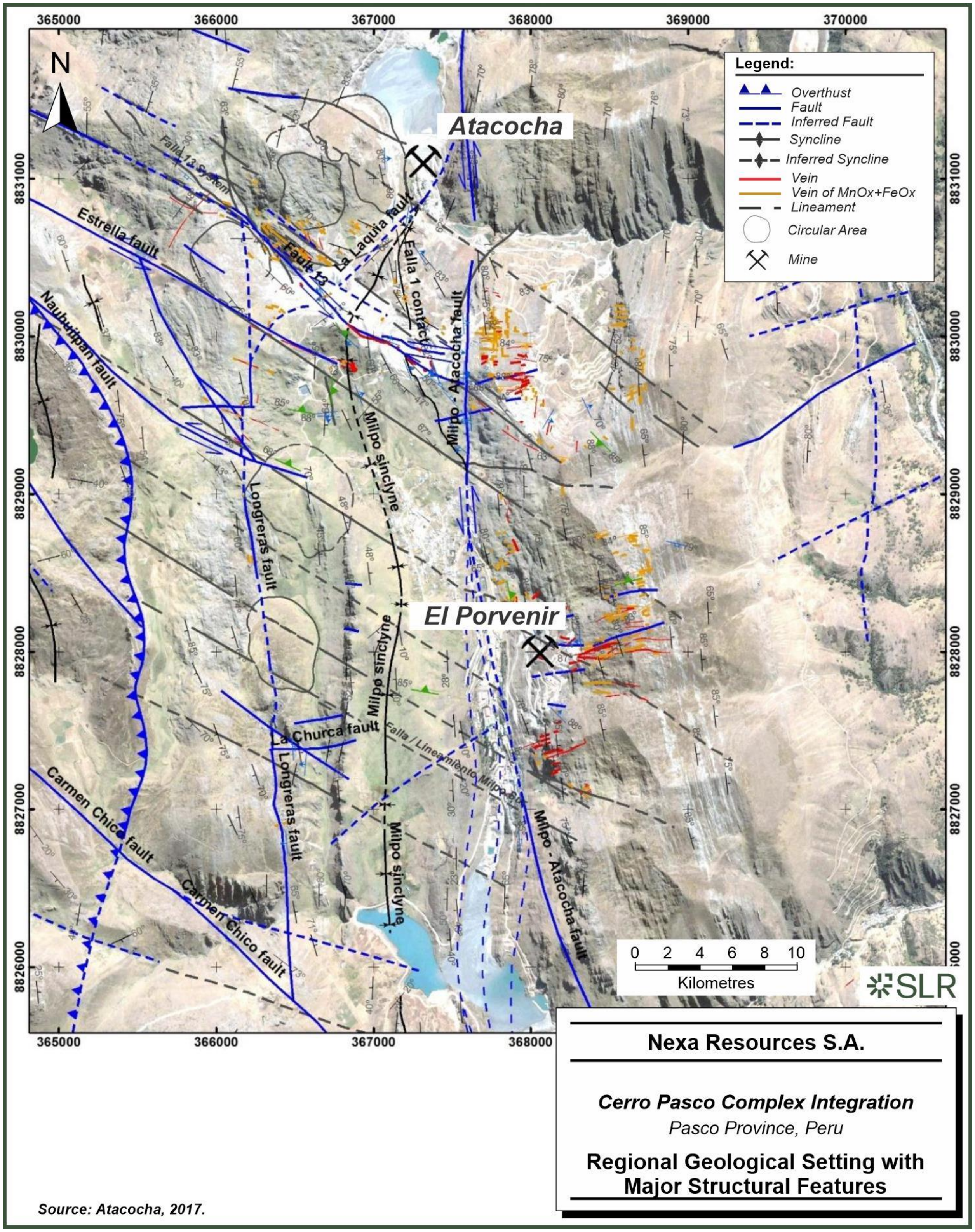
Three episodes of regional folding are recognized occurring during the Paleogene and possibly earlier and are separated by periods of tension. Throughout the region, the tectonics are characterized by northeast-southwest to east-west oriented compression, which occurred during the second Andean deformation phase (Incaico), from the Eocene to Oligocene. Most Mesozoic rocks appear to have been folded conformably generally forming a series of anticlines and synclines, parallel to the principal Andean trend, with a north-northwest to south-southeast oriented fold-axis, plunging to the south. Most folds described throughout the region have gently to moderately dipping (<60°) limbs.

The Milpo-Atacocha fault is a major structural feature in the region, which can be traced for nearly 15 km from Yarusyacán in the north to Carmen Chico in the south. The Milpo-Atacocha fault strikes north-south, dipping steeply to the east, with as much as 2,000 m of reverse displacement (east-block up) and probable sinistral movement. Mégard (1968) considers that the Milpo-Atacocha fault may be part of a fault system active since at least the Triassic, and during the Upper Cretaceous.

A series of fracture sets reportedly formed in response to the northeast-southwest tectonic compression, including:

- North-northeast trending dextral faults.
- Southwest trending sinistral faults.
- Northeast trending tensional joints.
- Northwest trending tensional joints.

Figure 6-4: Regional Geological Setting with Major Structures



Source: Atacocha, 2017.

6.3 Property Geology

Figure 6-5 and Figure 6-6 show representative geologic cross sections through the El Porvenir and Atacocha areas, respectively.

Within the property area, the stratigraphic units of primary interest are the Pucará and the Goyllarisquizga groups.

The Pucará Group is sub-divided into six units: A, B, C, D, which correspond to the Chambará Formation; and E and F, which correspond to the Aramachay and Condorsinga formations, respectively:

- Unit A is located to the east of the Atacocha fault. It consists of a grey to dark grey limestone with thin dolomite layers, calcarenites and fine, greenish volcanic siltstones at the base of the Chambará Formation. Yellowish grey limonites to compact dolomicrites are also observed.
- Unit B is located to the east of, and stratigraphically above, Unit A. Dark grey to black coloured limestones, dolomicrites, and micrites are observed in thin layers to tabular strata with lenticular bituminous horizons. It can be seen in many parts of the property due to its obliteration of marble and silicification. The more competent rocks are located at the intermediate zone in the Chambará Formation.
- Unit C is located to the east of the mine area. Monotonous grey chertic limestones in metric strata are observed. The unit also contains dolomitic horizons. It represents the intermediate zone of the Chambará Formation.
- Unit D is widely distributed within the Atacocha and Santa Bárbara sections. The limestones are beige varying from mudstone to grainstone with light beige dolomitic intercalations. Cherts and bituminous horizons are also observed. Unit D corresponds to the upper zone of the Chambará Formation.
- Unit E consists of black micritic limestones and black lutite. In many places, this package is obliterated by marble, silica, silica-sericite-clay, etc. In many places of the property, the rock is altered becoming recrystallized and discoloured, adopting clearer tones without converting to marble (loss of calcium). These rocks correspond to the Aramachay Formation of the Pucará Group.
- Unit F is grey to light grey limestones, mudstone to packstone, with fossil horizons and dolomitic levels.

The Goyllarisquizga Group outcrops in the area of the deposit consisting of quartz rich sandstone, corresponding to the Goyllarisquizga Formation. Sandstones may vary from quartz arenite to arkose. The matrix is argillaceous to siliceous. Above the 4000 Level, the lithology and stratification are well defined and easy to recognize. Below the 4000 Level, strong alteration has obliterated the original rock intensity forming siliceous breccias and massive silica where it is still possible to recognize quartz grains and in few places the stratification.

Localized basalt units are observed in some drill holes to the southwest of the mine, below the Cherchere and San Gerardo zones. The units consist of grey to greenish basalt with green vacuoles of zeolites with traces of flows with olivine phenocrystals, limonite, and magnetite.

Intrusive rocks within the property are variably porphyritic dacite to quartz diorite with hornblende and biotite phenocrysts. Dacitic dikes are sub-divided into two units: porphyritic with feldspar phenocrysts and minor quartz restricted to the groundmass; and porphyritic with abundant quartz phenocrysts, with minor biotite and hornblende. The quartz diorite comprises feldspar phenocrysts up to 6 mm long, with variable quartz "eyes", and aggregates of biotite and hornblende. The groundmass is microcrystalline quartz and plagioclase. These intrusive rocks generally form dikes trending north-south and are observed in three areas: Santa Bárbara/central, south along/parallel to the Atacocha fault, and the southern Section 3. These intrusive rocks are part of the Milpo-Atacocha-Vinchos Belt (28 Ma to 30 Ma).

6.4 Alteration

Skarn-related alteration has been characterized according to dominant key mineral assemblages: silica-wollastonite, garnet, silica, and pyrite-argillic.

Garnet-skarn is dominated by >50% garnet (by volume), generally brown to greenish and medium to fine grained, or light brown to yellowish (andradite) and light green (grosularia). Pyroxene, where present, is light green, very fine grained, and associated with minor sulphides. Magnetite is spatially associated with green garnet areas, as well as lesser pyrite and pyrrhotite.

Silica-skarn is defined where silica content exceeds 50%. Silica may occur in veinlets or as disseminations. Silica-wollastonite alteration appears to form a sub-division of the silica-dominant group and forms light grey to milky white zones with brecciated to massive/patchy textures. Wollastonite may form radiating fibrous crystals. Locally, a silica-skarn-chlorite assemblage may be present, exhibiting strong structural controls. White to grey silica developed early, followed by green skarn with variably associated chlorite and hematite.

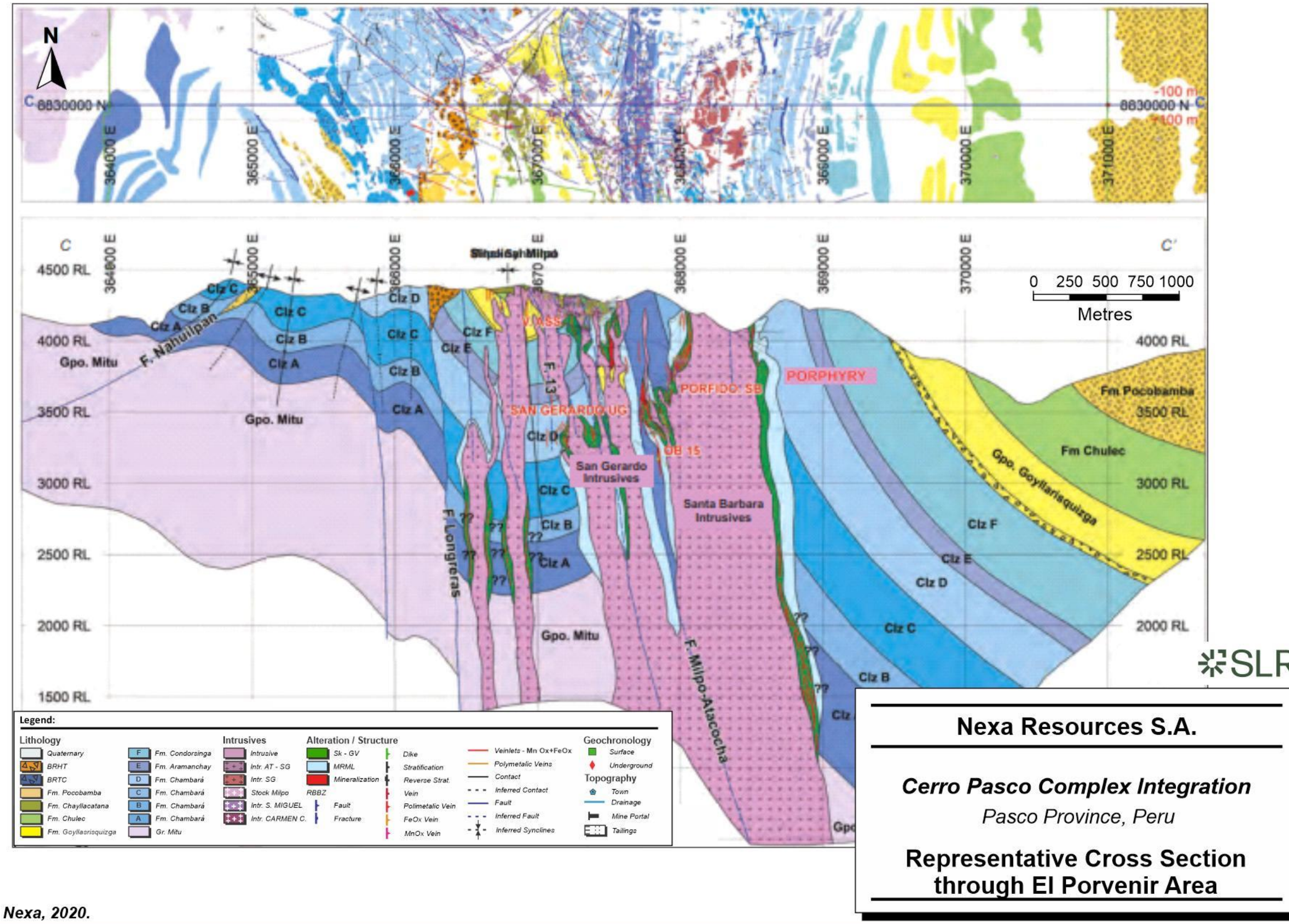
Pyrite-argillic skarn comprises 30% to 80% massive pyrite, with 10% to 30% undistinguished whitish clays, and up to 20% greenish garnet. Locally, pyrite appears to be pseudomorphic replacing garnet.

An alteration assemblage comprising silica-sericite-argillic (halloysite, montmorillonite, and kaolinite) is associated with hydrothermal mineralization. Locally this alteration assemblage is strong, and possibly replaces original rocks completely in areas below the 4000 Level.

West of the Milpo-Atacocha fault below the 4000 Level, strong siliceous alteration has variably obliterated the original rock; within the Goyllarisquizga Group, it is possible to recognize quartz grains and stratification in a few places. Locally, siliceous cemented breccias with silica-sericite-clays matrix (halloysite, montmorillonite, and kaolinite) and massive silica hydrothermal breccias have formed.

Marbleization of limestone and dolomite units appears to be spatially associated with intrusive units and skarn related alteration.

Figure 6-5: Representative Cross Section through El Porvenir Area



Nexa Resources S.A.

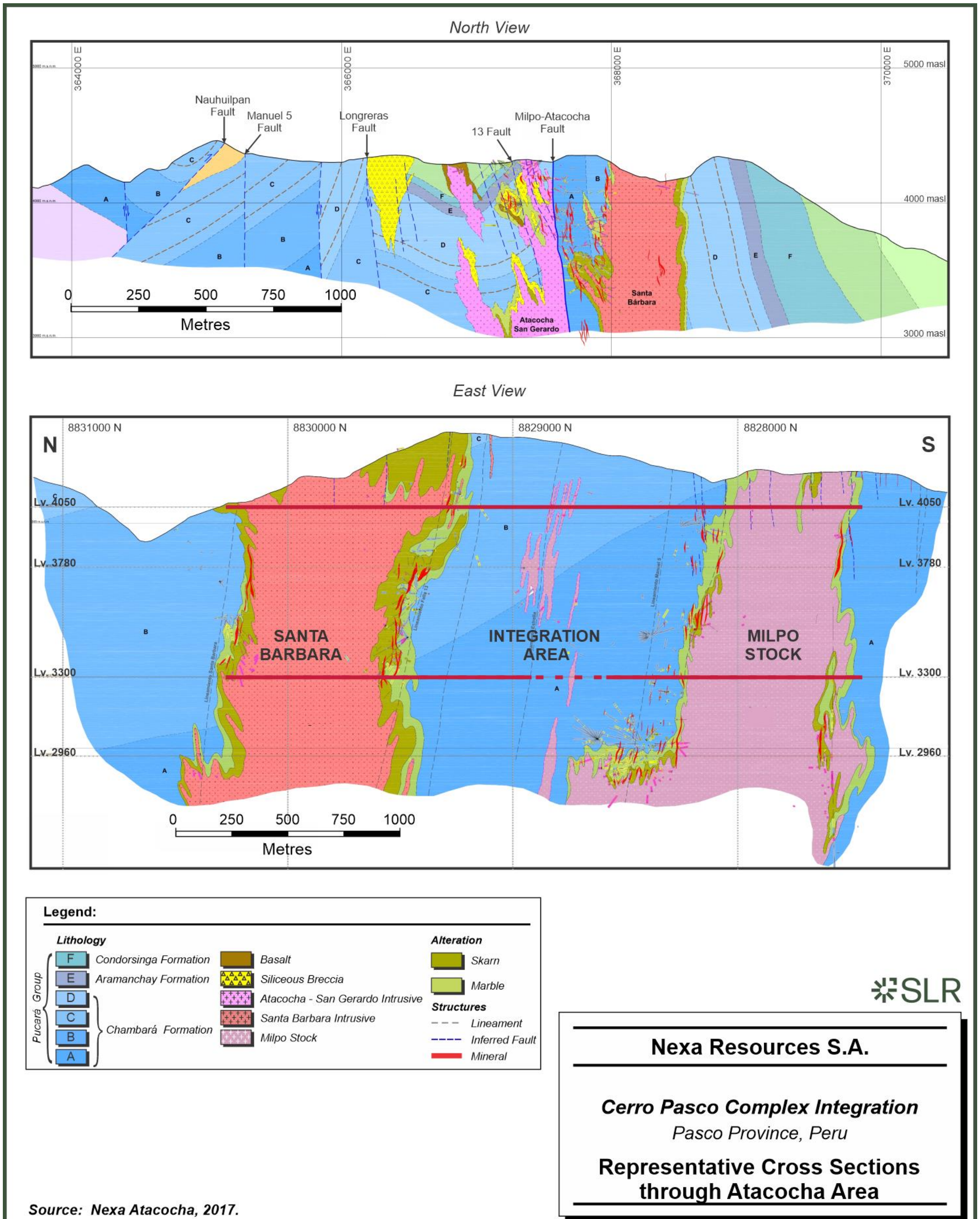
Cerro Pasco Complex Integration

Pasco Province, Peru

Representative Cross Section through El Porvenir Area

Source: Nexa, 2020.

Figure 6-6: Representative Cross Section through Atacocha Area



Source: Nexa Atacocha, 2017.

6.5 Mineralization

6.5.1 El Porvenir

At El Porvenir, mineralization is characterized as a skarn, intermediate sulphidation epithermal vein/breccia style, or stratabound mineralization in the Goyllarisquizga Formation.

Skarn related mineralization associated with the Milpo stock is paragenetically earlier, followed by hydrothermal mineralization. Skarn-related mineralization is commonly associated with the garnet and silica-skarn-chlorite assemblages, comprising pyrite, chalcopyrite, sphalerite, galena and minor pyrrhotite, pyrite, bornite, covellite, orpiment, and realgar within the Pucará Group sediments around the Milpo stock. Molybdenite may occur proximal to the skarn related mineralization. Elevated Bi and Au contents are reported to be associated with skarn related mineralization. Veins and veinlets with pyrite, chalcopyrite, sphalerite, galena, quartz, and carbonates occur within marble units, and are spatially associated with skarn bodies.

The silica breccia consists of sub-rounded to sub-angular white to milky grey opaline silica clasts, millimetres to centimetres in size, and to a lesser extent, sandstone, and limestone clasts. The silica breccia clasts are cemented by white granular silica, with occasional cross-cutting veins of white silica.

The massive (siliceous) breccia forms zones of pervasive alteration comprising predominantly fine grained and massive white silica.

The granular (siliceous) breccia comprises loose white to grey grains of silica within a poorly cemented (undifferentiated) clay matrix.

The Ag-Pb-Zn breccias are sub-divided into calcareous, polymictic-monomictic, and karst (collapse). Breccia clasts include limestone, marble, silica (massive), and skarn; the composition of the clasts indicates that brecciation occurred later than skarn development. Massive silica alteration may cross-cut skarns.

The calcareous breccia comprises sub-angular to sub-rounded clasts of limestone and marble, cemented by a grey to dark grey calcareous matrix, with occasional bituminous material and rare pyrite. Pyrite, sphalerite, galena, and other sulphides including orpiment, realgar, tetrahedrite, alabandite, stannite, as well as quartz, calcite, rhodochrosite and rhodonite occur within the matrix. The geochemical-mineralogical zoning is evident whereby galena (Pb) and Mn bearing minerals are more abundant distally relative to sphalerite (Zn). Bi and Sn bearing minerals are most elevated in the magmatic-hydrothermal system.

The polymictic to monomictic breccias are overall grey and comprise sub-angular clasts of black limestone, shale, white silica with veins of silica-pyrite, and marble with silica, wollastonite, and calcite. Monomictic breccias comprise sub-angular limestone or intrusive clasts. Polymictic and monomictic breccia clasts vary in size and are cemented with an amorphous black material with disseminated pyrite. Pyrite, chalcopyrite, sphalerite, galena, and possibly other sulphides occur within the matrix, forming veins/veinlets, pockets, or disseminations. Karst breccias contain clasts of limestone, marble, silica, skarn, and intrusive rocks. They are sub-angular to sub-rounded, occurring within a matrix of sub-horizontal laminated limestone and silica-sericite-clay material.

The stratabound Pb-Ag-Zn mineralization occurs in the sandstone strata (mantos) at the base of the Goyllarizquisga Formation (near the contact with the Pucará Group). Several disseminated sulphide mantos have recently been identified at Sara and Porvenir 2W within the quartz sandstone, generally in contact with layers of silt and microconglomerates. The minerals include galena with Ag content, sphalerite, and pyrite. Au is also present.

6.5.2 Atacocha

At Atacocha, mineralization is characterized as a skarn, intermediate sulphidation epithermal vein/breccia-style, or porphyry mineralization.

Skarn/metasomatic-related mineralization spatially associated with the Santa Bárbara stock or San Gerardo stock is paragenetically earlier, followed by the hydrothermal mineralization. Skarn-related mineralization is commonly associated with the garnet and silica-skarn-chlorite assemblages, comprising pyrite, chalcopyrite, sphalerite, galena, and lesser pyrrhotite, pyrite, bournonite, covelite, orpiment, and realgar occurring within the Pucará Group sediments around the Santa Bárbara stock.

Skarn-related mineralization is characterized by pyrite, chalcopyrite, sphalerite, galena, with lesser bismuthinite and a variety of sulphosalts (Bi-bearing) and pyrrhotite, bornite, and covellite at lower elevation. Molybdenite may occur proximal to the skarn-related mineralization. Elevated Bi and Au are reported to be associated with skarn-related mineralization. Veins and veinlets with pyrite, chalcopyrite, sphalerite, galena, with quartz and carbonate occur within marble units, and are spatially associated with skarn bodies.

The intermediate sulphidation epithermal mineralization occurs in the upper part of the system (i.e., at higher elevations) as veins and breccias, characterized by galena, Ag-bearing sulphosalts, sphalerite, and free Au. Gangue mineralogy comprises quartz (silica), pyrite, specularite/hematite, adularia, rhodochrosite, rhodonite, and alabandite. The silica-sericite-halloysite alteration assemblage is generally associated with this epithermal system. These veins and breccias are mostly between the San Gerardo stock and Fault 1, appearing to be at least partly controlled by the northwest-trending Fault 13. Breccias have been grouped into either Ag-Pb-Zn hydrothermal breccias or siliceous breccias based on their mineralogical assemblages and textural characteristics.

Siliceous breccias are further sub-divided into three groups: silica, granular (“terrosa”), and massive. Collectively the siliceous breccias may form large, relatively continuous bodies based on various interpretations; some appear to be spatially associated with the San Gerardo and Santa Bárbara intrusives and structurally controlled by the Milpo-Atacocha, Longreras, 13, 1, and Laquia faults. Veinlets of pyrite, galena, sphalerite, and possibly other fine undistinguished sulphides may occur within the variable silica-sericite-clay matrix.

The silica breccia comprises clasts of milky white to grey opaline silica, sub-rounded to sub-angular, from millimetre to centimetre size; as well as less common sandstone and limestone clasts. The silica-breccia clasts are cemented by a white granular silica, with occasional cross-cutting thin white silica veinlets.

The massive (siliceous) breccia forms zones of pervasive alteration comprising predominantly fine grained and massive white silica.

The granular-(siliceous) breccia comprises loose white to grey silica grains, within a poorly cemented clay (undifferentiated) matrix.

The Ag-Pb-Zn breccias are sub-divided into calcareous, polymictic-monomictic, and karst/collapse. Breccia clasts include limestone, marble, silica (massive), and skarn; the composition of the clasts indicates that brecciation occurred later than skarn development. Massive silica alteration may cross-cut skarns.

The calcareous breccia comprises sub-angular to sub-rounded clasts of limestone and marble; cemented by a grey to dark grey calcareous matrix, with occasional bituminous material and rare pyrite. Pyrite, sphalerite, galena, and other sulphides/sulphosalts including orpiment, realgar, tetrahedrite, alabandite, stannite, as well as quartz, calcite, rhodochrosite, and rhodonite occur within the matrix. Minor mineralization may occur within marble where the calcareous breccias cross-cut these units. Geochemical/mineralogical zonation is apparent whereby galena (Pb) and Mn-bearing minerals are more abundant distally relative to sphalerite (Zn). Bi- and Sn-bearing minerals are more elevated proximally.

The polymictic to monomictic breccias are overall grey, and comprise sub-angular clasts of black limestone, mudstone, white silica with silica-pyrite veinlets, and marble with silica-wollastonite and calcite. Monomictic breccias comprise sub-angular clasts of limestone or predominantly intrusive rocks. Both polymictic and monomictic breccias clasts vary in size and are cemented with a black amorphous material with disseminated pyrite. Pyrite, chalcopyrite, sphalerite, galena, and possibly other sulphides occur within the matrix forming veins/veinlets, pockets, or disseminations.

Karst/collapse breccias contain clasts of limestone, marble, silica, skarn, and intrusive rocks, are sub-angular to sub-rounded, within a matrix of sub-horizontal laminated limestone and silica-sericite-clay material.

The Cu-Au±Mo porphyry mineralization is found in the Santa Bárbara stock. It consists of porphyry quartz monzodiorite with potentially economic grades (i.e., 0.3% Cu, 0.3 g/t Au) of Cu-Au ± Mo. The San Gerardo stock is made of the same quartz monzodiorite, but with weaker alteration and much lower grades of all metals of interest. In the Milpo stock, the porphyry potential was poorly investigated, however, A- and B-type stockwork veinlets with low Cu grades were recorded in the past and the stock warrants future investigation.

6.6 Deposit Types

Four types of mineral deposits are recognized at the Complex:

- Skarn (exoskarn and endoskarn).
- Intermediate sulphidation epithermal veins and breccias.
- Stratabound (El Porvenir).
- Porphyry (Atacocha).

The description of the skarn deposit is largely derived from Einaudi and Burt (1982), Hammarstrom et al. (1991), and references therein. The hydrothermal vein deposit description is largely derived from Baumgartner et al. (2008) and references therein.

6.6.1 Skarn

Skarn deposits are generally considered as replacement style mineralization within or associated with carbonate dominant rocks. Skarns are classified as either endoskarn or exoskarn, referring to the location of skarn related mineralization either within an associated intrusive unit, or within carbonate lithology, respectively. Additionally, skarns can be divided into two broad groups: magnesian and calcic skarns, based on a dolomite dominated or limestone-dominated host lithology, respectively.

Skarn development commonly includes metamorphic and metasomatic processes associated with carbonate and intrusive rocks, and an associated hydrothermal system. Mineralization occurs via a physio-chemical reaction between circulating hydrothermal fluids and the host lithology, and results in irregular shaped bodies. The hydrothermal system is generally believed to be related to and expelled from a cooling igneous body, which then undergoes a chemical reaction and cools as the fluid interacts with the usually carbonate dominant host lithology. The lithochemistry of the host rocks (i.e., Ca or Mg rich carbonate, or calc-silicate assemblage) strongly controls or influences mineralization. Replacement mineralogy commonly comprises Ca and Mg bearing silicates, however, Fe, Al, and Mn bearing minerals may also be important. Mineral and metal zonation is common. Three generalized dynamic processes responsible for the formation of all skarns are described as:

- Isochemical contact metamorphism during pluton emplacement.
- Prograde metasomatic (infiltration) skarn formation as the pluton cools and an ore fluid develops.
- Retrograde alteration of earlier formed mineral assemblages.

The style of mineralization at El Porvenir appears to be best represented by the base and precious metal skarn category of the calcic skarn group. In terms of a conceptual model, Zn + Pb combined may average 10% to 15%, commonly with significant Ag (from 30 g/t to 300 g/t) as well as Cu, Au, and W. Cu mineralization commonly occurs proximal to the associated intrusive unit, whereas Zn and Pb mineralization typically occurs more distally to the associated intrusive. Mineralization commonly occurs as sulphides, including sphalerite, galena, chalcopyrite, and a variety of Ag-bearing sulphosalts. Gangue mineralogy may be dominated by Mn-bearing pyroxenes and garnet. Mineral textures vary from commonly coarse grained, associated with Ca rich host lithology and in close proximity to the related intrusion, to fine-grained, more distal and associated with calc-silicate rocks.

The tectonic setting of Zn-Pb skarns are commonly reported at continental margins and formed during syn- to late orogenic processes. Plutons are commonly absent but, if present, occur as stocks and dikes and may vary in composition from granite to granodiorite to syenite to diorite. Replacement mineralogy within carbonates is usually Fe, Mn, and S rich, and low in Al; and alteration within associated intrusions may comprise locally intense epidote, pyroxene, and garnet.

6.6.2 Hydrothermal Vein and Breccia

The hydrothermal veins and breccias at El Porvenir and Atacocha fall into a class of epithermal polymetallic base metal deposits (also referred to as Cordilleran base metal veins), which form in the upper parts of a magmatic-hydrothermal system (i.e., porphyry environment).

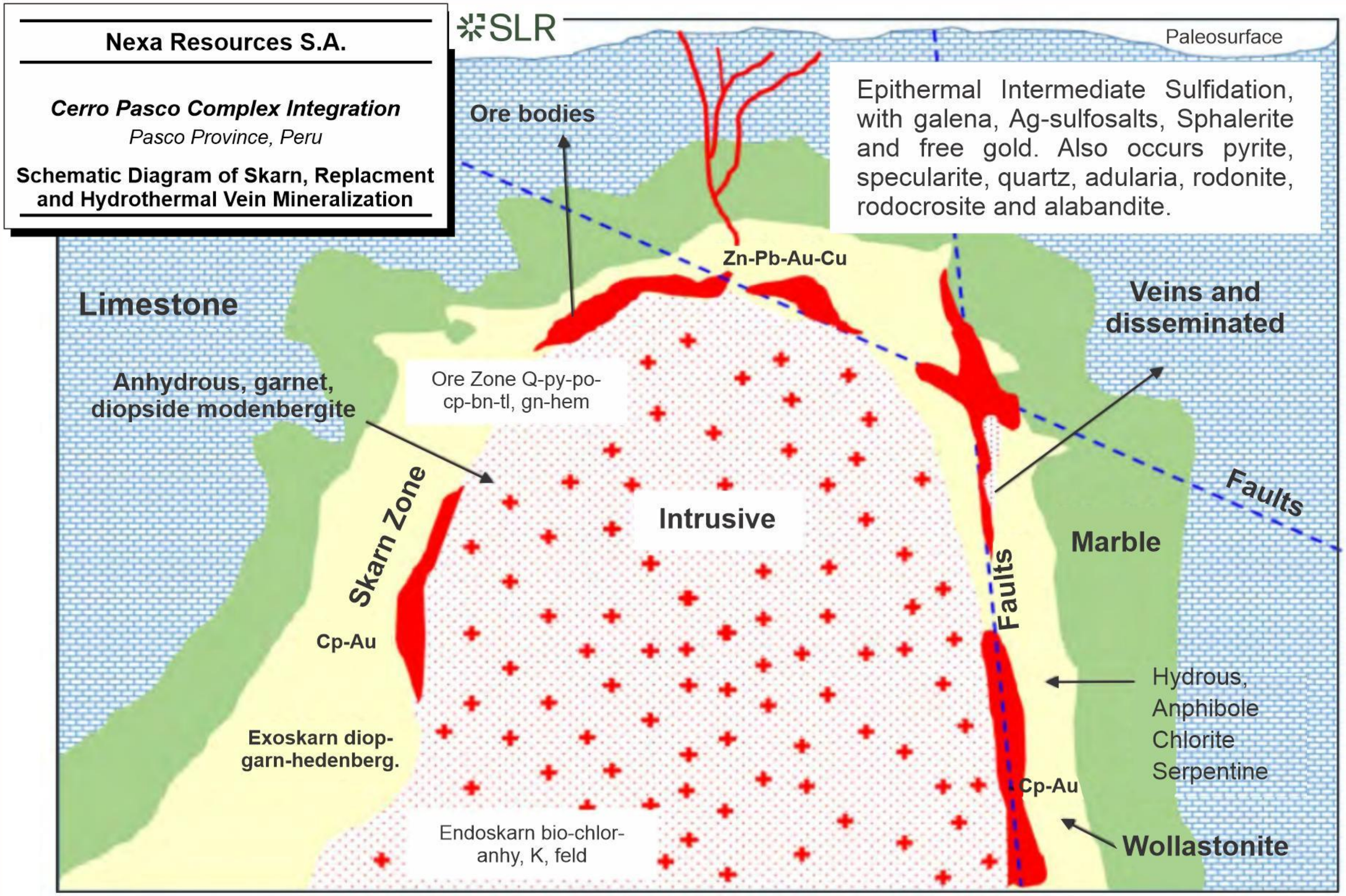
The Cordilleran base metal deposits have the following features:

- Close temporal and spatial association with calc-alkaline intrusions.
- Mineralization occurred under epithermal conditions (i.e., near Earth's surface).
- Sulphide-rich mineralogy, including a Cu-Zn-Pb-(Ag-Au-Bi) metal suite, and high Ag/Au ratio.
- Well-developed mineral zonation and alteration minerals, with Zn-Pb mineralization formed more distally (Pb-Ag-Au assemblage in the upper zone and Cu-Au association in the deeper zones).
- Early pyrite-quartz associated with low sulphidation mineralogy.

- Mineralization textures may be open-spacing filling in silicate host rocks, or as replacement in carbonate rocks.
- Mineralization occurred late in the temporal evolution of the magmatic-hydrothermal system.

Figure 6-7 is a schematic diagram showing the spatial relationship of skarn, replacement, and hydrothermal vein mineralization with intrusive rocks.

Figure 6-7: Schematic Diagram of Skarn, Replacement and Hydrothermal Vein Mineralization



Source: Gilbert and Lowell, 1974.

6.6.3 Stratabound (El Porvenir)

Stratabound deposits have been described by Fontboté et al. (1990), who defined the stratabound deposit model as deposits formed through volcanogenic, hydrothermal, metamorphic, diagenetic, and sedimentary processes both penecontemporaneously and much later than the host rock, which can be volcanic or sedimentary.

The empirical link of mineralization and host rock can be used to classify the stratabound deposit according to the age and geotectonic position of the enclosing rock. A systematic classification could be achieved with mineral deposits hosted by rocks of the Andean Cycle (Mesozoic-Recent) because the regional geology and geotectonic interpretation of the rocks of this period are well known. According to Fontboté et al. (1990), three metallogenic "stages" can be distinguished in the Central Andes. Each stage is characterized by its tectonic style, magmatic activity, and basin evolution; and in each stage, characteristic types of stratabound deposits occur.

The sandstone hosted stratiform Pb-Zn occurrences in the Goyllarisquizga Formation near Milpo were included by Samaniego (1982) in the Santa Metallotect, however, the possibility that they were formed by impregnation in relation with the Tertiary skarn deposits of the Milpo-Atacocha district (Soler, 1986) is supported by Pb isotopic data (Gunnesch et al., 1990).

6.6.4 Porphyry (Atacocha)

Porphyry deposits are large, low to medium grade deposits in which primary (hypogene) ore minerals are dominantly structurally controlled and which are spatially and genetically related to felsic to intermediate porphyritic intrusions (Kirkham, 1972). The large size and structural control (e.g., veins, vein sets, stockworks, fractures, "crackle zones", and breccia pipes) serve to distinguish porphyry deposits from a variety of deposits that may be peripherally associated, including skarns, high temperature mantos, breccia pipes, peripheral mesothermal veins, and epithermal precious metal deposits (Sinclair, 2007).

Porphyry deposits range in age from Archean to Recent, although are predominantly associated with Mesozoic to Cenozoic orogenic belts. They occur throughout the world in a series of extensive, relatively narrow, linear metallogenic provinces. Porphyry deposits occur in close association with porphyritic epizonal and mesozonal intrusions, typically in the root zones of andesitic stratovolcanoes. A close temporal relationship exists between magmatic activity and hydrothermal mineralization in porphyry deposits (Kirkham, 1971). Magma composition and petrogenesis of related intrusions exert a fundamental control on the metal content of porphyry deposits. Intrusive rocks associated with porphyry Cu, porphyry Cu-Mo, porphyry Cu-Au and porphyry Au tend to be low-silica, relatively primitive dioritic to granodioritic plutons whereas porphyry deposits of Mo, W-Mo, W, and Sn are typically associated with high-silica, strongly differentiated granitic plutons.

The overall form of individual porphyry deposits is highly varied and includes irregular, oval, solid, or "hollow" cylindrical and inverted cup shapes. Deposits may occur separately or overlap and, in some cases, are stacked. Individual deposits measure hundreds to thousands of metres in three dimensions. Deposits are characteristically zoned, with barren cores and crudely concentric metal zones that are surrounded by barren pyretic halos with or without peripheral veins, skarns, replacement manto zones and epithermal precious metal deposits. The Cu-Fe sulphides reside primarily in veins and hydrothermal breccias, with lesser amounts occurring as disseminations in the altered wall rocks. Complex, irregular mineralization and alteration patterns are due, in part, to the superposition and spatial separation of mineral and alteration zones of different ages.

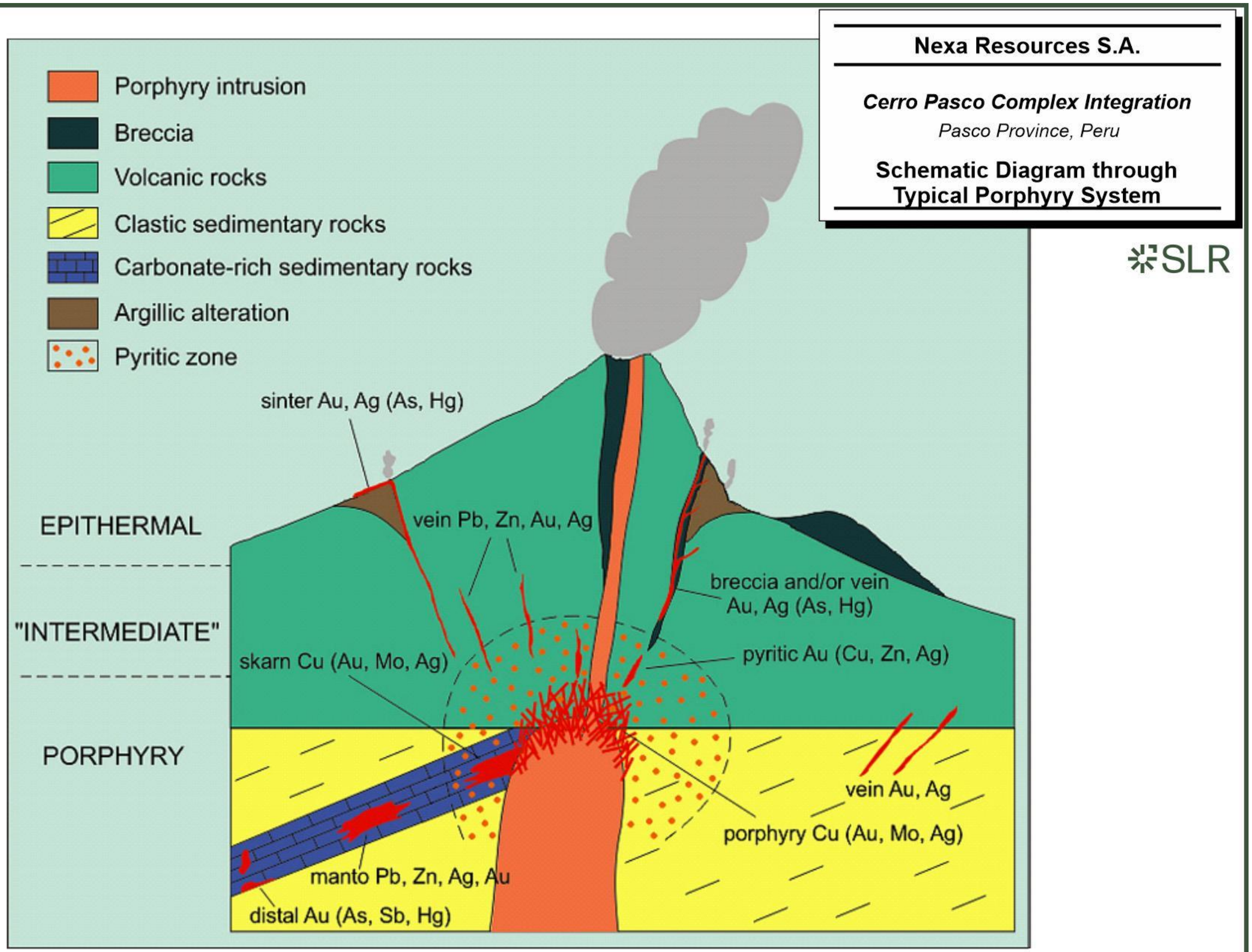
The mineralogy of porphyry deposits is highly varied, although pyrite is typically the dominant sulphide mineral in Cu, Cu-Mo, Cu-Au, Au, and Ag deposits. The principal ore and associated minerals in porphyry Cu-Au deposits are chalcopyrite, bornite, chalcocite, tennantite, enargite, other Cu minerals, native Au, electrum, and tellurides. Associated minerals include pyrite, arsenopyrite, magnetite, quartz, biotite, K-feldspar, anhydrite, epidote, chlorite, scapolite, albite, calcite, fluorite, and garnet.

Hydrothermal alteration is extensive and typically zoned, both on a deposit scale and around individual veins and fractures. In many porphyry deposits, alteration zones on a deposit scale consist of an inner potassic zone and an outer zone of propyllitic alteration. Zones of phyllic alteration and argillic alteration may be part of the zonal pattern between the potassic and propyllitic zones, or can be irregular or tabular, younger zones superimposed on older alteration and sulphide assemblages.

Figure 6-8 is a schematic diagram through a typical porphyry system showing mineral zonation and possible relationship to other deposit types like skarn, manto, "mesothermal", or "intermediate" precious-metal and base-metal vein and replacement, and epithermal precious-metal (Kirkham and Sinclair, 1995).

During the 2018 drilling campaign, an andesitic porphyry was intersected. This andesitic porphyry is associated with the Santa Bárbara diorite intrusive and consists of quartz veins and phyllic alteration.

Figure 6-8: Schematic Diagram through Typical Porphyry System



Source: Kirkham and Sinclair, 1995.

7.0 Exploration

7.1 Exploration

Exploration and development work has taken place at El Porvenir and Atacocha since 1936 and 1949, respectively. Exploration by the current operator, Nexa, has taken place since 2010.

Exploration at El Porvenir and Atacocha takes place within the broader context of an integrated exploration program for the Cerro Pasco Complex. This involves diamond drilling, mapping, sampling, and interpretations of known mineralized zones extensions and brownfield-type satellite targets.

Generally, exploration work is conducted simultaneously with underground development, which involves surface and underground diamond core drilling, as well as channel sampling following underground drifting. The channel sampling informs grade control at the El Porvenir and Atacocha underground operations but is also incorporated into the Long-Term Model (LTM). Grade control at San Gerardo is completed using blast hole data although this data is not directly included in the LTM.

Systematic underground geological mapping is completed at a scale of either 1:500 or 1:250, following underground development on all levels and sub-levels. A total of 26 underground levels have been developed at El Porvenir, with additional development on sub-levels. A total of 29 underground levels have been developed at Atacocha, with additional development on sub-levels. Geological mapping is completed by the mine/production geologists, with maps drawn on paper in the field and subsequently digitized with the help of a modelling assistant. The geological level plan maps are updated and incorporated into a three dimensional (3D) geological model daily to aid future exploration and mine development planning.

Airborne and ground magnetic surveys have been completed for the Cerro Pasco Complex, which show good correlation between Magnetization Vector Inversion (MVI) and the intrusives.

The El Porvenir and Atacocha mines are currently connected through two active tunnels; at the 3300 and 4070 levels, with the zone between the two mines termed the Integration Zone. Several additional connections are planned, which will facilitate underground exploration. Drilling within the Integration Zone has subsequently identified mineralization, which forms one of Nexa's highest priority exploration targets (Section 7.8).

In addition to the Integration Zone, Nexa has identified short term targets for exploration at the eastern side of the Santa Bárbara stock below 3,300 MASL and the San Gerardo above 3,300 MASL. Nexa has also identified several long-term brownfield target areas.

Exploration in 2022 included 1,656 m of diamond core drilling, focused on defining new potential mineralization zones at three different targets; Carmen Norte, Porvenir Sur, and the Integration Zone.

Exploration activities for 2023 included 16 diamond drill holes (DDH) for a total of 9,321 m. The drilling programs focused on the extensions of Integration Zone in 3300-3790-4050 Levels, and Porvenir Sur drilling from 3600 Level.

A total of $2.1 million has been budgeted for planned exploration work in 2024 at the Complex, which includes 8,500 m of diamond drilling focused on delineation of the Integration Zone toward the north and deeper levels.

7.2 Drilling

7.2.1 El Porvenir

As of December 31, 2023, a total of 5,683 drill holes totalling 944,070 m have been completed at El Porvenir (Table 7-1). All drilling was diamond drilling (DDH), with most of the holes (5,544) completed from underground workings and 139 holes completed from surface. Drilling has been completed by various contractors. The indicated year refers to the start date of drilling. Figure 7-1 illustrates the locations of the drill holes at El Porvenir.

SLR was unable to confirm the drilling totals, as excluded drill holes were not included in the provided database, and the HOLE_TYP variable was found to be unreliable (with many supposedly surface drill holes clearly drilled from underground). SLR understands that Nexa is currently in the process of correcting these errors.

The El Porvenir resource database closure date was January 31, 2023. Between then and the effective date of this report, 252 drill holes were completed. This is discussed further in Section 11.4.1 and is not considered to have a material impact on estimated Mineral Resources.

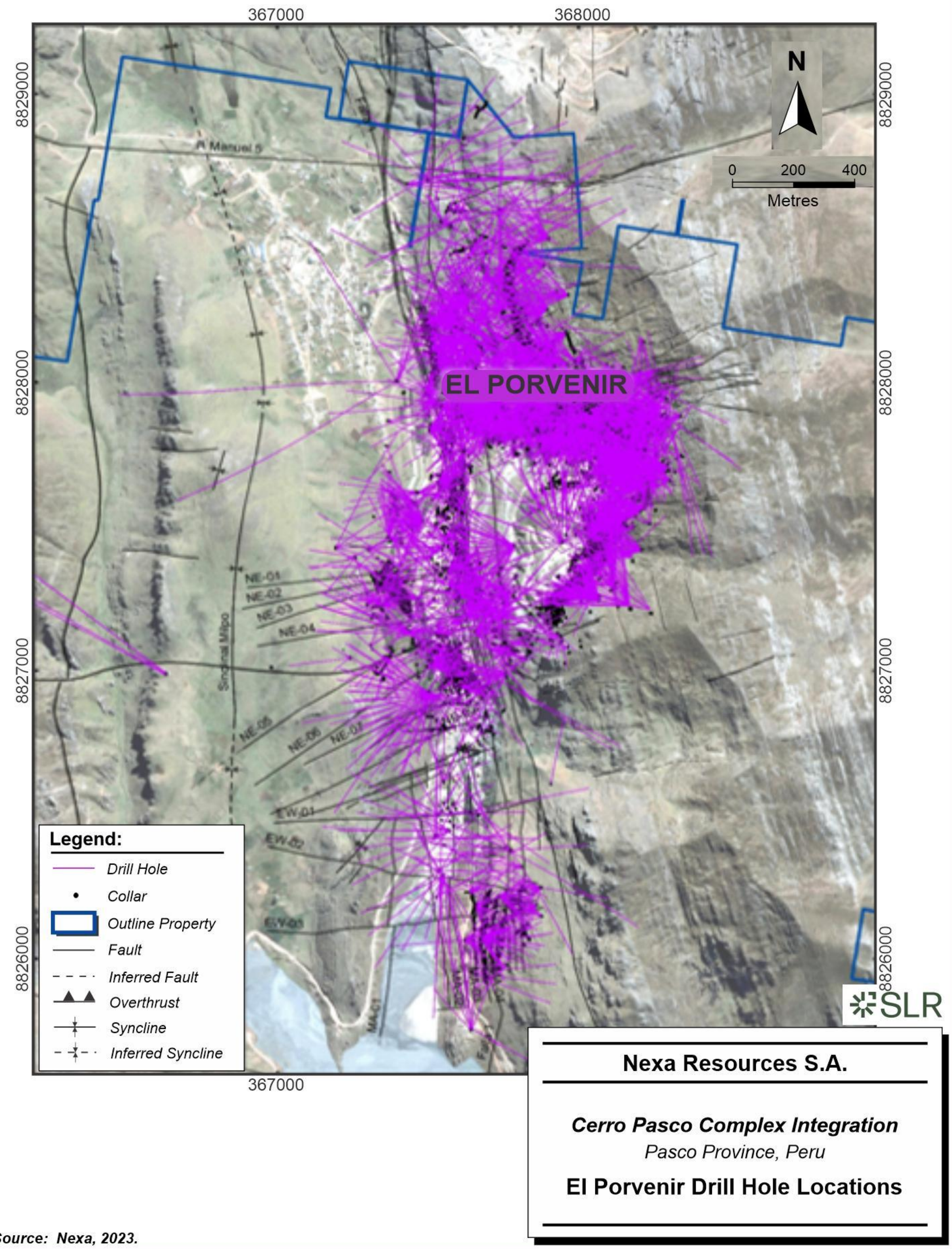
Exploration drilling is generally completed over a 50 m by 50 m grid, whereas infill drilling is designed to cover a 15 m by 15 m grid. The overall distribution of drill holes and channel samples has been concentrated around the Carmen Norte 3, Exito, and Sara zones.

Table 7-1: El Porvenir Drilling

Year	Surface DDH		Underground DDH		Total	
	Number	Metres	Number	Metres	Number	Metres
Historic	19	1,555	757	140,571	776	142,127
2006			22	2,915	22	2,915
2008	14	638	86	17,310	100	17,948
2009			142	22,877	142	22,877
2010			147	24,120	147	24,120
2011			261	47,031	261	47,031
2012			320	55,979	320	55,979
2013			269	43,856	269	43,856
2014			258	37,783	258	37,783
2015			301	48,859	301	48,859
2016			385	64,187	385	64,187
2017			575	71,482	575	71,482
2018			527	87,536	527	87,536
2019	40	15,469	491	72,142	531	87,611
2020	38	15,221	209	24,284	247	39,505
2021	24	11,198	263	43,441	287	54,640
2022			275	51,460	275	51,460

Year	Surface DDH		Underground DDH		Total	
	Number	Metres	Number	Metres	Number	Metres
2023	4	255	256	43,899	260	44,154
Total	**139**	**44,336**	**5,544**	**899,733**	**5,683**	**944,070**

Figure 7-1: El Porvenir Drill Hole Locations



Source: Nexa, 2023.

A total of ten historic holes, with no survey records, missing geological data, and causing grade discrepancy with overlapped new holes, were excluded from the Mineral Resource estimate. In addition to this exclusion, a total of 11 holes were transferred to the Atacocha database, as they were drilled within the Atacocha concession. Table 7-2 summarizes the drill hole data excluded from the El Porvenir resource database:

Table 7-2: El Porvenir Excluded Drill Holes

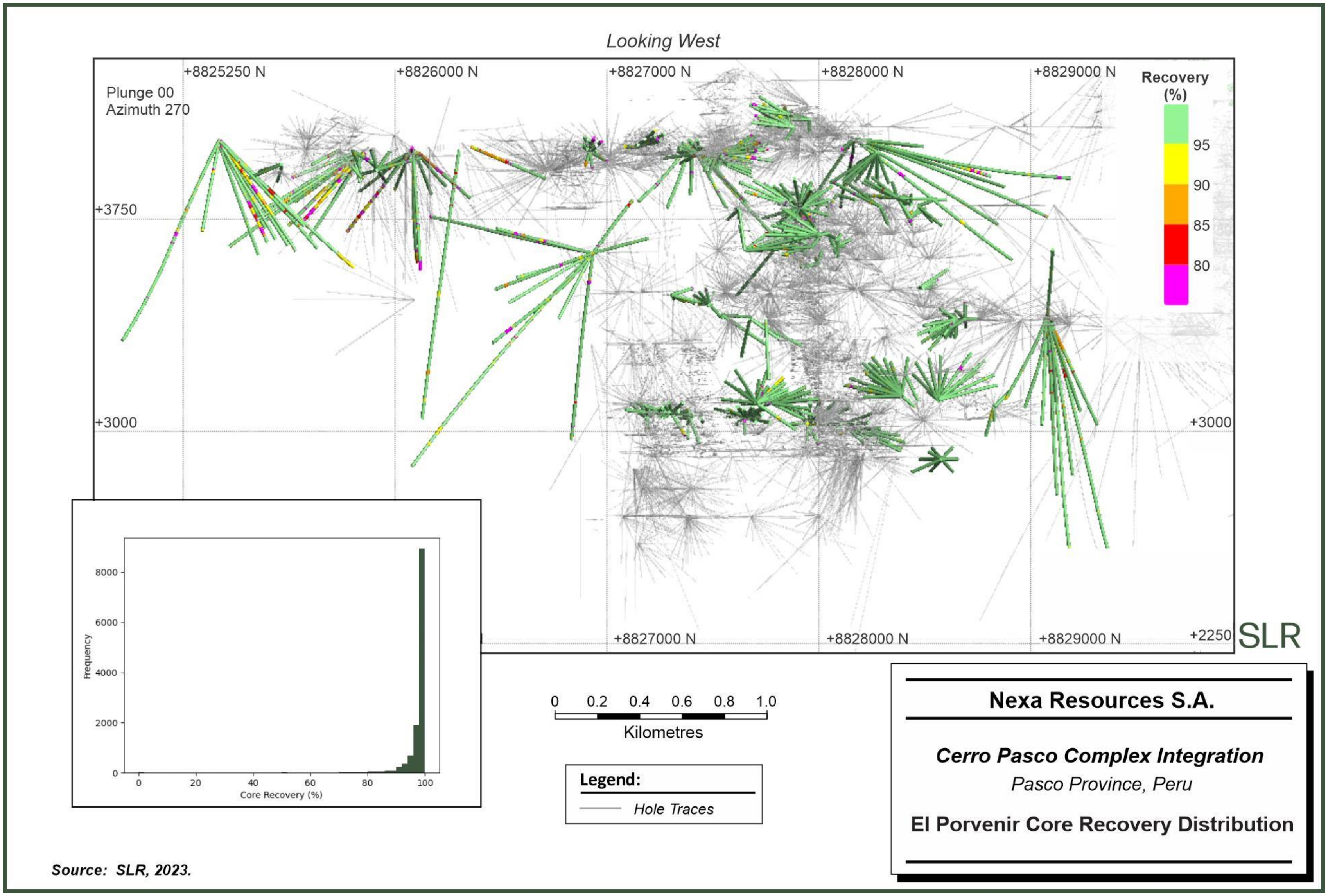
Year	Number	Metres	Type
Historic	13	3,892	DDH
2008	1	245	DDH
2011	2	361	DDH
2012	3	572	DDH
2013	1	171	DDH
2016	1	18	DDH
Totals	**21**	**5,258**	

7.2.1.1 Core Recovery

Core runs are 3.0 m for HQ and NQ and 1.5 m for BQ core size.

Since 2018, core recovery is routinely measured for each hole. Core recovery is available for 155,442 m of drill core at the effective date of the TRS, and 111,537 m of the drill core in the resource database (closed on January, 2023), equivalent to 12% of the database. The available core recovery data provides reasonable coverage for the deposit, although there are notable portions without data (Figure 7-2). Core recovery is generally above 97% and does not indicate any issues that may bias assay results.

Figure 7-2: El Porvenir Core Recovery Distribution



Source: SLR, 2023.

7.2.2 Atacocha

As of December 31, 2023, a total of 5,206 drill holes totalling 895,504 m have been completed at Atacocha (Table 7-5). All drilling was DDH, with 4,254 holes completed from underground workings, and 952 holes completed from surface, of which 917 were DDH and 35 were RC. The indicated year refers to the start date of drilling. Drilling has been completed by various contractors. Figure 7-4 illustrates the locations of the drill holes at Atacocha.

The Atacocha resource database closure date was January 31, 2023. Between then and the effective date of this report, 18 DDH were completed. This was limited to the San Gerardo open pit area. This is discussed further in Section 11.5.1 and is not considered by the QP to have a material impact on estimated Mineral Resources.

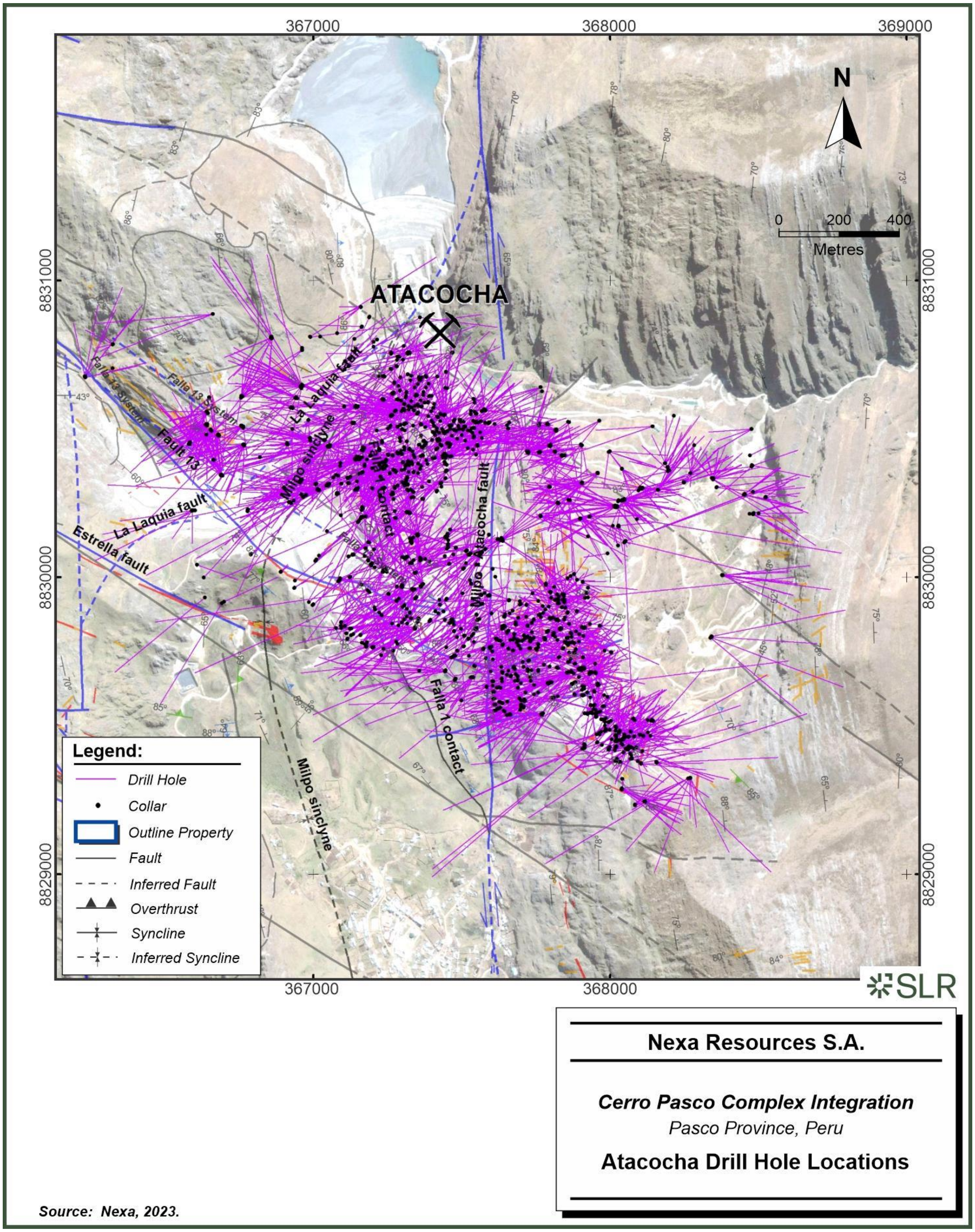
Exploration drilling is generally completed over a 50 m by 50 m grid, whereas infill drilling is designed to cover a 15 m by 15 m grid. The overall distribution of drill holes and channel samples has been concentrated around the Santa Bárbara, San Gerardo stock, and Integration zones.

Table 7-3: Atacocha Drilling

Year	Surface DDH		Surface RC		Underground DDH		Total	
	Number	Metres	Number	Metres	Number	Metres	Number	Metres
1968					4	350.00	4	350.00
1969					3	346.20	3	346.20
1971					1	31.08	1	31.08
1986					1	31.09	1	31.09
1991					2	135.02	2	135.02
1992					1	73.16	1	73.16
1997					4	231.67	4	231.67
1998					17	2,247.12	17	2,247.12
1999					41	3,460.20	41	3,460.20
2000	3	397.70			45	4,600.25	48	4,997.95
2001					94	8,756.05	94	8,756.05
2002					89	10,346.50	89	10,346.50
2003					179	20,541.40	179	20,541.40
2004	2	829.45			330	42,374.15	332	43,203.60
2005	6	1,366.75			150	29,886.65	156	31,253.40
2006					129	19,444.60	129	19,444.60
2007					225	29,896.55	225	29,896.55
2008	27	7,263.20			317	44,908.50	344	52,171.70
2009	13	6,236.35			107	20,222.30	120	26,458.65
2010	22	8,882.00			121	26,172.30	143	35,054.30

Year	Surface DDH		Surface RC		Underground DDH		Total	
	Number	Metres	Number	Metres	Number	Metres	Number	Metres
2011	9	1,406.00			179	38,558.80	188	39,964.80
2012					274	62,253.80	274	62,253.80
2013	30	3,978.10			157	44,306.20	187	48,284.30
2014	20	3,034.60			239	47,846.05	259	50,880.65
2015	127	19,710.40			152	25,138.10	279	44,848.50
2016	247	37,247.00			251	34,963.95	498	72,210.95
2017	66	15,707.30			321	52,141.45	387	67,848.75
2017			35	8,687.00			35	8,687.00
2018	93	16,048.10			425	64,968.40	518	81,016.50
2019	61	12,807.40			340	70,424.50	401	83,231.90
2020	69	12,239.70			53	8,344.00	122	20,583.70
2021	64	13,410.00					64	13,410.00
2022	40	9,466.20			3	845.50	43	10,311.70
2023	18	2,941.60					18	2,941.60
Total	**917**	**172,971.85**	**35**	**8,687.00**	**4,254**	**713,845.54**	**5,206**	**895,504.39**

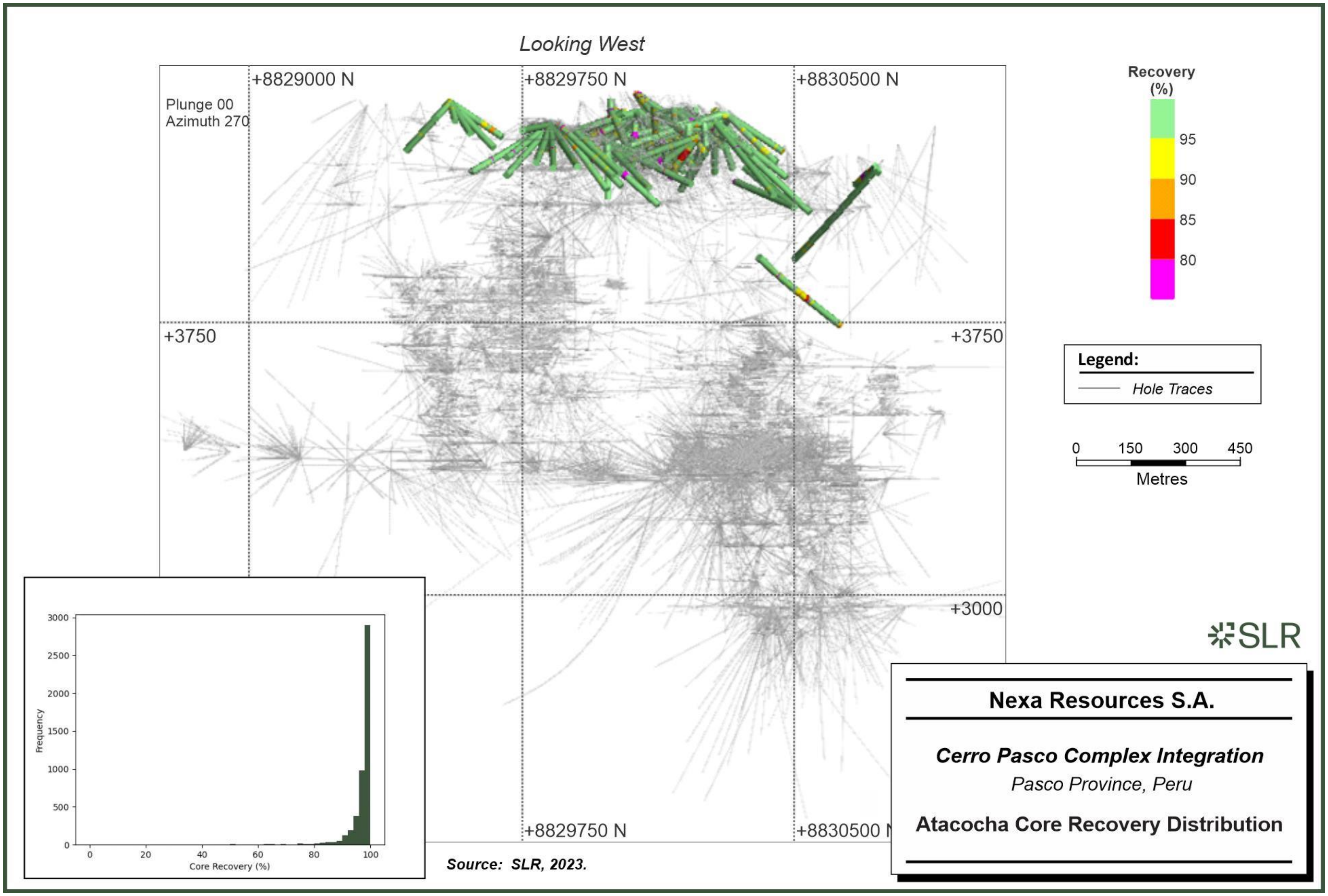
Figure 7-3: Atacocha Drill Hole Locations



7.2.2.1 Core Recovery

Since 2018, core recovery data is routinely gathered for each hole. This is available for 30,725 m of drill core at the effective date of the report, and 27,784 m of drill core within the resource database (closed on January 31, 2023), equivalent to 3% of the database. The underground portion of the mine has no core recovery data (Figure 7-4). Based on the available core recovery data within the open pit area, recovery is generally above 96% and does not indicate any issues that may bias assay results.

Figure 7-4: Atacocha Core Recovery Distribution



7.2.3 Drilling Practices

Drilling procedures are coordinated and supervised by company geologists and overseen by the Superintendent of Geology and Exploration.

Drill hole (and channel sample) identifiers are generated in a systematic and specific format, including codes to reference: country, mining unit, year, and sequential number. All related drill hole data generated is similarly referenced to the corresponding drill hole collar.

Drill hole collar coordinates determined by Total Station and orientation are certified by the surveyor and validated by the responsible geologist. The coordinates and collar orientation data are entered into a master CSV file and subsequently imported into the database (Fusion) and archived within four days of completing the drill hole.

Downhole orientation survey data is collected by various drilling contractors. The survey is generally carried out after the completion of the drill hole. Various survey equipment (i.e., Gyro, Reflex, Flexit, etc.) may be used depending on the drilling contractor and equipment availability. Gyro survey deviation information is archived in pdf format. Survey data are generally collected between approximately 5 m and 10 m downhole (5.4 m on average at El Porvenir and 7.6 m on average at Atacocha), depending on the drilling objective (infill and brownfield). Original survey data is marked on paper, and provided to the supervising geologist, signed by the driller in charge. Survey data is validated by the responsible geologist and recorded in a master CSV file, subsequently imported into the database.

Daily drilling logs completed and provided by the various contracted drilling companies are archived in PDF format.

Following the completion of a drill hole, the logging and core sampling procedures are carried out by a team of logging geologists. Core is logged for geology, lithology, mineralogy, and alteration, which is entered into logging software (Fusion). A complete series of core photos are taken for each drill hole and stored in JPEG or PDF format. Logging is completed within 48 hours after a drill hole is completed. Core sampling for geochemical analysis is carried out under the supervision of the Sampling Geologist Supervisor immediately after completion of the logging and core photography.

Current exploration core sampling follows a written Standard Operation Procedure (SOP) PO-EXP-GTO-009-PT (Nexa, 2024), which specifies sampling intervals between 0.5 m and 1.5 m in length and a recommended length of 1.0 m. Sampling length is variable however, to respect key structural, lithological, and mineralization boundaries.

At El Porvenir and Atacocha, exploration core has HQ (63.5 mm) or NQ (47.6 mm) diameter.

Once the sample length and cut-line have been defined by the supervising geologist, the core is cut longitudinally into two equal parts using an electric diamond drill core saw. If the core is very fractured, the sampler separates and removes 50% of the fragmented material for the sample. The fragments are deposited in a pre-coded polyethylene bag and transported to the laboratory. The remaining half-core is archived.

At El Porvenir, infill and resource definition drilling is typically BQ (36.4 mm) sized core and is sampled in its entirety on 1.5 m intervals, with TT-46 (35.3 mm) diameter core also occasionally used. At Atacocha, infill and resource definition drilling is typically NQ-sized.

As a result of the exploration, infill, and resource definition processes, diamond core sampling at both El Porvenir and Atacocha has mostly been completed on 1.0 m, 1.5 m, and 2.0 m intervals, resulting in a mean of 1.3 m at El Porvenir and 1.2 m at Atacocha.

At Atacocha, 35 RC drill holes were completed and largely sampled on 1.0 m intervals although further details regarding the sampling procedures are unavailable.

The company personnel responsible for managing the database incorporates the core logging and core sampling information, as well as the subsequent assay results once the analytical work is completed. Sample and assay data are initially combined in a master CSV file, subsequently imported into the database, and geological/mine/modelling software program.

Drilling information is stored in a structured directory and backed up on a central server located in Brazil.

7.3 Channel Sampling

7.3.1 El Porvenir

No channel sampling is documented before 2001 and the practice was discontinued in 2017, before being resumed in November 2019.

As of December 31, 2023, a total of 19,074 channel samples totalling 129,075 m have been completed at El Porvenir (Table 7-3).

The El Porvenir resource database closure date was January 31, 2023. Between then and the effective date of this report, 1,596 channels were completed. This is discussed further in Section 11.4.1 and the QP does not consider this to have a material impact on estimated Mineral Resources.

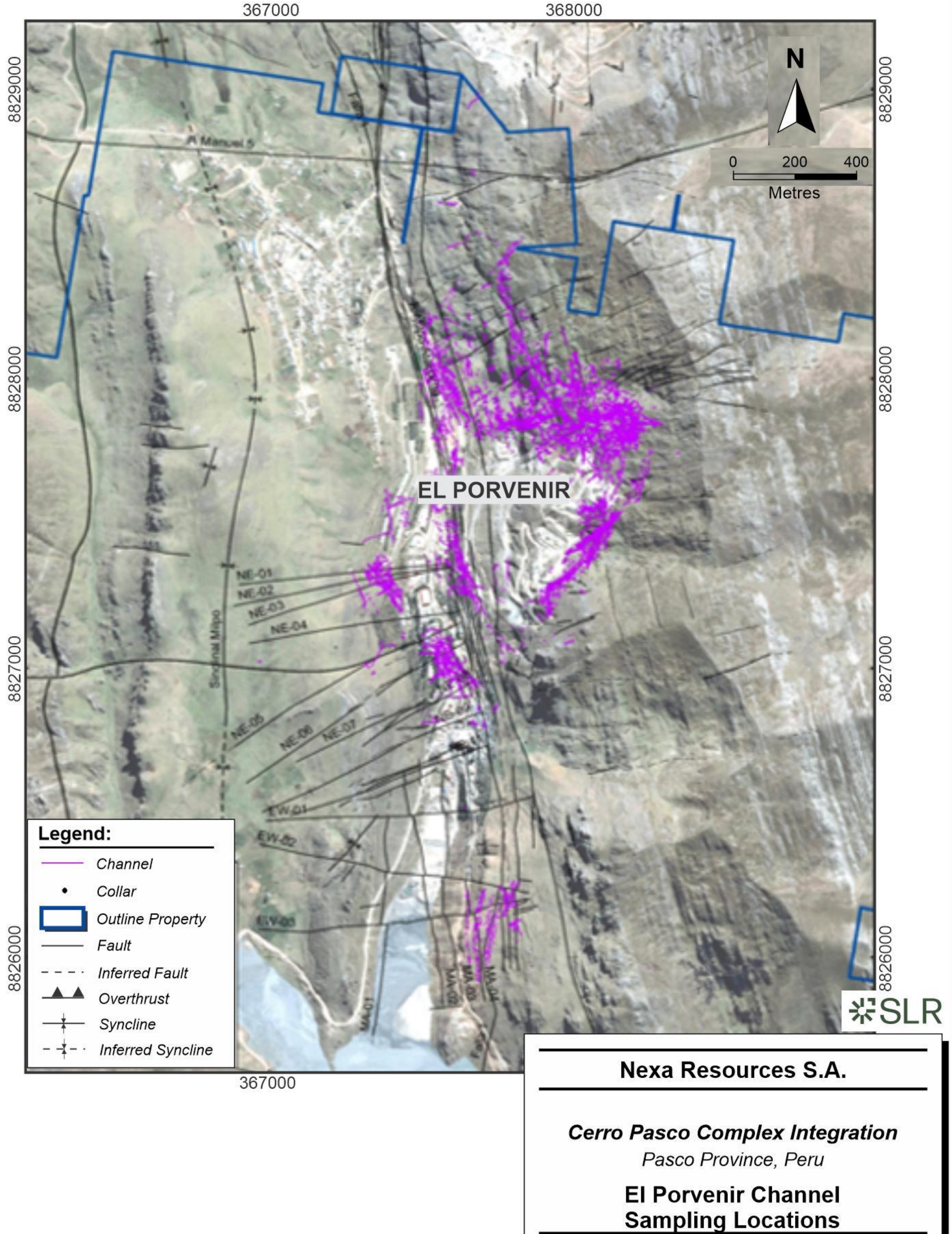
Figure 7-5 shows the distribution of channel sampling at El Porvenir:

Table 7-4: El Porvenir Channel Sampling

Year	Channels	Metres
Historic	2,906	19,442
2006	2,606	17,788
2007	998	8,915
2008	799	7,295
2009	1,097	6,982
2011	1,180	8,781
2012	1,153	7,740
2013	637	3,618
2014	607	3,702
2015	968	7,212
2016	437	4,026
2017	28	490
2019	135	753
2020	452	2,723
2021	1,637	9,319

Year	Channels	Metres
2022	1,674	9,926
2023	1,760	10,364
Total	**19,074**	**129,075**

Figure 7-5: El Porvenir Channel Sampling Locations



Source: Nexa, 2023.

7.3.2 Atacocha

As of December 31, 2023, a total of 69,154 channel samples totalling 262,171 m have been completed at Atacocha (Table 7-6). Channel sampling was discontinued in 2016 but resumed in 2022.

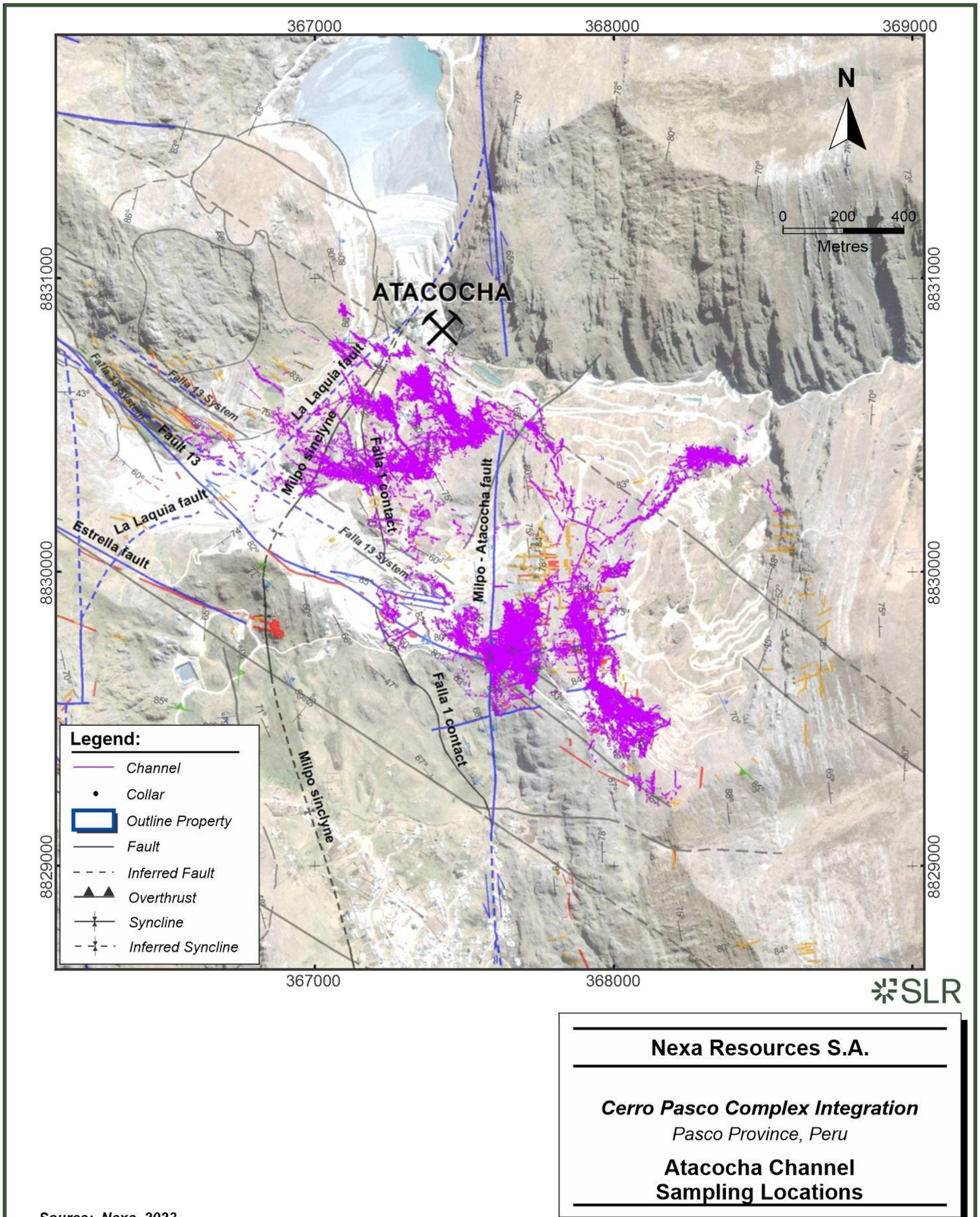
The Atacocha resource database closure date was January 31, 2023. Between then and the effective date of the report, 32 channels were completed, which were limited to the San Gerardo open pit area. This is discussed further in Section 11.5.1 and the QP does not consider this to have a material impact on estimated Mineral Resources.

Figure 7-6 shows the distribution of channel sampling locations at the Atacocha Mine.

Table 7-5: Atacocha Channel Sampling

Year	Quantity	Metres
2001	2,406	5,737.24
2002	8,523	23,044.88
2003	8,358	23,094.19
2004	6,316	23,035.27
2005	7,105	28,203.90
2006	9,505	36,975.60
2007	7,360	27,625.23
2008	6,141	22,777.25
2009	3,446	16,523.95
2010	2,357	12,879.30
2011	1,824	9,549.45
2012	1,949	10,376.30
2013	1,463	8,531.15
2014	1,290	7,652.65
2015	951	5,339.45
2016	112	648.60
2022	16	70.35
2023	32	106.40
Total	**69,154**	**262,171.16**

Figure 7-6: Atacocha Channel Sampling Locations



Source: Nexa, 2023.

7.3.3 Channel Sampling Practices

Channel samples are treated as drill holes in the database, with a location, survey (direction: azimuth and inclination), and associated sampling/assay data.

Channel chip samples are generally collected from the face of newly exposed underground workings. The entire process is carried out under the inspection of the sampling supervisor geologist.

Channel samples are collected between the hanging wall and footwall contacts of mineralized zones. A channel sample area is marked, oriented perpendicular to the strike of the mineralized structure.

The sample area is first washed down to provide a clear view of the vein. The width of each channel sample is approximately 0.2 m to 0.3 m wide, and 2.0 cm deep. The channel is sampled by taking a succession of chips in sequence from the hanging wall to the footwall.

Sample collection is normally performed by two samplers, one using the hammer and chisel, and the other holding the receptacle cradle to collect the rock fragments. The cradle consists of a sack, with the mouth kept open by a wire ring. The collected sample material is then placed on a mat measuring 1.0 m by 1.2 m; the larger sample fragments are then broken down to smaller fragments, less than approximately 2.0 cm, using a four- or six-pound hammer. Subsequently, the sample material is mixed, and approximately one quarter of the mixed material is separated to obtain a representative sample (cone-and-quarter method), with a target weight of between 2.5 kg and 3.0 kg.

At El Porvenir, the spacing between each channel sample is generally 1.0 m. If the width of the vein, or length of the channel sample, is longer than 1.0 m, sample lengths shorter than 1.0 m are collected. If the width of the vein is smaller than 0.2 m, the width of the sample is increased to 0.5 m to obtain a sufficient sample size.

At Atacocha, the spacing between each channel sample is generally 2.0 m. If the width of the vein, or length of the channel sample, is longer than 1.5 m, sample lengths shorter than 1.5 m are collected. If the width of the vein is smaller than 0.2 m, the width of the sample is increased to 0.4 m to obtain a sufficient sample size.

The final sample is placed in a bag with a coded ticket and shipped to the Inspectorate laboratory at the mine site.

7.4 Hydrogeology Data

7.4.1 El Porvenir

The El Porvenir Mine does not produce significant quantities of water. Details related to mine water drainage are covered in Section 13.1.6.2.

7.4.2 Atacocha

The Atacocha Mine does not produce significant quantities of water. Details related to hydrogeology are covered in Section 13.1.6.2.

7.5 Geotechnical Data

7.5.1 El Porvenir

Geotechnical studies have been conducted at El Porvenir to characterize the quality of the rock mass to predict the stope and mine workings stability. Underground geotechnical mapping, geotechnical core logging, and laboratory tests are part of Nexa geotechnical procedures. Nexa has performed laboratory testing in combination with geotechnical mapping and geotechnical logging to monitor the ground stability and to define parameters for ground support design of the underground workings as it is described in Section 13.1.4. The geotechnical logging, mapping, testing, and data analysis protocols include industry-standard practices.

7.5.1.1 Geotechnical Logging

Geotechnical logging information is available for 155,442 m of drill core (Table 7-6).

Table 7-6: El Porvenir Geotechnical Logging Summary Statistics

Analyte	Count	Length	Mean	StdDev	CV	Variance	Min	Q25	Median	Q75	Max
Core Recovery (%)	17,121	155,442	97.84	7.65	0.08	58.47	0	97.65	99.17	100	100
RQD (%)	17,146	155,884	61.73	25.57	0.41	653.94	0	25.14	57.65	79.74	100
RMR	17,146	155,884	39.93	13.23	0.33	174.91	8	25	35	46	82
Length (m)	17,146	155,884	9.09	14.45	1.59	208.68	0.04	1.55	3.8	10.2	210.2

7.5.2 Atacocha

Geotechnical studies have been conducted at the Atacocha Mine to characterize the quality of the rock mass to predict the stope and open pit mine workings stability. Underground geotechnical mapping, geotechnical core logging and laboratory tests are part of Nexa geotechnical procedures. Nexa has performed laboratory testing in combination with geotechnical mapping and geotechnical logging to monitor the ground stability and to define parameters for ground support design of the underground workings as it is described in Section 13.2.2. The geotechnical logging, mapping, testing and data analysis protocols include industry-standard practices.

7.5.2.1 Geotechnical Logging

Geotechnical logging is available for 30,725 m of drill core (Table 7-7). The underground portion of the mine has no geotechnical logging data.

Table 7-7: Atacocha Geotechnical Logging Summary Statistics

Analyte	Count	Length	Mean	StdDev	CV	Variance	Min	Q25	Median	Q75	Max
Core Recovery (%)	5,201	30,725	97.56	6.23	0.06	38.86	0	96.55	98.57	100	100
RQD (%)	5,201	30,725	58.13	27.42	0.47	751.83	0	17.27	46.67	71.43	100
RMR (%)	5,201	30,725	39.94	11.82	0.3	139.81	8	25	34	43	73

Analyte	Count	Length	Mean	StdDev	CV	Variance	Min	Q25	Median	Q75	Max
Length (m)	5,201	30,725	5.91	8.07	1.37	65.07	0.05	1.45	3.4	7.1	115.65

Note: CV – coefficient of variation

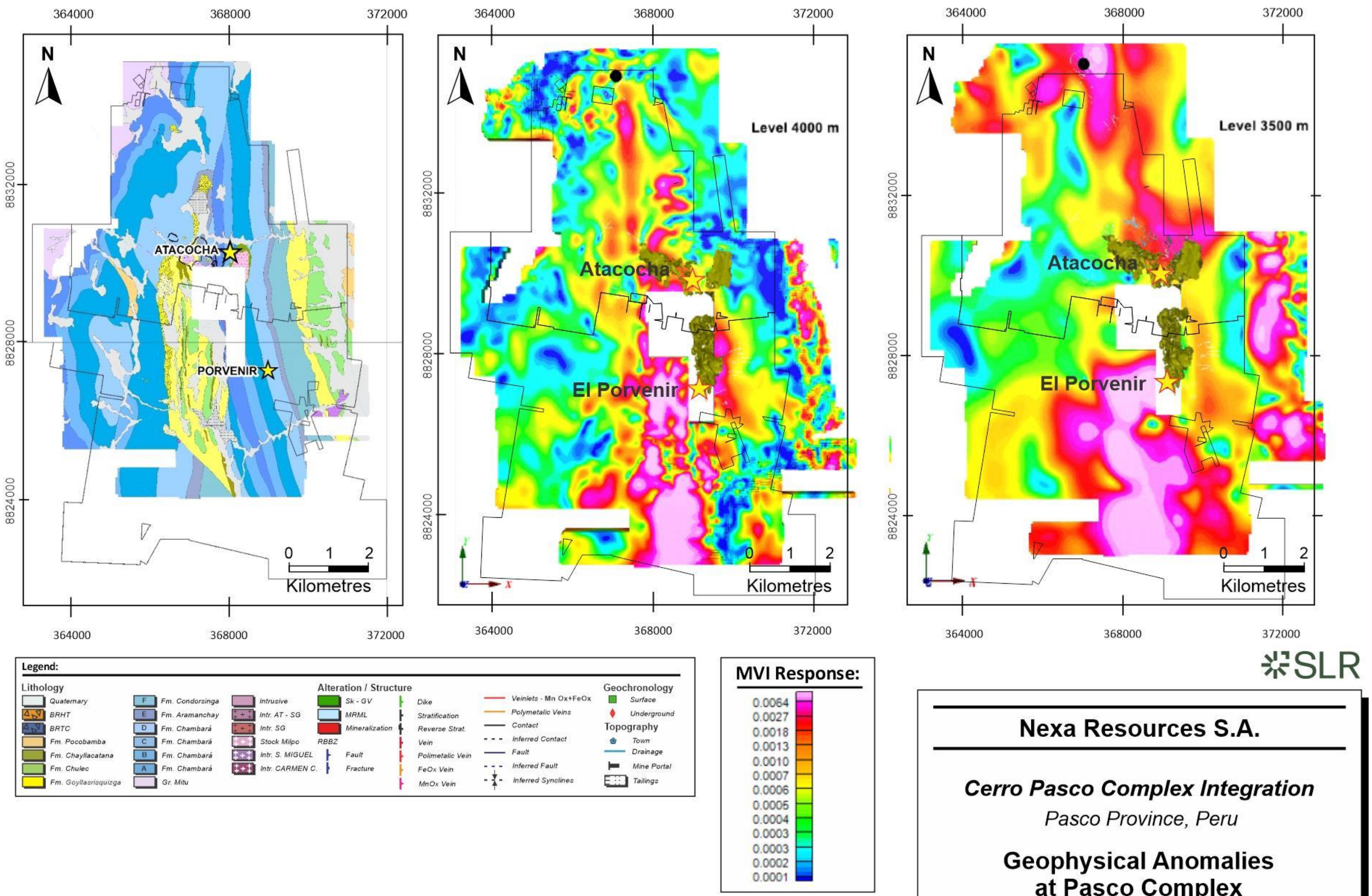
7.6 Geophysics

In 2020, Nexa commissioned a MagDrone magnetometry program covering 488 km of lines over a 7,200 ha area in the Cerro Pasco Complex district extending from the Machcan area to the south of El Porvenir (Figure 7-7). The geophysical survey indicated the possible presence of subcropping intrusives as new exploration targets. The magnetic surveys in the figures are coloured by MVI.

As shown in Figure 7-8, the magnetic surveys correlate with the intrusives, which is an important tool for determining prospective areas for the generation of new targets.

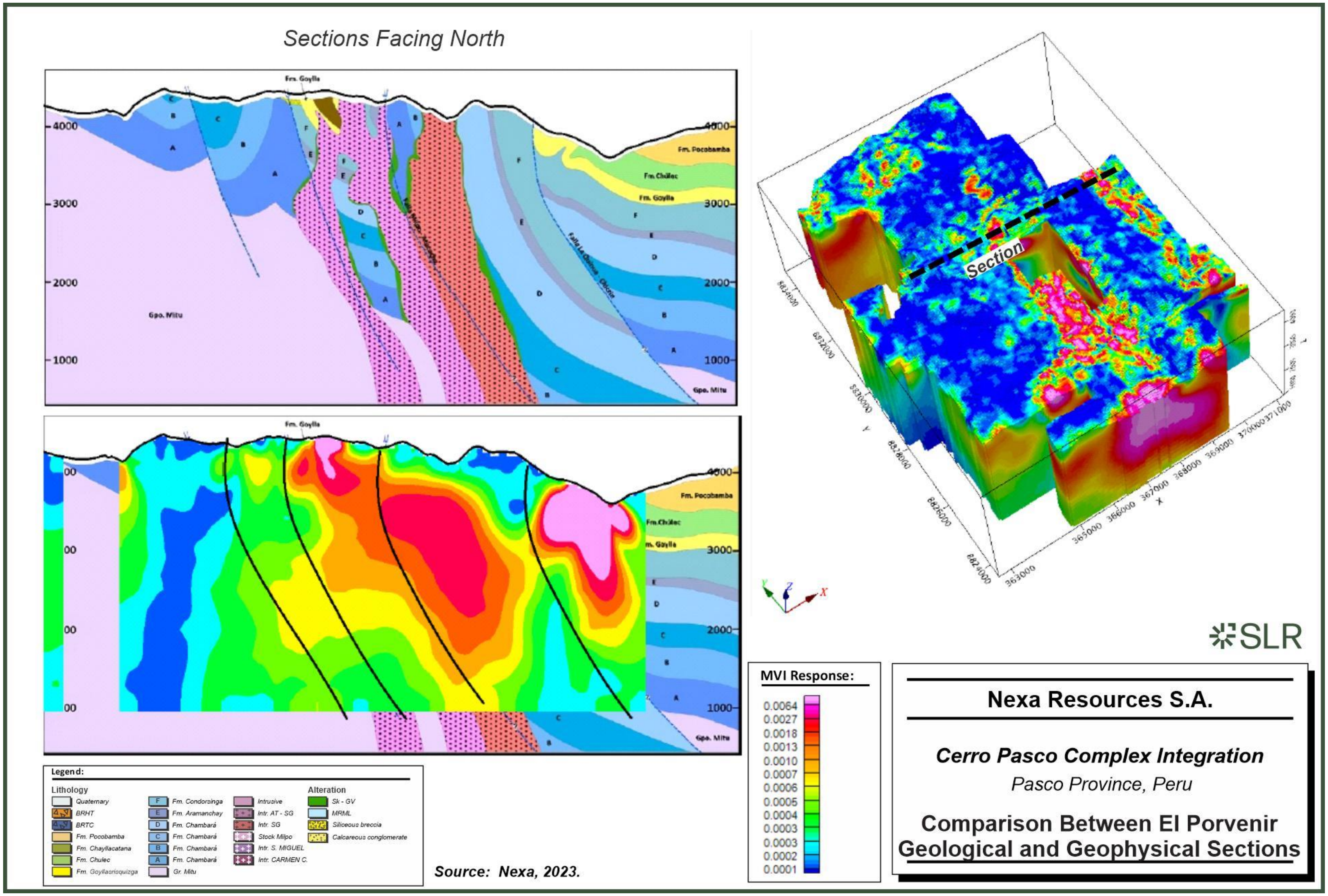
As part of Nexa's initiative to increase defined mineralization potential – termed the "Full Potential" program - exploration data acquisition and interpretation activities for 2023 focused on identifying mineralogical alteration patterns and included a surface magnetometric geophysical program, aiming to identify and define brownfield exploration targets (Section 7.8.2).

Figure 7-7: Geophysical Anomalies at Pasco Complex



Source: Nexa, 2023.

Figure 7-8: Comparison Between Geological and Geophysical Section



Source: Nexa, 2023.

7.7 Exploration Target

Nexa has identified areas of potential mineralization, for which there has been insufficient exploration to estimate a Mineral Resource or an Exploration Target, however, Nexa intends to test these with further exploration (Section 7.8).

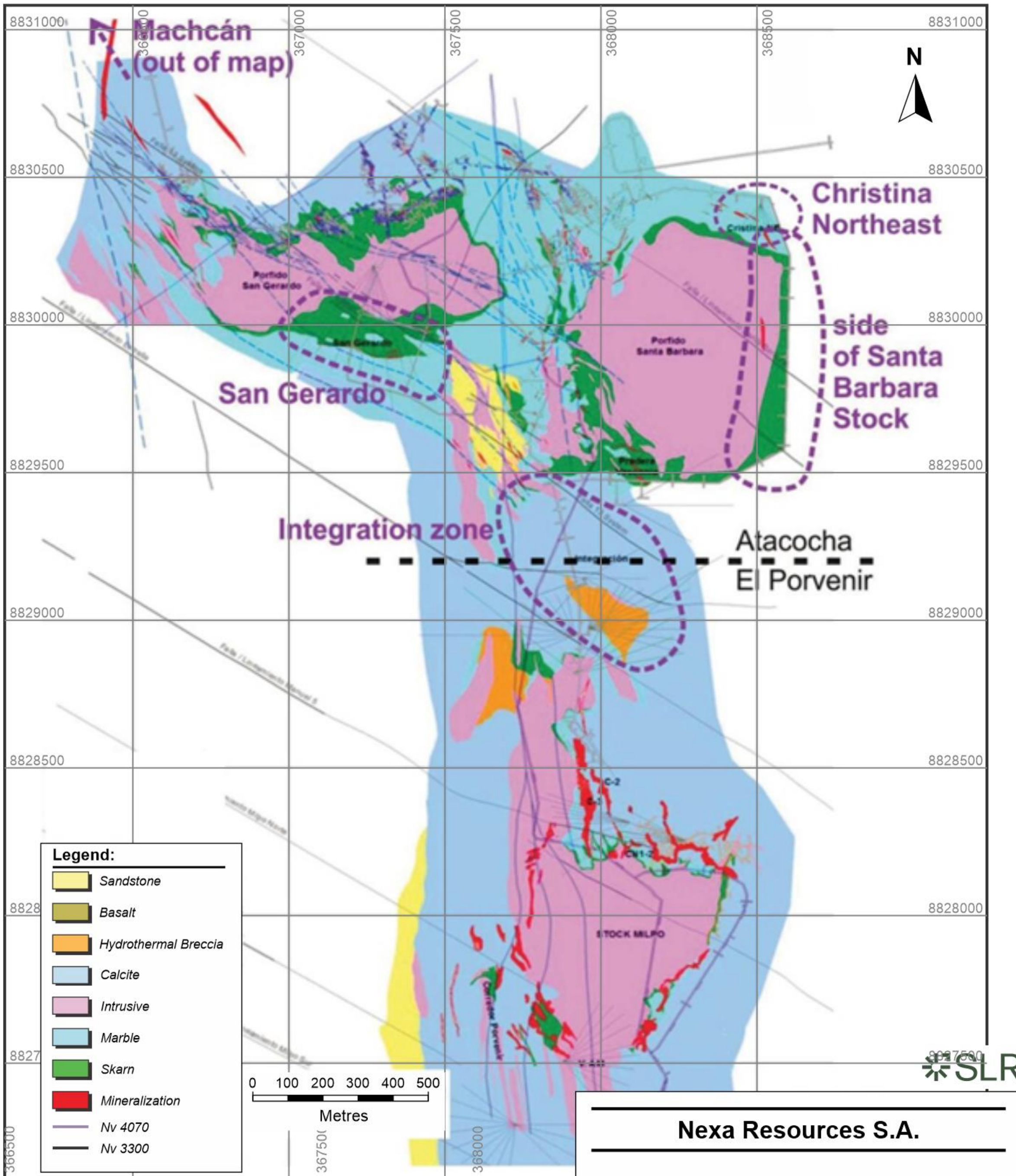
7.8 Exploration Potential

7.8.1 Short Term Exploration Potential

Short-term opportunities for discovering new and significant mineralization rely on developing exploration platforms and drilling exploration holes at the following locations (Figure 7-9):

- The upper levels (above 3,300 MASL) of the Integration Zone between El Porvenir and Atacocha.
- The eastern side of the Santa Bárbara stock, 3,300 MASL and below.
- The upper levels (above 3,300 MASL) of San Gerardo.

Figure 7-9: Short Term Exploration Potential



Nexa Resources S.A.

Cerro Pasco Complex Integration

Pasco Province, Peru

Short Term Exploration Potential

Source: Nexa Atacocha, 2023.

7.8.1.1 Integration of El Porvenir and Atacocha

To date, Nexa has developed two underground connections between the El Porvenir and Atacocha mines at the 3300 and 4070 levels. Several other connections were planned and allow ample opportunities to conduct underground exploration drilling to test the volume which lies between the two mines. Figure 7-10 presents the El Porvenir and Atacocha mines with underground workings in relation to the modelled mineralization wireframes, defined by drilling and underground channels and mapping, and to the potential mineralization wireframes, defined by the geological continuity and limited drilling. In 2018, mineralization within the Integration Zone was discovered at the 3300 Level, which consists of one mineralization zone hosted in hydrothermal breccias and another in skarn. Nexa plans to continue exploration towards levels above and below the 3300 Level. Since 2021, exploration has continued, with further drilling completed in 2022 and 2023.

The 2023 exploration program tested extensions of the Integration Zone in the 3300-3790-4050 Levels and confirmed the continuity of mineralization in the 3300 Level.

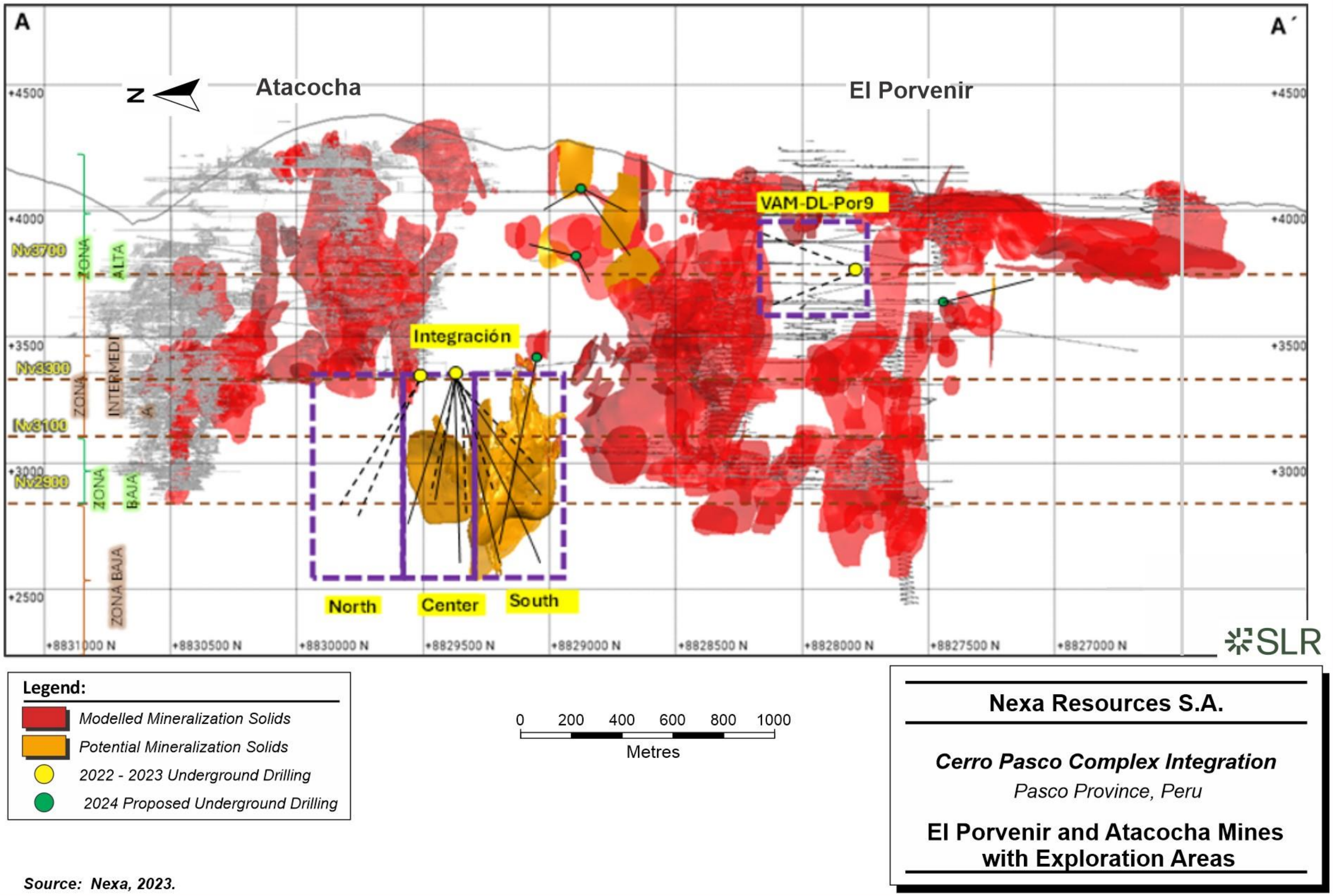
7.8.2 Long Term Brownfield Exploration Potential

In addition to brownfield targets in the deeper parts of both the Santa Bárbara skarns and the Integration Zone between Atacocha and El Porvenir, the following brownfield targets (Figure 7-11) have been recognized through surface mapping and subsequent work, including remote sensing process and geophysics:

- **Machcan:** Vein outcrops and mineralized mantle with Ag, Pb, and Zn mineralization, reflected in magnetic anomalies.
- **Curiajasha:** Northwest faulting, concordant with the dikes and magnetic anomalies.
- **Longreras:** Silicic breccia extending for more than two kilometres; the presence of Pb and Ag anomalies on surface and a magnetic anomaly to the south.
- **Manuel 05 and Pique Estrella:** Following the northwest structural trend; supported by historic holes intersecting vein mineralization.
- **La Quinua Chicrin Corridor:** Remote sensing anomalies, the presence of alunite, illite, and kaolinite, and sandstone host rock, supported by a geophysical anomaly at depth.

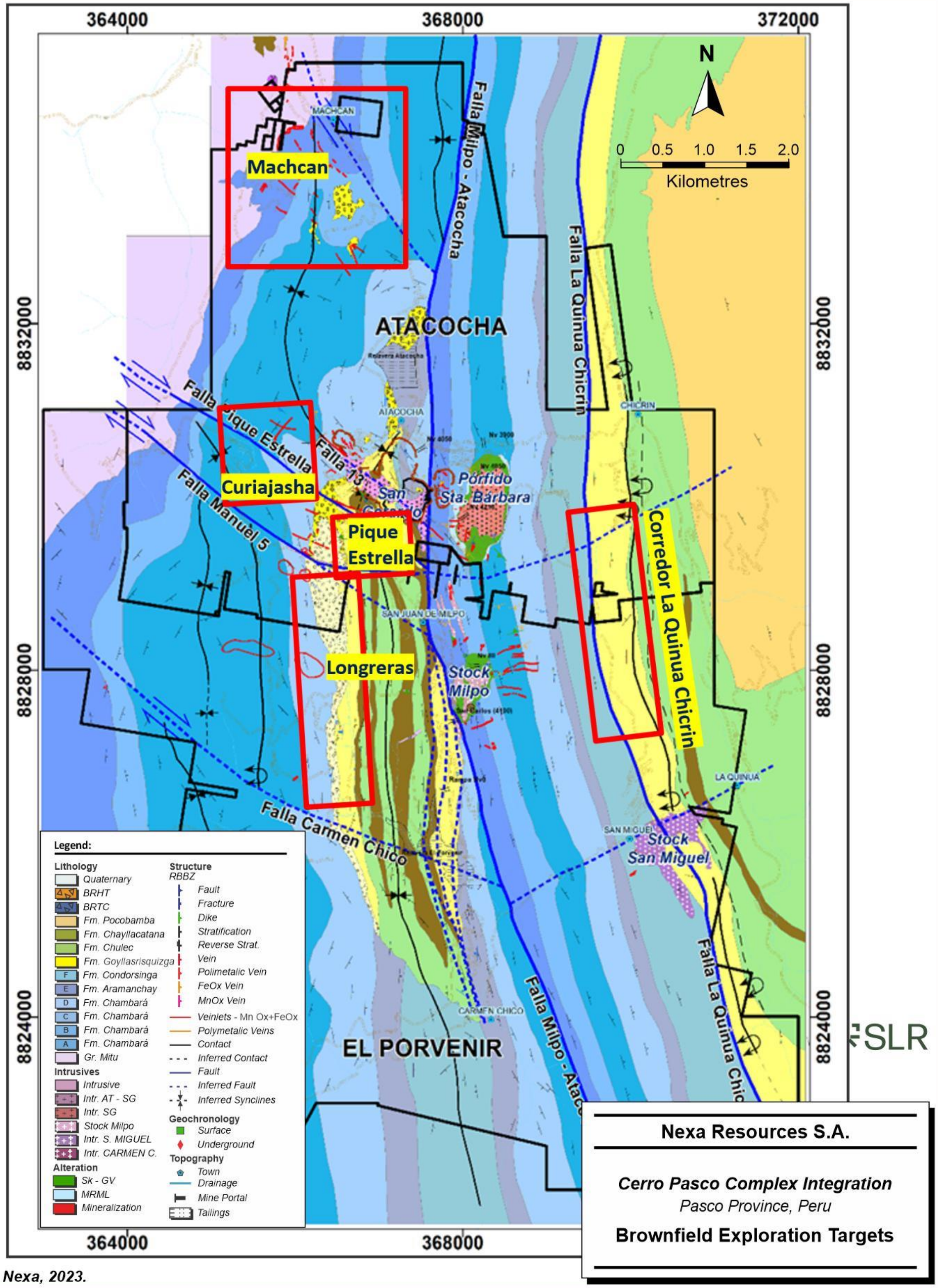
The Machán target is of particular exploration interest. This target is in the early concept phase but was tested by 3,879 m of core drilling during 2001 through 2013. The early results intersected a narrow polymetallic vein system with potential for a completely new skarn system, separate from Atacocha and El Porvenir. Nexa has modelled the vein system based on the drilling intercepts, but the mineralization remains open both laterally and at depth.

Figure 7-10: El Porvenir and Atacocha Mines with Exploration Areas



Source: Nexa, 2023.

Figure 7-11: Brownfield Exploration Targets



Source: Nexa, 2023.

7.8.3 Planned 2024 Exploration

A total of $2.1 million has been budgeted for planned exploration work in 2024 at the Complex, which includes approximately 8,500 m of diamond drilling focused on delineation of the Integration Zone toward the north and deeper levels. The program is intended to define new Inferred Mineral Resources where currently only potential mineralization has been identified, and test the extension of VAM, Don Lucho, and Porv 9 to the 3790 Level (Figure 7-11).

The exploration criteria for 2024 drilling are based on:

- **Structural Analysis:** Planned exploration drilling is focused on identifying extensions of known deposits based on structural geology and interpretation.
- **Geological Control:** Drilling will target skarn mineralization associated with intrusives; aiming to extend mineralized zones.

7.9 Summary

Exploration methods used by Nexa at the Complex are consistent with industry practices and the available data indicates further areas of potential mineralization.

Although additional drilling and channel sampling has taken place following the January 31, 2023 closure of the resource database used to estimate Mineral Resources, the QP considers that this information largely supports the existing interpretation and that it does not have a material impact.

8.0 Sample Preparation, Analyses, and Security

8.1 Laboratories

Cerro Pasco has used different independent laboratories including Inspectorate (referred to as Inspectorate AT and Inspectorate EP, at Atacocha and El Porvenir, respectively), ALS Peru S.A. (ALS) in Lima, Certimin S.A. (Certimin) in Lima, and, historically, SGS del Peru S.A.C. (SGS).

Inspectorate is an independent, commercial laboratory and is part of Bureau Veritas S.A., which is a global leader in testing, inspection, and certification ISO 17025:2017 standards for specific analytical procedures.

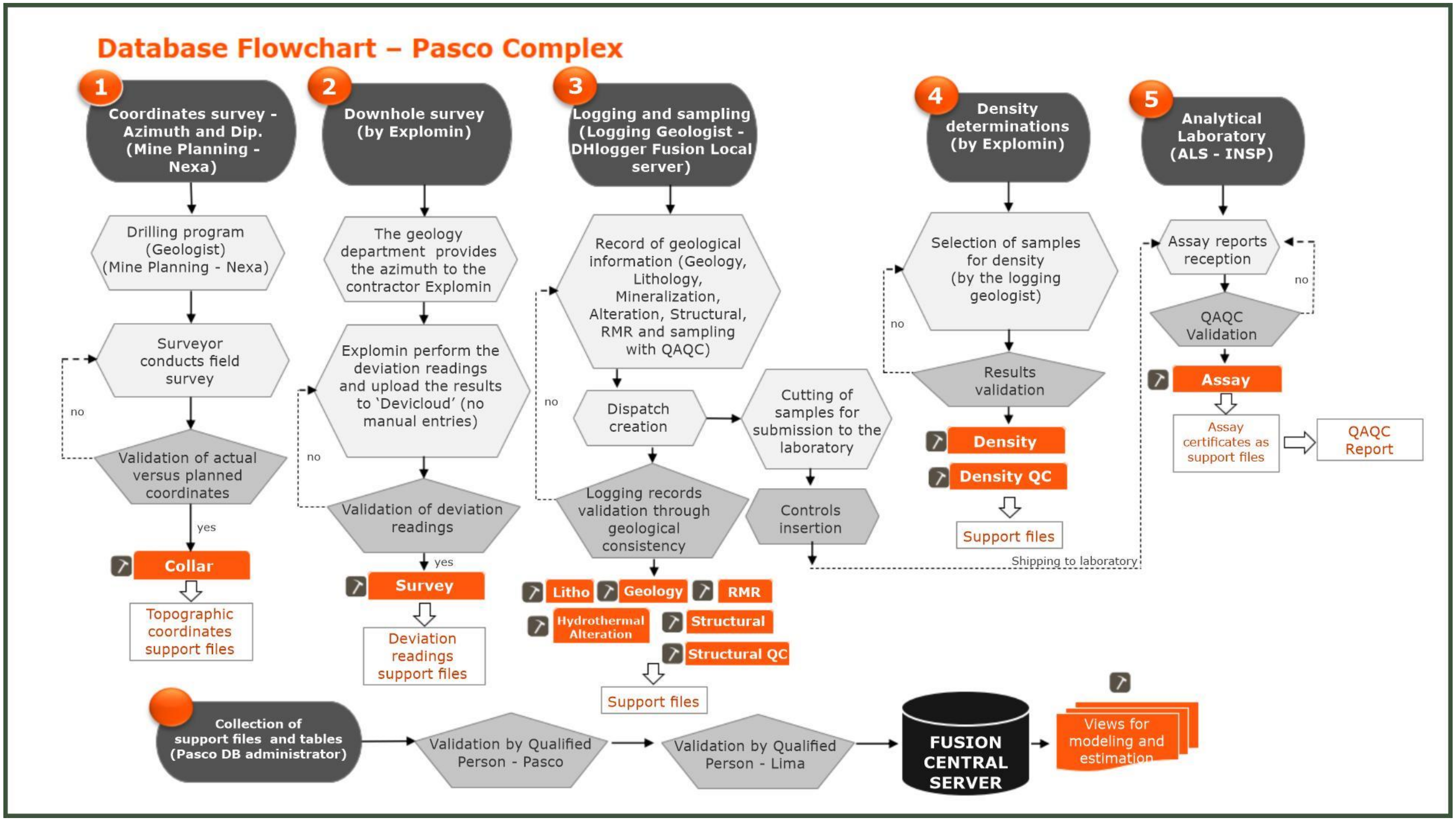
Certimin Lima holds ISO 9001 and NTP-ISO/IEC 17025 and 17021 certifications and is accredited by the Organismo Peruano de Acreditación (INACAL). ALS laboratories are accredited to ISO/IEC 17025:2005 for specific analytical procedures. Both Certimin and ALS laboratories are independent of Nexa.

SGS was used for sample preparation and analysis during the 2006 to 2009 drilling campaigns running the on-site laboratories at the mine sites. Since 2010, Nexa has generally used Inspectorate EP and AT for exploration sample preparation and analysis, with ALS and Certimin used if Inspectorate is running out of capacity.

8.2 Sample Preparation and Analysis

Figure 8-1 shows a schematic flow chart of sample control, data transfer, and personnel units responsible for each respective area.

Figure 8-1: Nexa Schematic Flow Chart for Sample and Data Controls



Source: Nexa, 2023

El Porvenir and Atacocha both have a contract with Inspectorate, which began its operations in 2011, and with ALS starting in 2018. SGS ran an on-site laboratory from 2006 to 2009. Exploration samples were sent to Certimin in 2017 and 2018.

Sampling was completed by Nexa geologists following standard operating procedures.

Sample preparation and analysis at the on-site Inspectorate EP and Inspectorate AT laboratories consisted of:

- Samples were dried at 105ºC, with primary crushing at 85% on a ¼" American Standard Test Sieve Series (ASTM) mesh and secondary crushing at 85% on a 10 mesh ASTM, split using a Jones riffle splitter (250 g to 280 g) and pulverized to 95% passing a 140 mesh screen (-105 µm).
- Samples were analyzed using aqua regia digestion with an atomic absorption spectroscopy (AAS) finish for the elements Zn, Pb, Cu, Ag, and Fe, and samples with over limits were re-assayed by Volumetric/Gravimetric Method.

Sample preparation and analysis at Certimin consisted of:

- Samples were dried at 105ºC and coarse crushed to 90% passing a 10 mesh screen (2.0 mm), riffle split (200 g to 250 g), and pulverized to 85% passing a 200 mesh screen (-75 µm).
- Samples were analyzed using the multielement inductively coupled plasma optical emission spectroscopy (ICP-OES) method with aqua regia digestion. Subsequently, upper limit samples were analyzed using AAS, particularly for the elements Zn, Pb, Cu, Ag, Fe, and Mn.
- Determination of Au using a standard fire assay (FA) fusion and AAS finish.

Sample preparation and analysis at ALS consisted of:

- Samples were dried at 105ºC and coarse crushed to 70% passing a 10 mesh screen (-2.0 mm), riffle split (200 g to 250 g), and pulverized to 85% passing a 200 mesh screen (-75 µm).
- Samples were analyzed by 35 multielement ICP-OES method and aqua regia digestion. For samples with upper limits, assays were conducted using AAS and, where appropriate, the Volumetric/Gravimetric Method, particularly for the elements Zn, Pb, Cu, Ag, Au, Bi, and Mn, as outlined in Table 8-2.
- Assays were also complemented using a standard FA with a 30 g aliquot and AAS finish.

Detection limits (DL) for Inspectorate EP and AT, ALS, and Certimin are summarized in Table 8-1.

Table 8-1: El Porvenir and Atacocha Laboratory Detection Limits

Laboratory	Element	Unit	Method	Detection Lower Limit	Detection Upper Limit	1st Upper Limit Default Method	2nd Upper Limit Default Method
Inspectorate EP	Ag	ppm	F-AA	4	-	GRA	-
	Cu	%	F-AA	0.01	30	VOL	-
	Fe	%	F-AA	0.01	-	VOL	-
	Mn	%	F-AA	0.01	-	VOL	-
	Pb	%	F-AA	0.01	30	VOL	-
	Zn	%	F-AA	0.01	30	VOL	-
Inspectorate AT	Ag	ppm	F-AA	2	-	GRA	-
	Au	ppm	FA	0.03	-	GRA	-
	Cu	%	F-AA	0.001	30	VOL	-
	Mn	%	F-AA	0.001	-	VOL	-
	Pb	%	F-AA	0.001	30	VOL	-
	Zn	%	F-AA	0.001	30	VOL	-
	Bi	%	F-AA	0.005	-	-	-
ALS	Au	ppm	Au-AA23	0.005	10	Au-GRA21	-
	Ag	ppm	ME-ICP41	0.2	100	Ag-OG46	Ag-GRA21
	Al	%	ME-ICP41	0.01	25	-	-
	As	ppm	ME-ICP41	2	10,000	-	-
	B	ppm	ME-ICP41	10	10,000	-	-
	Ba	ppm	ME-ICP41	10	10,000	-	-
	Be	ppm	ME-ICP41	0.5	1,000	-	-
	Bi	%	ME-ICP41	0.0002	1	-	-
	Ca	%	ME-ICP41	0.01	25	-	-
	Cd	ppm	ME-ICP41	0.5	1,000	-	-
	Co	ppm	ME-ICP41	1	10,000	-	-
	Cr	ppm	ME-ICP41	1	10,000	-	-
	Cu	%	ME-ICP41	0.0001	1	Cu-OG46	-
	Fe	%	ME-ICP41	0.01	50	Fe-OG46	-
	Ga	ppm	ME-ICP41	10	10,000	-	-
	Hg	ppm	ME-ICP41	1	10,000	-	-
	K	%	ME-ICP41	0.01	10	-	-
	La	ppm	ME-ICP41	10	10,000	-	-
	Mg	%	ME-ICP41	0.01	25	-	-
	Mn	%	ME-ICP41	0.0005	5	Mn-OG46	-
	Mo	ppm	ME-ICP41	1	10,000	-	-
	Na	%	ME-ICP41	0.01	10	-	-
	Ni	ppm	ME-ICP41	1	10,000	-	-

Laboratory	Element	Unit	Method	Detection Lower Limit	Detection Upper Limit	1st Upper Limit Default Method	2nd Upper Limit Default Method
	P	ppm	ME-ICP41	10	10,000	-	-
	Pb	%	ME-ICP41	0.0002	1	Pb-OG46	Pb-VOL70
	S	%	ME-ICP41	0.01	10	-	-
	Sb	ppm	ME-ICP41	2	10,000	-	-
	Sc	ppm	ME-ICP41	1	10,000	-	-
	Sr	ppm	ME-ICP41	1	10,000	-	-
	Th	ppm	ME-ICP41	20	10,000	-	-
	Ti	%	ME-ICP41	0.01	10	-	-
	Tl	ppm	ME-ICP41	10	10,000	-	-
	U	ppm	ME-ICP41	10	10,000	-	-
	V	ppm	ME-ICP41	1	10,000	-	-
	W	ppm	ME-ICP41	10	10,000	-	-
	Zn	%	ME-ICP41	0.0002	1	Zn-OG46	Zn-VOL70
Certimin	Au	ppm	G0108	0.005	10	G0014	-
	Ag	ppm	G0148	0.2	100	G0001	G0008
	Al	%	G0148	0.01	15	-	-
	As	ppm	G0148	3	10,000	-	-
	Ba	ppm	G0148	1	10,000	-	-
	Be	ppm	G0148	0.5	10,000	-	-
	Bi	%	G0148	0.0005	1	-	-
	Ca	%	G0148	0.01	15	-	-
	Cd	ppm	G0148	1	10,000	-	-
	Co	ppm	G0148	1	10,000	-	-
	Cr	ppm	G0148	1	10,000	-	-
	Cu	%	G0148	0.00005	1	G0038	-
	Fe	%	G0148	0.01	15	G0051	-
	Ga	ppm	G0148	10	10,000	-	-
	Hg	ppm	G0148	1	10,000	-	-
	K	%	G0148	0.01	15	-	-
	La	ppm	G0148	0.5	10,000	-	-
	Mg	%	G0148	0.01	15	-	-
	Mn	%	G0148	0.0002	1	G0060	-
	Mo	ppm	G0148	1	10,000	-	-
	Na	%	G0148	0.01	15	-	-
	Ni	ppm	G0148	1	10,000	-	-
	P	%	G0148	0.01	15	-	-
	Pb	%	G0148	0.0002	1	G0076	G0339
	S	%	G0148	0.01	10	-	-

Laboratory	Element	Unit	Method	Detection Lower Limit	Detection Upper Limit	1st Upper Limit Default Method	2nd Upper Limit Default Method
	Sb	ppm	G0148	5	10,000	-	-
	Sc	ppm	G0148	0.5	10,000	-	-
	Sr	ppm	G0148	0.5	5,000	-	-
	Th	ppm	G0148	50	10,000	-	-
	Ti	%	G0148	0.01	15	-	-
	Tl	ppm	G0148	2	10,000	-	-
	U	ppm	G0148	50	10,000	-	-
	V	ppm	G0148	2	10,000	-	-
	W	ppm	G0148	10	10,000	-	-
	Zn	%	G0148	0.00005	1	G0387	G0338

8.3 Sample Security

Core boxes were transported daily to the core shed by personnel from the drilling company. Samples were transported by a contractor supervised by company personnel. Core boxes and samples were stored in safe, controlled areas.

Chain-of-custody procedures were followed whenever samples were moved between locations and to and from the laboratory, by the completion of sample submittal forms.

8.4 Density Determinations

Density samples were collected from 2009 to 2023 for El Porvenir and from 2013 to 2023 for Atacocha and tested by various laboratories. Historically, Nexa used Certimin and ALS as independent laboratories for density determinations. A water immersion method is used, consisting of coating the sample in paraffin wax, weighing the sample in air, then suspending the sample in water, and weighing the sample again. By the end of 2020, dedicated density laboratories were established at El Porvenir and Atacocha to conduct density measurements using the water immersion method, but with a lacquer spray applied to porous samples rather than paraffin wax. To monitor accuracy and precision, quality control (QC) samples are integrated into the process, including certified reference, duplicate readings, and inter-method checks.

Density sample intervals are generally consistent with assay sampling intervals and are approximately one metre in length, although sometimes representative 10 cm to 20 cm lengths of the entire core are used, taken from a variety of lithological and mineralogical types. Photographs and brief descriptions were taken before sending the samples to the laboratory for density determinations. Density data is recorded in the main database.

The ALS and Certimin laboratories used the water immersion method to determine the density of the provided samples.

8.4.1 El Porvenir

A total of 14,634 density samples were taken from 2009 to 2023 at the El Porvenir deposit and tested by various laboratories. A summary of the density measurements taken is presented in Table 8-2.

From 2014 to 2016, on-site trained technicians performed density measurements using the water immersion method. Between 2017 and 2020, a team from third-party company Explomin Del Peru S.A.C. carried out density measurements within the El Porvenir core facility, in addition to Certimin and ALS. However, starting from December 2020, density measurements have been exclusively performed at the El Porvenir laboratory.

Table 8-2: El Porvenir Density Measurements

Phase	Sample Type	Total No. Samples	No. Samples within Mineralization Zones
LOM2009	Drill Holes	9	-
LOM2010	Drill Holes	37	-
LOM2011	Rock	686	508
LOM2011	Drill Holes	44	-
LOM2012	Rock	18	14
LOM2012	Drill Holes	92	-
LOM2014	Rock	62	22
LOM2014	Drill Holes	290	89
LOM2015	Rock	229	158
LOM2015	Drill Holes	828	187
LOM2016	Rock	236	169
LOM2016	Drill Holes	375	148
LOM2017	Drill Holes	386	134
LOM2018	Rock	86	36
LOM2018	Drill Holes	316	41
LOM2019	Drill Holes	834	118
LOM2020	Drill Holes	836	124
LOM2021	Drill Holes	966	86
LOM2022	Drill Holes	3,350	-
LOM2023	Drill Holes	4,954	-
Total		**14,634**	**1,834**

8.4.2 Atacocha

A total of 7,612 density samples were taken from LOM2013 to LOM2023 at the Atacocha deposit and tested by various laboratories. A summary of the density measurements taken is presented in Table 8-3.

Since December 2020, density measurements have been exclusively performed at the Atacocha laboratory.

Table 8-3: Atacocha Density Measurements

Phase	Sample Type	Total No. Samples	No. Samples within Mineralization Zones
LOM2013	Rock	859	817
LOM2013	Drill Hole	75	1
LOM2014	Drill Hole	89	-
LOM2015	Drill Hole	38	12
LOM2016	Rock	720	359
LOM2016	Drill Hole	240	-
LOM2017	Rock	152	-
LOM2017	Drill Hole	227	45
LOM2018	Rock	97	-
LOM2018	Drill Hole	889	130
LOM2019	Rock	20	10
LOM2019	Drill Hole	1060	102
LOM2020	Drill Hole	1004	202
LOM2021	Drill Hole	577	27
LOM2022	Drill Hole	659	-
LOM2023	Drill Hole	906	-
TOTAL		**7,612**	**1,705**

8.5 Quality Assurance and Quality Control

Both El Porvenir and Atacocha implement quality assurance (QA) and quality control (QC) practices to maintain and monitor sample data quality. The implemented QA practices include standardized operating procedures and maintaining robust data management and transfer systems, while the implemented QC includes sampling to monitor performance of the sampling, sample preparation, and analytical processes. Analysis of QC data is performed to assess the reliability of all sample assay data and the confidence in the data used for resource estimation.

For the current Mineral Resource estimate, SLR was retained to independently review the QA/QC data from El Porvenir (since January 16, 2020) and Atacocha (since September 1,

2018) until January 31, 2023, the cut-off date for the resource database. The QA/QC program implemented by Nexa complies with current industry best practices which involve appropriate procedures and routine insertion of certified reference materials (CRM), blanks, and duplicates to monitor the sampling, sample preparation, and analytical processes.

QC samples have been inserted into the drill core sample stream since 2014 and the channel sample batches since 2012. The mines routinely send CRMs generated from in-house material, blanks, field duplicates, coarse reject (preparation) duplicates, and pulp (laboratory) duplicates to the laboratory.

During 2018, Nexa incorporated systematic external checks into the QC program. Check assay programs were also carried out prior to 2018, in which pulps were sent to external laboratories for analysis. Currently, Inspectorate and ALS analyze samples from infill drilling and brownfield exploration drilling, respectively.

During the 2006 to 2009 drilling campaign, samples were sent to SGS for analysis. Since 2010, underground infill drilling samples have been sent to Inspectorate EP and Inspectorate AT. If the Inspectorate laboratories are running out of capacity, samples are delivered to Certimin and/or ALS laboratories.

For infill and exploration drilling, one batch of samples is prepared for each drill hole. Field duplicates are inserted directly following the original sample, while coarse blank samples are inserted following a mineralized zone, and CRM samples are inserted randomly.

The insertion of the QC samples into the sample stream follows the sample ID sequence.

Pulp check samples are inserted at a rate of approximately 2% of the total samples submitted, consisting of an additional split of material taken after the pulverizing stage and submitted to a secondary laboratory.

Each batch of check samples submitted to the secondary laboratory includes CRM and blank samples.

A QC report is prepared monthly by the on-site Database Administrator, and subsequently reviewed by the Resource Geologist and Nexa corporate QC coordinator. Batches of samples identified by a QC review as an anomalous result are repeated by the laboratory at the request of the Nexa Geology team. QA/QC databases are maintained within Fusion.

Table 8-4 shows the control sample insertion rate and acceptance criteria followed during Nexa’s QA/QC programs for El Porvenir and Atacocha.

Table 8-4: El Porvenir and Atacocha Control Sample Insertion Rate and Failure Criteria

Control Sample	Type	Insertion Rate	Failure Criteria	Expected/Allowed % Failures
Blanks		1 in 50 (2%)	5 x DL	<5%
CRMs		1 in 20 (5%)	Outside 3 SD	<10%
Duplicates	Field	1 in 100 (1%)	<±30% relative error	<10%
	Coarse	1 in 100 (1%)	<±20% relative error	<10%
	Pulp	1 in 20 (5%)	<±10% relative error	<10%
External checks	Pulp	1 in 50 (2%)	<5% bias	<10%

8.5.1 El Porvenir

El Porvenir QC samples represent approximately 13% to 17% of the total samples (Table 8-5).

Table 8-5: El Porvenir QC Submittals: 2020 to 2023

Sample Type	Laboratory	Period	Primary Samples	Fine Blanks	Coarse Blanks	Pulp Duplicates	Coarse Duplicates	Field Duplicates	CRM	Check Assay	Insertion Rates (%)
Channel	INSP EP	2020-2023	17,316		401	1,039	195	182	1,058		14
	INSP AT	2020-2023			2	3	1		3		
	ALS	2020-2023		3					12		
Drill Hole Sample	ALS	2020 - 2023	48,699	6	1,418	3,546	812	593	2,903	639	17
	Certimin	2020-2023	546	9	14	30	14		46	62	24
	INSP EP	2020 - 2023	35,074		794	2,074	828	2	1,996	634	15
	INSP AT	2020 - 2023			38	18	10		86		
Total Samples			**101,635**	**18**	**2,667**	**6,710**	**1,860**	**777**	**6,104**	**1,335**	16

8.5.1.1 Certified Reference Material

Results of the regular submission of CRMs are used to identify potential issues with specific sample batches and long-term biases associated with the primary assay laboratory.

Nexa regularly uses CRMs prepared from in-house material and certified by eleven reputable laboratories. These CRMs are inserted into the sample streams by technicians trained in QC procedures.

Specific pass/fail criteria were used based on setting the CRM acceptance limits at the mean ±3 standard deviations (SD) as a failure limit threshold. QC failures are re-assayed as well as three shoulder samples from each side at the request of Nexa.

Milpo, 2014 to 2017

This section has mostly been summarized from SRK (2017).

The database recorded 31,314 drill core samples with 1,764 standards (a submission rate of 1 in 18 samples) submitted in 2014 and 2017 and 11,129 channel samples with 753 standards (a submission rate of 1 in 15 samples) submitted between 2014 and 2016. Prior to 2014, El Porvenir did not have a QA/QC program implemented.

Pass rates reported for standards submitted with drill core samples were 99% for Ag, 84% for Pb, 97% for Zn, and 99% for Cu. The accuracy levels were considered acceptable for Ag, Zn, and Cu but below acceptable levels for Pb. Pass rates reported for standards submitted with channel samples were 99% for Ag, 77% for Pb, 96% for Zn, and 99% for Cu. The accuracy levels for Ag, Zn, and Cu can be considered acceptable, however Pb performance should be improved. Both channel and drill core show values below 80% for CRMs MAT-05 (moderate-grade), STD2_ACTLABS2015 (moderate-grade), and STD3_ACTLABS2015 (high-grade). SRK identified minor biases in some of the standards.

In SLR's opinion, the latest results indicate that performance has improved and that the minor biases do not materially impact the results.

Nexa, 2017 to 2020

From November 2017 to 2020, El Porvenir sent to Certimin, Inspectorate EP, and ALS a total of 139,319 drill core samples and 7,799 CRMs resulting in an insertion rate of 5.3%.

SLR reviewed the results returned from the CRMs and notes that Nexa had implemented procedures reducing the CRM failure rates significantly. Results for the CRMs are generally within acceptable limits with a small percentage of failures. The CRMs covered a reasonable range of grades with respect to the overall Mineral Resource grades and no significant bias was observed.

Nexa, 2021 to 2023

A total of five different CRMs were employed for accuracy monitoring purposes. These included high grade (PEPSSTD006), moderate (PEPSSTD005), and low grade (PEPSSTD004) standards. In 2022, standards PEPSSTD008 and PEPSSTD009 were introduced and certified specifically for base metals analysis. Additionally, a separate standard, PLSUL43, was introduced to ensure the accuracy of gold measurements.

Overall, the control charts demonstrate favourable levels of dispersion and accuracy across all participant laboratories, including Inspectorate EP, Certimin, and ALS. The results of all the CRMs utilized between 2021 and 2023 are presented in Table 8-6.

SLR observed that biases exceeding 5% are associated with CRM Cu values close to its detection limit and do not necessarily indicate poor performance.

Table 8-6: El Porvenir Certified Reference Material Performances

Laboratory	CRM	Element	Unit	Period Range	Num Samples	Std Dev	Mean	Expected Value	Num Outliers	Bias (%)	Outliers (%)
ALS	PEPSSTD004	Ag	ppm	2020-2022	731	0.91	24.62	23.3	38	5.66	5.20
		Au	ppm	2020-2022	730	0.02	0.33	0.316	41	4.02	5.62
		Cu	pct	2020-2022	731	0.00	0.06	0.054	40	5.57	5.47
		Pb	pct	2020-2022	731	0.02	0.47	0.46	27	1.18	3.69
		Zn	pct	2020-2022	731	0.02	0.54	0.57	32	-5.51	4.38
	PEPSSTD005	Ag	ppm	2020-2022	1543	1.33	42.04	40.8	76	3.05	4.93
		Au	ppm	2020-2022	1538	0.02	0.53	0.525	78	1.18	5.07
		Cu	pct	2020-2022	1543	0.00	0.06	0.055	73	3.70	4.73
		Pb	pct	2020-2022	1543	0.03	1.12	1.15	70	-2.21	4.54
		Zn	pct	2020-2022	1543	0.06	1.53	1.52	18	0.47	1.17
	PEPSSTD006	Ag	ppm	2020-2023	1196	4.04	185.97	185	41	0.52	3.43
		Au	ppm	2020-2023	1194	0.01	0.45	0.438	60	1.71	5.03

Laboratory	CRM	Element	Unit	Period Range	Num Samples	Std Dev	Mean	Expected Value	Num Outliers	Bias (%)	Outliers (%)
		Cu	pct	2020-2023	1196	0.01	0.19	0.186	56	2.52	4.68
		Pb	pct	2020-2023	1196	0.09	4.13	4.17	52	-1.03	4.35
		Zn	pct	2020-2023	1196	0.22	6.85	6.63	4	3.30	0.33
	PEPSS TD008	Ag	ppm	2023-2023	96	1.29	41.66	40.1	3	3.89	3.13
		Cu	pct	2023-2023	96	0.00	0.03	0.03	6	-12.21	6.25
		Pb	pct	2023-2023	96	0.03	1.35	1.37	1	-1.81	1.04
		Zn	pct	2023-2023	96	0.28	2.84	2.88	2	-1.55	2.08
	PLSUL 43	Au	ppm	2023-2023	4	0.01	0.76	0.71	0	6.58	0.00
Certimin	PEPSS TD004	Ag	ppm	2020-2021	6	0.22	23.98	23.3	0	2.93	0.00
		Au	ppm	2020-2021	6	0.01	0.33	0.316	0	4.85	0.00
		Cu	pct	2020-2021	6	0.00	0.06	0.054	0	3.56	0.00
		Pb	pct	2020-2021	6	0.01	0.46	0.46	0	-0.15	0.00
		Zn	pct	2020-2021	6	0.01	0.54	0.57	0	-4.45	0.00
	PEPSS TD005	Ag	ppm	2020-2021	26	0.76	41.17	40.8	2	0.91	7.69
		Au	ppm	2020-2021	26	0.01	0.51	0.525	1	-2.97	3.85
		Cu	pct	2020-2021	26	0.00	0.06	0.055	1	0.19	3.85
		Pb	pct	2020-2021	26	0.02	1.14	1.15	2	-0.84	7.69
		Zn	pct	2020-2021	26	0.03	1.49	1.52	0	-1.85	0.00
	PEPSS TD006	Ag	ppm	2021-2022	22	3.70	185.95	185	0	0.52	0.00
		Au	ppm	2021-2022	22	0.02	0.45	0.438	0	2.00	0.00
		Cu	pct	2021-2022	22	0.00	0.19	0.186	1	1.53	4.55
		Pb	pct	2021-2022	22	0.05	4.29	4.17	3	2.76	13.64
		Zn	pct	2021-2022	22	0.07	6.79	6.63	2	2.37	9.09
INSP_AT	PEPSS TD004	Ag	ppm	2020-2021	5	0.32	23.01	23.3	0	-1.25	0.00
		Au	ppm	2020-2021	5	0.00	0.30	0.316	0	-4.62	0.00
		Cu	pct	2020-2021	5	0.00	0.06	0.054	0	9.26	0.00
		Pb	pct	2020-2021	5	0.00	0.48	0.46	0	4.13	0.00
		Zn	pct	2020-2021	5	0.00	0.58	0.57	0	0.98	0.00
	PEPSS TD005	Ag	ppm	2020-2022	20	0.50	39.54	40.8	1	-3.09	5.00
		Au	ppm	2020-2022	20	0.01	0.49	0.525	0	-6.79	0.00
		Cu	pct	2020-2022	20	0.00	0.06	0.055	1	8.45	5.00
		Pb	pct	2020-2022	20	0.02	1.14	1.15	0	-0.69	0.00
		Zn	pct	2020-2022	20	0.03	1.52	1.52	0	-0.16	0.00

Laboratory	CRM	Element	Unit	Period Range	Num Samples	Std Dev	Mean	Expected Value	Num Outliers	Bias (%)	Outliers (%)
	PEPSS TD006	Ag	ppm	2020-2022	54	2.59	180.71	185	1	-2.32	1.85
		Au	ppm	2020-2022	54	0.01	0.44	0.438	2	-0.52	3.70
		Cu	pct	2020-2022	54	0.00	0.18	0.186	1	-0.91	1.85
		Pb	pct	2020-2022	54	0.07	4.17	4.17	1	0.07	1.85
		Zn	pct	2020-2022	54	0.12	6.66	6.63	3	0.50	5.56
	PLSUL 43	Au	ppm	2022-2022	10	0.01	0.69	0.71	1	-2.15	10.00
INSP_EP	PEPSS TD004	Ag	ppm	2020-2022	225	0.49	24.15	23.3	8	3.63	3.56
		Cu	pct	2020-2022	225	0.00	0.06	0.054	12	4.78	5.33
		Pb	pct	2020-2022	225	0.01	0.46	0.46	14	-0.65	6.22
		Zn	pct	2020-2022	225	0.01	0.57	0.57	4	0.11	1.78
	PEPSS TD005	Ag	ppm	2020-2023	1251	0.77	41.11	40.8	49	0.77	3.92
		Cu	pct	2020-2023	1251	0.00	0.06	0.055	78	3.92	6.24
		Pb	pct	2020-2023	1251	0.03	1.20	1.15	6	4.60	0.48
		Zn	pct	2020-2023	1251	0.03	1.56	1.52	24	2.96	1.92
	PEPSS TD006	Ag	ppm	2020-2023	1477	2.46	185.29	185	23	0.16	1.56
		Cu	pct	2020-2023	1477	0.00	0.19	0.186	13	0.94	0.88
		Pb	pct	2020-2023	1477	0.09	4.26	4.17	27	2.22	1.83
		Zn	pct	2020-2023	1477	0.16	6.68	6.63	9	0.81	0.61
	PEPSS TD008	Ag	ppm	2022-2023	64	1.15	40.41	40.1	2	0.77	3.13
		Cu	pct	2022-2023	64	0.00	0.03	0.03	0	-9.64	0.00
		Pb	pct	2022-2023	64	0.03	1.44	1.37	2	5.10	3.13
		Zn	pct	2022-2023	64	0.06	3.02	2.88	2	4.91	3.13
	PEPSS TD009	Ag	ppm	2022-2023	37	0.30	25.82	26	2	-0.67	5.41
		Cu	pct	2022-2023	37	0.00	0.02	0.015	2	13.33	5.41
		Pb	pct	2022-2023	37	0.01	0.86	0.84	0	1.99	0.00
		Zn	pct	2022-2023	37	0.02	1.33	1.38	2	-3.84	5.41

SLR selected three distinct CRMs for an in-depth review, representing the low, average, and high grade ranges. These materials were chosen based on factors such as sample size, the laboratory of origin, and their recent performance.

Figure 8-2 to Figure 8-5 illustrate the CRM performance from Inspectorate EP, indicating generally good accuracy with biases ranging from 0.2% to 2.2% for all the evaluated elements. SLR noted some failures exceeding the ±3SD, particularly detected for Ag and Cu. In 2022, a change in the trend of the standards data is particularly observed for Zn and Ag. This shift is attributed to the scheduled semi-annual maintenance performed on the Inspectorate EP equipment. These slight biases are observed in the high grade range CRM PEPSSTD006 and the medium-grade range CRM PEPSSTD005; however, it is still within acceptable limits and is not considered to indicate significantly adverse results obtained from Inspectorate EP.

Figure 8-6 to Figure 8-8 present the CRM performance at ALS, indicating overall good accuracy with biases ranging from -1.6% to 3.3%. In 2023, SLR observed two instances of analyses exceeding the upper limit (>1%) for Zn as demonstrated in Figure 8-8. SLR recommends conducting over-limit re-assays to accurately evaluate standard performance.

Figure 8-2: El Porvenir Zn Control Chart for CRM PEPSSTD006 at Inspectorate EP: 2020 to 2023

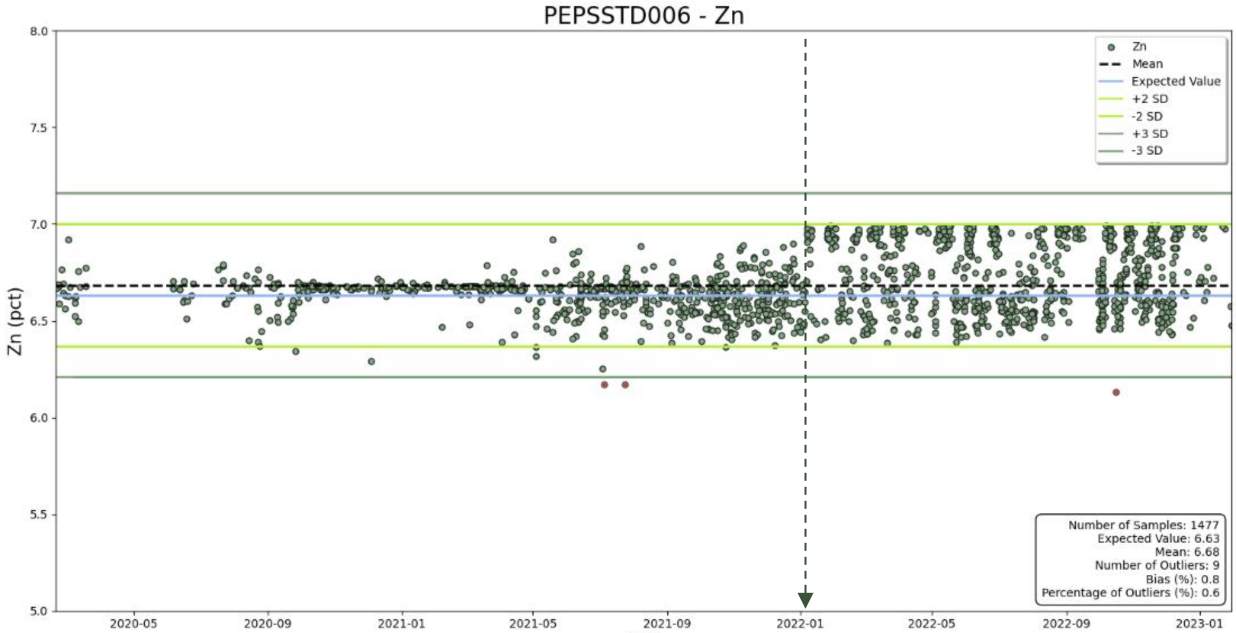


Figure 8-3: El Porvenir Pb Control Chart for CRM PEPSSTD006 at Inspectorate EP: 2020 to 2023

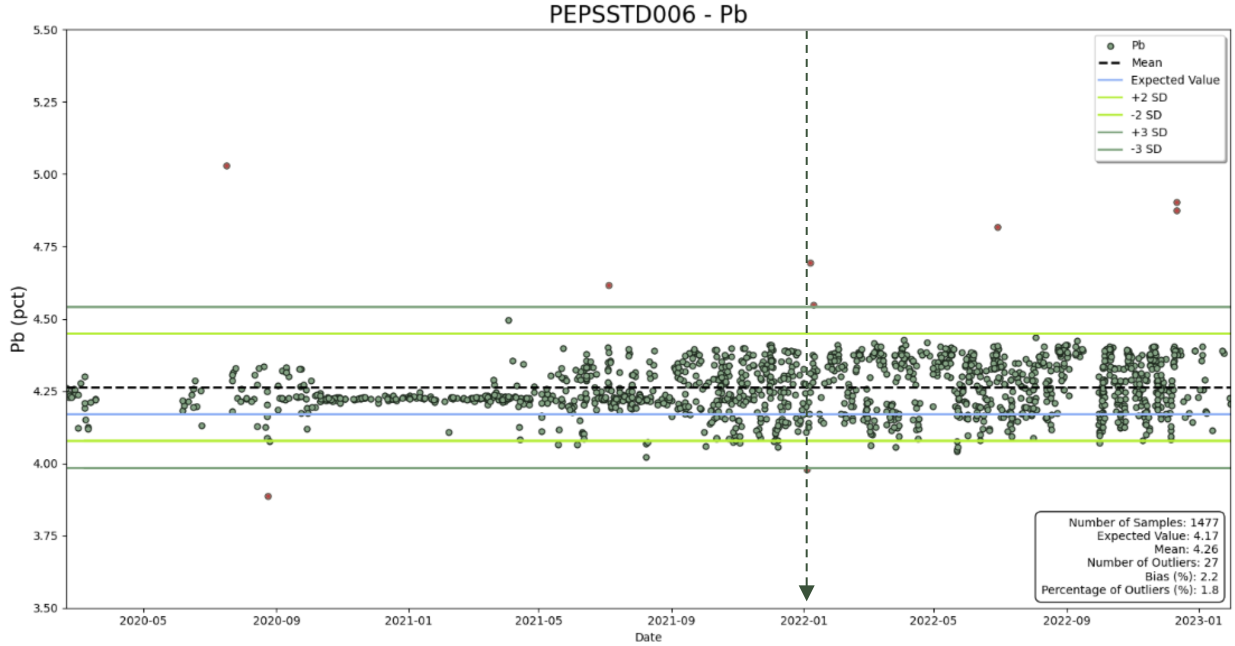


Figure 8-4: El Porvenir Ag Control Chart for CRM PEPSSTD006 at Inspectorate EP: 2020 to 2023

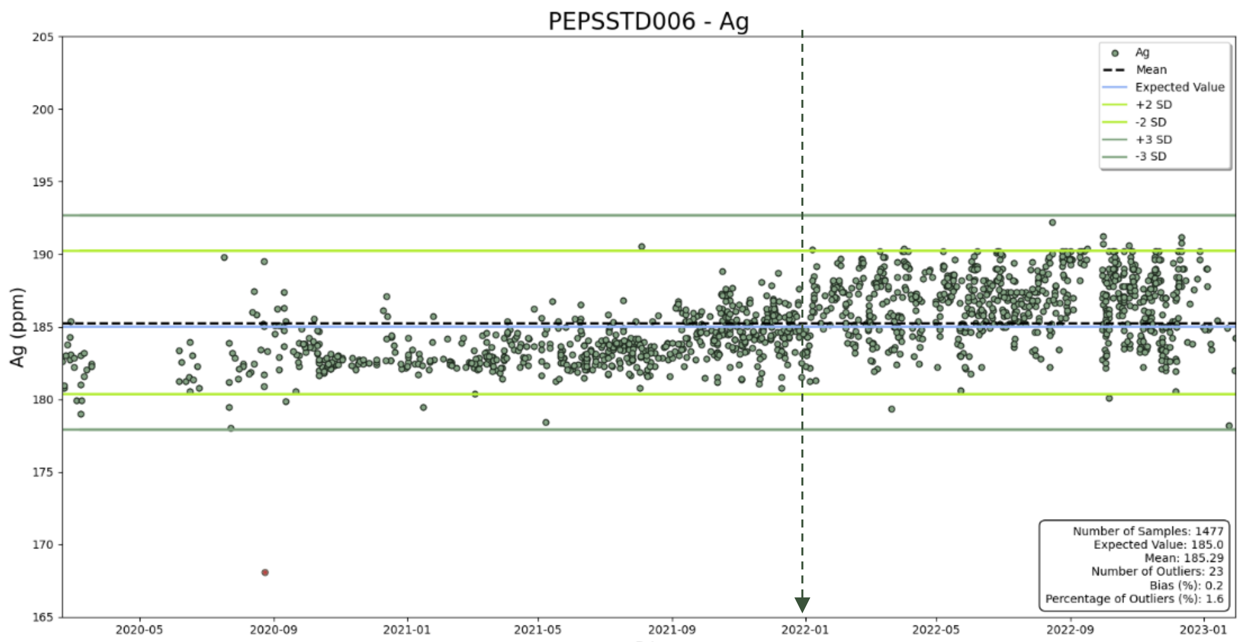


Figure 8-5: El Porvenir Pb Control Chart for CRM PEPSSTD009 at Inspectorate EP: 2022 to 2023

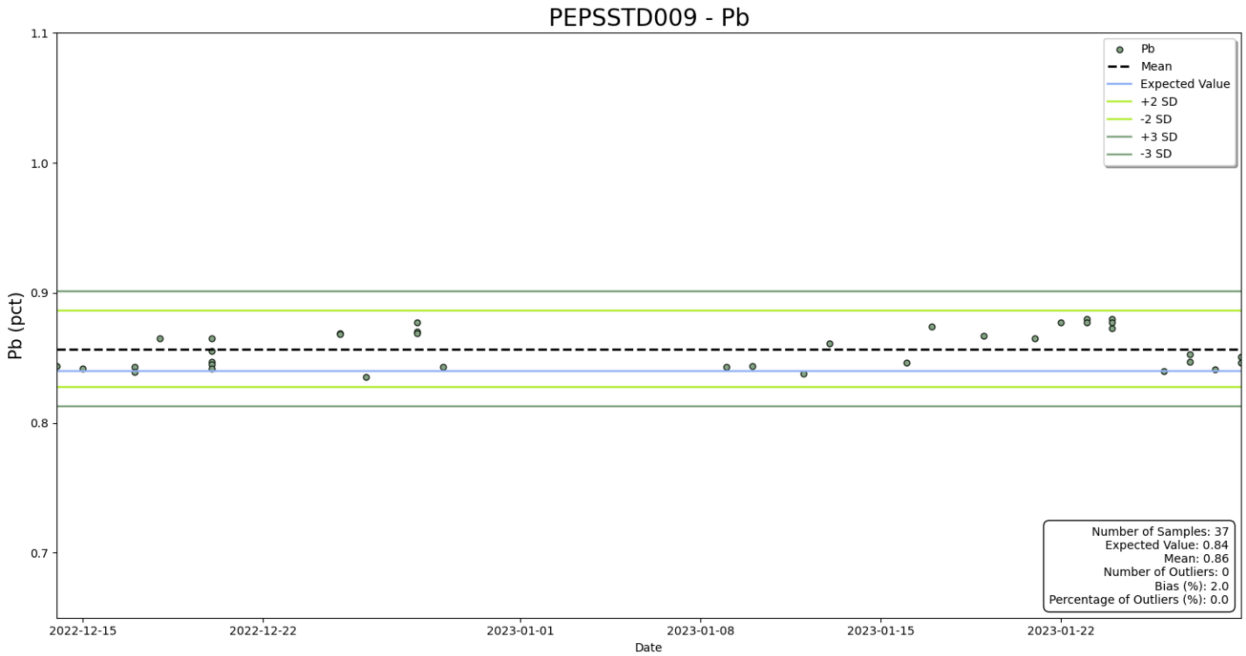


Figure 8-6: El Porvenir Zn Control Chart for CRM PEPSSTD006 at ALS: 2020 to 2023

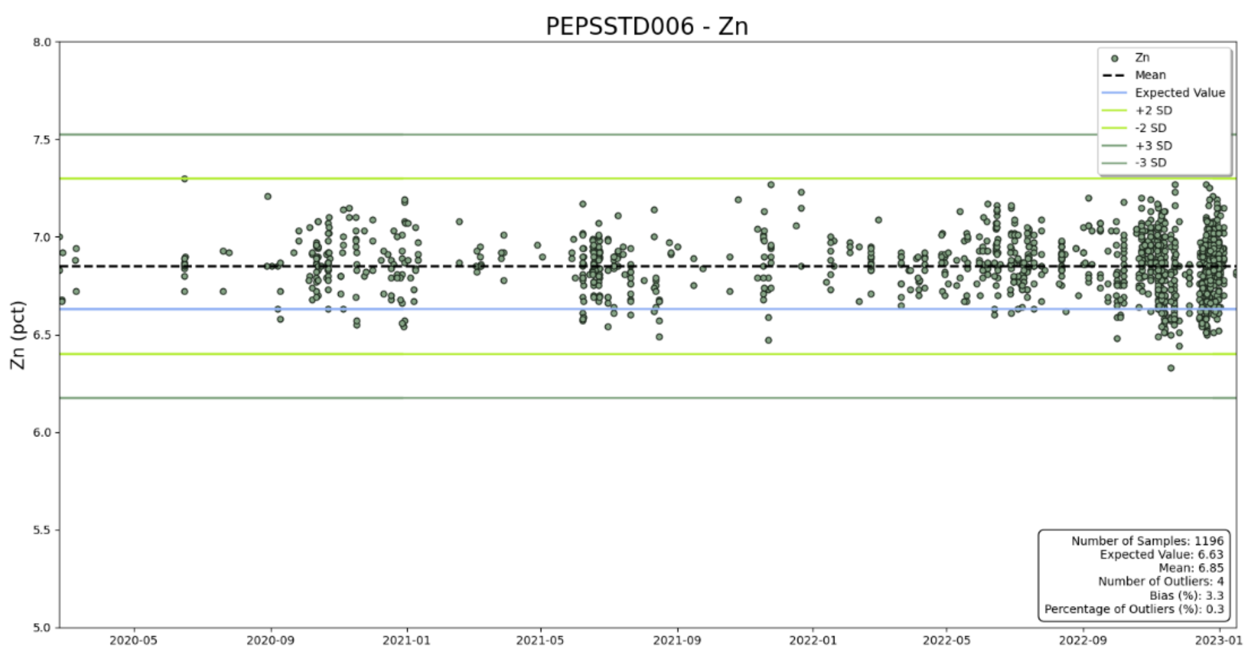


Figure 8-7: El Porvenir Pb Control Chart for CRM PEPSSTD006 at ALS: 2020 to 2023

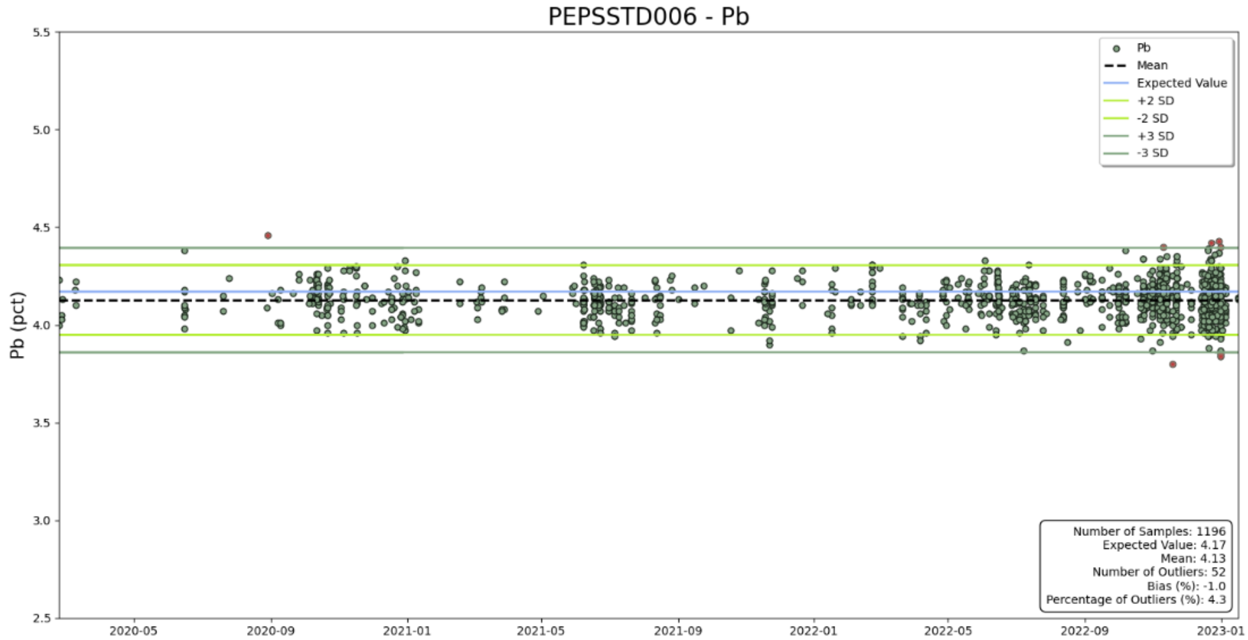
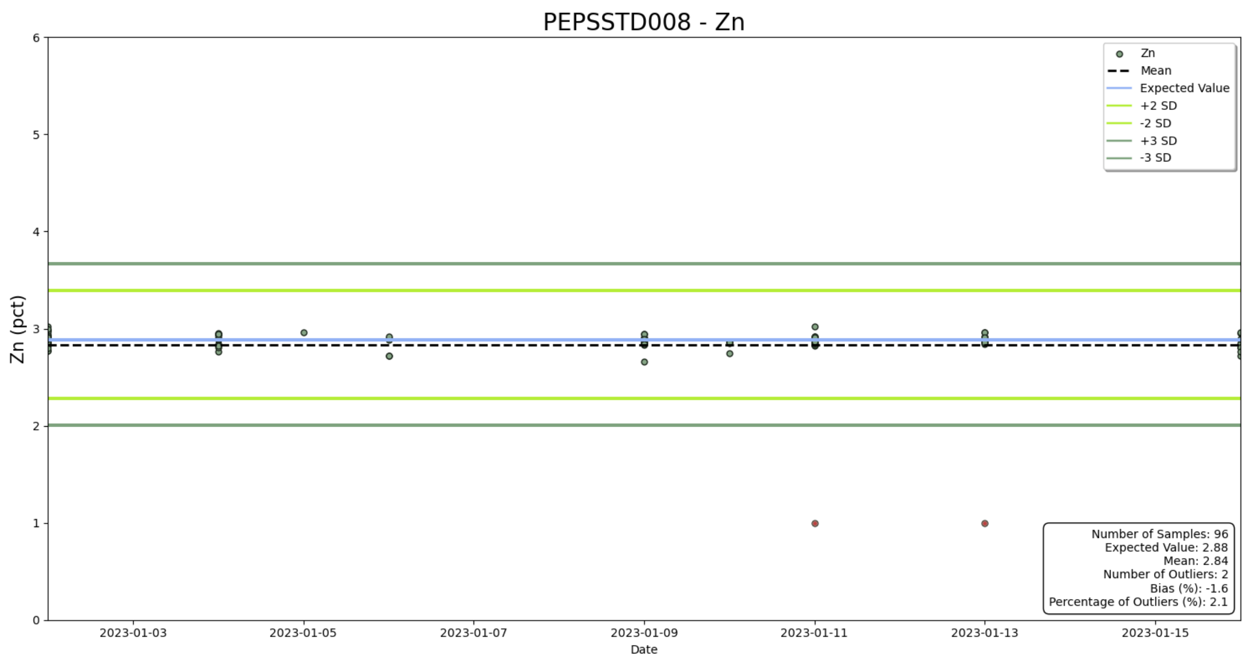


Figure 8-8: El Porvenir Zn Control Chart for CRM PEPSSTD008 at ALS: 2023



8.5.1.2 Blank Material

The regular submission of blank material is used to assess contamination during sample preparation and to identify sample numbering errors. Field blank samples are composed of barren material that have grades below the detection limit.

Milpo, 2014 to 2017

Between 2014 and 2017, a total of 1,800 blanks were included with 30,370 drill hole samples (a submission rate of approximately 1 in 17 samples) and 785 blanks were included with 10,213 channel samples (a submission rate of 1 in 13 samples) submitted to Inspectorate EP for analysis.

All the laboratories – Certimin, Inspectorate EP, and ALS - showed a pass rate greater than 99% indicating negligible contamination.

Nexa, November 2017 to 2020

Between November 2017 and 2020, a total of 3,821 coarse blanks (2.3%) and 2,600 fine blanks (1.6%) were inserted with core samples. These indicated that no significant contamination occurred during the preparation and analysis of the samples.

Nexa, 2021 to 2023

A total of 2,685 blanks, including both fine and coarse materials, were utilized. Fine blank PEPSBLK001 has been discontinued, and currently only the coarse material, PEPSBLK002, is used for controlling contamination. This 3/4-inch coarse blank material was acquired from Target Rocks Peru and analyzed by ICP-OES or ICP-mass spectrometry (MS) in six laboratories, all of which confirmed the low content of Zn, Pb, Cu, Ag, and Au.

A review of the blanks revealed that no significant contamination has been detected in either type of blank material as exemplified in Figure 8-9. Only one sample exceeded the Zn limit, as shown in Figure 8-10.

Figure 8-9: El Porvenir Pb Coarse Blank PEPSBLK002 at ALS: 2020 – 2023

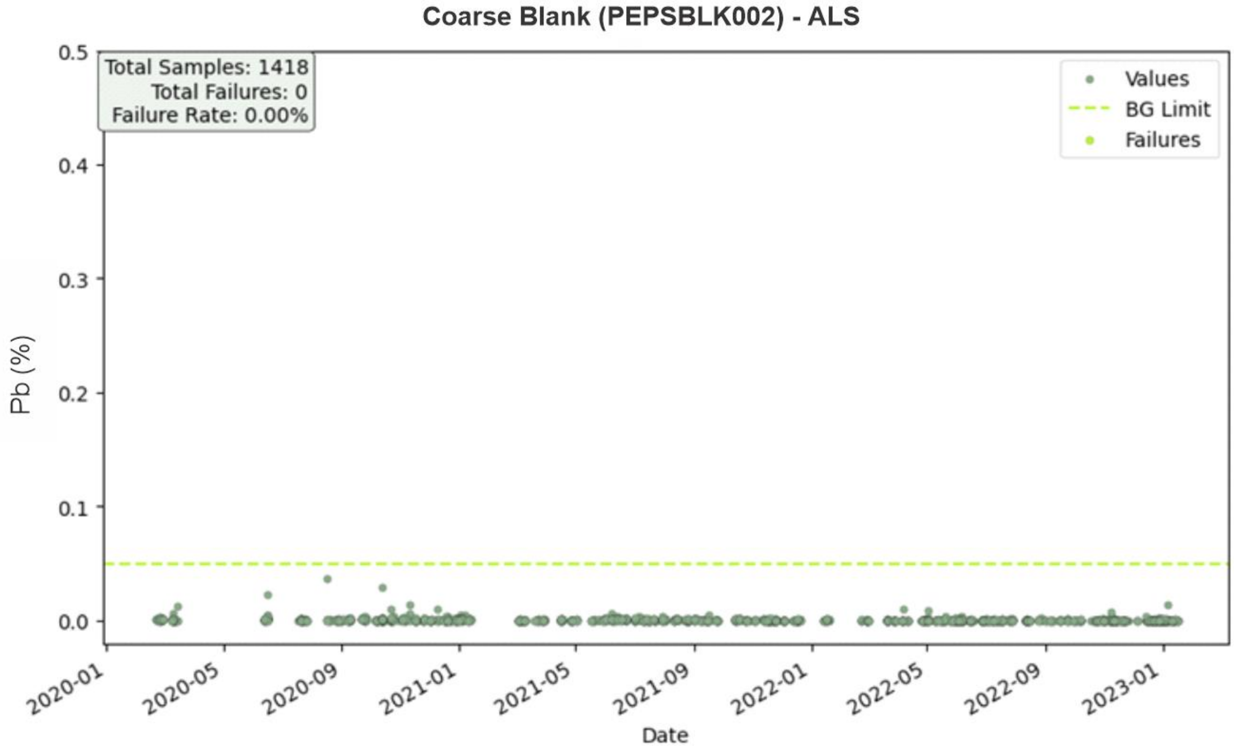
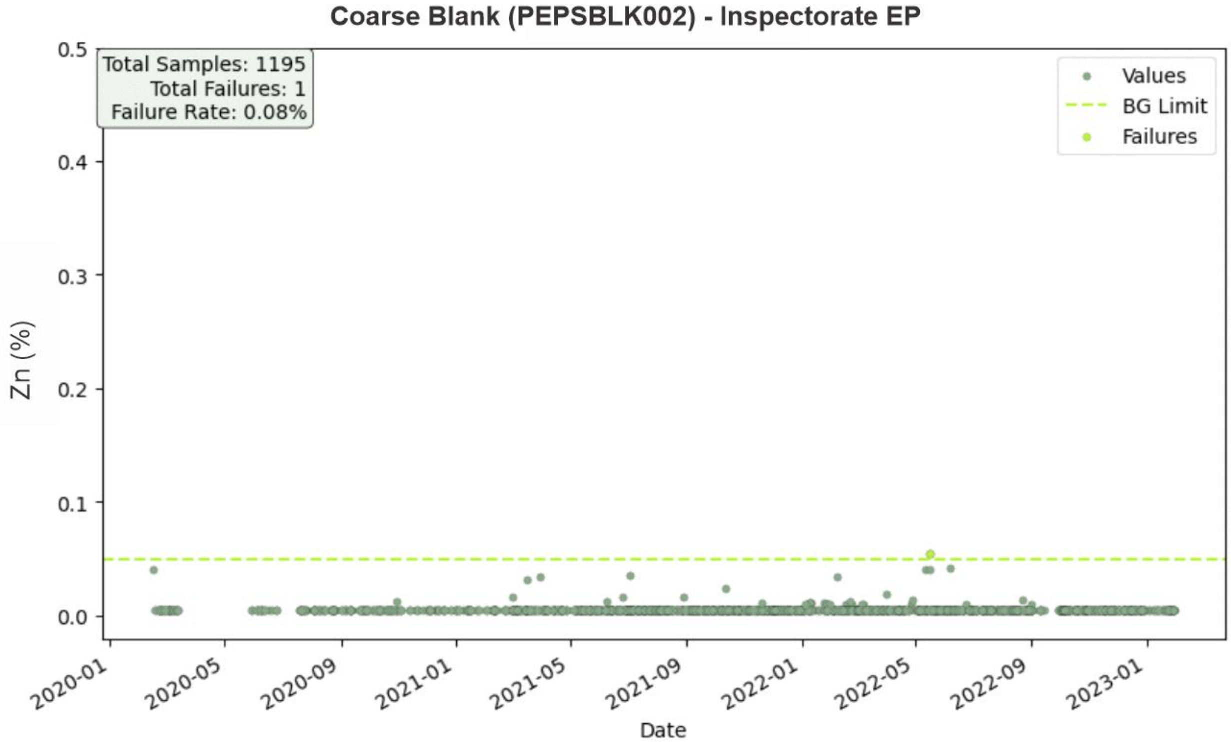


Figure 8-10: El Porvenir Zn Coarse Blank PEPSBLK002 at Inspectorate EP: 2020 to 2023



8.5.1.3 Duplicates

Duplicates help assess the natural local-scale grade variance or nugget effect and are also useful for detecting sample numbering mix-ups. The field (core) duplicates help monitor the grade variability as a function of both sample homogeneity and laboratory error.

The precision of sampling and analytical results can be quantified by re-analyzing the same sample using the same methodology. The variance between the measured results will indicate their precision. Precision is affected by mineralogical factors such as grain size, distribution, and inconsistencies in the sample preparation and analysis processes. There are several different duplicate sample types, which can be used to determine the precision of the entire sampling, sample preparation, and analytical process. Blind duplicate samples are submitted to the laboratory. A description of the different types of duplicates used by El Porvenir is provided in Table 8-7.

Table 8-7: El Porvenir Duplicate Types and Descriptions

Duplicate	Description
Field	The sample generated by another sampling operation at the same collection point includes a duplicate sample taken from a quarter of the drill core sample. Since mid-2016, a duplicate sample has been taken from the second half of the drill core sample.
Reject	The second sample obtained from splitting the coarse crushed rock during sample preparation and submitted blind to the same laboratory that assayed the original sample.

Duplicate	Description
Pulp	The second sample obtained from splitting the pulverized material during sample preparation and later submitted blind to the same laboratory that assayed the original pulp.

Milpo, 2014 to 2017

This section has mostly been taken from SRK (2017).

SRK calculated Half Absolute Relative Difference (HARD) analysis for the elements Ag, Pb, Zn, and Cu, which had the following detection limits: 4.04 g/t Ag, 0.01% Pb, 0.01% Zn, and 0.01% Cu. SRK filtered all the samples with grades below two times the detection limit. El Porvenir inserted field duplicates with drill core samples and channel samples as part of its QC program.

Field duplicates for drill core sample indicate precision levels outside of the acceptable limits. Additionally, failure results were poor for both Pb and Zn and the duplicate assay results for Pb were outside of acceptable limits. The poor precision levels for the field duplicates have been attributed to the sampling procedures, specifically that Milpo did not mark the cut line on the core before the cutting phase or sending a quarter of the core for analysis as a field duplicate. Precision levels for field duplicates in the channel samples were also outside the acceptable limit and failure results were poor for both Ag and Pb. Duplicate assay results for Cu were slightly out of acceptable limits. To improve field duplicate performance, Nexa began marking the cut line before the cutting process and uses the remaining half core for field duplicates, thereby reducing variability.

Nexa, November 2017 to 2020

Duplicate control charts were prepared for Zn, Au, Ag, Cu, and Pb in both laboratories. A total of 4,685 pulp duplicates (2.8%), 3,640 coarse duplicates (2.2%), and 3,244 field duplicates (2%) were inserted. Overall, the duplicate results indicate relatively good assay precision, except for Zn field duplicates, which showed lower precision due to the variability that is inherent in the samples.

SLR recommended continuing to select duplicates that were representative of the mineralization Zn, Pb, Cu, and Ag grade ranges, and completing ongoing studies to investigate the component of variability that is inherent in the sample, versus the component due to assay precision.

Nexa, 2020 to 2023

A total of 9,347 sample pairs were available for review between February 2020 and January 2023. SLR re-evaluated the duplicate database using the hyperbolic method to calculate the relative error between pairs. A failure rate of 10% was considered the threshold for taking corrective action for a group of samples. Individual failure criteria were set for pulp, coarse reject, and field duplicates, whether from Inspectorate EP, ALS, or Certimin.

Good precision was indicated for pulp, coarse, and field duplicates in general, as illustrated in Figure 8-11 to Figure 8-13. SLR observes that channel field duplicates analyzed at Inspectorate-EP showed higher failure rates (Figure 8-14), reaching up to 42%. However, these rates are likely due to the use of the channel duplicate method, where the duplicate sample is taken from the same location but at a deeper depth. This variation in sampling depth could contribute to increased variability in the results.

Figure 8-11: El Porvenir Zn Pulp Duplicates at ALS: 2020 to 2023

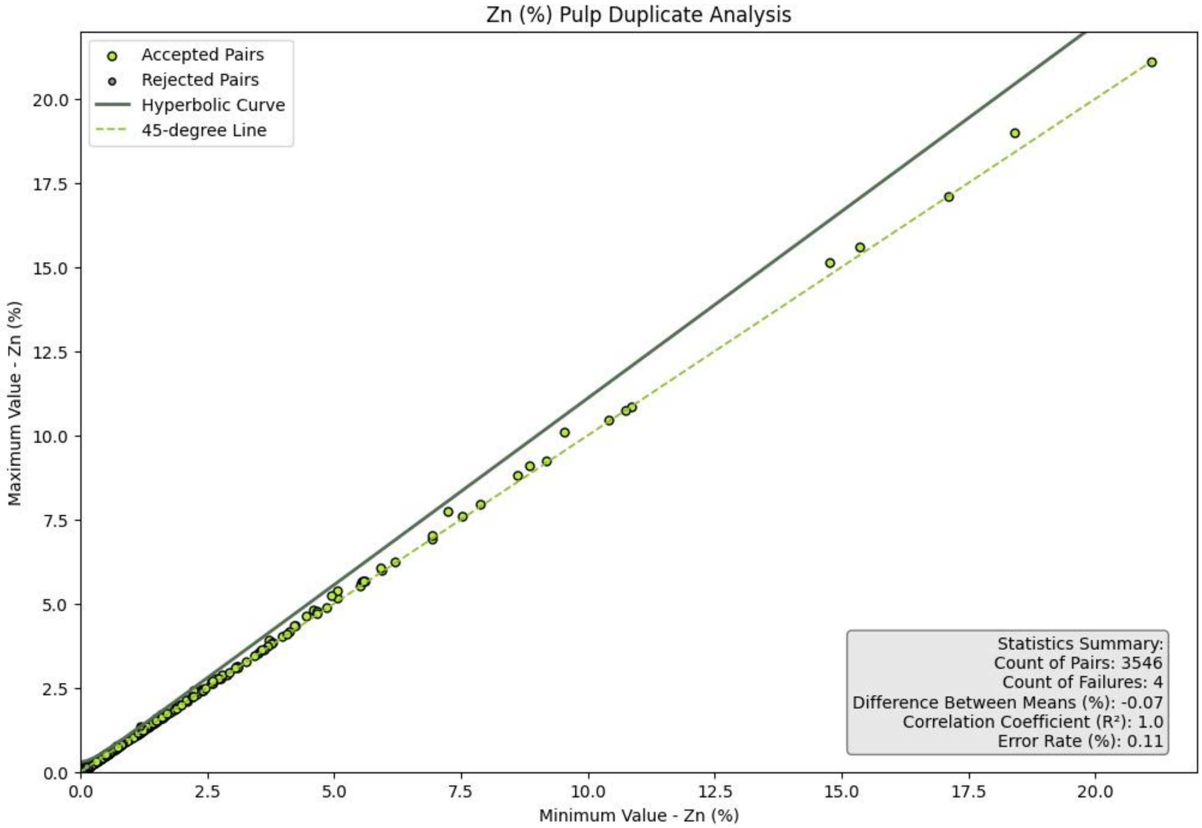


Figure 8-12: El Porvenir Pb Coarse Duplicates at Inspectorate EP: 2020 to 2023

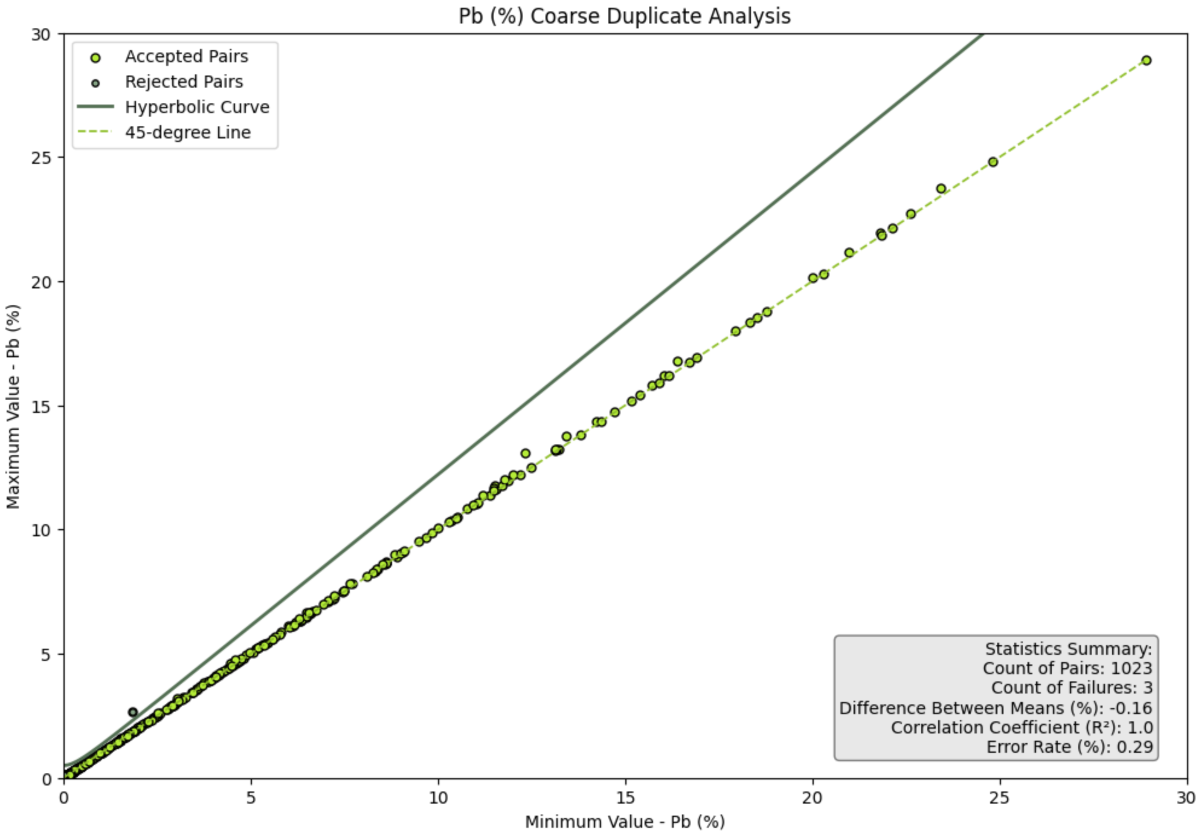


Figure 8-13: El Porvenir Pb Drilling Field Duplicates at ALS: 2020 to 2023

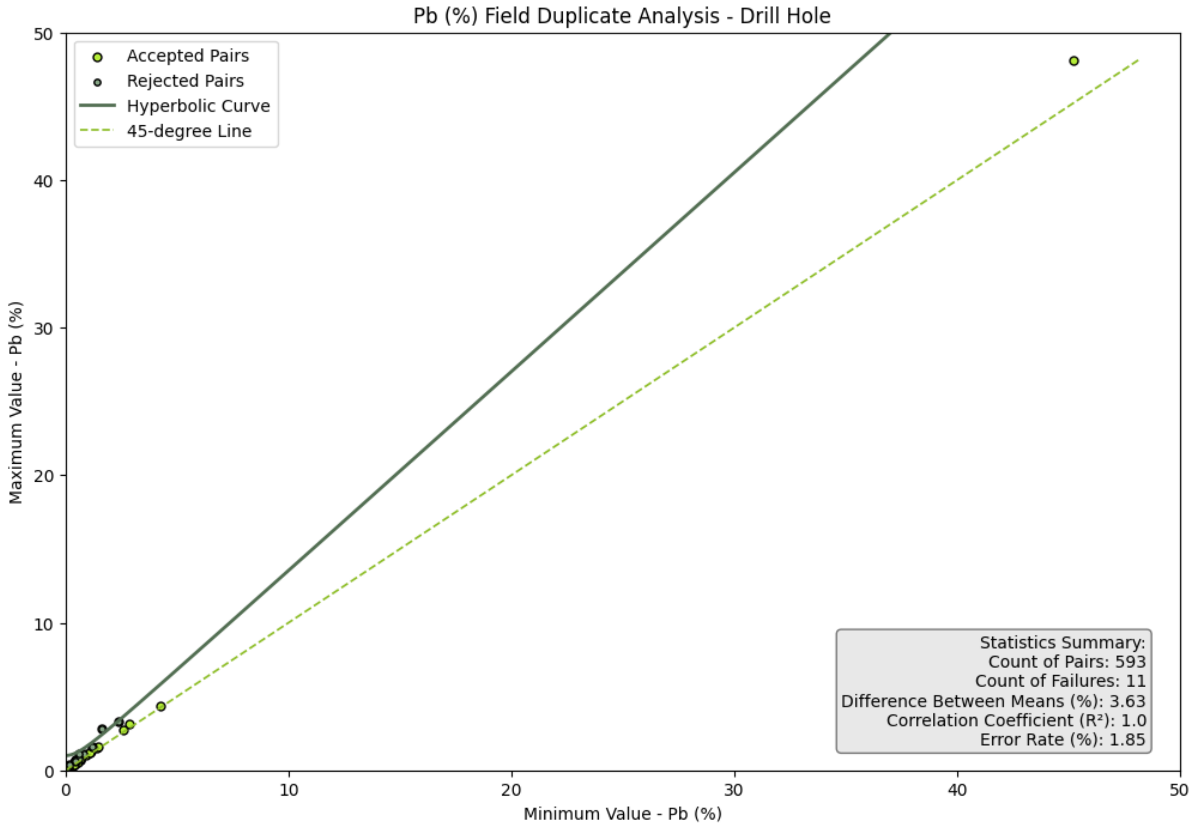


Figure 8-14: El Porvenir Zn Channel Field Duplicates at Inspectorate EP: 2020 to 2023

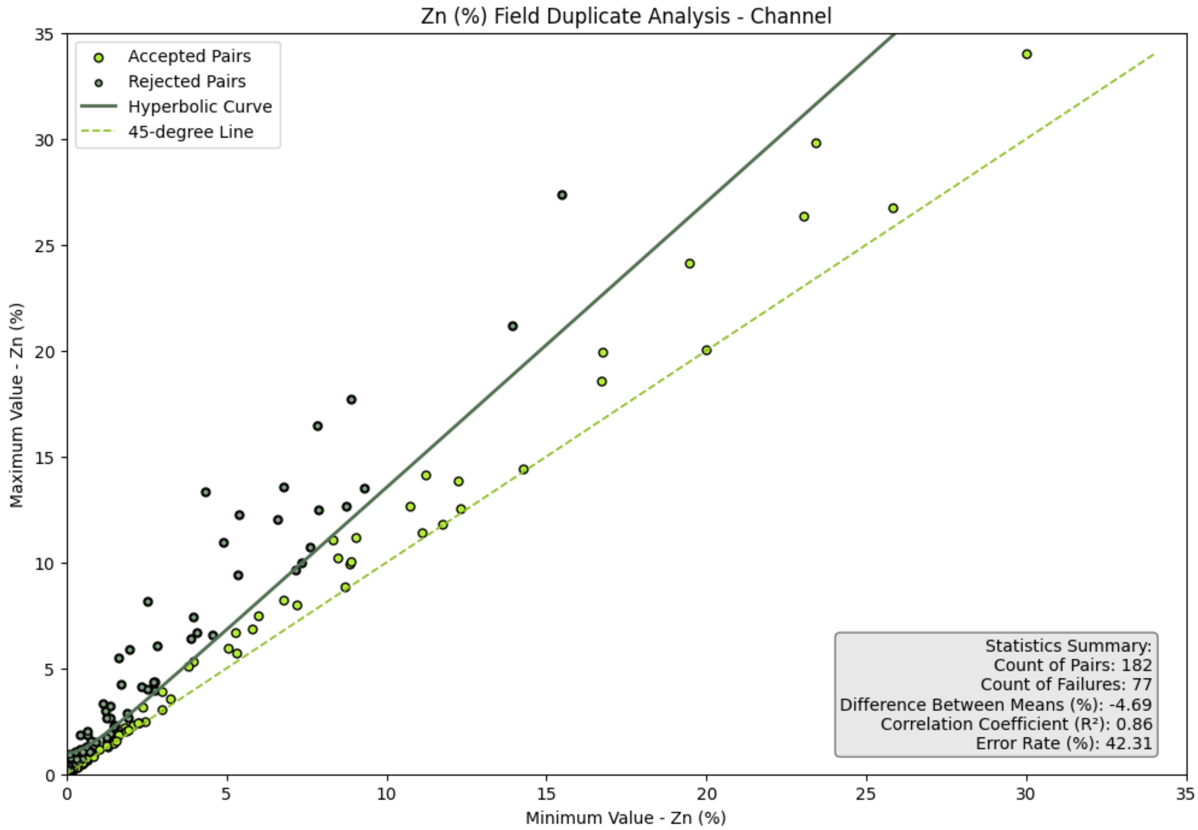


Table 8-8 summarizes the statistics of El Porvenir duplicate results from 2017 to 2023.

Table 8-8: EL Porvenir Duplicate Performance: 2017 to 2023

Period	Laboratory	Duplicate Type	No. Samples	Relative Error Limit %	Failure Rate (%)					
					Au ppm	Ag oz/t	Ag ppm	Cu %	Pb %	Zn %
Nov. 2017 – Aug. 2018	Certimin	Field	616	<30%	4.90%	9.60%	-	5.50%	10.60%	14.00%
		Coarse	612	<20%	0.80%	0.80%	-	0.70%	10.60%	0.30%
		Pulp	612	<10%	1.30%	1.50%	-	0.00%	0.20%	0.00%
	Inspectorate EP	Field	340	<30%	-	3.80%	-	2.90%	7.60%	11.50%
		Coarse	340	<20%	-	0.30%	-	0.00%	7.60%	0.90%
		Pulp	339	<10%	-	0.60%	-	0.90%	1.20%	1.50%
Aug. 2018 – May. 2019	Certimin	Field	322	<30%	0.31%	1.49%	0.75%	2.17%	1.55%	3.11%
		Coarse	330	<20%	0.30%	0.00%	0.00%	0.00%	0.00%	0.00%
		Pulp	335	<10%	0.60%	0.00%	0.00%	0.00%	0.00%	0.00%
		Field	193	<30%	-	5.47%	4.55%	3.11%	11.92%	11.40%

Period	Laboratory	Duplicate Type	No. Samples	Relative Error Limit %	Failure Rate (%)					
					Au ppm	Ag oz/t	Ag ppm	Cu %	Pb %	Zn %
	Inspectorate EP	Coarse	357	<20%	-	0.00%	0.00%	0.00%	0.00%	0.00%
		Pulp	340	<10%		0.00%	0.40%	0.52%	0.52%	1.04%
	ALS	Field	943	<30%	0.95%	2.86%	1.87%	2.33%	3.29%	6.79%
		Coarse	965	<20%	0.10%	0.00%	0.32%	0.10%	0.00%	0.21%
		Pulp	1,012	<10%	0.99%	0.00%	0.31%	0.30%	0.10%	0.20%
Jun. 2019 – Feb. 2020	Inspectorate EP	Field	23	<30%	-	-	0.00%	4.35%	21.74%	30.43%
		Coarse	182	<20%	-	-	0.00%	0.00%	0.00%	1.10%
		Pulp	282	<10%		-	0.71%	0%	0.35%	0.71%
	ALS	Field	807	<30%	1.24%	-	2.97%	2.60%	4.83%	5.33%
		Coarse	854	<20%	0.12%	-	0.00%	0.12%	0.12%	0.00%
		Pulp	1,765	<10%	0.62%	-	0.57%	0.28%	0.34%	0.45%
Feb 2020 - Jan.2023	ALS	Field	593	<30%	0.67%	-	1.52%	1.18%	1.85%	2.19%
		Coarse	812	<20%	0.37%	-	0.37%	0.12%	0.37%	0.12%
		Pulp	3,546	<10%	0.87%	-	0.42%	0.06%	0.11%	0.11%
	Certimin	Field	-	<30%	-	-	-	-	-	-
		Coarse	14	<20%	0.00%	-	0.00%	0.00%	0.00%	0.00%
		Pulp	30	<10%	0.00%	-	3.33%	0.00%	0.00%	0.00%
	Inspectorate EP	Field	184	<30%	-	-	30.98%	26.63%	33.70%	41.85%
		Coarse	1023	<20%	0.00%	-	0.20%	0.39%	0.29%	0.20%
		Pulp	3,113	<10%	0.00%	-	0.74%	0.19%	0.26%	0.19%
	Inspectorate AT	Field	-	<30%	-	-	-	-	-	-
		Coarse	11	<20%	0.00%	-	0.00%	0.00%	0.00%	0.00%
		Pulp	21	<10%	0.00%	-	0.00%	0.00%	0.00%	0.00%

8.5.1.4 Umpire Check Assays

As part of the Nexa QC program, pulp samples are routinely submitted to a third-party laboratory to verify the accuracy and precision of primary assay results, using the same analytical procedures.

Statistics for the check assay results for El Porvenir are presented in Table 8-9.

SLR is of the opinion that the results of the check assays support the use of the primary assays in the Mineral Resource estimation.

Nexa, November 2017 to 2020

Nexa sent 1,776 pulp samples analyzed at Inspectorate EP to ALS and analyzed at ALS to Certimin for referee check assays. An approximate insertion rate of 2.0% was used for external check samples.

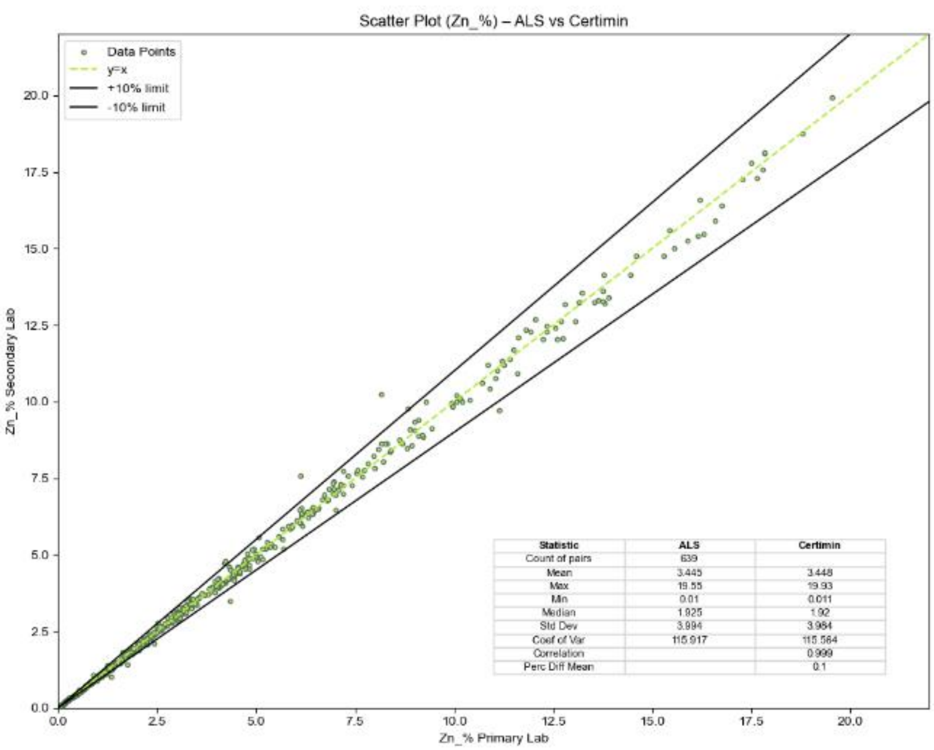
The check assay results compared well, showing very high overall correlation coefficients. For Ag, a potential positive bias of approximately 5% at Inspectorate EP in comparison to ALS was observed and should be investigated.

Nexa, 2021 to 2023

Between 2021 and 2023, 1,335 samples were collected from drill holes and submitted either to Certimin or ALS as third-party laboratory. These samples were shipped along with blanks and standards to validate the secondary results. The Zn analysis presented in Figure 8-15 revealed strong correlation of 0.999 with a percent mean difference of 0.1% between ALS and Certimin.

Similarly, the Pb analysis displayed in Figure 8-16 achieved a high correlation of 0.994 between Inspectorate EP and ALS, with a difference of 0.3% between means. Furthermore, a variation is observed for grades over 15% Pb, where ALS appears to slightly over-estimate the grades compared to the primary laboratory, Inspectorate EP. However, both datasets are statistically similar, validating the grades reported by the primary laboratory.

Figure 8-15: El Porvenir Check Assay Scatter Plot - Zn



Statistic	ALS	Certimin
Count of pairs	639	
Mean	3.445	3.448
Max	19.55	19.93
Min	0.01	0.011
Median	1.925	1.92
Std Dev	3.994	3.984
Coef of Var	115.917	115.564
Correlation		0.999
Perc Diff Mean		0.1

Figure 8-16: El Porvenir Check Assay Scatter Plot - Pb

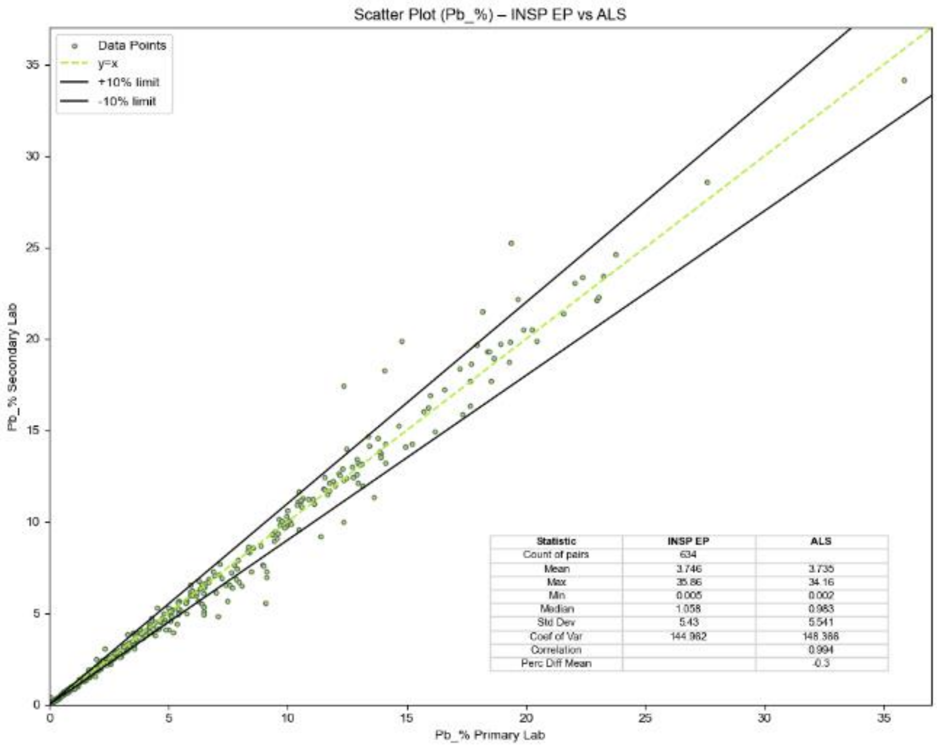


Table 8-9: El Porvenir External Check Assay Performance: 2017 to 2023

Period	Secondary Laboratory	Primary Laboratory	Element	No. Samples	Bias (%)
Nov. 2017 - Aug. 2018	Certimin	ALS	Au ppm	432	-2.15
			Ag ppm	435	0.56
			Cu per	435	-1.66
			Pb per	435	-1.1
			Zn per	435	-0.55
	ALS	Certimin	Au ppm	202	-6.68
			Ag ppm	202	0.09
			Cu per	202	1.59
			Pb per	202	-0.35
			Zn per	202	2.37
		Inspectorate EP	Ag ppm	110	4.63
			Cu per	110	2.25
			Pb per	110	0.63
			Zn per	110	3.3

Period	Secondary Laboratory	Primary Laboratory	Element	No. Samples	Bias (%)
Aug. 2018 - May. 2019	Certimin	ALS	Au ppm	280	0.32
			Ag ppm	282	-1.42
			Cu per	282	-1.86
			Pb per	282	-1.03
			Zn per	282	-4.02
	ALS	Certimin	Au ppm	162	-0.26
			Ag ppm	162	-0.71
			Cu per	162	-1.75
			Pb per	162	-1.28
			Zn per	162	1.54
		Inspectorate EP	Ag ppm	197	4.04
			Cu per	197	2.63
			Pb per	197	1.53
			Zn per	197	2.45
Jun. 2019 - Feb. 2020	Certimin	ALS	Au ppm	294	0.26
			Ag ppm	294	2.9
			Cu per	294	-1.8
			Pb per	294	1.76
			Zn per	294	-1.47
	ALS	Inspectorate EP	Ag ppm	94	2.23
			Cu per	94	3.44
			Pb per	94	1.52
			Zn per	94	4.06
Mar. 2020 – Jan. 2023	Certimin	ALS	Ag ppm	639	-0.1
			Cu per	639	-2.1
			Pb per	639	2.5
			Zn per	639	0.1
	ALS	Inspectorate EP	Ag ppm	634	0.4
			Cu per	634	2.9
			Pb per	634	-0.30
			Zn per	634	3.9

8.5.1.5 QA/QC Recommendations

The QP's QA/QC recommendations for El Porvenir are as follows:

- Improve the field duplicate rates of channels by revising the sampling protocol of duplicates in channels.
- Increase the frequency of monitoring Inspectorate EP laboratory results to rectify potential bias trends or address instances of failure that may require re-analysis
- Ensure all the samples analyzed by ALS are re-assayed using the relevant analytical method when exceeding the detection limit (i.e., samples >10,000 ppm Zn), to prevent incomplete results in the assay database.

8.5.2 Atacocha

Atacocha QC samples represent approximately 16% of the total samples. The QC sample insertion rate and the acceptance criteria followed during Nexa's QC program for Atacocha are presented in Table 8-10, with an overview of QC submissions from September 1, 2018 to January 31, 2023.

Table 8-10: Atacocha QC Submittals: 2018 to 2023

Sample Type	Laboratory	Year	Primary Samples	Fine Blanks	Coarse Blanks	Pulp Duplicates	Coarse Duplicates	Field Duplicates	CRM	Check Assay	Insertion Rate (%)
Drill Hole Sample	ALS	2018-2023	47,928	821	1,282	1,296	828	702	2,821	1,004	15
	Certimin	2018-2023	2,303	22	49	114	35	18	143	104	17
	INSP AT	2018-2023	42,951	499	1,065	2,103	1,127	229	2,359	844	16
Total Samples			**93,182**	**1,342**	**2,396**	**3,513**	**1,986**	**949**	**5,323**	**1,952**	**16**

8.5.2.1 Certified Reference Material

Milpo, 2012 to 2017

Between 2012 and 2017, Nexa sent 2,587 CRMs to Inspectorate AT, with 31,617 drill core samples (a submission rate of 1 in 12 samples) in 2014 to 2017 and 27,307 channel samples with 1,613 CRMs (a submission rate of 1 in 17 samples) from 2012 to 2015.

Nexa sent a total of 1,157 CRMs to the Inspectorate Lima laboratory, with 14,190 drill hole samples (a submission rate of 1 in 12 samples) submitted from November 2015 to August 2016, and a total of 1,289 CRMs to ALS, with 21,648 drill hole samples (a submission rate of 1 in 17 samples) submitted from August 2016 to April 2017.

Overall, most of the CRM results for Zn, Pb, Cu, Ag, and Au were within acceptable limits. SLR (then RPA) noticed some CRM numbering mix-ups during 2016 that were addressed later in the database by Nexa.

Nexa January to August 2018

During 2018, Atacocha dispatched 66,083 drill core samples and 3,291 CRMs, achieving an insertion rate of 5.0%. As per RPA's evaluation, the CRMs encompassed a satisfactory range of grades in relation to the overall resource grades. RPA recommended that Nexa introduce new high-grade Zn and Pb CRMs, alongside the implementation of procedures aimed at reducing CRM failure rates.

Nexa, September 2018 to January 2023

A total of six different CRMs were employed to monitor accuracy. These included high grade (PEPSSTD006 and MAT 12), moderate grade (PEPSSTD005 and MAT 11), and low grade (PEPSSTD004 and MAT 10) standards. The MAT series CRMs were only used until 2019.

Overall, the control charts demonstrate favourable levels of dispersion and accuracy across all participant laboratories, including Inspectorate AT, Certimin, and ALS. The results of all the CRMs utilized between 2018 and 2023 are presented in Table 8-11. The biases exceeding the 5% threshold are associated with Cu lower grade standards and do not necessarily reflect poor laboratory performance.

Table 8-11: Atacocha CRM Performance: 2018 to 2023

Lab	CRM	Element	Unit	Period	No. Samples	Std Dev	Mean	Expected Value	No. Outliers	Bias (%)	Percentage Outliers (%)
ALS	MAT10	Ag	ppm	(2019, 2019)	111	0.38	9.08	8.70	6	4.38	5.41
		Au	ppm	(2019, 2019)	110	0.02	0.25	0.25	4	1.35	3.64
		Cu	pct	(2019, 2019)	111	0.01	0.27	0.25	7	6.70	6.31
		Pb	pct	(2019, 2019)	111	0.01	0.11	0.11	1	4.01	0.90
		Zn	pct	(2019, 2019)	111	0.01	0.29	0.30	3	-4.80	2.70
	MAT11	Ag	ppm	(2018, 2019)	490	1.80	56.61	54.60	24	3.68	4.90
		Au	ppm	(2018, 2019)	488	0.03	0.94	0.93	10	0.64	2.05
		Cu	pct	(2018, 2019)	490	0.01	0.18	0.17	42	4.15	8.57
		Pb	pct	(2018, 2019)	490	0.03	1.34	1.37	21	-1.96	4.29
		Zn	pct	(2018, 2019)	490	0.05	2.10	2.19	19	-3.95	3.88
	MAT12	Ag	ppm	(2018, 2019)	160	6.60	273.47	268.00	8	2.04	5.00
		Au	ppm	(2018, 2019)	160	0.20	9.00	8.98	8	0.27	5.00
		Cu	pct	(2018, 2019)	160	0.01	0.18	0.18	8	1.32	5.00
		Pb	pct	(2018, 2019)	160	0.17	6.72	6.83	6	-1.66	3.75
		Zn	pct	(2018, 2019)	160	0.15	6.98	6.95	6	0.39	3.75
	PEPSSTD 004	Ag	ppm	(2019, 2021)	733	0.80	24.69	23.30	27	5.95	3.68
		Au	ppm	(2019, 2021)	730	0.03	0.33	0.32	40	2.12	5.48
		Cu	pct	(2019, 2021)	733	0.00	0.06	0.05	99	17.24	13.51
		Pb	pct	(2019, 2021)	733	0.02	0.47	0.46	18	1.94	2.46
		Zn	pct	(2019, 2021)	733	0.02	0.54	0.57	37	-4.52	5.05

Lab	CRM	Element	Unit	Period	No. Samples	Std Dev	Mean	Expected Value	No. Outliers	Bias (%)	Percentage Outliers (%)
	PEPSSTD 005	Ag	ppm	(2019, 2022)	1028	1.28	41.96	40.80	51	2.83	4.96
		Au	ppm	(2019, 2022)	1026	0.02	0.53	0.53	29	-0.24	2.83
		Cu	pct	(2019, 2022)	1028	0.00	0.06	0.06	155	-2.51	15.08
		Pb	pct	(2019, 2022)	1028	0.02	1.13	1.15	38	-1.51	3.70
		Zn	pct	(2019, 2022)	1028	0.03	1.54	1.52	41	1.16	3.99
	PEPSSTD 006	Ag	ppm	(2019, 2022)	299	4.02	186.33	185.00	14	0.72	4.68
		Au	ppm	(2019, 2022)	299	0.01	0.44	0.44	13	0.13	4.35
		Cu	pct	(2019, 2022)	299	0.01	0.19	0.19	4	0.42	1.34
		Pb	pct	(2019, 2022)	299	0.09	4.13	4.17	12	-1.00	4.01
		Zn	pct	(2019, 2022)	299	0.14	6.88	6.63	16	3.82	5.35
Certimin	MAT11	Ag	ppm	(2018, 2018)	11	0.51	53.43	54.60	0	-2.15	0.00
		Au	ppm	(2018, 2018)	7	0.01	0.95	0.93	0	1.69	0.00
		Cu	pct	(2018, 2018)	11	0.01	0.18	0.17	0	3.21	0.00
		Pb	pct	(2018, 2018)	11	0.01	1.37	1.37	0	-0.33	0.00
		Zn	pct	(2018, 2018)	11	0.03	2.19	2.19	1	-0.17	9.09
	MAT12	Ag	ppm	(2018, 2018)	5	1.95	268.60	268.00	0	0.22	0.00
		Au	ppm	(2018, 2018)	5	0.02	9.22	8.98	0	2.65	0.00
		Cu	pct	(2018, 2018)	5	0.00	0.18	0.18	0	0.00	0.00
		Pb	pct	(2018, 2018)	5	0.03	6.77	6.83	0	-0.82	0.00
		Zn	pct	(2018, 2018)	5	0.05	6.85	6.95	0	-1.44	0.00
	PEPSSTD 004	Ag	ppm	(2019, 2021)	15	0.74	24.03	23.30	1	3.15	6.67
		Au	ppm	(2019, 2021)	12	0.01	0.32	0.32	0	0.26	0.00
		Cu	pct	(2019, 2021)	15	0.00	0.05	0.05	0	6.67	0.00
		Pb	pct	(2019, 2021)	15	0.01	0.46	0.46	0	0.72	0.00
		Zn	pct	(2019, 2021)	15	0.02	0.54	0.57	0	-5.15	0.00
	PEPSSTD 005	Ag	ppm	(2019, 2021)	73	0.73	41.43	40.80	3	1.54	4.11
		Au	ppm	(2020, 2021)	70	0.01	0.52	0.53	5	-1.11	7.14
		Cu	pct	(2019, 2021)	73	0.00	0.06	0.06	0	-4.79	0.00
		Pb	pct	(2019, 2021)	73	0.01	1.17	1.15	2	1.44	2.74
		Zn	pct	(2019, 2021)	73	0.01	1.53	1.52	3	0.82	4.11
	PEPSSTD 006	Ag	ppm	(2019, 2022)	39	2.82	188.85	185.00	2	2.08	5.13
		Au	ppm	(2020, 2022)	35	0.02	0.45	0.44	2	2.21	5.71
		Cu	pct	(2019, 2022)	39	0.00	0.19	0.19	0	0.00	0.00
		Pb	pct	(2019, 2022)	39	0.06	4.24	4.17	3	1.70	7.69
		Zn	pct	(2019, 2022)	39	0.10	6.76	6.63	3	1.92	7.69

Lab	CRM	Element	Unit	Period	No. Samples	Std Dev	Mean	Expected Value	No. Outliers	Bias (%)	Percentage Outliers (%)
INSP_AT	MAT10	Ag	ppm	(2019, 2019)	69	0.22	9.19	8.70	8	5.59	11.59
		Au	ppm	(2019, 2019)	69	0.00	0.24	0.25	1	-4.70	1.45
		Cu	pct	(2019, 2019)	69	0.01	0.27	0.25	1	7.07	1.45
		Pb	pct	(2019, 2019)	69	0.01	0.12	0.11	1	5.53	1.45
		Zn	pct	(2019, 2019)	69	0.01	0.30	0.30	3	-1.01	4.35
	MAT11	Ag	ppm	(2018, 2019)	114	1.24	56.75	54.60	7	3.94	6.14
		Au	ppm	(2018, 2019)	237	0.02	0.95	0.93	16	1.88	6.75
		Cu	pct	(2018, 2019)	237	0.00	0.18	0.17	32	5.39	13.50
		Pb	pct	(2018, 2019)	237	0.03	1.39	1.37	4	1.32	1.69
		Zn	pct	(2018, 2019)	237	0.04	2.25	2.19	8	2.60	3.38
	MAT12	Ag	ppm	(2018, 2019)	50	1.88	276.64	268.00	1	3.23	2.00
		Au	ppm	(2018, 2019)	116	0.12	8.92	8.98	3	-0.67	2.59
		Cu	pct	(2018, 2019)	116	0.00	0.18	0.18	12	-0.38	10.34
		Pb	pct	(2018, 2019)	116	0.10	6.78	6.83	5	-0.66	4.31
		Zn	pct	(2018, 2019)	116	0.10	6.96	6.95	4	0.16	3.45
	PEPSSTD 004	Ag	ppm	(2019, 2021)	657	0.51	22.73	23.30	24	-2.46	3.65
		Au	ppm	(2019, 2021)	657	0.01	0.30	0.32	0	-4.73	0.00
		Cu	pct	(2019, 2021)	657	0.00	0.06	0.05	17	19.54	2.59
		Pb	pct	(2019, 2021)	657	0.01	0.47	0.46	45	2.39	6.85
		Zn	pct	(2019, 2021)	657	0.01	0.56	0.57	8	-1.16	1.22
	PEPSSTD 005	Ag	ppm	(2019, 2022)	839	0.84	39.78	40.80	21	-2.50	2.50
		Au	ppm	(2019, 2022)	839	0.01	0.49	0.53	13	-6.76	1.55
		Cu	pct	(2019, 2022)	839	0.00	0.06	0.06	3	-0.02	0.36
		Pb	pct	(2019, 2022)	839	0.03	1.15	1.15	21	0.28	2.50
		Zn	pct	(2019, 2022)	839	0.04	1.52	1.52	22	0.08	2.62
	PEPSSTD 006	Ag	ppm	(2019, 2022)	441	3.13	182.08	185.00	19	-1.58	4.31
		Au	ppm	(2019, 2022)	441	0.01	0.45	0.44	8	1.42	1.81
		Cu	pct	(2019, 2022)	441	0.01	0.19	0.19	1	-1.86	0.23
		Pb	pct	(2019, 2022)	441	0.09	4.19	4.17	19	0.56	4.31
		Zn	pct	(2019, 2022)	441	0.16	6.75	6.63	7	1.78	1.59

SLR selected five distinct CRMs for an in-depth review, representing the low, average, and high-grade ranges. These materials were chosen based on factors such as sample size, the laboratory of origin, and their recent performance in implementation.

Figure 8-17 and Figure 8-18 show acceptable biases ranging from 0.4% to 1.8% in high grade CRMs. Generally, the results for the moderate CRMs fall within acceptable boundaries, with only a minor proportion of failures displayed in Figure 8-19.

The low grade MAT10 and PEPSSTD004 have shown good results, as illustrated in Figure 8-20 and Figure 8-21, respectively.

Figure 8-17: Atacocha Zn Control Chart for CRM MAT12 at ALS: 2018 to 2019

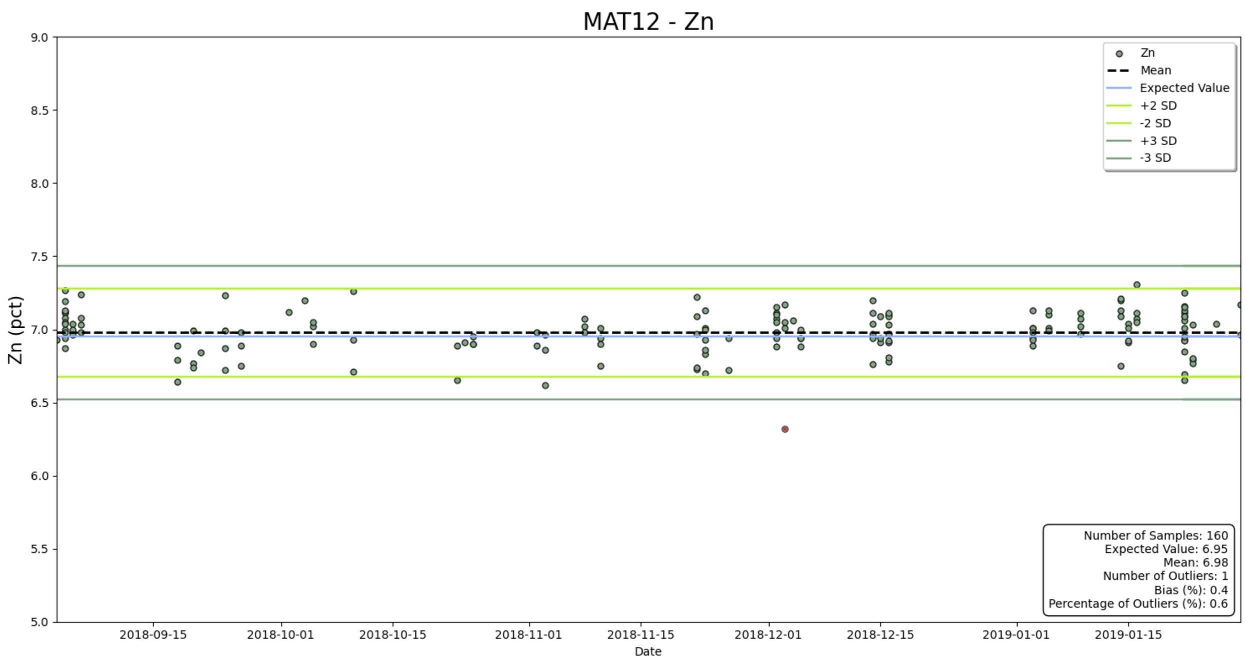


Figure 8-18: Atacocha Zn Control Chart for CRM PEPSSTD006 at Inspectorate AT: 2019 to 2022

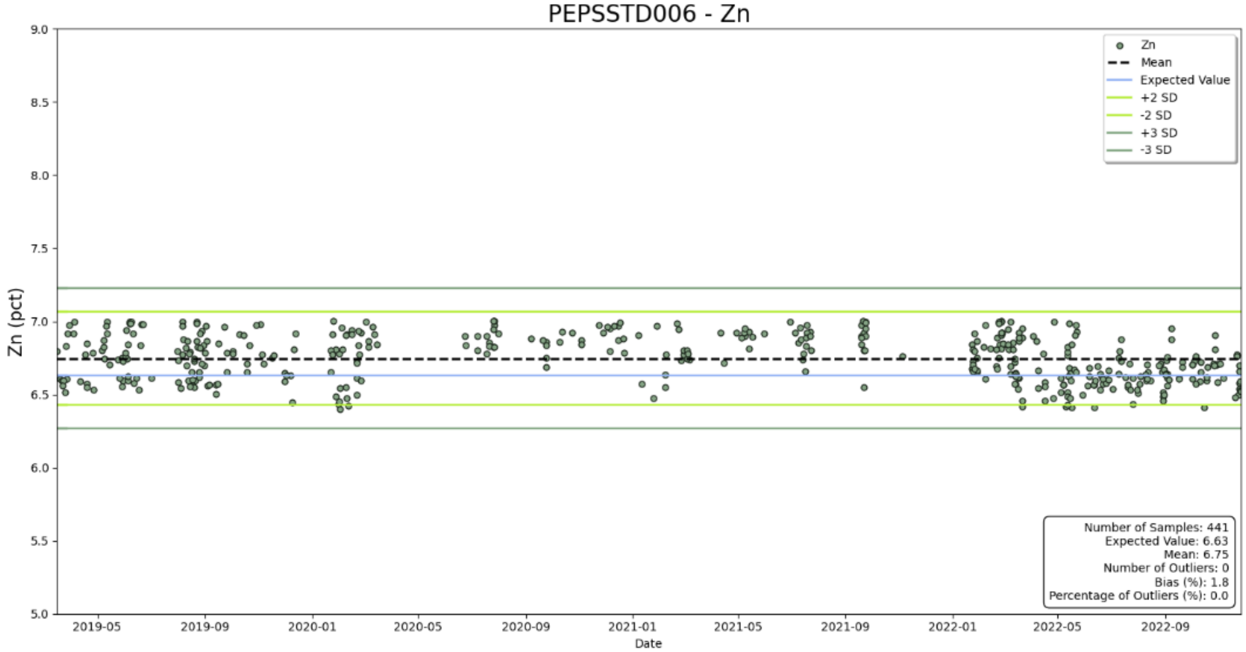


Figure 8-19: Atacocha Zn Control Chart for CRM PEPSSTD005 at Inspectorate AT: 2019 to 2022

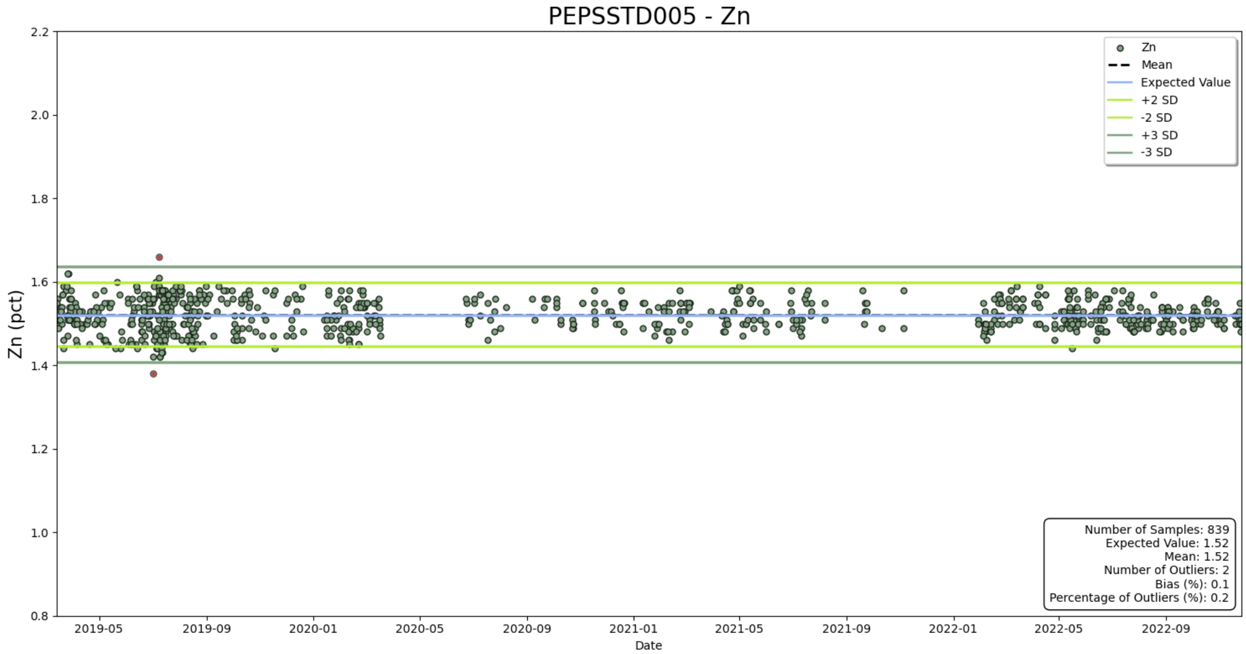


Figure 8-20: Atacocha Zn Control Chart for CRM MAT10 at ALS: 2019

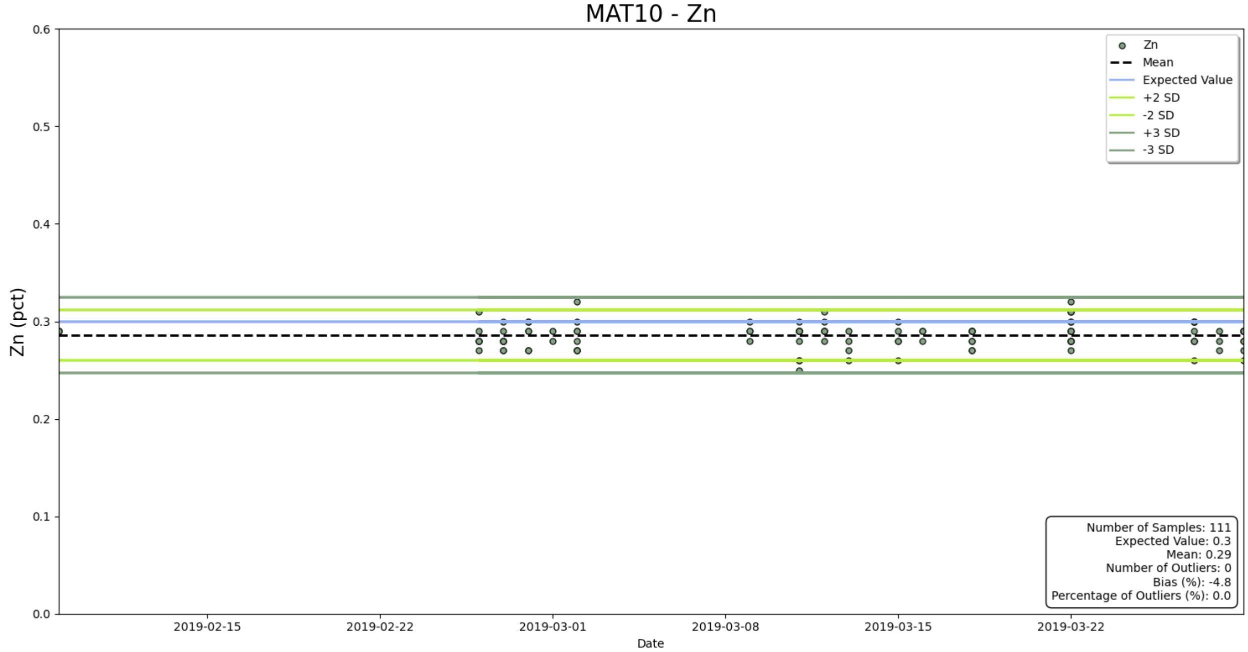
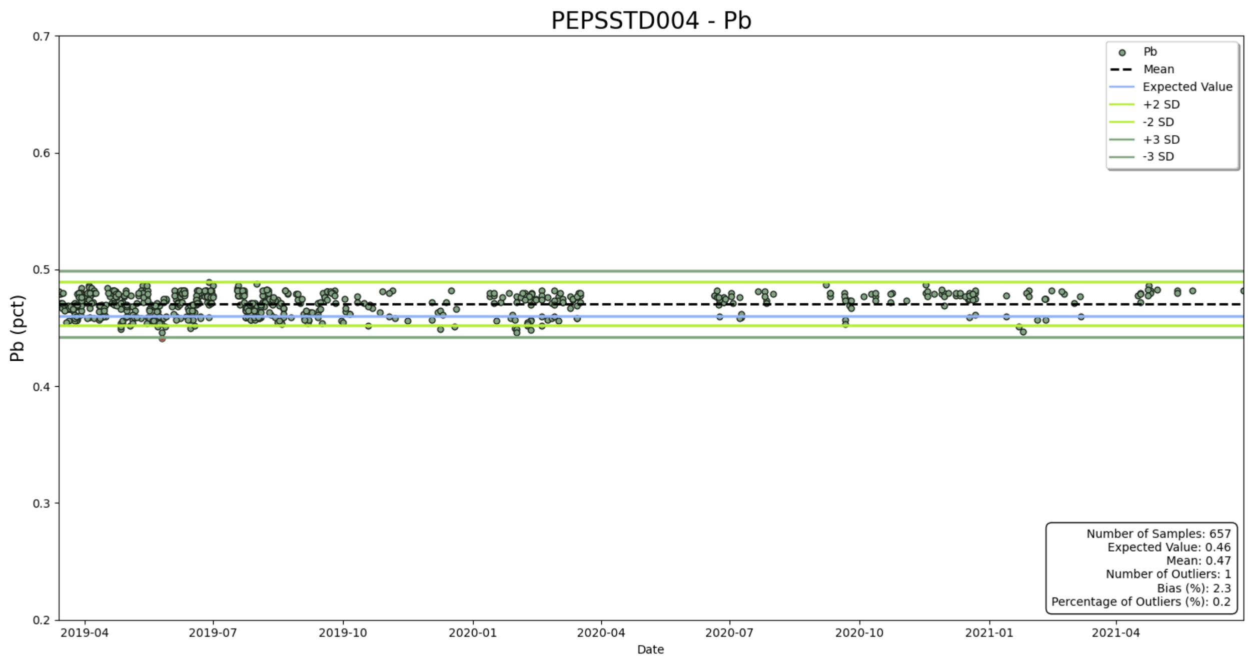


Figure 8-21: Atacocha Pb Control Chart for CRM PEPSSTD004 at Inspectorate AT: 2019 to 2021



8.5.2.2 Blank Material

Coarse blanks are submitted with core samples to assess contamination during sample preparation and to identify sample numbering errors. The blank utilized consists of barren material with grades below detection limits.

Milpo, 2012 to 2017

Between January 2014 and February 2017, a total of 1,752 blanks were included with 25,925 drill hole samples and 290 blanks were included with 18,993 channel samples (a submission rate of 1 in 15 samples) submitted to Inspectorate AT.

In addition, a total of 1,824 blanks with 30,370 drill hole samples (a submission rate of 1 in 17 samples) were sent to Lima Inspectorate over the same time period.

A total of 1,315 blanks with 22,089 drill hole samples (a submission rate of 1 in 17 samples) were also sent to ALS from August 2016 to April 2017.

The results in all the laboratories show a pass rate greater than 98% indicating negligible contamination.

Nexa, January 2017 to August 2018

A total of 1,304 coarse blanks (2.1%) and 1,374 fine blanks (2.0%) were inserted with core samples and showed no significant contamination during the preparation and analysis. The results of the blanks were within acceptable limits at all three laboratories.

Nexa, 2018 to 2023

A total of 3,738 blanks, encompassing both fine and coarse materials, were utilized. Fine blanks (PEPSBLK001 - BF) were no longer used after September 2019 and are now exclusively inserted during external checks. Currently, only coarse blanks (PEPSBLK002 - BG) are utilized for contamination control. Sourced from Target Rocks Peru, this 3/4-inch coarse blank material underwent analysis by ICP-OES or ICP-MS in six laboratories, all of which validated its low Zn, Pb, Cu, Ag, and Au content.

A review of the blanks revealed that no contamination has been detected in either type of blank material. Only one sample slightly exceeded the Zn limit set as displayed in Figure 8-22. For fine blanks, all samples fall within the limit, as depicted in **Figure** 8**-**23.

Figure 8-22: Atacocha Zn Coarse Blank PEPSBLK002 at ALS: 2018 to 2022

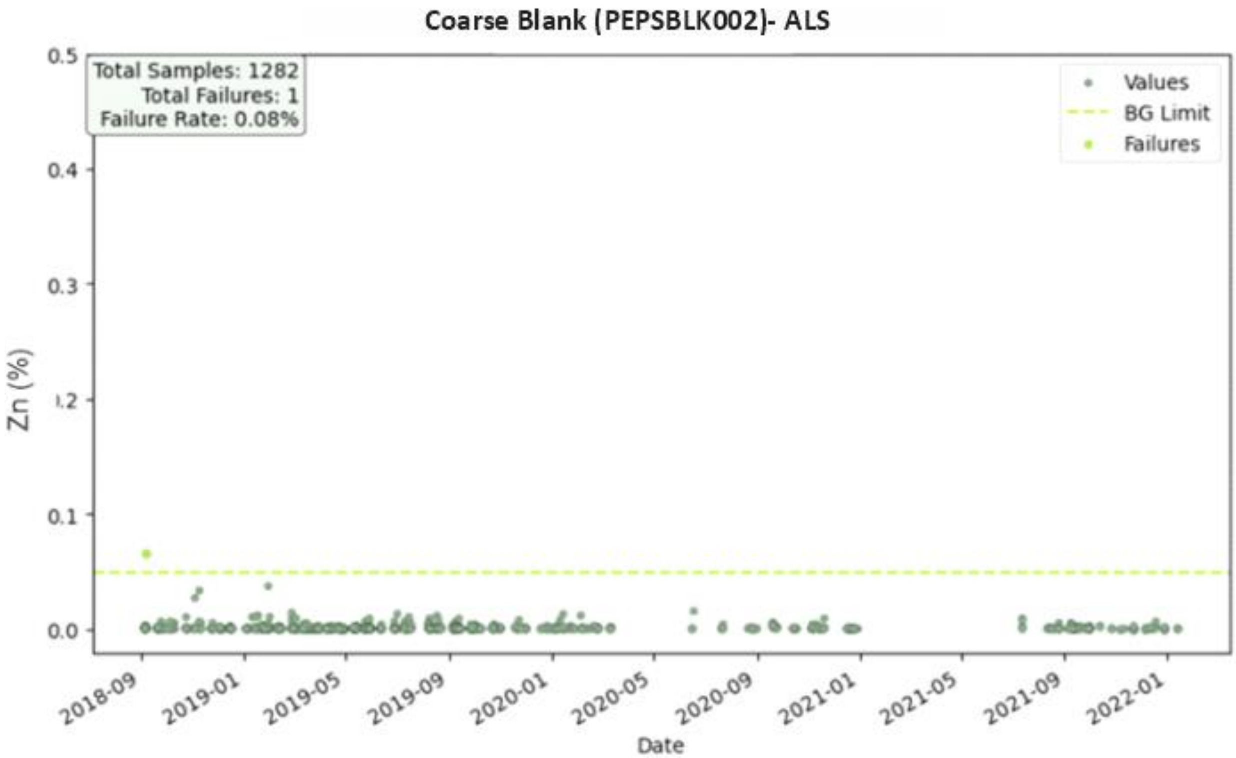
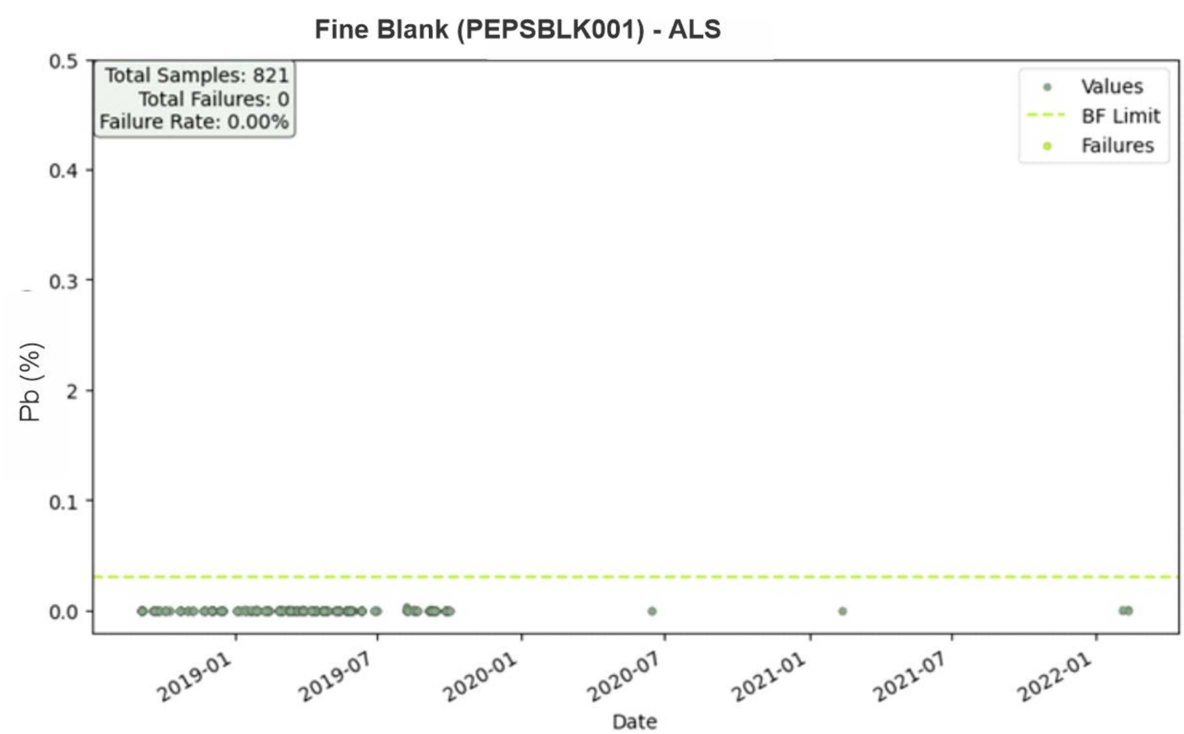


Figure 8-23: Atacocha Pb Fine Blank PEPSBLK001 at ALS: 2018 to 2022



8.5.2.3 Duplicates

Field duplicates are inserted into the sample streams to monitor the representativeness of sampling and grade variability. Additionally, coarse duplicates and pulp duplicates are included to evaluate precision during both preparation and analysis processes.

Milpo, 2012 to 2017

Atacocha sent duplicate samples to Inspectorate AT, Inspectorate Lima, and ALS. SLR (then RPA) reviewed the duplicate results for Zn, Pb, Cu, Ag, and Au and found that they generally compared well. Some of the pulp duplicates at the Inspectorate AT for Zn, Pb, and Cu fall outside the 10% HARD threshold.

Nexa, 2017 to 2018

Duplicate control charts were prepared for Zn, Au, Ag, Cu, and Pb for the laboratories Certimin, ALS, and Inspectorate AT. Overall, the duplicate results showed relatively good assay precision, except for Zn and Pb field duplicates, the poor performance of which is attributed by Nexa to inherent sample variability within breccia, irregularly distributed veins.

RPA observed that representative duplicates spanning mineralization grade ranges are selected, and a study to investigate the component of variability that is inherent in the sample, versus the component due to assay precision is still ongoing.

Nexa, 2018 to 2023

A total of 6,457 sample pairs were available for review between September 2018 and January 2023. SLR re-evaluated the duplicate database using the hyperbolic method to calculate the relative error between pairs. A failure rate of 10% was considered the threshold for taking corrective action for a group of samples. Individual failure criteria were set for pulp, coarse reject, and field duplicates, whether from Inspectorate AT, ALS, or Certimin.

Good precision rates were obtained from pulp, coarse, and field duplicates in general, as illustrated in Figure 8-24 to Figure 8-26. Overall, the precision of the duplicate assays remained consistent.

Figure 8-24: Atacocha Pb Pulp Duplicates at ALS: 2018 to 2022

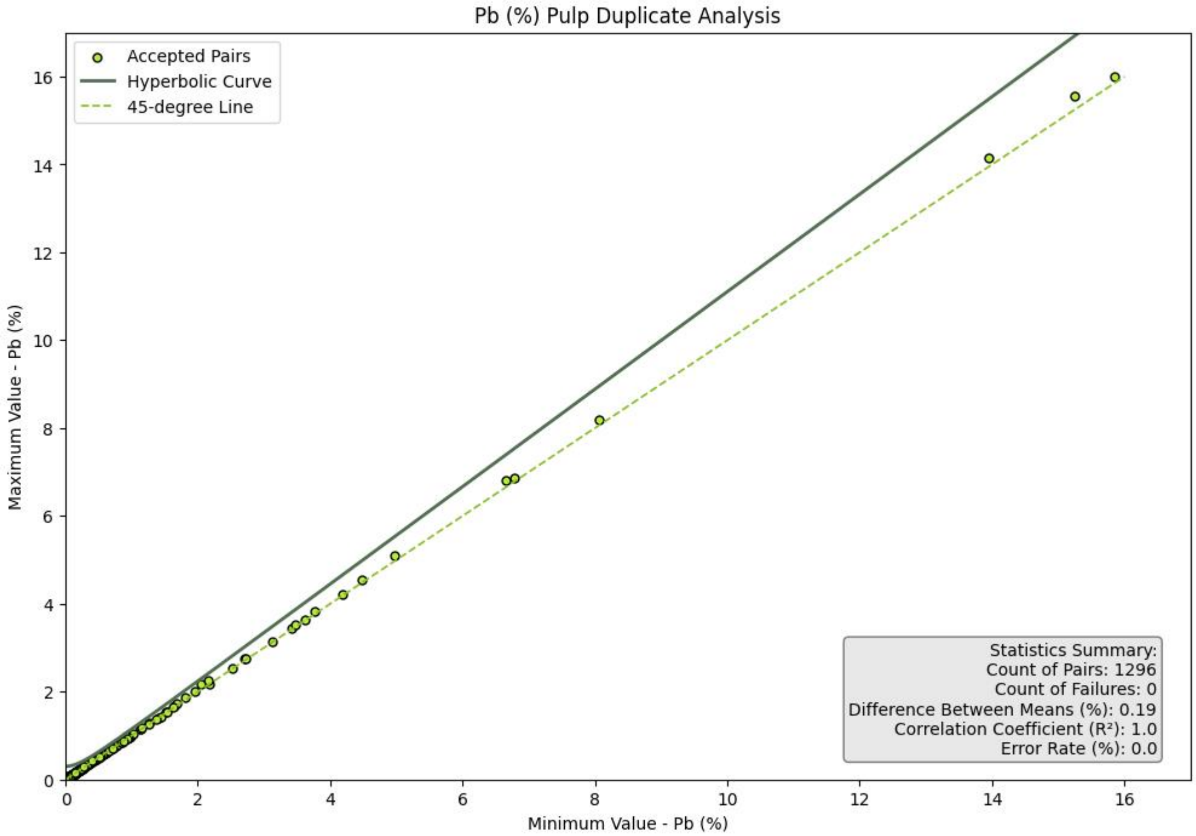


Figure 8-25: Atacocha Zn Coarse Duplicates at Inspectorate AT: 2018 to 2022

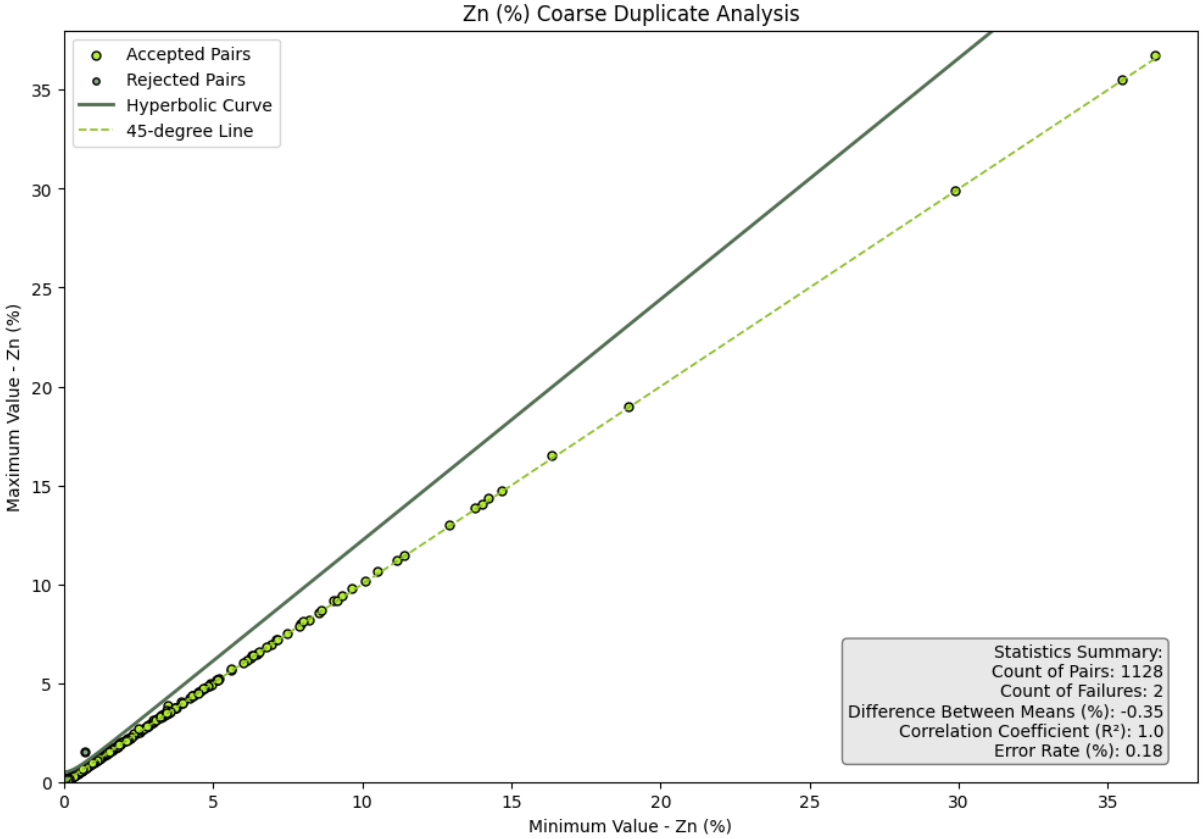


Figure 8-26: Atacocha Zn Field Duplicates at ALS: 2018 to 2022

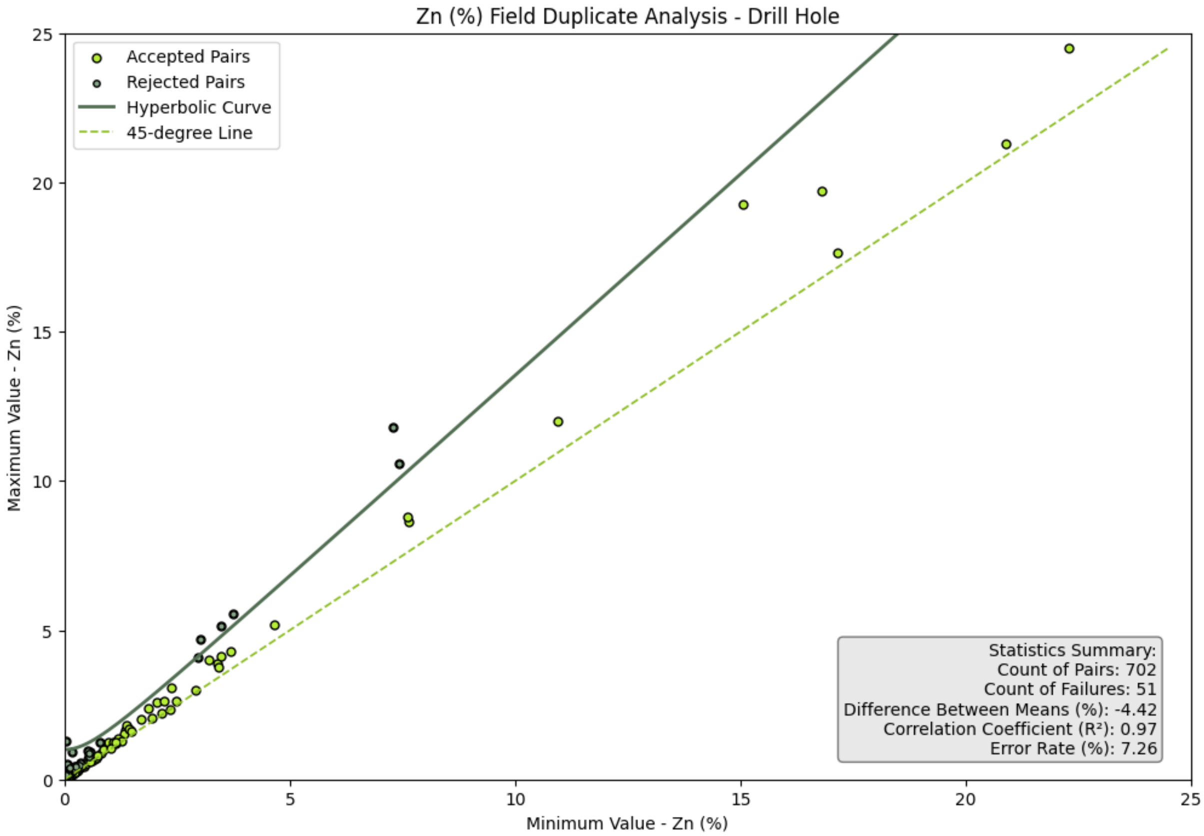


Table 8-12 summarizes the statistics of Atacocha duplicate results from 2018 to 2023.

Table 8-12: Atacocha Duplicate Types and Failure Rates

Period	Laboratory	Element	Field Duplicates			Coarse Duplicates			Pulp Duplicates		
			Sample	Failure	Failure Rate%	Sample	Failure	Failure Rate %	Sample	Failure	Failure Rate %
Jan 2018, Aug 2018	CERTIMIN	Au(g/t)	42	3	7%	51	0	0%	76	1	1%
		Ag(oz/t)	42	2	5%	51	0	0%	76	5	7%
		Cu (%)	42	2	5%	51	0	0%	76	0	0%
		Pb (%)	42	5	12%	51	6	12%	76	0	0%
		Zn (%)	42	8	19%	51	0	0%	76	0	0%
	ALS	Au(g/t)	1,092	33	3%	1,092	3	0%	1,519	34	2%
		Ag(oz/t)	1,092	38	4%	1,092	6	1%	1,519	4	0%
		Cu (%)	1,092	39	4%	1,092	4	0%	1,519	3	0%
		Pb (%)	1,092	123	11%	1,092	123	11%	1,519	2	0%

Period	Laboratory	Element	Field Duplicates			Coarse Duplicates			Pulp Duplicates		
			Sample	Failure	Failure Rate%	Sample	Failure	Failure Rate %	Sample	Failure	Failure Rate %
		Zn (%)	1,092	150	14%	1,092	18	2%	1,519	1	0%
	INSPECTORATE AT	Au(g/t)	471	6	1%	478	0	0%	682	5	1%
		Ag(oz/t)	471	11	2%	478	0	0%	682	0	0%
		Cu (%)	471	20	4%	478	1	0%	682	3	0%
		Pb (%)	471	30	6%	478	30	6%	682	3	0%
		Zn (%)	471	65	14%	478	1	0%	682	1	0%
Set 2018 - Jan 2023	CERTIMIN	Au(g/t)	18	2	11%	35	0	0%	114	3	3%
		Ag(oz/t)	18	1	6%	35	0	0%	114	0	0%
		Cu (%)	18	0	0%	35	0	0%	114	0	0%
		Pb (%)	18	1	6%	35	0	0%	114	0	0%
		Zn (%)	18	3	17%	35	0	0%	114	0	0%
	ALS	Au(g/t)	702	44	6%	828	21	3%	1,296	74	6%
		Ag(oz/t)	702	19	3%	828	3	0%	1,296	4	0%
		Cu (%)	702	23	3%	828	2	0%	1,296	0	0%
		Pb (%)	702	30	4%	828	1	0%	1,296	0	0%
		Zn (%)	702	51	7%	828	0	0%	1,296	1	0%
	INSPECTORATE AT	Au(g/t)	230	53	23%	1,128	6	1%	2,106	13	1%
		Ag(oz/t)	215	33	15%	1,024	2	0%	1,953	1	0%
		Cu (%)	230	27	12%	1,128	2	0%	2,106	5	0%
		Pb (%)	230	38	17%	1,128	1	0%	2,106	1	0%
		Zn (%)	230	48	21%	1,128	2	0%	2,106	3	0%

8.5.2.4 Umpire Check Assays

As part of the Nexa QA/QC program, pulp samples are routinely submitted to a third-party laboratory to verify the accuracy and precision of primary assay results, using the same analytical procedures. Statistics for the check assay results for Atacocha are presented in Table 8-13.

SLR is of the opinion that the results of the check assays support the use of the primary assays in the Mineral Resource estimation.

Nexa, January to August 2018

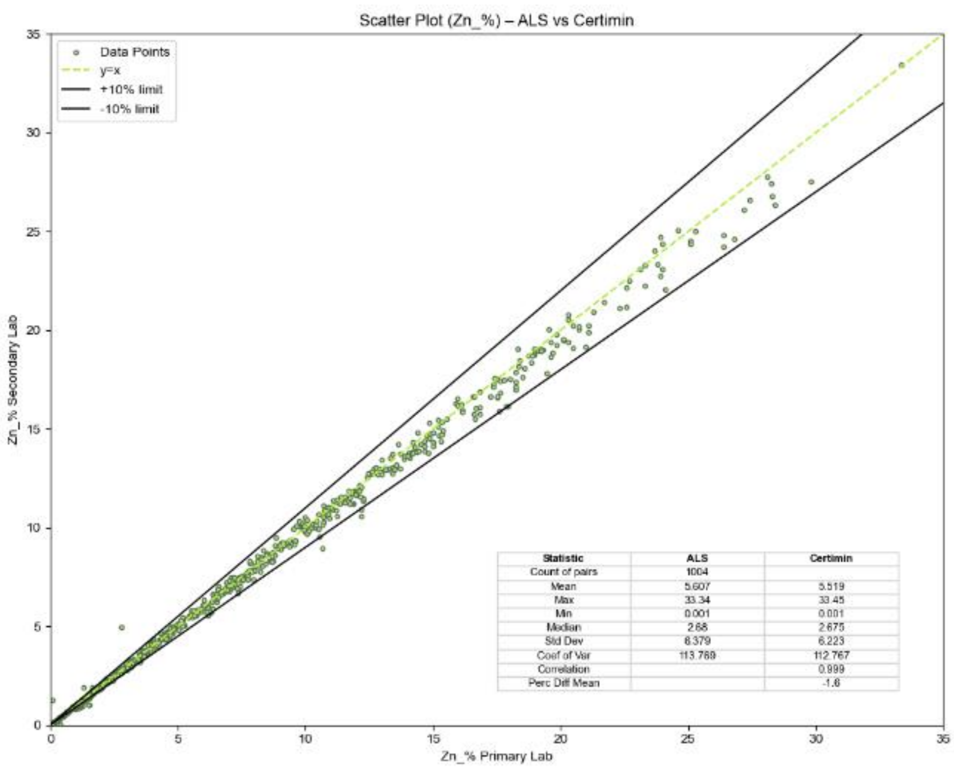
Nexa sent 261 pulp samples analyzed at Inspectorate to ALS and 495 sample pulps analyzed at ALS to Certimin for umpire check assays. External check samples were inserted at a rate of approximately 2%.

The results for Zn showed a correlation coefficient of 0.99, which is very good. There were some samples removed as they were at detection limit value. The check assay results compared well, showing very high overall correlation coefficients, except for the ALS Ag value, which was less at 0.96%. For Ag, a potential negative bias of approximately 10% at Inspectorate in comparison to ALS should be investigated.

Nexa, September 2018 to 2023

Between 2018 and 2023, 1,952 samples were collected from drill holes and submitted either to Certimin or ALS as a third-party laboratory. These samples were shipped along with blanks and standards to validate the secondary results. The Zn analysis illustrated in Figure 8-27 demonstrated a high correlation of 0.999 and a mean percentage difference of 1.6% between ALS and Certimin. Likewise, the Pb analysis shown in Figure 8-28 indicated a strong correlation of 0.996 between Inspectorate AT and ALS, with a 0.7% difference between the mean values. The statistical similarity of both datasets confirms the accuracy of the grades reported by the primary laboratory.

Figure 8-27: Atacocha Check Assay Scatter Plot - Zn



Statistic	ALS	Certimin
Count of pairs	1004	
Mean	5.607	5.519
Max	33.34	33.45
Min	0.001	0.001
Median	2.68	2.675
Std Dev	6.379	6.223
Coef of Var	113.769	112.767
Correlation		0.999
Perc Diff Mean		-1.6

Figure 8-28: Atacocha Check Assays Scatter Plot - Pb

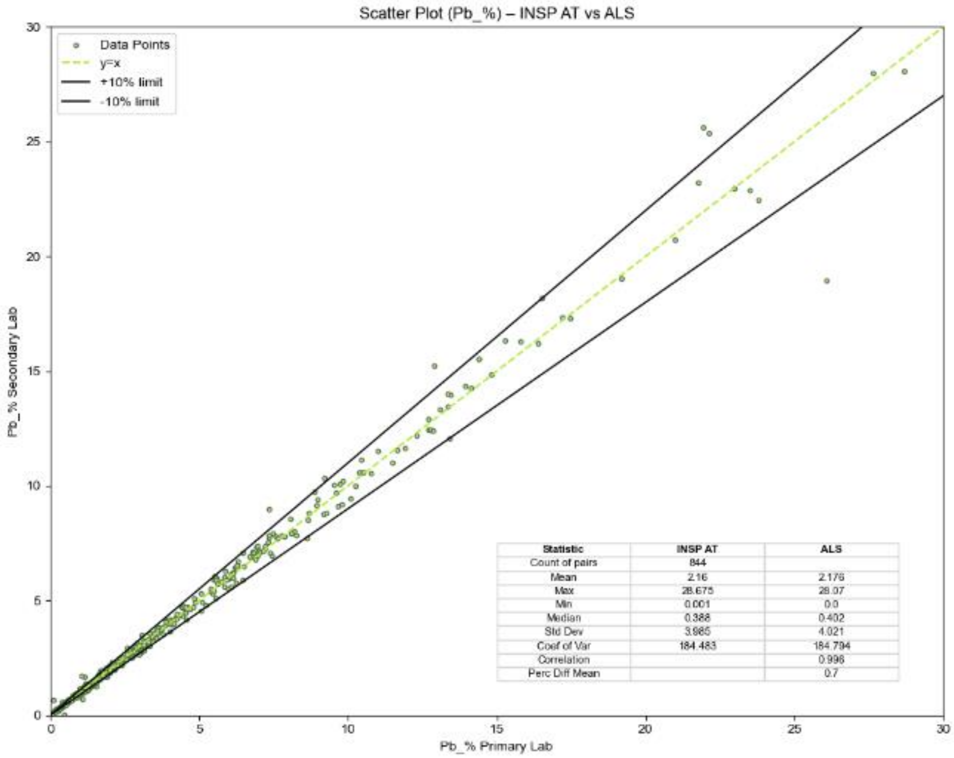


Table 8-13: Atacocha External Check Assay Performance: 2018 to 2023

Period	Secondary Laboratory	Primary Laboratory	Element	No. Samples	Bias (%)
Jan 2018 - Sept 2018	ALS	Inspectorate AT	Au ppm	226	3.50%
			Ag ppm	226	-10.80%
			Cu per	276	-3.90%
			Pb per	286	-4.00%
			Zn per	330	-2.00%
	Certimin	ALS	Au ppm	431	-0.70%
			Ag ppm	434	0.60%
			Cu per	333	1.40%
			Pb per	332	0.70%
			Zn per	404	0.60%

Period	Secondary Laboratory	Primary Laboratory	Element	No. Samples	Bias (%)
Sept 2018 - Jan 2023	Inspectorate AT	ALS	Au ppm	844	5.30%
			Ag ppm	844	0.60%
			Cu per	844	3.10%
			Pb per	844	0.70%
			Zn per	844	2.40%
	ALS	Certimin	Au ppm	1,004	1.40%
			Ag ppm	1,004	-7.50%
			Cu per	1,004	-1.80%
			Pb per	1,004	0.60%
			Zn per	1,004	-1.60%
	Certimin	ALS	Au ppm	104	-0.50%
			Ag ppm	104	-0.50%
			Cu per	104	1.20%
			Pb per	104	-2.20%
			Zn per	104	-0.10%

8.5.2.5 QA/QC Recommendations

Prior to preparation of the Mineral Resource estimates for El Porvenir, Atacocha underground, and Atacocha open pit, the QP reviewed the adequacy of Nexa's sample preparation, analysis, security protocols and procedures and QA/QC program at these operations.

The QP also reviewed the independent audit of the QA/QC program completed by SLR.

The QP's QA/QC recommendations for Atacocha are as follows:

- Keep monitoring CRMs and controls to prevent and/or mitigate trends, biases, or other issues which may require sample re-analysis. Continue to periodically conduct external checks across laboratories to ensure the primary laboratory's performance remains satisfactory.

8.6 QP Opinion

In the QP's opinion, the sample preparation, analysis, and security procedures at El Porvenir and Atacocha are appropriate for use in the estimation of Mineral Resources.

In the QP's opinion, the QA/QC program as designed and implemented by Nexa is adequate and the assay results within the databases for El Porvenir and Atacocha are suitable for use in a Mineral Resource estimate.

9.0 Data Verification

9.1 Databases and Internal Verification

During the last quarter of 2017, Nexa transferred the El Porvenir and Atacocha databases from their in-house developed Mining Information System (SIOM) , and Excel files to Fusion software and prepared an exhaustive number of checks to confirm the accuracy of the data migration. Nexa has implemented a series of routine verifications to ensure the collection of reliable data. Logging and sampling data are digitally entered into the database by downloading the information from the logging tablets.

Core logging, surveying, and sampling were monitored by exploration and mine geologists and verified routinely for consistency. The El Porvenir and Atacocha resource databases are regularly maintained and validated by the database administrator using Fusion software validation routines and by regularly checking the drill hole data on-screen visually. Personnel from the Geology department conduct daily quality control checks on the data entry. A first check consists of identifying duplicate sample numbers or lack of information for certain intervals. Every month, all the assay data entered in the server are compared with a compilation of individual CSV files issued by the laboratory. Paper records are stored at a safe location at the mines.

Assay data are captured from the Global Laboratory Information Management System (LIMS) server using custom routines, and this information is then entered into the Fusion database. The laboratory also issues CSV and pdf-format certificates, however, only the information that is stored digitally on the local mine servers is considered to be the true record.

Nexa prepared “The Informe de Validación de Base de Datos Atacocha” report containing additional detail regarding the data validation for El Porvenir. During this validation, Nexa found 76 channel samples and one drill hole creating inconsistencies with surrounding data. As a result, these channel samples and hole were removed from the Mineral Resource database.

9.2 El Porvenir

9.2.1 Previous Verification

In 2017, Amec Foster Wheeler (Amec) audited the Atacocha database (which also included El Porvenir). Amec reviewed and validated the information from 2011 to 2017 compiled by El Porvenir. Amec used signed assay certificates to verify the assays in the database; some inconsistencies were observed in Zn and Cu assays. Other checks included collar locations, downhole survey measurements, and lithology codes, and some inconsistencies were observed. In addition, a comparison between drill hole assay and channel assay was performed. The test compared results of nearby holes by searching for channel samples within a four-metre distance of drill holes. Amec constructed QQ plots and found that both grade distributions were very similar, with no bias observed (Amec, 2017)

As part of SRK’s 2017 NI 43-101 Technical Report, SRK performed assay data verification by comparing assay certificates with values in the database. SRK found that a significant number of historical samples did not have assay certificates and downgraded some areas to Inferred Resources as a result. Nexa has found more assay certificates since 2017 and completed a statistical and visual study that concluded that there were no significant issues with the historical data. SLR reviewed Nexa's comparison work and concurred with the inclusion of historical data in the resource estimate with no classification downgrade.

9.2.2 2020 SLR Verification

SLR visited El Porvenir from September 5 to 7, 2018. During the site visit, SLR reviewed plans and sections, visited the core shack, examined some drill cores and mineralization exposures at the underground mine, and held discussions with Nexa personnel.

As part of the data verification process, SLR inspected the drill holes in section and plan view to review geological interpretations related to drill hole and channel databases and found good correlation. SLR queried the database for unique headers, unique samples, duplicate holes, overlapping intervals, blank and zero grade assays, and long interval samples, and reviewed QA/QC data collected by Nexa. SLR did not identify any significant discrepancies.

9.2.2.1 Assay Certificate Verification

SLR performed checks on the El Porvenir Mineral Resource database by compiling approximately 166,000 assay certificate results from August 2011 to March 2020 and comparing them to the assay database. Approximately 53,000 sample IDs were matched to the assay database for Zn, Cu, Pb, Ag, and Fe. No significant errors were found. There were 629 samples for Ag where the values in the database ranged from 25 g/t Ag to 285 g/t Ag and were lower than the certificate assays. This is likely a result of choosing the lower value of multiple re-assays, which shows a conservative approach since all mismatched values were lower in the Mineral Resource database. SLR did not include the results of re-assay programs in its certificate conversion and compilation exercise.

SLR did not review the pre-2011 certificate data as it is mostly located in mined-out areas. The bulk of the Mineral Resources and Mineral Reserves are supported with data from 2011 to 2020. Note the Mineral Resource and Mineral Reserve solids are well-covered by the 2011-2020 sampling. Assay certificates pre-2011 were not available, with the exception of 2009 certificates, however, Nexa and SLR reviewed this data in sections and plan views. Overall, the data compared well with recent drilling. SLR found no indication of any significant issues with this data. Additionally, Nexa was actively conducting drilling in these areas to validate assay values.

9.2.2.2 Density Certificate Verification

SLR analyzed 3,553 density measurement certificates from November 2015 to February 2020. Four files from 2011, 2012, and 2014 appear to contain grab samples, and only two of these had sample ID fields which concatenated the index and year in the table. Spot checks of the available sample IDs against the density table in the Mineral Resource database resulted in zero matches.

There were 565 certificate ID matches out of 1,131 in the El Porvenir Mineral Resource database, resulting in a comparison rate of 50%. SLR noted that there was only one density discrepancy greater than 0.2 g/cm^3 between the matching certificate and the Mineral Resource sampleIDs. SLR considered this to be a very good result.

9.2.3 SLR Verification 2021 - 2023

SLR found that the database is well maintained and that database verification procedures for El Porvenir comply with industry standards and are adequate for the purposes of Mineral Resource estimation.

9.2.3.1 Assay Certificate Verification

SLR carried out cross-checks between the El Porvenir assay database and the Inspectorate, Certimin, and ALS assay certificates. SLR compiled 41,816 samples from 282 certificates from 2019 to 2023 and compared values for Au, Ag, Pb, Cu, and Zn against the PS-EP-ASSAY_31-01-2023 assay database. This allowed for approximately 44% of the assay database to be verified. No significant errors were identified.

SLR is the opinion that the database is well supported by the available assay certificates.

9.2.3.2 Density Certificate Verification

SLR compiled ALS density measurement from original certificates and compared them to the density database.

In 2020, the ALS laboratory conducted tests on 469 samples, across eight certificates, using the wax-coated immersion method. Subsequently, density assessments commenced at the El Porvenir density dedicated laboratory. SLR noted that 46 of the samples were missing from the density database. Nexa attributes this missing information to damage during transport of the samples, which, as a result, were removed from the density database. Additionally, 92 samples measured by ALS were re-analyzed and replaced in the database with the on-site laboratory.

Starting in 2020, density measurements have been exclusively conducted in the El Porvenir density dedicated laboratory, with the results directly recorded into the Fusion database. Consequently, these measurements are not supported by certificates. However, recalculation of initial weights also recorded in the database confirm final density values.

9.3 Atacocha

9.3.1 2018 RPA Verification

RPA visited the Atacocha Mine from September 5 to 7, 2018. During the site visit, RPA reviewed plans and sections, visited the core shack, examined some drill cores and mineralization exposures at the underground mine, and held discussions with Nexa personnel.

RPA performed checks on the Atacocha Mineral Resource database by comparing 2017 assay certificates to the assay values in the database. The database values correspond well with the assay certificate data.

As part of the data verification process, RPA inspected the drill holes in section and plan view to review geological interpretations related to drill hole and channel databases and found good correlation. RPA queried the database for unique headers, unique samples, duplicate holes, overlapping intervals, blank and zero grade assays, and long interval sample, and reviewed QA/QC data collected by Nexa. RPA did not identify any significant discrepancies.

9.3.2 SLR Verification 2021 - 2023

SLR found that the database is well maintained, and generally exceeds industry standards. SLR is of the opinion that database and database verification procedures for Atacocha comply with industry standards and are adequate for the purposes of Mineral Resource estimation.

9.3.2.1 Assay Certificate Verification

SLR carried out cross-checks between the Atacocha assay database and the Inspectorate, Certimin, and ALS assay certificates. SLR compiled 67,316 samples from 791 certificates from 2019 to 2022 and compared values for Au, Ag, Pb, Cu, and Zn against the PS-AT-ASSAY_31-01-2023 assay database. This allowed for approximately 88% of the assay database to be verified. There is a total of 110 errors found in certificate LI19305593, which is related to the holeID PEATD01284.

SLR completed database validity checks for out-of-range values, gaps, and mismatched sample intervals.

Overall, SLR found no significant issues with the Atacocha drill hole databases.

9.3.2.2 Density Certificate Verification

SLR conducted an analysis of 6,025 density measurement certificates dated from 2013 to 2021 from ALS, all of which were determined using the wax-coated immersion method. Out of these, 1,975 samples were not found in the database. Nexa attributes this missing information to damage during transport of the samples, leading to its removal from the density database. A total of 3,159 samples matched the results between the certificate measurements and the database records. SLR noted that 30 samples measured by ALS were re-analyzed and replaced in the database with the on-site laboratory measurements.

Since January 2021, density measurements have been conducted exclusively in the El Porvenir density dedicated laboratory, with the results directly recorded into the Fusion database. Consequently, these measurements are not supported by certificates. However, recalculation of initial weights also recorded in the database confirm final density values.

9.4 Data Verification by the QP

Prior to preparation of the Mineral Resource estimates for El Porvenir, Atacocha underground, and San Gerardo, the QP reviewed the adequacy of Nexa's data management processes and completed database validity checks on the resource databases used in the estimates.

The QP also reviewed the validation and verification checks completed by SLR.

No limitations were imposed when conducting the QP's checks.

9.5 QP's Opinion and Recommendations

In the QP's opinion, the data verification for El Porvenir and Atacocha revealed no major discrepancies. Therefore, the assay and density results within the database are considered suitable for use in a Mineral Resource estimate.

The QP's data verification recommendations are as follows:

- Confirm whether the 1,975 density samples removed from the Atacocha database were justifiably excluded or, if necessary, consider re-including them in the database. Ensure that this exclusion of density samples is documented within the database's record of changes to track any modifications made to the database.

- Investigate and correct the noted sample discrepancies, mostly in Au values.
- Maintain standardization of the format and database structure.

10.0 Mineral Processing and Metallurgical Testing

10.1 El Porvenir

10.1.1 Geometallurgical Test Work

Nexa began developing a geometallurgical model for El Porvenir in 2017. The objectives of the work were to develop a geometallurgical model able to predict the recovery of lead, zinc, copper, arsenic, and manganese, concentrate grades, as well as abrasiveness (abrasion index (Ai)) and hardness (Bond ball mill work index (BWi)), and therefore throughput based on ore source within the deposit. The aim of the development work included:

- Maximization of operational value of the El Porvenir mining unit.
- Reduction of risks to production related to:
  - Plant throughput.
  - Grinding media consumption.
  - Recovery of valuable minerals.
  - Concentrate quality.
  - Identification of flaws in the quality and interpretation of the available information.
  - Identification of opportunities for improvement and to reduce risk.
  - Definition and validation of geometallurgical domains from metallurgical test results.
  - Evaluation of contaminants in the deposit.

The geometallurgical sample selection and test work were performed with the assistance of Transmin Metallurgical Consultants (Transmin). Preliminary results and interpretation were reported by Transmin in the following reports:

- Estudio Geometalurgico Preliminar para Unidad Minera El Porvenir, June 15, 2018 (Transmin, 2018).
- Estudio Geometalúrgico Fase 2 para Unidad Minera El Porvenir, April 29, 2019 (Transmin, 2019)
- Estudio Geometalúrgico Fase 3 para Unidad Minera El Porvenir, May 18, 2020 (Transmin, 2020)
- Estudio Geometalúrgico Fase 4 para Unidad Minera El Porvenir, June 17, 2021 (Transmin, 2021)
- Estudio Geometalúrgico Fase 5 para Unidad Minera El Porvenir, May 5, 2022 (Transmin, 2022)
- Estudio Geometalúrgico Fase 6 para Unidad Minera El Porvenir, April 20, 2023 (Transmin, 2023).

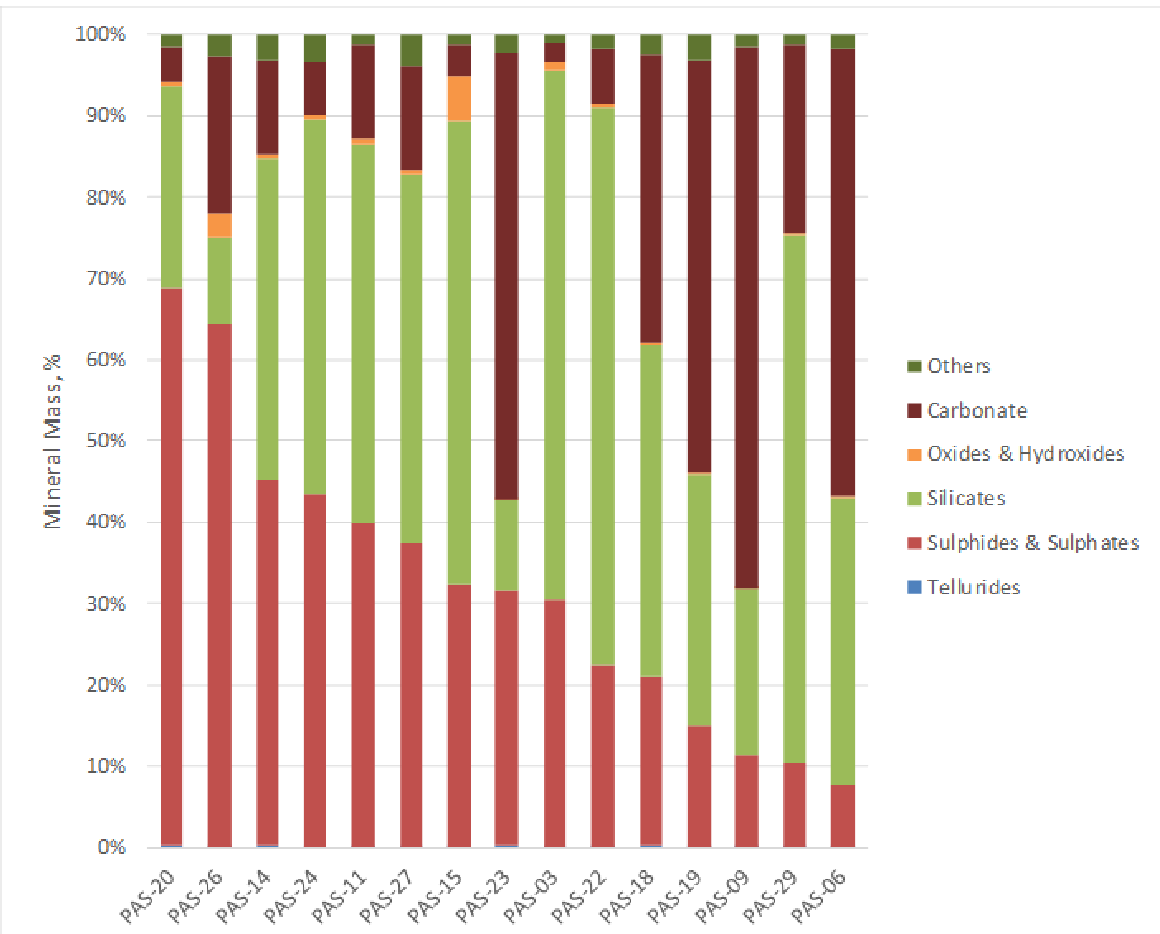
10.1.1.1 Phase 1 Results

In 2017, fifteen samples from El Porvenir were submitted for metallurgical testing. The samples were intended to be representative of 2018 concentrator feed. Test work included mineralogy, comminution testing (BWi and Ai), and flotation (variability tests, locked cycle tests (LCTs), and grind size evaluation).

Sampling and Mineralogy

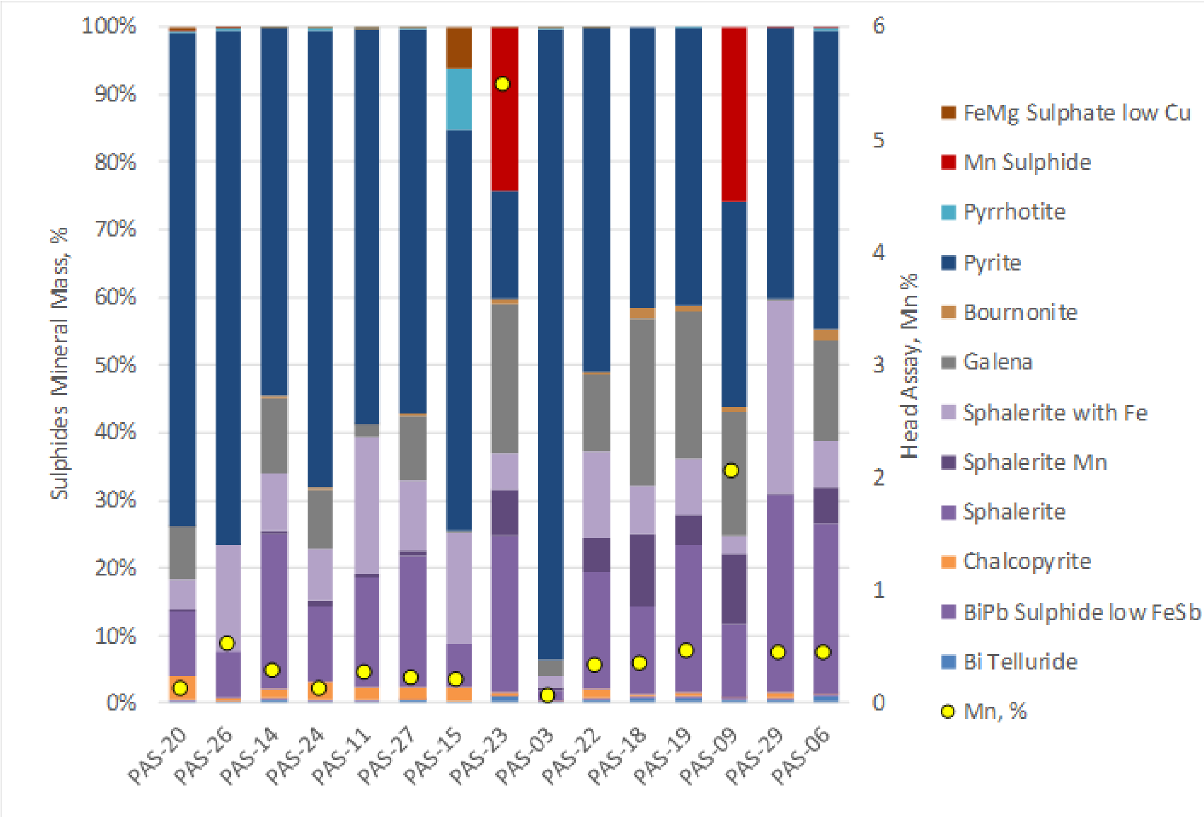
Priority was given to samples from holes drilled in 2016 and 2017 to use the freshest possible material for metallurgical test work. Samples were selected to represent areas in the block model with NSR values greater than or equal to $40.94/t, as well as to include the majority of lithologies to be processed in 2018 (predominantly skarn and limestone). Grades of zinc, lead, copper, and silver were also considered in the selection of samples. Mineralogical characterization of the samples is represented in Figure 10-1 and Figure 10-2. The mineralogy is notable for the wide range of sulphide and sulphate content, the presence of sphalerite with manganese inclusions, as well as high levels of manganese sulphide in two samples, PAS-09 and PAS-23.

Figure 10-1: Bulk Mineralogical Analysis



Source: Transmin, 2018

Figure 10-2: Sulphide Mineral Breakdown



Source: Transmin, 2018

Comminution

Comminution test results ranged from 0.04 g to 0.33 g for Ai and 7.3 kWh/t to 20.6 kWh/t for BWi.

Flotation – Grind Size Optimization

Three composite samples were produced for use in grind size optimization flotation tests and for LCTs. Two composites of plant feed representing October 2017 and November 2017 were collected for repeatability testing and cleaner regrind testing. Bulk rougher flotation was completed at three grind sizes, 80% passing (P_{80}) 100 µm, 150 µm, and 200 µm. The tests indicated that there was a tendency towards higher recoveries of copper and zinc to the bulk rougher concentrate at the finer grind sizes. This would result, however, in the need for more effort to reject the additional zinc from the bulk concentrate. Recovery of lead to the bulk concentrate was less affected but improved at finer grind sizes. Therefore, it was noted that optimization of primary grind size could help to maximize recoveries of valuable minerals and metals, but primary grind size should be considered in conjunction with throughput and energy consumption.

An evaluation of regrind size was conducted by completing cleaner tests on bulk and zinc rougher concentrates at P_{80} 20 µm and 40 µm, as well as without regrinding. The tests indicated that recoveries were lower at finer grind sizes, but also that grades at the finer grind sizes were higher. It was noted that optimization of regrind size could help to reduce energy consumption for regrinding, while still achieving target concentrate grades.

Locked Cycle Flotation Testing

An LCT was completed which produced a bulk concentrate of 53.8% Pb and zinc concentrate of 52.7% Zn. The limit for bismuth in the bulk concentrate (1,000 ppm Bi) was exceeded at 5,597 ppm Bi, and the limit for cadmium in the zinc concentrate (3,000 ppm Cd) was exceeded at 3,275 ppm Cd. Final recoveries for lead and zinc were 88.2% and 91.5%, respectively.

Variability tests were completed on the 15 variability samples. The tests consisted of bulk and zinc rougher flotation conditions that were adjusted according to the lead and zinc content of the samples, resulting in five different sets of flotation conditions.

Lead recovery to the bulk concentrate averaged 92% (excluding the low lead content samples), while zinc recovery to the zinc rougher concentrate averaged 79%.

Recovery Versus Head Grade

Test work results from the samples were used to derive recovery versus head grade relationships for lead, zinc, copper, manganese, and arsenic. Transmin noted that the number of samples tested was less than the number required to represent the variability of the deposit, and that additional test work would be required to validate and update the geometallurgical model. In addition, it was recommended that arsenopyrite and manganese sulphides be included in the logging of drill core samples, and that the behaviours of bismuth and antimony should be evaluated in future test work.

10.1.1.2 Phase 2 Test Work

In Phase 2 of the geometallurgical model development, 96 samples were selected for metallurgical test work, including samples from both El Porvenir and Atacocha. Samples were selected to represent the distribution of ore (from different zones within the mines) planned to be mined in 2019 (except for Atacocha where sample material for certain zones to be mined in 2019 was not available), and from blocks in the block model with NSR values greater than or equal to $40.94/t.

Comminution

Samples that underwent comminution testing included 36 samples from El Porvenir and 10 samples from Atacocha. Ai values of the samples ranged from 0.0056 g to 0.47 g, with the majority of samples in the low abrasiveness range of < 0.3 g. BWi for the samples ranged from 5.6 kWh/t to 20.7 kWh/t with the majority of samples in the medium to hard range of 9 kWh/t to 20 kWh/t. Abrasiveness and hardness were found to be related to the SiO_2 content of the samples.

Flotation

Flotation test work was completed on 45 variability samples (rougher tests) and a composite produced from 40 individual samples from El Porvenir and 10 individual samples from a blend of 75% El Porvenir and 25% Atacocha material. Three composites (two El Porvenir and one Atacocha) were submitted for mineralogical analysis. The main gangue minerals in the composites were silicates and carbonates and the main sulphide minerals were pyrite, sphalerite, and galena. The flotation test work indicated that lead recovery was related to the lead head grade, and silver recovery was related to lead recovery; zinc, manganese, and arsenic recoveries were noted to be related to the source zone of the samples. LCTs conducted on the composites did not achieve stability and were therefore not included in the analysis of results.

10.1.1.3 Phase 3 Test Work

In Phase 3 of the geometallurgical model development, 46 additional samples representing different zones and lithologies at El Porvenir underwent comminution testing. Ai results ranged from 0.0030 g to 0.68 g and BWi results ranged from 5.67 kWh/t to 23.1 kWh/t. Abrasiveness was found to be related to ore zone, lithology, SiO_2 content, and loss on ignition (LOI). BWi was found to be related to ore zone, lithology, and SiO_2 content.

Mineralogy

A further 29 samples were used to produce two composites representing ore to be mined from 2020 to 2022, as well as three samples used to produce a composite representing the Don Ernesto zone for flotation test work. Mineralogical analysis of the composites indicated that the main sulphide minerals were pyrite, sphalerite, pyrrhotite, and galena. Compared to the 2020 to 2022 composites (PDFC-01 and PDFC-02), the Don Ernesto composite (PDFC-03) was higher in sulphides and also contained 2.5% bournonite ($PbCuSbS_3$), while PDFC-02 contained 2.1% alabandite (MnS). Gangue minerals were mainly silicates and carbonates.

Flotation

LCTs were completed on PDFC-01 and PDFC-02 to produce bulk copper-lead concentrates and zinc concentrates. These tests produced the following results:

PDFC-01

- The bulk concentrate achieved a grade of 6.1% Cu, 41.7% Pb, and 2,623 g/t Ag at recoveries of 50.3% Cu, 91.7% Pb, and 73.6% Ag.
- The zinc concentrate achieved a grade of 49.7% Zn at a recovery of 91%.
- The bulk concentrate consisted mainly of galena (47%), chalcopyrite (16%), and sphalerite (15%, mostly associated with galena).
- The zinc concentrate consisted mainly of sphalerite (85%).

PDFC-02

- The bulk concentrate reached a grade of 1.0% Cu, 42.4% Pb, and 2.808 g/t Ag at recoveries of 34% Cu, 87% Pb, and 70% Ag. It also contained 8% Mn and 11% Zn.
- The Zn concentrate reached a grade of 41.8% Zn at a recovery of 73%.
- The bulk concentrate consisted of galena (44%), alabandite (13%), and sphalerite (21%). Sphalerite was associated equally with galena and pyrite.
- The zinc concentrate consisted mainly of sphalerite (70%) and 5% alabandite.

Transmin recommended that manganese sulphides, lead oxides, and whole rock analysis, particularly for SiO_2, be included in drill core analysis, that manganese be included in the geological model, and that consideration be given to mapping high SiO_2 zones.

Based on the results of the test work, Transmin produced relationships for comminution parameters (Ai and BWi) and flotation predictions for recoveries and grades for copper, lead, and zinc concentrates using ore zones and grades that could be used in geometallurgical modelling. These relationships were updated through the various phases of test work.

10.1.1.4 Phase 6 Test Work

The phase 6 metallurgical testing program carried out in 2023 continued the work in the previous phases to characterize the geometallurgical behaviour of the ore from the El Porvenir deposit.

The objective of this geometallurgical program was to maximize the operational value of the Mining Unit by reducing the risk on the production of the 2023-2026 input material including:

- Plant tonnage
- Consumption of grinding media
- Recoveries of valuable minerals
- Quality of the final concentrate
- Identification of fatal failures
- Look for flaws in the interpretation of available information
- Validation and definition of geometallurgical domains
- Find opportunities for improvement and reduce existing risks

Prior to the phase 6 study, five phases of geometallurgical studies were carried out, increasing the available geometallurgical data progressively to reduce the risk in metallurgical predictions. Identified risks include the presence of high-hardness material in intrusive materials and limestone, as well as high abrasiveness in sandstone and clastic materials.

A total of 24 samples were selected for the flotation program, 12 samples for the comminution program, and 25 samples for Wall Rock Analysis (WRA), considering the relevant geological and geochemical parameters according to the available information.

From the individual samples, two El Porvenir geometallurgical (PGC) flotation composites were formed. Composite PGC-01, corresponding to main bodies to be mined in 2023-2026. Composite PGC-02, corresponding to breccia zone material, (High Cu). Comminution tests were developed on PGS samples.

Comminution

The tests carried out were abrasion, Ai, and Bond work index, BWi. The results of the comminution tests showed that the material from the period 2023-2026 has abrasiveness between 0.01 and 0.18.

The abrasiveness depends on the lithology: the sandstone material at the top is more abrasive, because it is mainly made up of quartz, and this material is more abrasive at fine-grained sizes (lower SiO_2 content). The rest of the deposit depends on the content of SiO_2 (silicates) and the content of LOI – material with high carbonate content.

Mineralogy

From the mineralogical characterization tests of the composites prepared at 210 µm, the following was observed:

- Primary sulphides are sphalerite, galena, and chalcopyrite.

- Pb is only found as galena in all composites.
- PGC-01 has 56% carbonates and 28% sulfides and sulfates.
- PGC-02 is 39% silicates and 40% sulfides and sulfates.
- Associations with higher percentages:
  - Release of "Free" galena more than 75% (PGC-02) and 45% (PGC-01).
  - Release of "Free" type sphalerite more than 60% (PGC-02) and 53% (PGC-01).
- Modal mineralogy presents 2% fluorite in PGC-01.

Risks Identified

From the geometallurgical analysis, the following risks were identified:

- Tonnage to plant and steel consumption.
- Areas of high hardness ore, associated with high silicate content, mainly on VCN3 and V5 bodies.
- The Sara body with sandstone lithology has the highest abrasiveness of the deposit.
- Recovery of valuable minerals including lower Zn recovery in RL<36000
- Concentrate quality
  - Presence of Bi in the bulk concentrate of composite PGC-01
  - Presence of Sn in the Zn concentrate of composite PGC-01

Recommended Geometallurgical Model for Pb and Zn Recovery

Recommended geometallurgical flotation models for mine planning and production prediction were developed. Table 10-1 presents the values or algorithms for the final Pb recovery to the Pb concentrate and the final Pb concentrate grade for the domains presented.

Table 10-1: Algorithms for Pb Recovery in Pb Concentrate and Pb Concentrate Grade

Domain	Current	Algorithm	Final Pb Recovery In Pb Concentrate
ID	ID	Head	CC Pb_ Rec Pb %
CC Pb_Rec Pb	Feed	All	Min(77+9.6*Ln(HA_Pb%); 88.8)
CC Pb_Grade Pb	Feed	All	Min(50+9.13*Ln(HA_Pb%); 88.8)

Table 10-2 presents the values or algorithms for the final Zn recovery to the Zn concentrate and the final Zn concentrate grade for the domains presented.

Table 10-2: Algorithms for Zn Recovery in Zn Concentrate and Zn Concentrate Grade

Domain	Current	Algorithm	Final Zn Recovery In Zn Concentrate
ID	ID	Head	%

CC Zn_Rec Zn %_01	Feed	Orebody = Exito & RL>36,000	72
CC Zn_Rec Zn %_02	Feed	Orebody = Exito & RL<36,000	87
CC Zn_Rec Zn %_03	Feed	Remainder	91.2+3.78*Ln(HA_Zn/HA_Fe)
CC Zn_Grade Zn %_01	Feed	All	47.99+2.7*Ln(HA_Zn/HA_Fe)

Transmin recommended that the geological data be validated by the Nexa geologists, this could create opportunities to refine and obtain more robust geometallurgical models.

Conclusions

The objective of the phase 6 work was to evaluate the behaviour of the input material for the years 2023 to 2026, as well as to validate the geometallurgical models of comminution and flotation of Unidad Minera El Porvenir (UMEP) material, expanding the dataset with samples of bodies and rock types not evaluated in the previous phases.

From comminution tests, the following was observed:

- Abrasion index tests reported values between 0.003 g and 0.14 g.
- The sandstone domain has a relationship between abrasiveness and SiO_2 content. The higher the SiO_2 content, the greater the abrasiveness.
- The BWi tests reported values between 5.7 kWh/t to 23.1 kWh/t; the results of this phase are consistent and validate the geometallurgical model, the higher values correspond to higher SiO_2 content.

From the results obtained from the composites it was concluded that:

- The recovery of Pb varies according to the content of Pb in the feed.
- Ag recovery is related to the Cu/Pb ratio. The higher the Pb content, the higher the Ag content in the feed.
- The recovery of Zn varies according to the ratio of Zn/Fe in the feed for all ore types except Success. Zn recovery in the Success material is proportional to Zn grade.
- Risk zones for Pb and Zn recoveries were identified Veda Éxito.

From the geometallurgical analysis, the following risks were identified:

- Tonnage to plant and steel consumption
- The upper area, with sandstone lithology has the greatest abrasiveness of the deposit.
- Areas of high-hardness ore in the rest of the deposit are associated with a high silicate content.
- Recovery of valuable minerals:
  - The intermediate and lower zones of Success present a risk of low Pb and Zn recovery.
  - Low Zn recovery in Success Zones
- Concentrate quality:

- o Presence of Bi in the bulk concentrate of the composite PGC-01
- o Presence of Sn in the Zn concentrate of the composite PGC-01

10.1.2 Operational Performance

Production figures for 2018 through 2023 including head grades and recoveries of metals to concentrates are presented in Table 10-3. The El Porvenir concentrator processed 2,220,011 tonnes of ore in 2023 with Cu, Pb, and Zn grades of 0.16%, 1.37%, and 2.86% respectively. Recoveries to their respective concentrates were 10.1% Cu, 82.1% Pb and 88.0% Zn.

The head grades of Zn, Cu, Au, and Ag have been consistent over the period, while Pb has increased from 0.98% to 1.37%. Pb, Ag, and Au recoveries have increased and the recovery of Ag and Au to the Pb concentrate has increased over the period. Cu grades and recoveries have decreased significantly over the period.

Production in 2020 was significantly lower than in 2019 because of the COVID-19 pandemic and associated production interruptions. During that period, mining activities were limited to critical operations with a minimum workforce to ensure appropriate maintenance, safety, and security. On May 6, 2020, the Peruvian Government announced the conditions for the resumption of operations for different sectors, including mining operations above 5,000 tpd. As a result, El Porvenir operations, which were suspended on March 18, 2020, restarted production on May 11, 2020, following the end of the quarantine period. After the resumption of operations, El Porvenir ramped up production to pre-pandemic levels by June 2020.

Table 10-3: Concentrator Operational Performance 2018 - 2023

	Item	Units	2018	2019	2020	2021	2022	2023
Ore Processed		tonnes	2,149,927	2,120,765	1,502,618	2,077,591	2,111,961	2,220,011
Mill Head Grade	Ag	g/t	59.70	64.60	62.30	65.31	76.5	72.8
	Au	g/t	0.01	0.01	0.01	0.01	0.01	0.01
	Cu	%	0.15	0.15	0.17	0.19	0.16	0.16
	Pb	%	0.98	1.01	0.93	1.08	1.34	1.37
	Zn	%	3.04	2.93	2.65	2.83	2.80	2.86
Cu Concentrate		tonnes	2,701	2,185	1,711	2,599	1,580	1,989
	Cu Grade	%	21.00	21.30	19.50	19.43	16.81	17.83
	Cu Recovery	%	18.00	14.70	12.70	12.92	7.85	10.06
	Ag Grade	oz/t	55.40	81.30	89.90	81.02	91.08	69.22
	Ag Recovery (to Cu)	%	3.70	4.10	5.10	4.82	2.77	2.65
	Au Grade	oz/t	0.68	0.87		0.64	0.49	0.29
	Au Recovery (to Cu)	%	5.80	5.00		7.08	3.10	2.43
Pb Concentrate		tonnes	31,662	33,018	21,213	34,691	45,907	48,599
	Pb Grade	%	52.60	51.20	51.20	51.02	50.53	51.31
	Pb recovery	%	79.10	79.00	77.80	78.72	81.75	82.10

	Item	Units	2018	2019	2020	2021	2022	2023
	Ag Grade	oz/t	75.30	78.40	80.70	75.37	74.55	70.89
	Ag Recovery (to Pb)	%	57.80	58.80	56.90	59.91	65.80	66.20
	Au Grade	oz/t	0.25	0.24		0.20	0.18	0.17
	Au Recovery (to Pb)	%	24.70	25.50		30.01	34.02	34.28
Zn Concentrate		tonnes	115,256	109,976	69,891	103,994	104,507	111,566
	Zn Grade	%	50.20	49.70	49.90	49.40	49.34	50.04
	Zn Recovery	%	88.70	88.20	87.70	87.27	87.27	88.01

Table 10-4, Figure 10-3, and Figure 10-4 present the grade and recovery statistics for Au, Ag, Cu, Pb, and Zn using daily results for 2022 and 2023. The box and whisker plots show the grade and recovery ranges including the minimum (bottom horizontal line), 25th percentile (bottom of box), 50th percentile or mean (line in middle of box), 75th percentile (top of the box) and the maximum (top horizontal line) of each metal along with outliers. The following table provides a summary of the data. The average grades of Zn, Pb, and Cu for the period were 2.83%, 1.36% and 0.16% respectively and the recoveries of Zn, Pb, and Cu for the period were 87.49%, 81.65%, and 8.67% respectively.

Table 10-4: Summary of Daily Grade and Recovery Results for 2022 – 2023

	Head Grade					Metal Recovery				
	Zn (%)	Pb (%)	Cu (%)	Ag (oz/t)	Au (oz/t)	Zn (%)	Pb (%)	Cu (%)	Ag (%)	Au (%)
2022 – 2023										
Average	2.83	1.36	0.16	2.41	0.01	87.49	81.65	8.67	81.10	36.80
Maximum	4.60	2.52	0.25	3.90	0.02	91.17	85.39	31.26	86.28	49.56
Minimum	1.46	0.82	0.09	1.50	0.01	83.72	73.32	0.0	73.15	22.87
Median	2.79	1.35	0.16	2.37	0.01	87.58	81.83	8.70	81.42	37.02
2022										
Average	2.81	1.35	0.16	2.47	0.01	87.21	81.63	7.70	80.56	37.28
Maximum	4.05	1.96	0.25	3.85	0.02	90.43	85.39	23.38	86.28	49.56
Minimum	1.46	0.82	0.09	1.72	0.01	83.72	74.80	0.0	73.15	22.87
Median	2.77	1.35	0.16	2.43	0.01	87.35	81.74	7.64	80.89	37.72
2023										
Average	2.85	1.37	0.16	2.35	0.01	87.77	81.66	9.65	81.61	36.33
Maximum	4.60	2.52	0.25	3.90	0.02	91.17	85.39	31.26	86.28	49.56
Minimum	1.46	0.82	0.09	1.50	0.01	83.72	73.32	0.0	73.15	22.87
Median	2.82	1.36	0.16	2.31	0.01	87.82	81.89	9.72	81.72	36.74

Figure 10-3: El Porvenir Head Grade Statistics for 2022 – 2023

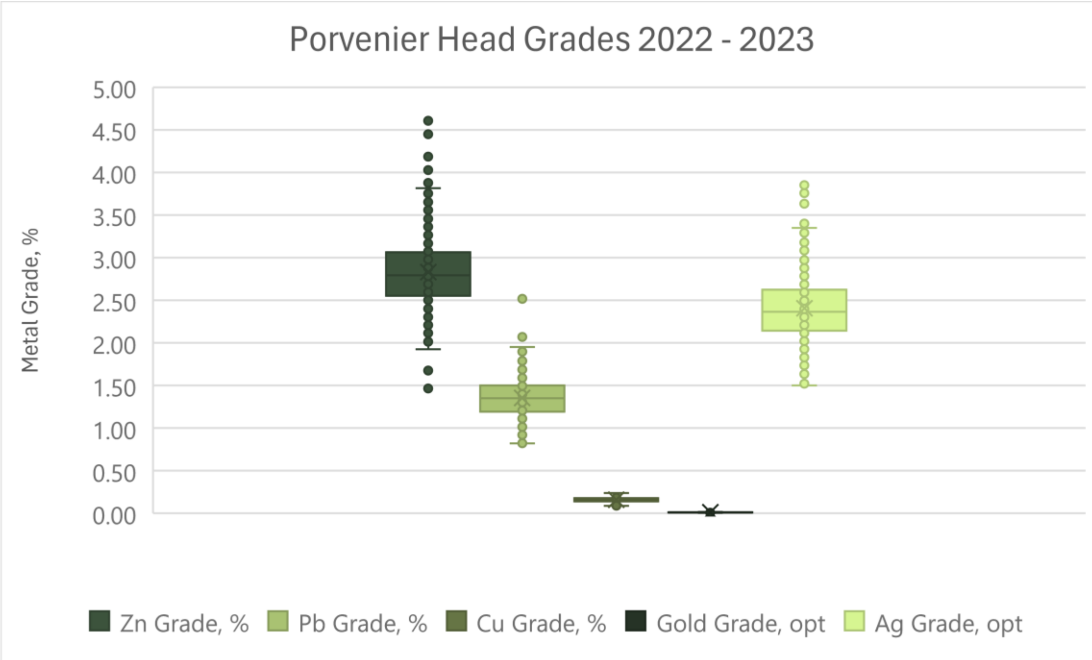
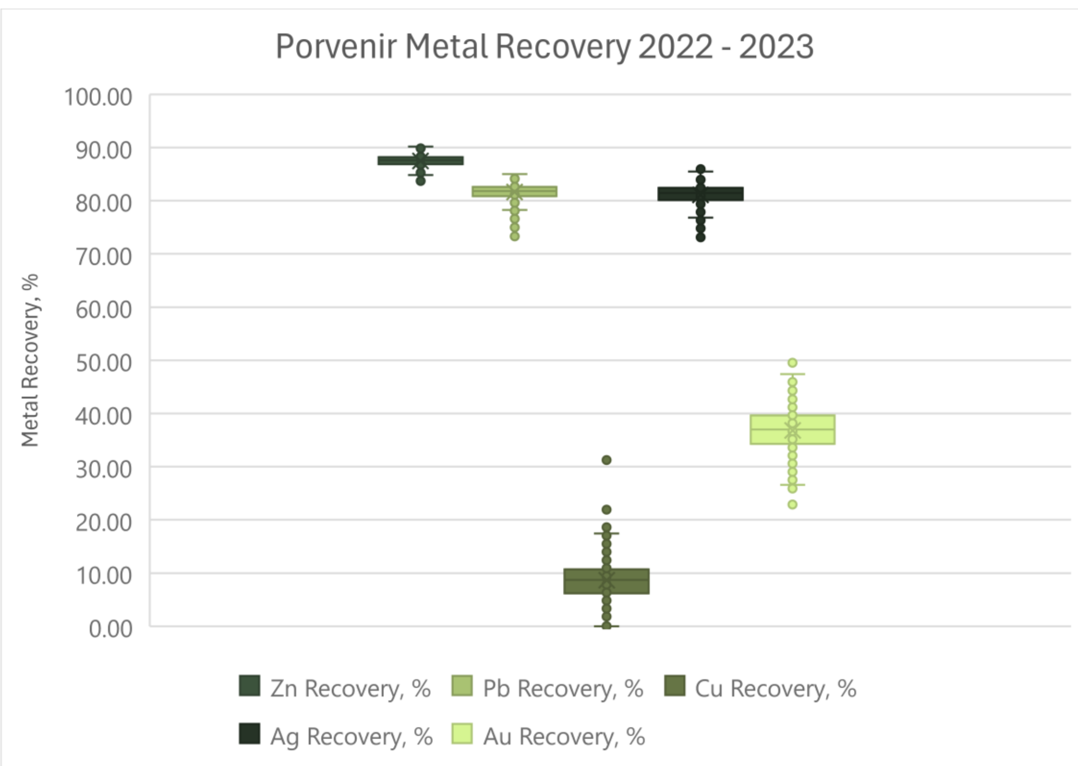


Figure 10-4: El Porvenir Recovery Statistics for 2022 – 2023



Historical annual recoveries at El Porvenir for 2003 – 2023 are presented in Figure 10-5 through Figure 10-10, which show zinc, lead, and copper head grades and recoveries to concentrate.

Figure 10-5: Zinc Head Grade from 2003 - 2023

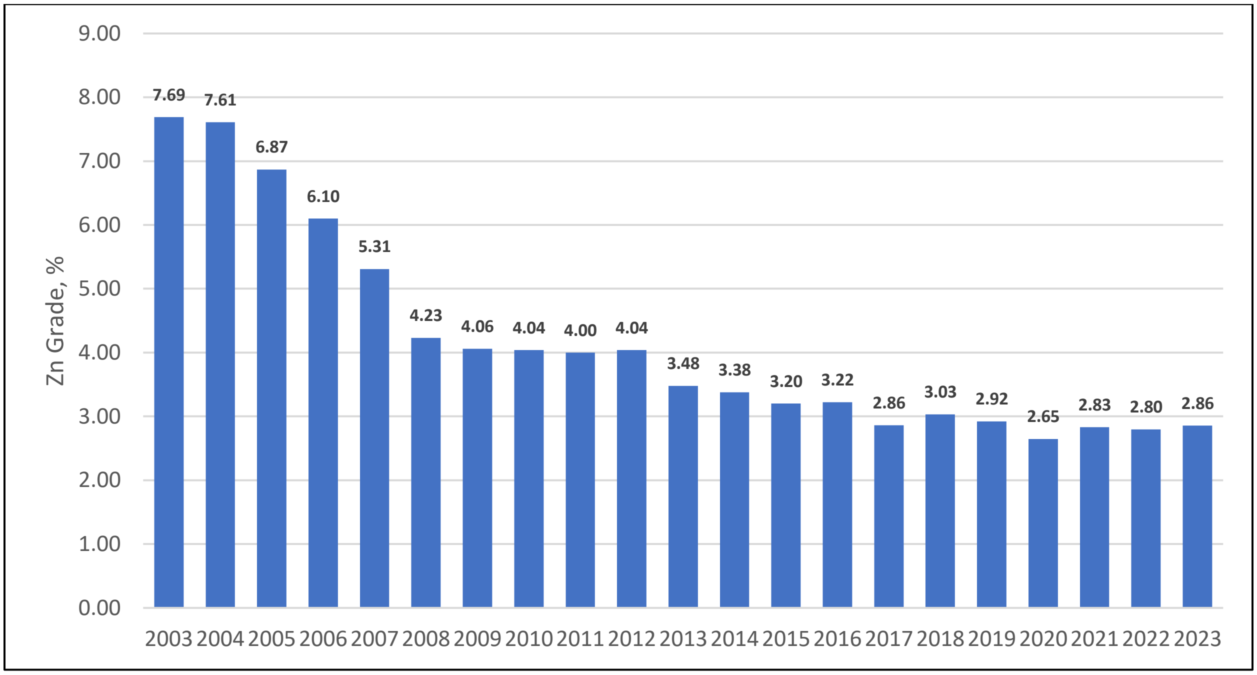


Figure 10-6: Zinc Recovery from 2003 - 2023

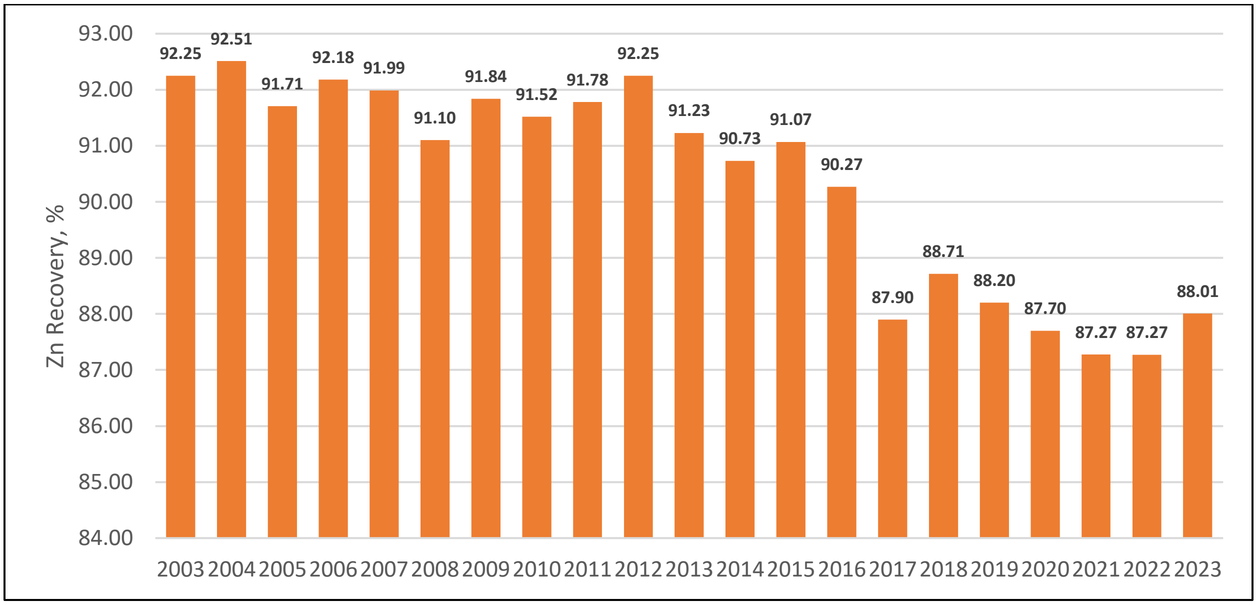


Figure 10-7: Lead Head Grade from 2003 - 2023

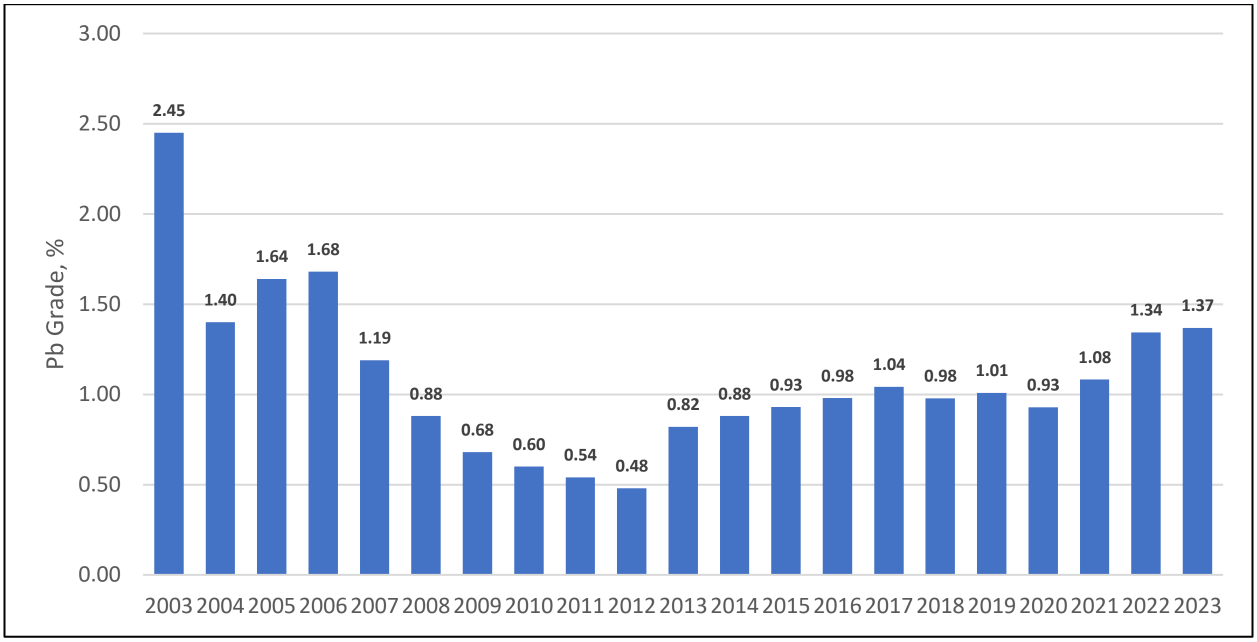


Figure 10-8: Lead Recovery from 2003 - 2023

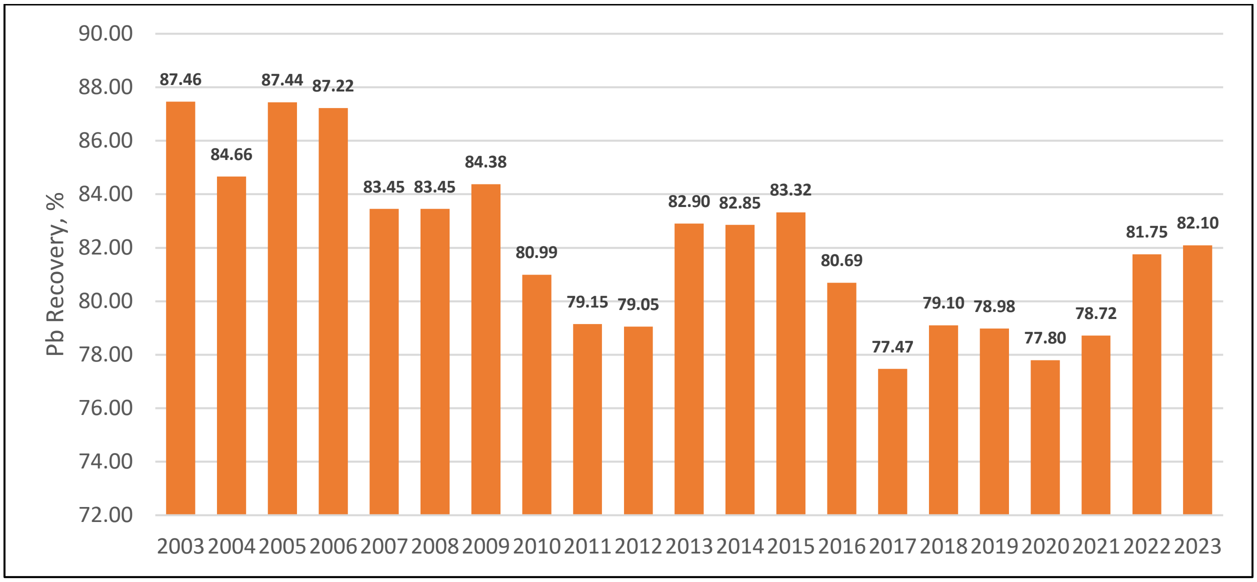


Figure 10-9: Copper Head Grade from 2003 - 2023

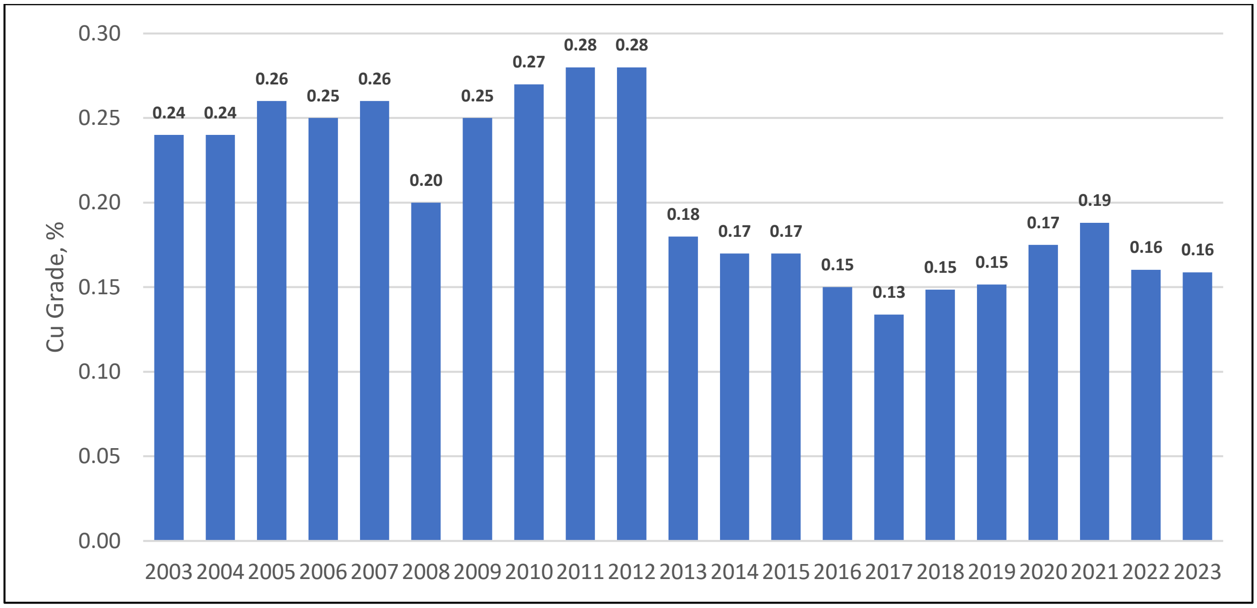
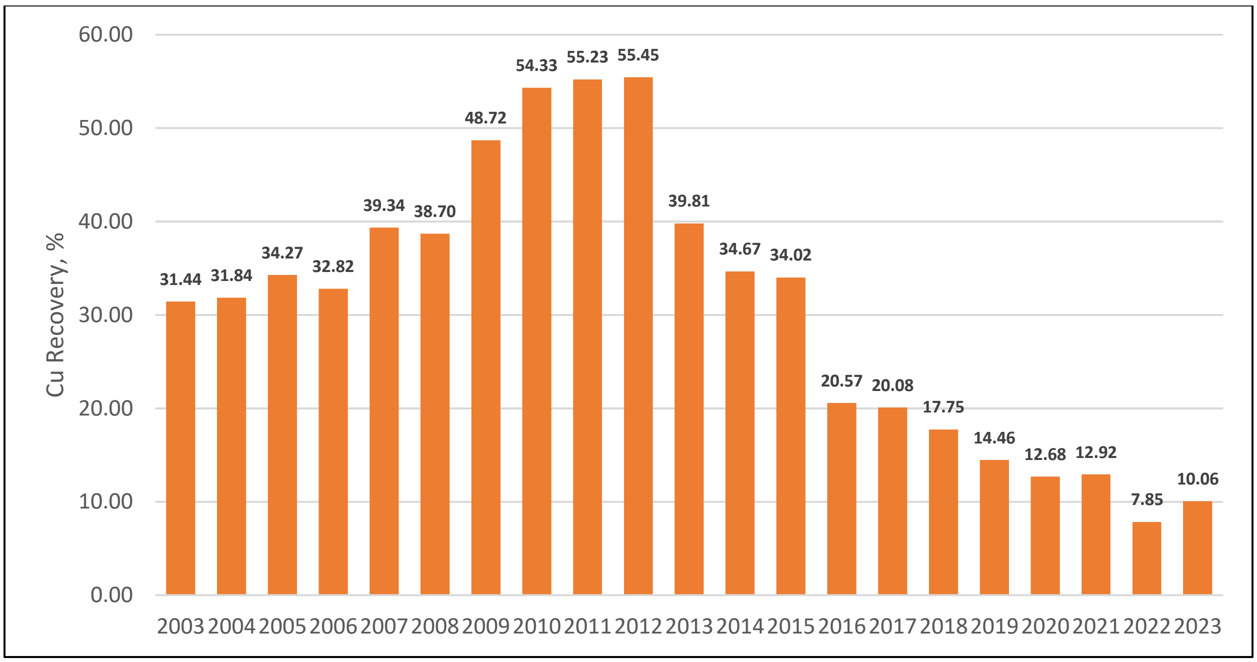


Figure 10-10: Copper Recovery from 2003 - 2023



10.1.3 Deleterious Elements

The potential penalty elements that should be monitored in the copper concentrate include arsenic, antimony, bismuth, cadmium, and combined lead plus zinc.

The potential penalty elements in the lead concentrate are low lead concentrate grade bismuth and fluorine.

The potential penalty elements in the zinc concentrate are copper and manganese.

10.1.4 QP Opinion

In the SLR QP's opinion, the metallurgical recovery data is adequate for the purposes of Mineral Resource and Mineral Reserve estimation.

10.2 Atacocha

10.2.1 Geometallurgical Test Work

Nexa has developed geometallurgical models for the Atacocha underground and San Gerardo open pit mines. In 2017, fifteen samples from Atacocha (nine from the open pit and six from the underground mine) were submitted for metallurgical testing. The samples were intended to be representative of the planned 2018 concentrator feed.

Test work included mineralogy, hardness testing (Bond ball mill work index and abrasion index), and flotation testing (variability tests, locked cycle tests, and grind size evaluation).

The geometallurgical sample selection and test work were performed with the assistance of Transmin, and results and interpretation are reported by Transmin in the following reports:

- Estudio Geometalurgico Preliminar para Unidad Minera Atacocha, 13 June 2018
- Estudio Geometalúrgico Fase 2 para Unidad Minera Atacocha, April 29, 2019 (Transmin, 2019)
- Estudio Geometalúrgico Fase 3 para Unidad Minera Atacocha, May 18, 2020 (Transmin, 2020)
- Estudio Geometalúrgico Fase 4 para Unidad Minera Atacocha, June 17, 2021 (Transmin, 2021)

10.2.1.1 Phase 1 Results

Initially, 30 samples of drill core were selected to represent ore to be processed by the concentrator in 2018 (six from the underground and 24 from the open pit), however, ultimately only 15 of these samples were selected for test work (five from the underground ore and 10 from the open pit ore). Priority was given to selecting samples from holes drilled in 2016 and 2017, to use the freshest possible material for metallurgical test work. Samples of the underground orebodies were selected to represent key parameters, including orebody, lithology, and grades of Pb, Cu, Zn, Ag, and Mn. Samples from the open pit were selected based on grades of Pb, Cu, Zn, Ag, and Mn; lithology and domain were not available for use in the sample selection for the open pit. Sample selection was also limited to areas in the block model with values of NSR ≥ $47.79/t (underground) or NSR ≥ $22.00/t (open pit) (Transmin, 2018). A summary of the samples selected for metallurgical test work is presented in Table 10-5.

Table 10-5: Atacocha Samples Selected for Metallurgical Test Work

Sample	Orebody	Lithology	Location	Program
AAS-07	Orebody 10	intrusive	Open Pit	Comminution
AAS-07-01	Orebody 10	intrusive	Open Pit	Flotation / comminution
AAS-09-01	Orebody 10	intrusive	Open Pit	Flotation / comminution

Sample	Orebody	Lithology	Location	Program
AAS-10-01	Orebody 10	intrusive	Open Pit	Flotation / comminution
AAS-24-01	Vein L	intrusive	Open Pit	-
AAS-27	Vein LA27	intrusive	Open Pit	Flotation / comminution
AAS-28	Vein LA27	intrusive	Open Pit	Flotation / comminution
AAS-29	Vein LA27	limestone	Open Pit	Flotation / comminution
AAS-30	Vein LA27	intrusive	Open Pit	Flotation / comminution
AAS-30-01	Orebody 10	intrusive	Open Pit	Flotation / comminution
AAS-05	Anita Orebody	skarn	Underground	Flotation / comminution
AAS-31	Orebody 23	marble	Underground	Flotation
AAS-33	Orebody 23	mineralization	Underground	Flotation
AAS-34	Orebody 18	mineralization	Underground	Flotation
AAS-36	Anita Orebody	mineralization	Underground	Flotation

Source: Transmin, 2018

Sample AAS-24-01 was not submitted for test work as it was found to have very low grades of Pb, Cu, Zn, and Ag. Chemical analysis of the samples is shown in Table 10-6.

Table 10-6: Analysis of Samples Selected for Metallurgical Test Work

Sample	Orebody	Lithology	Zone	Au g/t	Ag g/t	As %	Bi ppm	Cu %	Fe %	Mn %	Pb %	Zn %
AAS-07	Orebody 10	intrusive	OP	0.18	6.00	0.064	<5	0.0056	4.36	0.24	0.19	0.40
AAS-07-01	Orebody 10	intrusive	OP	0.26	8.10	0.071	<5	0.0055	4.73	0.15	0.14	0.11
AAS-09-01	Orebody 10	intrusive	OP	1.99	38.2	0.12	10.0	0.041	4.12	0.23	0.94	1.64
AAS-10-01	Orebody 10	intrusive	OP	0.65	60.2	0.17	28.0	0.061	4.89	0.16	1.54	1.29
AAS-24-01	Vein L	intrusive	OP	<0,005	1.00	0.0005	<5	0.00093	0.44	0.017	0.0013	0.0044
AAS-27	Vein LA27	intrusive	OP	0.14	39.3	0.065	16.0	0.035	4.24	0.48	1.81	1.18
AAS-28	Vein LA27	intrusive	OP	0.64	61.3	0.20	<5	0.029	4.88	0.22	3.11	1.21
AAS-29	Vein LA27	limestone	OP	0.046	30.2	0.039	<5	0.0074	1.75	0.56	1.52	1.90
AAS-30	Vein LA27	intrusive	OP	0.15	41.0	0.058	13.0	0.032	4.36	0.48	1.89	1.21
AAS-30-01	Orebody 10	intrusive	OP	0.44	80.0	0.13	<5	0.047	5.39	0.22	3.96	1.70
AAS-05	Anita Orebody	skarn	UG	0.098	16.6	0.022	<5	0.18	17.2	0.17	0.35	0.94
AAS-31	Orebody 23	marble	UG	0.34	173	0.081	1,126	0.47	6.70	0.31	1.58	8.37
AAS-33	Orebody 23	mineralization	UG	0.60	89.6	0.59	1,492	0.36	19.0	1.31	0.51	6.72
AAS-34	Orebody 18	mineralization	UG	0.17	63.6	0.14	488	0.46	18.1	1.41	0.39	8.26
AAS-36	SB Orebody	mineralization	UG	0.22	6.40	0.0059	7.00	0.47	16.0	0.19	0.0039	10.1

Source: Transmin, 2018

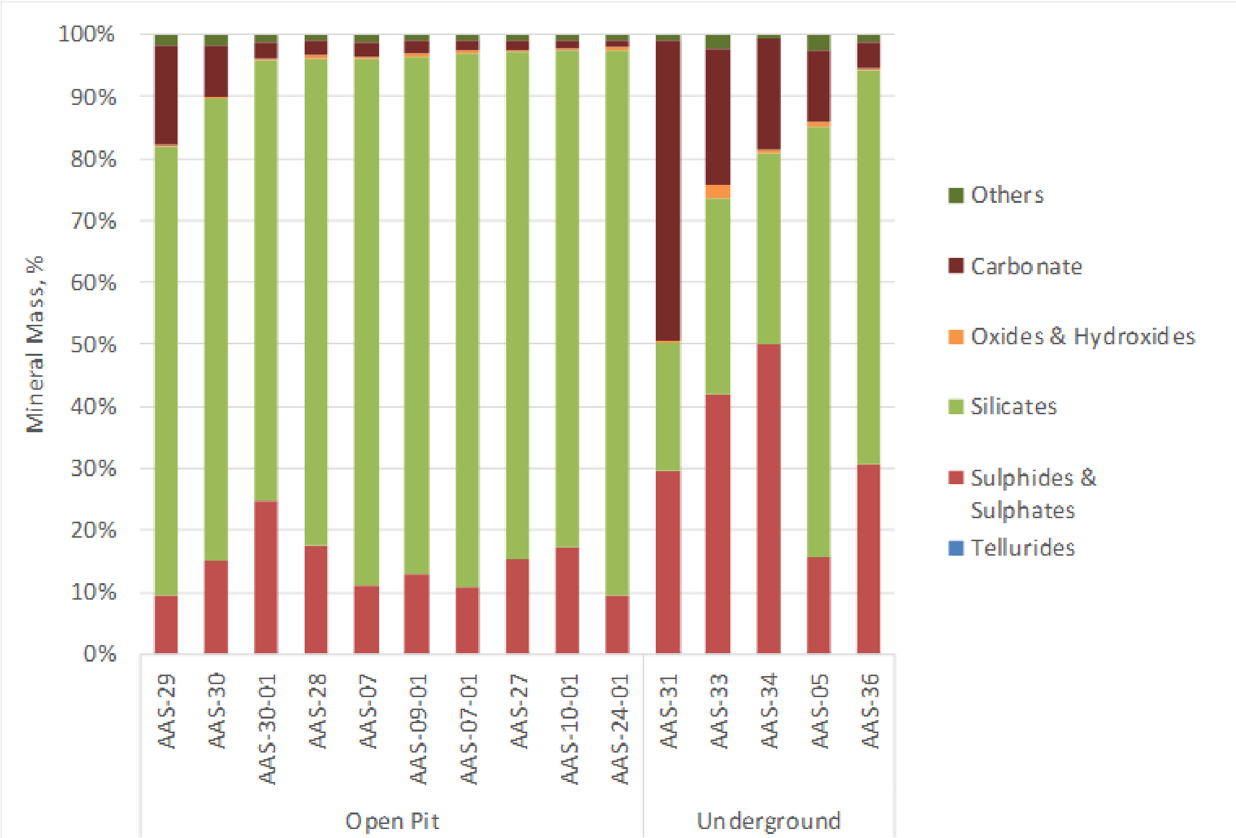
Mineralogy

Mineralogical analysis of the samples is presented in Figure 10-11 and Figure 10-12. In the open pit samples, silicates make up the majority of the samples, ranging from 71% to 88%, whereas the underground samples typically contain lower amounts of silicates – the samples ranged from 20% to 70% silicates. A major component of the underground samples is carbonates, whereas carbonates are a minor component of the open pit samples. Open pit samples are notable for the presence of sphalerite containing Mn, arsenic containing Pb sulphides, and the lack of chalcopyrite. The mineralogical characterization is summarized in Table 10-7.

Table 10-7: Mineralogical Characterization Summary

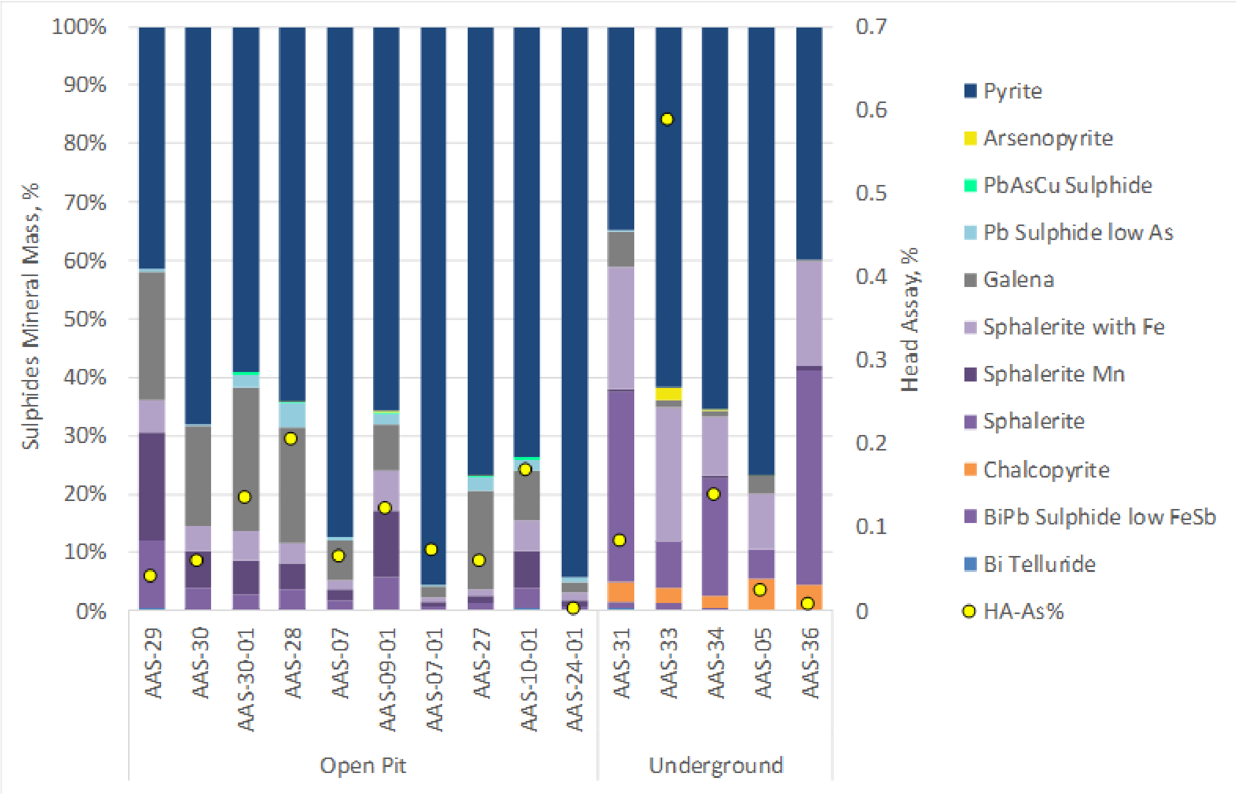
Zone	Sample	Orebody	Tellurides %	Sulphides & Sulphates %	Silicates%	Oxides & Hydroxides %	Carbonate %	Others %
OP	AAS-29	Vein LA27	0.04	9.5	72.3	0.22	16.1	1.75
	AAS-30	Vein LA27	0.020	15.1	74.5	0.35	8.3	1.71
	AAS-30-01	Orebody 10	0.04	24.6	71.1	0.36	2.7	1.08
	AAS-28	Vein LA27	0.04	17.5	78.4	0.40	2.50	0.95
	AAS-07	Orebody 10	0.015	11.1	84.7	0.32	2.30	1.19
	AAS-09-01	Orebody 10	0.03	13.0	83.3	0.36	2.1	1.01
	AAS-07-01	Orebody 10	0.00	10.7	85.6	0.312	1.6	1.05
	AAS-27	Vein LA27	0.03	15.2	81.8	0.36	1.4	1.01
	AAS-10-01	Orebody 10	0.07	17.1	80.1	0.46	1.18	0.96
	AAS-24-01	Vein L	0,000	9.5	88.0	0.50	1.0	1.00
UG	AAS-31	Orebody 23	0.149	29.3	20.5	0.25	48.61	0.85
	AAS-33	Orebody 23	0.109	41.82	31.7	2.15	21.9	2.19
	AAS-34	Orebody 18	0.12	49.7	31.1	0.44	18.0	0.61
	AAS-05	Anita Orebody	0.03	15.6	69.6	0.66	11.66	2.42
	AAS-36	SB Orebody	0.08	30.5	63.7	0.19	4.2	1.31

Figure 10-11: Bulk Mineralogical Analysis



Source: Transmin, 2018

Figure 10-12: Sulphide Mineral Breakdown



Source: Transmin, 2018

Comminution

Comminution test results are shown in Table 10-8. The open pit ore is moderate to hard in terms of grindability, with low abrasiveness. Only one sample of underground ore was tested, and therefore no conclusions can be drawn about the general comminution characteristics of the underground ore.

Table 10-8: Comminution Test Work Results

Sample	Orebody	Lithology	Zone	Ai g	BWi kWh/t
AAS-05	Anita Orebody	Skarn	UG	0.24	8.10
AAS-07	Orebody 10	Intrusive	OP	0.24	18.1
AAS-07-01	Orebody 10	Intrusive	OP	0.12	15.0
AAS-09-01	Orebody 10	Intrusive	OP	0.36	16.1
AAS-10-01	Orebody 10	Intrusive	OP	0.13	13.1
AAS-27	Vein LA27	Intrusive	OP	0.10	12.9
AAS-30	Vein LA27	Intrusive	OP	0.093	12.2
AAS-28	Vein LA27	Intrusive	OP	0.22	14.1

Sample	Orebody	Lithology	Zone	Ai g	BWi kWh/t
AAS-30-01	Orebody 10	Intrusive	OP	0.098	12.0

Source: Transmin, 2018

Locked Cycle Flotation Test Results

Five composite samples were produced for use in grind optimization and locked cycle flotation tests. Compositions of the composites are provided in Table 10-9.

Table 10-9: Analysis of Composite Samples

Composite	Zone	Au g/t	Ag g/t	Cu %	Fe %	Mn %	Pb %	Zn %
AAC-01	UG	0.54	342	1.05	19.3	0.48	10.1	16.8
AAC-02	UG + OP	0.87	355	0.36	13.8	2.62	9.48	12.4
AAC-03	OP	0.83	228	0.22	4.62	0.98	8.57	12.6
AAC-04	Plant Oct 17	0.49	39	0.13	9.25	0.88	0.95	1.49
AAC-05	OP + UG	0.48	36.4	0.07	6.8	0.31	1.43	1.29

Source: Transmin, 2018

Bulk rougher flotation was completed at three grind sizes on AAC-01, AAC-02, and AAC-03 at P_{80} of 100 µm, 150 µm, and 200 µm. The tests indicated little sensitivity in terms of recovery to grind size in the range tested.

AAC-05 was used in locked cycle flotation testing, with six cycles completed. The primary grind size used was 48% passing 74 µm. Pb and Zn concentrates were produced with grades of 61.1% Pb and 53.3% Zn respectively. Final Pb and Zn recoveries to the Pb and Zn concentrates were 84.1% and 85.9% respectively. Penalty elements As and Mn exceeded their respective limits: As in the Pb concentrate exceeded 8,000 ppm at 8,114 ppm, and Mn in the Zn concentrate exceeded the limit (0.5%) at 0.68%.

Flotation Variability Tests

Rougher flotation variability tests were completed on 13 of the 15 variability samples, consisting of bulk and Zn rougher flotation. Flotation conditions were varied based on Pb and Zn grades of the samples, resulting in four different flotation schemes being used during the variability tests.

The effect of the four different flotation schemes on the results is unknown, and therefore, while some general conclusions can be drawn, a comparison of individual results should be treated with care.

Lead recovery to the bulk concentrate averaged 91% for open pit ore and 83% for underground ore (excluding the low lead content samples). Zn recovery to the Zn rougher concentrate averaged 59% for open pit ore and 87% for the underground ore.

With the open pit samples, average Zn recovery to the bulk concentrate was significantly higher than for the underground samples (37% versus 5% respectively), even though the Zn head grades of the underground samples were far higher than those of the open pit samples. This would put more pressure on the bulk cleaning circuit to separate Zn from Pb and Cu.

Recovery Versus Head Grade

Test work results from the samples were used to derive recovery-versus-head-grade relationships for Pb, Zn, Cu, Mn, and As. Significantly more samples would be required to derive recovery relationships that could be used for long term planning.

As a result of the changes in recoveries brought about by the introduction of San Gerardo ore, recovery curves for Pb and Zn were derived by Transmin to predict future recoveries from the Atacocha concentrator, while copper recoveries have been assumed to average approximately 5.5%. The recovery curves are shown in Table 10-10 and illustrated in Figure 10-13 to Figure 10-15, plotted against monthly recoveries achieved in 2017 and 2018 over the range of head grades realized at the concentrator. The results of the models are similar but slightly higher than 2023 results.

Table 10-10: Recovery Curves for the Atacocha Concentrator

	Recovery Curve	Recovery Cap
		(%)
Zn Recovery	Recovery = $- 7.456 (Grade_{Zn})^2 + 27.45 (Grade_{Zn}) + 54.21$	79.5
Pb Recovery	Recovery = $- 7.47 (Grade_{Pb}) + 77.08$	89.0
Cu Recovery	5.52	5.52

Figure 10-13: Monthly Zinc Recovery in 2017 and 2018, and the 2019 NSR Recovery Curve

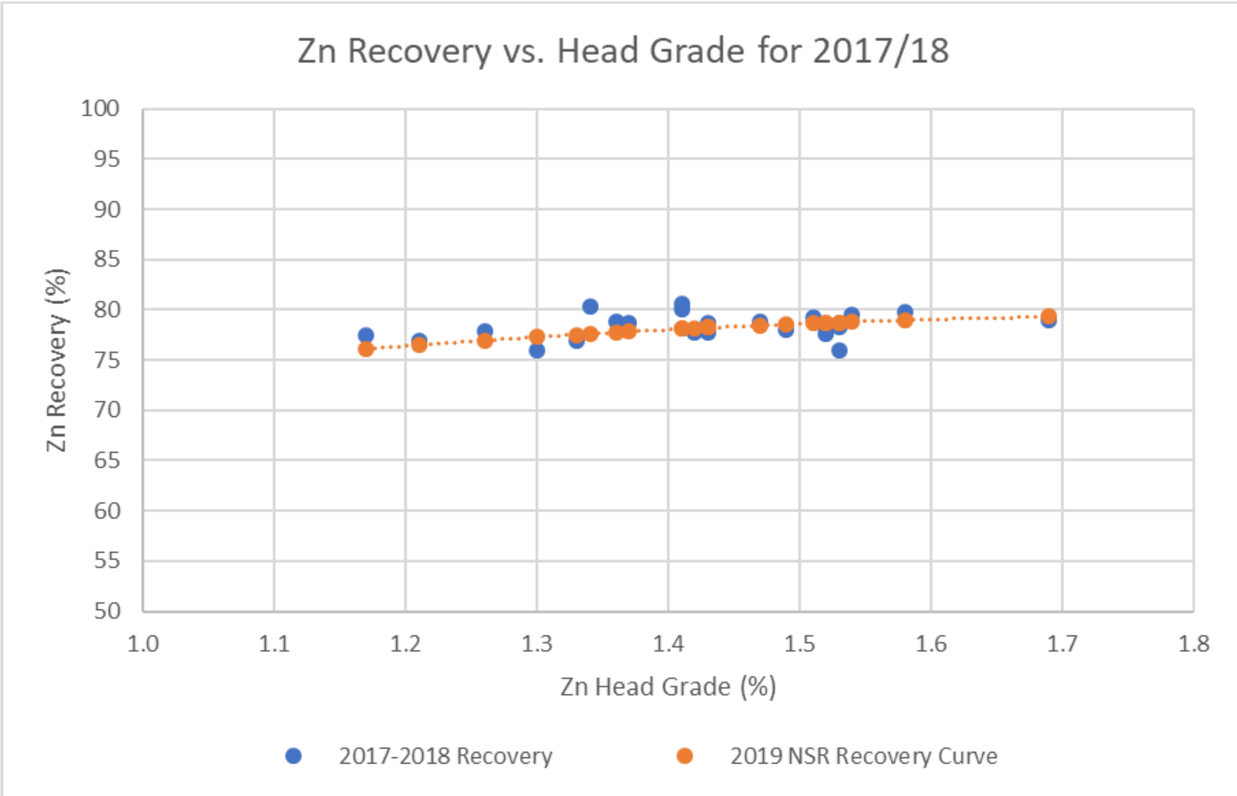


Figure 10-14: Monthly Lead Recovery in 2017 and 2018, and the 2019 NSR Recovery Curve

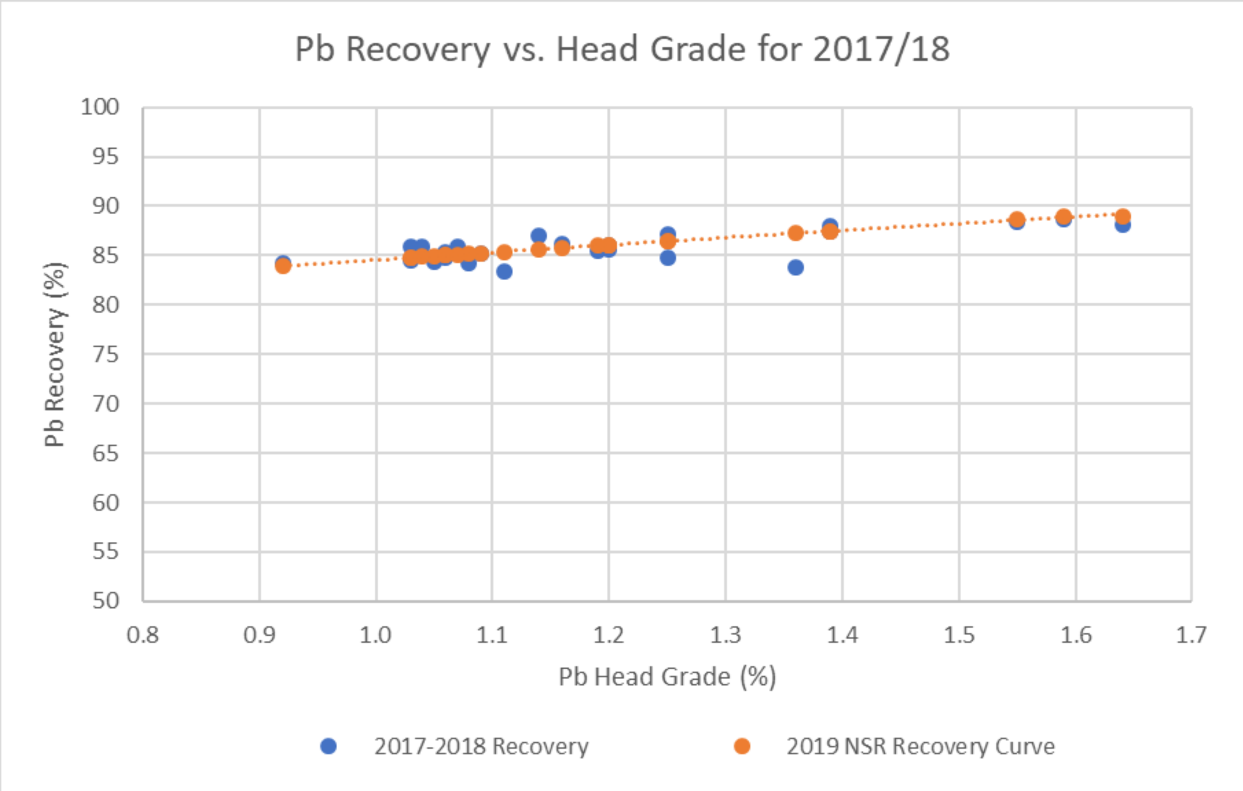
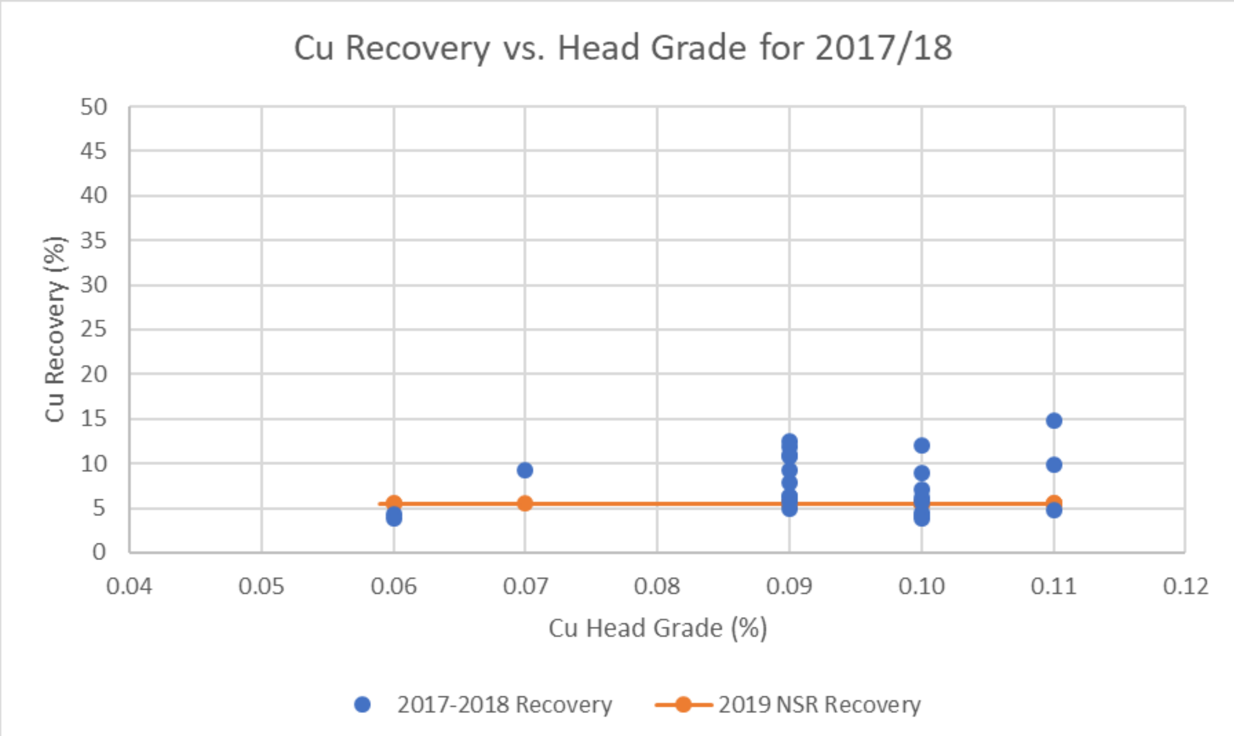


Figure 10-15: Monthly Copper Recovery in 2017 and 2018, and the 2019 NSR Recovery



10.2.1.2 Phase 4 Results

The phase 4 metallurgical testing program was carried out in 2021 to characterize the geometallurgical behaviour of the San Gerardo ore according to the 2022-2023 mining plan.

The objective of the geometallurgical program was to:

- Maximize the operational value of the mining unit.
- Reduce risk concerning:
  - Throughput of the plant.
  - Consumption of grinding media.
  - Recoveries of valuable minerals.
  - Quality of the final concentrate.
- Identification of fatal failures.
- Look for flaws in the interpretation of available information.
- Validation and definition of geometallurgical domains.
- Find opportunities for improvement and reduce existing risks.

Prior to the phase 4 study, three phases of geometallurgical studies were carried out, increasing the available geometallurgical data progressively to reduce the risk in metallurgical predictions.

Previously identified risks included the presence of high hardness and abrasiveness material in intrusive material and hydrothermal breccias, as well as areas of low Au recovery associated with Au disseminations in pyrite in mainly marble-type material.

A total of 24 samples were selected for use in comminution tests and 24 samples for flotation tests in the phase 4 work, considering the relevant geological and geochemical parameters according to the available information.

From the individual samples, four flotation composites were formed, in coordination with the unit's geology area:

- The composite AEC-01, corresponding to intrusive and silicification.
- The AEC-02 composite, corresponding to intrusive and other alterations.
- The composite AEC-03, corresponding to sandstones and silicification.
- The AEC-04 composite, corresponding to calcites and marble.

In addition, comminution tests were developed on Atacocha samples. The tests carried out were Ai and BWi.

The results of the comminution tests for the deposit show:

- Abrasion index tests reported values between 0.02 g and 0.71 g. The abrasiveness of the ore depends on the mineralized body, with the Chen1, CPO1, CPO16, and CPO18 bodies having greater abrasiveness.
- BWi tests reported values between 11kWh/t to 22kWh/t. The hardness of the mineral depends on the type of rock, with the highest hardness being DACT, CALC, BRT, and PFQF lithologies.

From the mineralogical characterization tests of the composites, the following was observed:

- The composite AEC-04 was 45% carbonates, mainly calcite, and 48% silicates.
- In the composites the main sulphides are pyrite, galena, and sphalerite.
- Presence of muscovite and silicon and aluminum clays in all four composites.
- All composites have a liberation of 80% galena and 87% sphalerite at a P_{80} of 180 µm.

Recommended geometallurgical flotation models for mine planning and production prediction were developed. Table 10-11 presents the values or algorithms for the final Pb recovery to the Pb concentrate and the final Pb concentrate grade for the domains presented.

Table 10-11: Algorithms for Pb Recovery in Pb Concentrate and Pb Concentrate Grade

Domain	Current	Algorithm	Final Pb Recovery In Pb Concentrate
Pb_Rec Pb	Feed	Mine – AT OP	Min(88+12.14*Ln(HA_Pb%); 87.8)
Pb_Grade Pb	Feed	Mine – AT OP	Min(53.6+4.94*Ln(HA_Pb%); 54)

Table 10-12 presents the values or algorithms for the final Zn recovery to the Zn concentrate and the final Zn concentrate grade for the domains presented.

Table 10-12: Algorithms for Zn Recovery in Zn Concentrate and Zn Concentrate Grade

Domain	Current	Algorithm	Final Zn Recovery In Zn Concentrate
Zn_Rec Zn %	Feed	Mine – AT OP	Min(77.84+11.46*Ln(HA_Zn%); 85)
Zn_Grade Zn %	Feed	Mine – AT OP	Min(52.6+6.76*Ln(HA_Zn%)+9.07*Ln(HA_Zn/Fe); 53)

Transmin recommended that the geological data be validated by Nexa geologists, as it could create opportunities to refine and obtain more robust geometallurgical models.

Additionally, Transmin recommended that the implementation of geometallurgical models should be reviewed by the Nexa geometallurgy team to ensure their correct interpretation and consequences for the production plan.

Conclusions

The objective of phase 4 was to validate the geometallurgical models of comminution and flotation, expanding the geometallurgical dataset.

From comminution tests, the following was observed:

- Abrasion index tests reported values between 0.02 g and 0.71 g, the bodies CHEN1, CPO1, CPO16 and CPO18 have higher abrasiveness.
- The BWi tests reported values between 11 kWh/t and 22 kWh/t; the DACT, CALC, BRT and PFQF lithologies presented the highest values.

From the tests on the composites it was concluded that:

- The composite AEC-04 has 45% carbonates, mainly calcite.
- In composites the main sulphides are pyrite, galena and sphalerite.
- Presence of muscovite and silicon and aluminum clays in all four composites.
- All composites have a liberation of more than 80% galena and 87% sphalerite.

From the geometallurgical analysis, the following risks were identified:

- Tonnage to plant and steel consumption
- The abrasiveness of the ore depends on the ore body, presenting greater abrasiveness bodies 10, Chee (Qi), cpo1 and cpo18 for the Open Pit tank.
- The hardness of the ore depends on the mining phase and associated lithologies, being the dacites and hydrothermal breccias.
- Recovery of valuable minerals:
    - Areas with low Pb floatability were identified, suggesting the presence of oxidized species or complex associations between Pb and gangue.
    - Risks to Zn recovery are identified in specific areas of the deposit, in marble-type material.
    - It is recommended to evaluate the behaviour of the low-recovery material close to upcoming mining phases.

    - Recoveries and concentrate qualities were evaluated at a P80 out of 180 µm, it is expected that with a coarser grain size decreases in recoveries and obtainable qualities will be observed.
- Concentrate quality:
    - Presence of Mn in the Zn concentrate. While these are found in values <1%, does not rule out that there are areas in the deposit where the Mn grades in the head increase and affect the quality of the Zn concentrate.
    - Presence of Sn, Sb and Cd in Zn concentrate.
    - Presence of As and Sb in the Pb concentrate.
    - Sb and As in both concentrates are mainly present as gray coppers and sulfosalts of Pb.

Recommendations

Based on the results of the study phase, Transmin recommended:

- Including in the drill hole database:
    - Manganese sulphides, tetrahedrite, and tennantite
    - Grades of arsenic, manganese, and antimony
    - Chemical analysis: Total rock analysis, mainly SiO_2 and LOI for drilling underground
- Performing a geological assessment of the Au association to galena and Au associated with pyrite based on deposit genesis and geometallurgical results.
- A geological assessment to identify areas associated with oxides in Phase 2 of mining. These areas represent a risk to the recovery of Pb, Zn and Au.
- Evaluating the behaviour of low-recovery material near upcoming mining phases to validate the results obtained.
- Performing recovery studies by size with plant feed material to quantify losses in recoveries of valuable metals by size fraction.
- Updating the steel tonnage and consumption estimation model derived in 2018, based on circuit data and operating variables reported by Nexa to date by incorporating the operational changes made to date in the grinding circuit.

10.2.2 Atacocha Concentrator Production

Production figures for 2021 through 2023 including head grades and recoveries of metals to concentrates are presented in Table 10-13. The Atacocha concentrator processed 1,397,192 tonnes of ore in 2023 with Pb and Zn grades of 0.93% and 0.77% respectively. Recoveries to their respective concentrates were 85.7% Pb and 75.9% Zn.

Head grades of ore being treated in the Atacocha concentrator have changed since the introduction of open pit ore in early 2016. Head grades of Zn have decreased from 1.8% to 0.77%, Cu has decreased from 0.11 % to 0.04% and Pb has decreased from 1.31% to 0.93% from 2016 to 2023.

Table 10-13: Atacocha Concentrator Production for 2021 - 2023

	Item	Units	2021	2022	2023
Ore Processed		tonnes	1,271,107	1,353,681	1,397,192
Mill Head Grade	Ag	g/t	1.01	1.05	1.21
	Au	g/t	0.014	0.015	0.010
	Cu	%	0.03	0.03	0.04
	Pb	%	0.82	0.97	0.93
	Zn	%	0.88	0.89	0.77
Pb Concentrate		tonnes	16,845	20,798	20,996
	Pb Grade	%	51.70	53.87	52.94
	Pb recovery	%	83.27	85.51	85.70
	Ag Grade	oz/t	57.95	53.32	64.49
	Ag Recovery (to Pb)	%	76.00	77.65	79.98
	Au Grade	g/t	0.709	0.654	0.360
	Au Recovery (to Pb)	%	69.58	67.86	56.19
Zn Concentrate		tonnes	16,908	18,809	16,172
	Zn Grade	%	50.40	50.79	50.66
	Zn Recovery	%	76.25	79.07	75.94

Table 10-14, Figure 10-16, and Figure 10-17 present the grade and recovery statistics for Au, Ag, Cu, Pb, and Zn using daily results for 2022 and 2023. The box and whisker plots show the grade and recovery ranges including the minimum (bottom horizontal line), 25th percentile (bottom of box), 50th percentile or mean (line in middle of box), 75th percentile (top of the box), and the maximum (top horizontal line) of each metal along with outliers. The average grades of Zn and Pb for the period were 0.84% and 0.95%, respectively and the recoveries of Zn and Pb for the period were 76.57% and 83.64%, respectively. The recoveries used for the cut-off grade and resource model at these grades were 70.44% for Zn and 84.06% for Pb, which compares well to the operating data, the Zn values being somewhat conservative.

Table 10-14: Summary of Daily Grade and Recovery Results for 2022 - 2023

	Head Grade				Metal Recovery			
	Zn (%)	Pb (%)	Ag (oz/t)	Au (oz/t)	Zn (%)	Pb (%)	Ag (%)	Au (%)
2022-2023								
Average	0.84	0.95	1.13	0.01	76.57	83.64	81.12	64.45
Maximum	1.62	1.96	2.23	0.03	86.75	90.19	89.57	84.38

	Head Grade				Metal Recovery			
	Zn (%)	Pb (%)	Ag (oz/t)	Au (oz/t)	Zn (%)	Pb (%)	Ag (%)	Au (%)
Minimum	0.25	0.43	0.56	0.00	44.97	45.35	60.31	0.00
Median	0.82	0.91	1.10	0.01	77.83	85.33	81.32	67.29
2022								
Average	0.90	0.96	1.05	0.01	78.84	85.22	80.38	67.32
Maximum	1.56	1.96	2.23	0.03	86.75	89.51	87.39	84.38
Minimum	0.45	0.43	0.56	0.01	64.68	79.75	70.42	43.12
Median	0.88	0.93	1.03	0.01	79.37	85.38	80.55	68.25
2023								
Average	0.77	0.93	1.21	0.01	74.16	81.97	81.90	46.54
Maximum	1.62	1.90	2.10	0.02	84.84	90.19	89.57	65.83
Minimum	0.25	0.44	0.59	0.00	44.97	45.35	60.31	0.00
Median	0.75	0.88	1.18	0.01	75.92	85.18	82.78	46.59

Figure 10-16: Atacocha Head Grade Statistics for 2022 - 2023

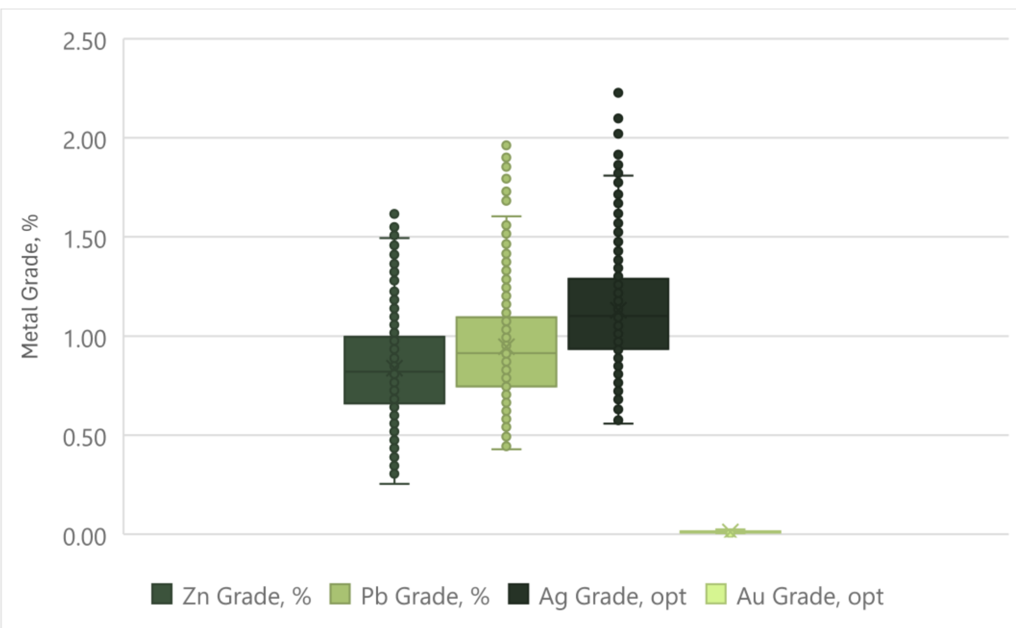
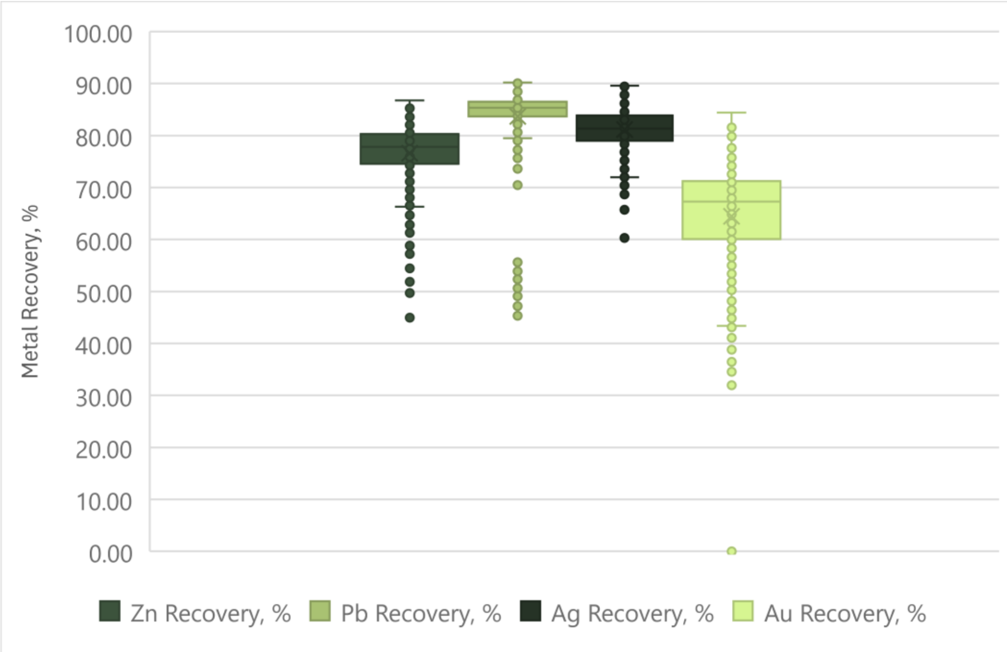


Figure 10-17: Atacocha Recovery Statistics for 2022 - 2023



Historical annual recoveries at Atacocha for 2000 - 2023 are presented in Figure 10-18 through Figure 10-23, which show zinc, lead, and copper head grades, and recoveries to concentrate. Copper head grades decreased to the point that a separate copper concentrate was not produced after 2019.

Figure 10-18: Zinc Head Grade from 2000 to 2023

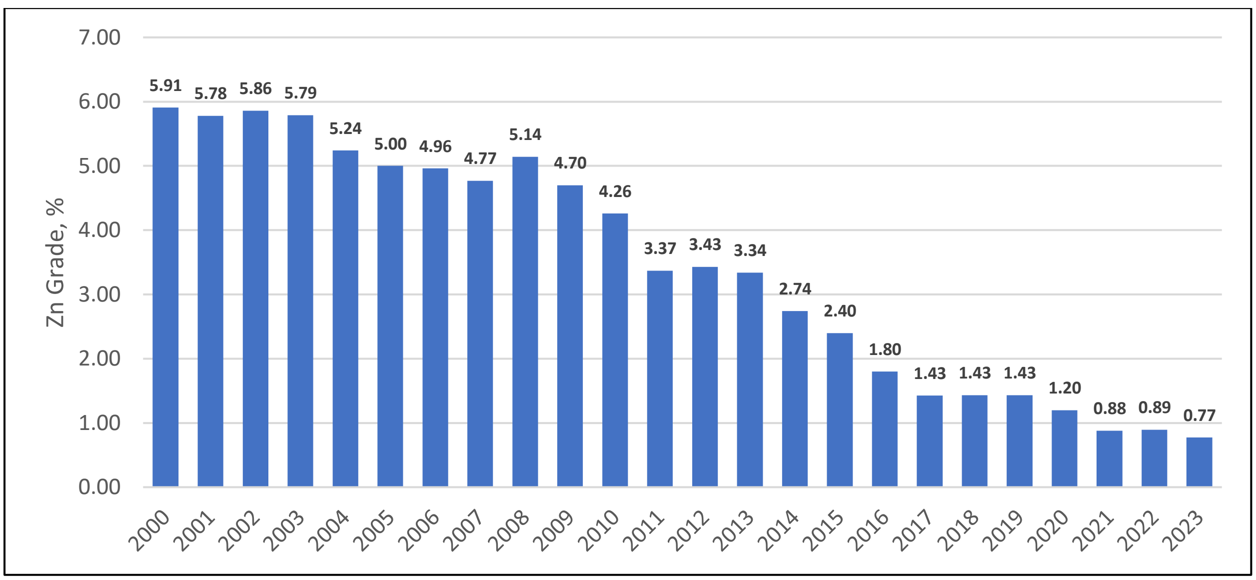


Figure 10-19: Zinc Recovery from 2000 to 2023

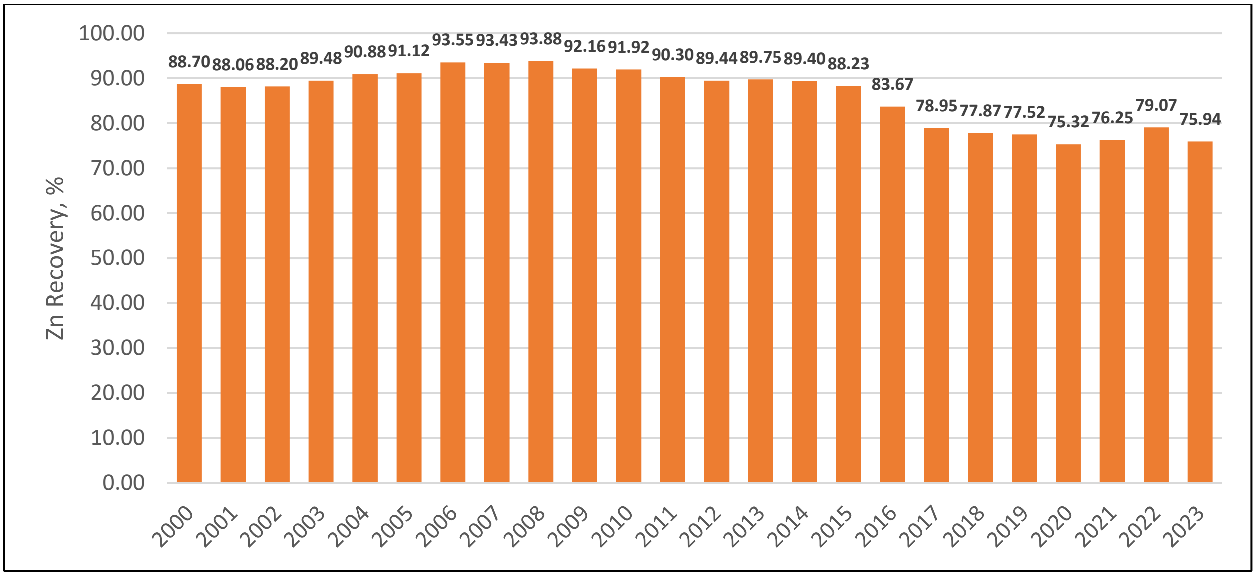


Figure 10-20: Lead Head Grade from 2000 to 2023

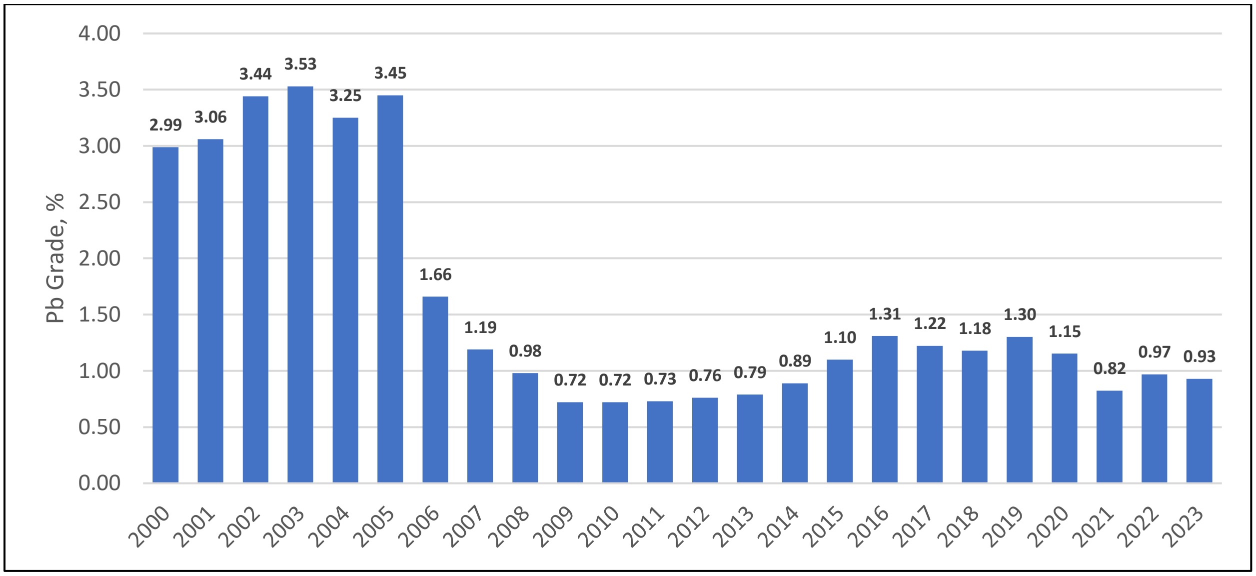


Figure 10-21: Lead Recovery from 2000 to 2023

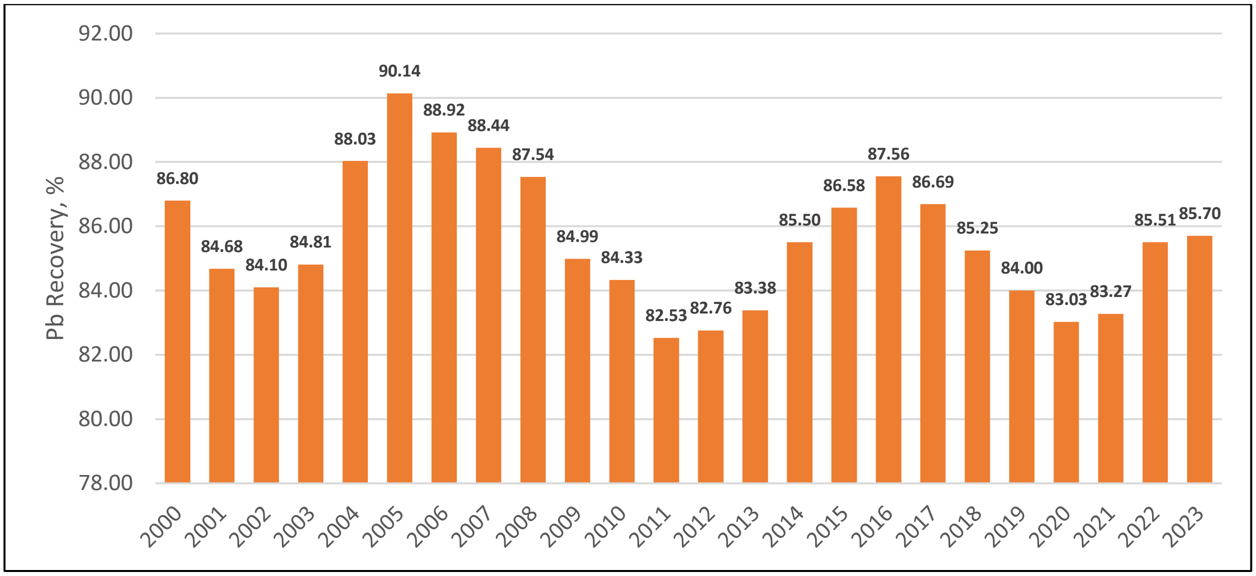


Figure 10-22: Copper Head Grade from 2000 to 2023

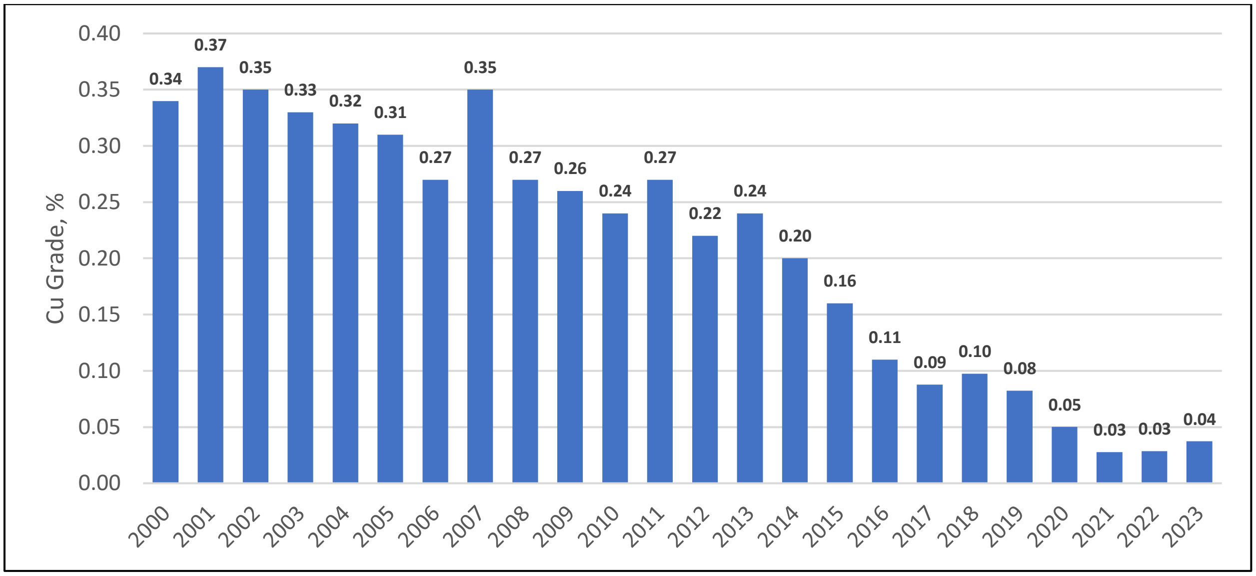
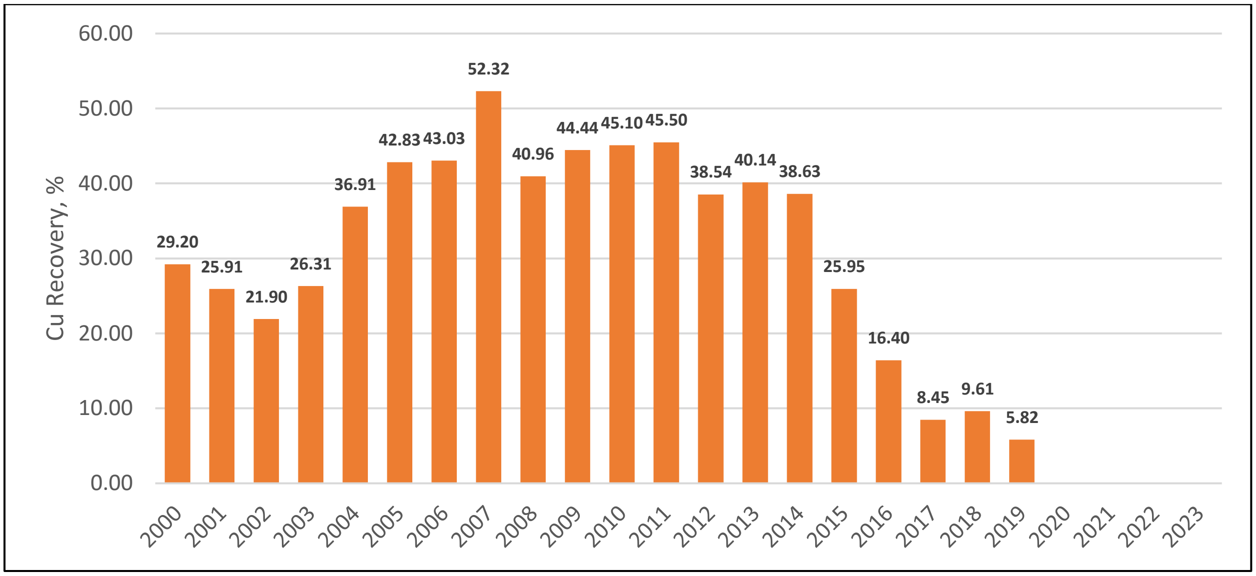


Figure 10-23: Copper Recovery from 2000 to 2019



10.2.1 Deleterious Elements

The potential penalty elements in the lead concentrate are arsenic and fluorine.

The potential penalty elements in the zinc concentrate are manganese, silica, and cadmium.

10.2.2 QP Opinion

In the SLR QP's opinion, the metallurgical recovery data is adequate for the purposes of Mineral Resource and Mineral Reserve estimation.

11.0 Mineral Resource Estimates

11.1 Summary

Mineral Resources have been classified in accordance with the definitions for Mineral Resources in S-K 1300, which are consistent with Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM (2014) definitions).

The Mineral Resource estimate for the El Porvenir Mine was completed using all data available as of January 31, 2023. The estimate was completed by El Porvenir staff, followed by auditing and approval by the QP. Similarly, Mineral Resource estimates for the Atacocha underground (UG) and Atacocha (San Gerardo) open pit (OP) mines were completed in June 2023, using all data available up to January 31, 2023. These estimates were completed by Atacocha staff and underwent auditing and approval by the QP.

Since the closure date of the resource database on January 31, 2023, a small amount of drilling and channel sampling has been produced at El Porvenir and Atacocha OP mines. However, these additional data has been reviewed and determined not to have a material impact on estimated Mineral Resources.

Mineral Resources are reported based on actual production as of September 30, 2023, with production forecast to the effective date of December 31, 2023. Geological wireframes and estimation domains were generated using Leapfrog Geo software, with further refinement using Datamine software. Grade estimation was carried out in Datamine software.

Channel samples were included in the resource databases for the El Porvenir, Atacocha UG, and Atacocha OP estimates, while blast hole data was excluded from the Atacocha OP estimate. Grades were interpolated within the estimation domains using ordinary kriging (OK) and inverse distance cubed (ID^3), with nearest neighbour (NN) estimates used for validation purposes. Dynamic anisotropy was used to interpolate grades reflecting vein orientations.

In addition to validation completed by the QP, the database, geological interpretation, and block model validation were also validated by SLR. For block model validation, SLR used visual checks, statistical checks, and swath plots.

NSR cut-off values were determined using a Zn price of US$3,218.90/t, Pb price of US$2,300.33/t, Cu price of US$8,820.05/t, Ag price of US$24.35/oz, and Au price of US$1,875.57/oz. The sub-blocked model for the Atacocha OP was re-blocked to the SMU prior to reporting Mineral Resources, while the El Porvenir and Atacocha UG Mineral Resources were reported from the sub-blocked models.

Mineral Resources at El Porvenir are reported within optimized underground reporting panels generated in Deswik Stope Optimizer (DSO) software, satisfying minimum mining thickness. NSR cut-off values of US$67.04/t were used for the sub-level stoping (SLS) Upper Zone, US$63.98/t for the SLS Intermediate Zone, US$63.77/t for the SLS Lower Zone, and US$65.21/t for the SLS Mine Deepening Zone. NSR cut-off values of US$69.04/t were used for the cut and fill (CAF) Upper Zone, US$66.25/t for the CAF Intermediate Zone, US$65.77/t for the CAF Lower Zone, and US$67.21/t for the CAF Mine Deepening Zone.

Mineral Resources at Atacocha UG are reported within optimized reporting panels generated in DSO software, satisfying minimum mining thickness, NSR cut-off values of US$71.07/t for CAF stopes, NSR cut-off values of US$69.00/t for SLS stopes, and continuity criteria.

Mineral Resources at the Atacocha OP are reported within a preliminary pit shell generated in Datamine NPV Scheduler software package at a reporting NSR cut-off value of US$22.44/t.

For the Cerro Pasco Complex, Mineral Resources as of December 31, 2023, are summarized in Table 11-1 and Table 11-2 on a Nexa attributable ownership basis and 100% ownership basis, respectively. Figure 11-1 illustrates the El Porvenir and Atacocha underground Mineral Resource reporting panels alongside San Gerardo Mineral Resource blocks exclusive of Mineral Reserves.

The QP is of the opinion that with consideration of the recommendations summarized in Sections 1 and 23 of this TRS, any issues relating to all relevant technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work.

Table 11-1: Summary of Cerro Pasco Complex Mineral Resource Estimate (Nexa Attributable Basis) – December 31, 2023

Mine	Ownership (%)	Category	Tonnage (Mt)	Grade					Contained Metal				
				Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Au (g/t)	Zn (kt)	Cu (kt)	Ag (koz)	Pb (kt)	Au (koz)
El Porvenir UG	83.48%	Measured	0.55	3.47	0.27	57.7	0.95	-	19.1	1.5	1,023	5.3	-
		Indicated	2.69	3.25	0.20	63.2	0.97	-	87.4	5.3	5,460	26.0	-
		Total Measured + Indicated	3.24	3.29	0.21	62.2	0.97	-	106.5	6.8	6,483	31.3	-
		Inferred	9.23	3.83	0.24	82.9	1.32	-	353.6	22.1	24,602	121.9	-
Atacocha UG	75.96%	Measured	0.80	3.47	0.27	55.0	0.98	-	27.6	2.1	1,411	7.8	-
		Indicated	1.91	3.30	0.36	54.9	0.92	-	63.2	6.9	3,379	17.6	-
		Total Measured + Indicated	2.71	3.35	0.33	54.9	0.94	-	90.8	9.0	4,790	25.4	-
		Inferred	6.12	4.09	0.56	77.3	1.21	-	250.4	34.3	15,216	74.1	-
Atacocha OP	75.96%	Measured	1.37	1.28	-	31.4	0.87	0.19	17.5	-	1,381	11.9	8.4
		Indicated	2.95	1.05	-	29.0	0.90	0.24	30.9	-	2,747	26.5	22.7
		Total Measured + Indicated	4.31	1.12	-	29.8	0.89	0.22	48.4	-	4,128	38.4	31.1
		Inferred	1.29	1.27	-	32.7	1.15	0.22	16.4	-	1,357	14.9	9.1
Total Cerro Pasco		Measured	2.72	2.37	0.13	43.7	0.92	0.10	64.2	3.6	3,815	25.0	8.4
		Indicated	7.55	2.40	0.16	47.7	0.93	0.09	181.5	12.3	11,586	70.2	22.7
		Total Measured + Indicated	10.27	2.39	0.15	46.7	0.93	0.09	245.8	15.9	15,401	95.2	31.1
		Inferred	16.65	3.73	0.34	76.9	1.27	0.02	620.5	56.4	41,175	210.8	9.1

Notes:

1. The definitions for Mineral Resources in S-K 1300 were followed for Mineral Resources which are consistent with CIM (2014) definitions.
2. Mineral Resources are reported on a Nexa attributable ownership basis.

3. Mineral Resources are estimated at the following NSR cut-off values, calculated based on the LOM costs:
    - El Porvenir UG: varies by mining method from US$63.77/t to US$67.04/t for SLS, and from US$65.77/t to US$69.04/t for CAF, with an average of US$66.04/t.
    - Atacocha UG: US$69.00/t for SLS and US$71.07/t for CAF
    - Atacocha OP: US$ 22.44/t
4. Mineral Resources are estimated using average long-term metal prices of Zn: US$3,218.90/t (US$1.46/lb), Cu: US$8,820.05/t (US$4.00/lb), Ag: US$24.35/oz, Pb: US$2,300.33/t (US$1.04/lb), and Au: US$1,875.57/oz.
5. Metallurgical recoveries are based on historical processing data:
    - El Porvenir UG: Zn (89.2%), Pb (80.0%), Cu (14.6%), and Ag (77.5%)
    - Atacocha UG: Zn (89.3%), Pb (80.0%), Cu (15.7%), Ag (77.5%), and Au (30.2%)
    - Atacocha OP: Zn (70.4%), Pb (84.0%), Ag (75.8%), and Au (65.5%)
6. Bulk density is assigned based on rock type and averages:
    - El Porvenir UG: 3.13 t/m^3
    - Atacocha UG: 3.53 t/m^3
    - Atacocha OP: 2.76 t/m^3
7. The minimum thickness for underground resource reporting panels (El Porvenir and Atacocha UG) is 4 m for CAF and 3 m for SLS. The minimum height for the Atacocha OP resource reporting is 6.0 m.
8. Mineral Resources were depleted according to actual production as of September 30, 2023, and forecast production to the effective date of December 31, 2023.
9. Mineral Resources are exclusive of Mineral Reserves.
10. There are no Cu grades estimated for Atacocha OP and no Au grades estimated for Atacocha UG and El Porvenir UG. This has reduced the Cu and Au average grades for the total Cerro Pasco tonnes.
11. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
12. Mineral Resources are constrained within optimized underground reporting shapes for El Porvenir and Atacocha UG and an optimized reporting pit shell for Atacocha OP.
13. Numbers may not add due to rounding.

Table 11-2: Summary of Cerro Pasco Complex Mineral Resource Estimate (100%) – December 31, 2023

Mine	Category	Tonnage (Mt)	Grade					Contained Metal				
			Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Au (g/t)	Zn (kt)	Cu (kt)	Ag (koz)	Pb (kt)	Au (koz)
El Porvenir UG	Measured	0.66	3.47	0.27	57.7	0.95	-	22.9	1.8	1,225	6.3	-
	Indicated	3.22	3.25	0.20	63.2	0.97	-	104.7	6.4	6,540	31.2	-
	Total Measured + Indicated	3.88	3.29	0.21	62.2	0.97	-	127.6	8.2	7,765	37.5	-
	Inferred	11.06	3.83	0.24	82.9	1.32	-	423.6	26.5	29,471	146.0	-
Atacocha UG	Measured	1.05	3.47	0.27	55.0	0.98	-	36.4	2.8	1,857	10.3	-
	Indicated	2.52	3.30	0.36	54.9	0.92	-	83.2	9.1	4,448	23.2	-
	Total Measured + Indicated	3.57	3.35	0.33	54.9	0.94	-	119.6	11.9	6,305	33.5	-
	Inferred	8.06	4.09	0.56	77.3	1.21	-	329.7	45.1	20,031	97.5	-
Atacocha OP	Measured	1.80	1.28	-	31.4	0.87	0.19	23.0	-	1,818	15.7	11.0
	Indicated	3.88	1.05	-	29.0	0.90	0.24	40.7	-	3,616	34.9	29.9
	Total Measured + Indicated	5.68	1.12	-	29.8	0.89	0.22	63.7	-	5,434	50.6	40.9
	Inferred	1.70	1.27	-	32.7	1.15	0.22	21.6	-	1,787	19.6	12.0
Total Cerro Pasco	Measured	3.51	2.34	0.13	43.4	0.92	0.10	82.3	4.6	4,900	32.3	11.0
	Indicated	9.62	2.38	0.16	47.2	0.93	0.10	228.6	15.5	14,604	89.3	29.9
	Total Measured + Indicated	13.13	2.37	0.15	46.2	0.93	0.10	310.9	20.1	19,504	121.6	40.9
	Inferred	20.82	3.72	0.34	76.6	1.26	0.02	774.9	71.6	51,289	263.1	12.0

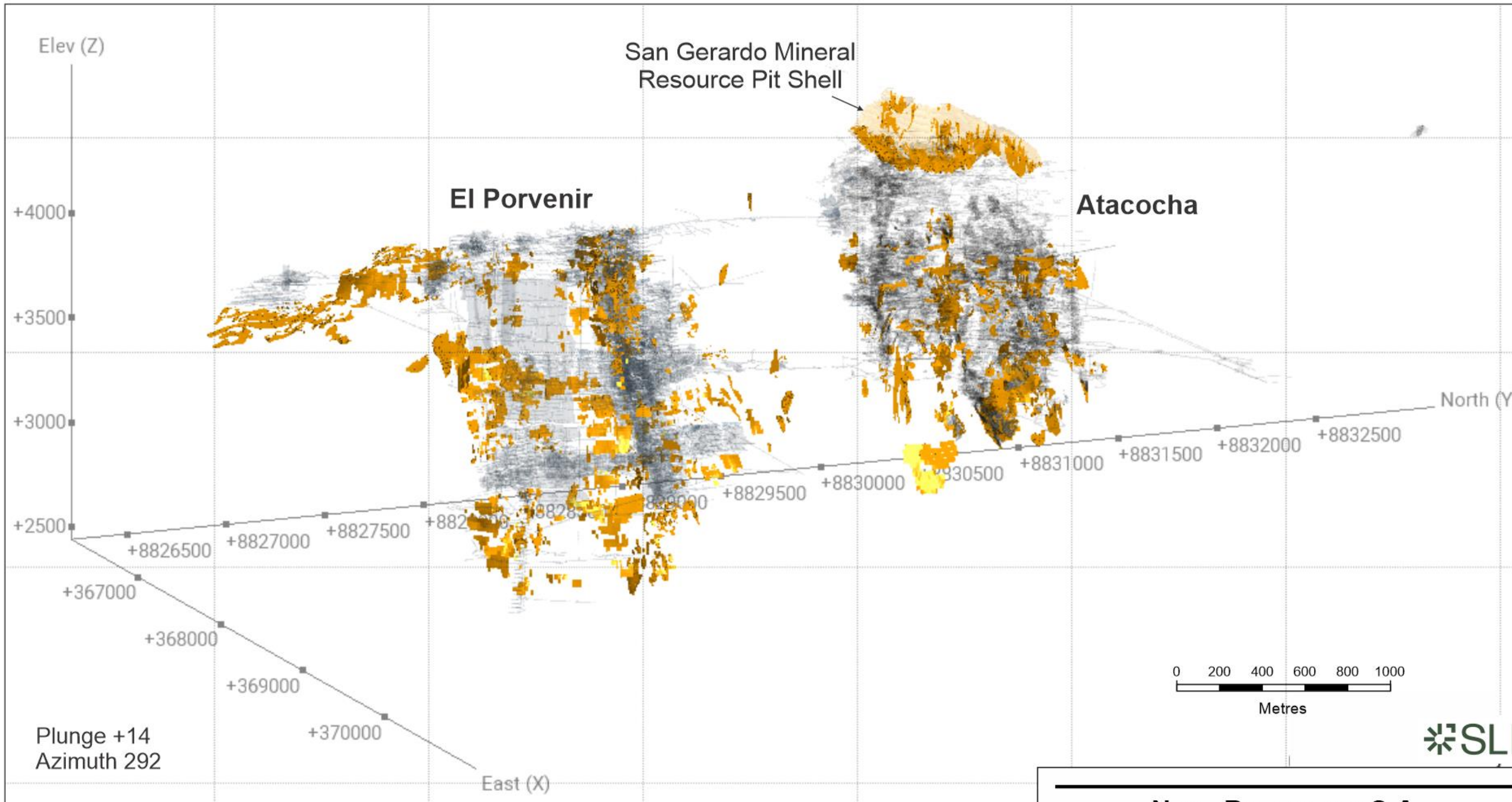
Notes:

1. The definitions for Mineral Resources in S-K 1300 were followed for Mineral Resources which are consistent with CIM (2014) definitions.
2. Mineral Resources are reported on a 100% ownership basis.
3. Mineral Resources are estimated at the following NSR cut-off values, calculated based on the LOM costs:

- El Porvenir UG: varies by mining method from US$63.77/t to US$67.04/t for SLS, and from US$65.77/t to US$69.04/t for CAF, with an average of US$66.04/t.
- Atacocha UG: US$69.00/t for SLS and US$71.07/t for CAF
- Atacocha OP: US$ 22.44/t

4. Mineral Resources are estimated using average long-term metal prices of Zn: US$3,218.90/t (US$1.46/lb), Cu: US$8,820.05/t (US$4.00/lb), Ag: US$24.35/oz, Pb: US$2,300.33/t (US$1.04/lb), and Au: US$1,875.57/oz.
5. Metallurgical recoveries are based on historical processing data:
   - El Porvenir UG: Zn (89.2%), Pb (80.0%), Cu (14.6%), and Ag (77.5%)
   - Atacocha UG: Zn (89.3%), Pb (80.0%), Cu (15.7%), Ag (77.5%), and Au (30.2%)
   - Atacocha OP: Zn (70.4%), Pb (84.0%), Ag (75.8%), and Au (65.5%)
6. Bulk density is assigned based on rock type and averages:
   - El Porvenir UG: 3.13 t/m^3
   - Atacocha UG: 3.53 t/m^3
   - Atacocha OP: 2.76 t/m^3
7. The minimum thickness for underground resource reporting panels is 4 m for CAF and 3 m for SLS. For open pit resource reporting, the minimum height is 6 m.
8. Mineral Resources were depleted according to actual production as of September 30, 2023, and forecast production to the effective date of December 31, 2023.
9. Mineral Resources are exclusive of Mineral Reserves.
10. There are no Cu grades estimated for Atacocha OP and no Au grades estimated for Atacocha UG and El Porvenir UG. This has reduced the Cu and Au average grades for the total Cerro Pasco tonnes.
11. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
12. Mineral Resources are constrained within optimized underground reporting shapes for El Porvenir and Atacocha UG and an optimized reporting pit shell for Atacocha OP.
13. Numbers may not add due to rounding.

Figure 11-1: El Porvenir and Atacocha Underground Resource Panels, with San Gerardo Mineral Resource Blocks Exclusive of Mineral Reserves



Legend:
Mineral Resource Panels / Blocks
Workings

Nexa Resources S.A.

Cerro Pasco Complex Integration

Pasco Province, Peru

El Porvenir and Atacocha Underground Resource Panels, with San Gerardo Mineral Resource Blocks Exclusive of Mineral Reserves

Source: SLR, 2023.

11.2 Comparison with Previous Estimate

The effective date of the previous Mineral Resource estimate for El Porvenir, San Gerardo, and Atacocha UG is December 31, 2022.

11.2.1 El Porvenir

Table 11-3 presents a comparative analysis between the December 31, 2023 Nexa Mineral Resource estimate, exclusive of Mineral Reserves, and the previous estimate from 2022. The comparison reveals an overall increase in both tonnage and grade. The changes are attributed to the following factors:

- Continuous drilling and channel program development, which added 274 new drill holes and 1,705 channels, throughout the mineral deposit extension.
- Infill drilling has resulted in an increase of 1.3 Mt across the VCN, POR9, EXITO, and AM domains.
- Exploration areas that are being reported for the first time.
- Depletion of material through mining.

Table 11-3: El Porvenir Comparison of 2022 Versus 2023 Mineral Resources (83.48% Ownership Basis)

Category	Tonnage (Mt)	Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Zn (kt)	Cu (kt)	Ag (koz)	Pb (kt)
December 31, 2022									
Measured	0.29	3.31	0.21	70.5	1.10	9.6	0.6	657	3.2
Indicated	2.54	3.04	0.20	57.1	0.92	77.2	5.1	4,663	23.4
Measured and Indicated	**2.83**	**3.07**	**0.20**	**58.5**	**0.94**	**86.8**	**5.7**	**5,320**	**26.6**
Inferred	8.92	3.83	0.19	72.9	1.05	341.6	16.9	20,907	93.7
December 31, 2023									
Measured	0.55	3.47	0.27	57.7	0.95	19.1	1.5	1,023	5.3
Indicated	2.69	3.25	0.20	63.1	0.97	87.4	5.3	5,460	26.0
Measured and Indicated	**3.24**	**3.29**	**0.21**	**62.2**	**0.97**	**106.5**	**6.8**	**6,483**	**31.3**
Inferred	9.23	3.83	0.24	82.8	1.32	353.6	22.1	24,602	121.9
DIFFERENCE (NOMINAL)									
Measured	0.26	0.16	0.06	-12.8	-0.15	9.52	0.90	366	2.1
Indicated	0.15	0.21	0.00	6.1	0.05	10.20	0.24	797	2.6
Measured and Indicated	**0.41**	**0.22**	**0.01**	**3.7**	**0.02**	**19.72**	**1.15**	**1,163**	**4.7**
Inferred	0.31	0.00	0.05	10.0	0.27	12.02	5.22	3,695	28.2
DIFFERENCE (%)									
Measured	90.0%	4.8%	28.6%	-18.1%	-13.6%	99.1%	150.4%	55.7%	64.4%
Indicated	5.8%	6.9%	0.0%	10.6%	5.4%	13.2%	4.8%	17.1%	11.3%
Measured and Indicated	**14.5%**	**7.2%**	**5.0%**	**6.3%**	**3.2%**	**22.7%**	**20.1%**	**21.9%**	**17.7%**
Inferred	3.5%	0.0%	26.3%	13.7%	25.7%	3.5%	30.9%	17.7%	30.1%

11.2.2 San Gerardo Open Pit

Table 11-4 presents a comparative analysis between the December 31, 2023 San Gerardo Mineral Resource estimate, exclusive of Mineral Reserves, and the previous estimate from 2022. The comparison reveals an overall decrease in both tonnage and grade. The changes are attributed to the following factors:

- The Inferred Mineral Resources decreased mainly due to limit of the pit shell constraint.
- The Measured and Indicated Mineral Resources decreased mainly due to the conversion to Mineral Reserves.

Table 11-4: San Gerardo Comparison of 2022 Versus 2023 Mineral Resources (75.96% Ownership Basis)

Category	Tonnage (Mt)	Zn (%)	Ag (g/t)	Pb (%)	Au (g/t)	Zn (kt)	Ag (koz)	Pb (kt)	Au (koz)
December 31, 2022									
Measured	2.42	1.04	36.9	1.02	0.25	25.2	2,871	24.7	19.5
Indicated	5.22	1.09	30.0	0.94	0.19	56.9	5,035	49.1	31.9
Measured and Indicated	**7.64**	**1.07**	**32.2**	**0.97**	**0.21**	**82.1**	**7,906**	**73.8**	**51.4**
Inferred	2.92	1.13	31.7	1.01	0.20	33.0	2,976	29.5	18.8
December 31, 2023									
Measured	1.37	1.28	31.4	0.87	0.19	17.5	1,381	11.9	8.4
Indicated	2.95	1.05	29.0	0.90	0.24	30.9	2,747	26.5	22.7
Measured and Indicated	**4.31**	**1.12**	**29.8**	**0.89**	**0.22**	**48.4**	**4,128**	**38.4**	**31.1**
Inferred	1.29	1.27	32.7	1.15	0.22	16.4	1,358	14.9	9.1
DIFFERENCE (NOMINAL)									
Measured	-1.05	0.24	-5.5	-0.15	-0.06	-7.7	-1,490	-12.8	-11.1
Indicated	-2.27	-0.04	-1.0	-0.04	0.05	-26	-2,288	-22.6	-9.2
Measured and Indicated	**-3.33**	**0.05**	**-2.4**	**-0.08**	**0.01**	**-33.7**	**-3,778**	**-35.4**	**-20.3**
Inferred	-1.63	0.14	1.0	0.14	0.02	-16.60	-1,619	-14.6	-9.7
DIFFERENCE (%)									
Measured	-43.5%	23.1%	-14.9%	-14.7%	-24.0%	-30.7%	-51.9%	-51.7%	-57.2%
Indicated	-43.5%	-3.7%	-3.4%	-4.3%	26.3%	-45.7%	-45.4%	-46.0%	-28.8%
Measured and Indicated	**-43.5%**	**4.7%**	**-7.5%**	**-8.2%**	**4.8%**	**-41.1%**	**-47.8%**	**-47.9%**	**-39.6%**
Inferred	-55.8%	12.4%	3.2%	13.9%	10.0%	-50.2%	-54.4%	-49.5%	-51.5%

11.2.3 Atacocha Underground

Table 11-5 presents a comparative analysis between the December 31, 2023 estimate and the estimate from 2022. The comparison reveals an overall increase in both tonnage and grade. The changes are attributed to the following factors:

- The Inferred Mineral Resources decreased mainly due to classification criteria revision.
- The Measured and Indicated Mineral Resources decreased mainly due to the conversion to Mineral Reserves.
- Depletion of material through mining.

Table 11-5: Atacocha Underground Comparison of 2022 Versus 2023 Mineral Resources (75.96% Ownership Basis)

Category	Tonnage (Mt)	Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Zn (kt)	Cu (kt)	Ag (koz)	Pb (kt)
December 31, 2022									
Measured	2.10	4.18	-	78.9	1.52	87.7	-	5,327	31.9
Indicated	3.27	4.15	-	76.0	1.43	135.7	-	7,990	46.8
Measured and Indicated	**5.37**	**4.16**	-	**77.1**	**1.47**	**223.4**	-	**13,317**	**78.7**
Inferred	6.16	4.45	-	82.0	1.26	274.1	-	16,240	77.6
December 31, 2023									
Measured	0.80	3.47	0.27	55.0	0.98	27.6	2.1	1,411	7.8
Indicated	1.91	3.30	0.36	54.9	0.92	63.2	6.9	3,379	17.6
Measured and Indicated	**2.71**	**3.35**	**0.33**	**54.9**	**0.94**	**90.8**	**9.0**	**4,790**	**25.4**
Inferred	6.12	4.09	0.56	77.3	1.21	250.4	34.3	15,216	74.1
DIFFERENCE (NOMINAL)									
Measured	-1.30	-0.71	-	-23.9	-0.54	-60.1	-	-3,916	-24.1
Indicated	-1.36	-0.85	-	-21.1	-0.51	-72.5	-	-4,611	-29.2
Measured and Indicated	**-2.66**	**-0.81**	-	**-22.2**	**-0.53**	**-132.6**	-	**-8,527**	**-53.3**
Inferred	-0.04	-0.36	-	-4.7	-0.05	-23.7	-	-1,024	-3.5
DIFFERENCE (%)									
Measured	-62.0%	-17.0%	-	-30.3%	-35.5%	-68.5%	-	-73.5%	-75.5%
Indicated	-41.5%	-20.5%	-	-27.8%	-35.7%	-53.4%	-	-57.7%	-62.3%
Measured and Indicated	**-49.5%**	**-19.5%**	-	**-28.8%**	**-36.1%**	**-59.3%**	-	**-64.0%**	**-67.7%**
Inferred	-0.6%	-8.1%	-	-5.7%	-4.0%	-8.6%	-	-6.3%	-4.6%

11.3 Reconciliation

Nexa provided reconciliation data comprising tonnages and grades for the main elements for the whole 2023 year. The Long-Term Factor (LTF) denotes the percentage variation between the Resource Model and the Plant Accounted figures, while the Short-Term Factor (STF) indicates the percentage variation between the Grade Control Model and Plant Accounted figures.

The tonnage and LTF and STF at the El Porvenir and Atacocha mines exhibit expected small fluctuations around zero, typically ranging from -5% and 8%, with sporadic occurrences reaching ±11%. This trend is similarly observed for Zn and Ag data for El Porvenir. It is noteworthy that the Atacocha underground mine has been inactive since 2020, and consequently, the reconciliation information represents only the San Gerardo open pit.

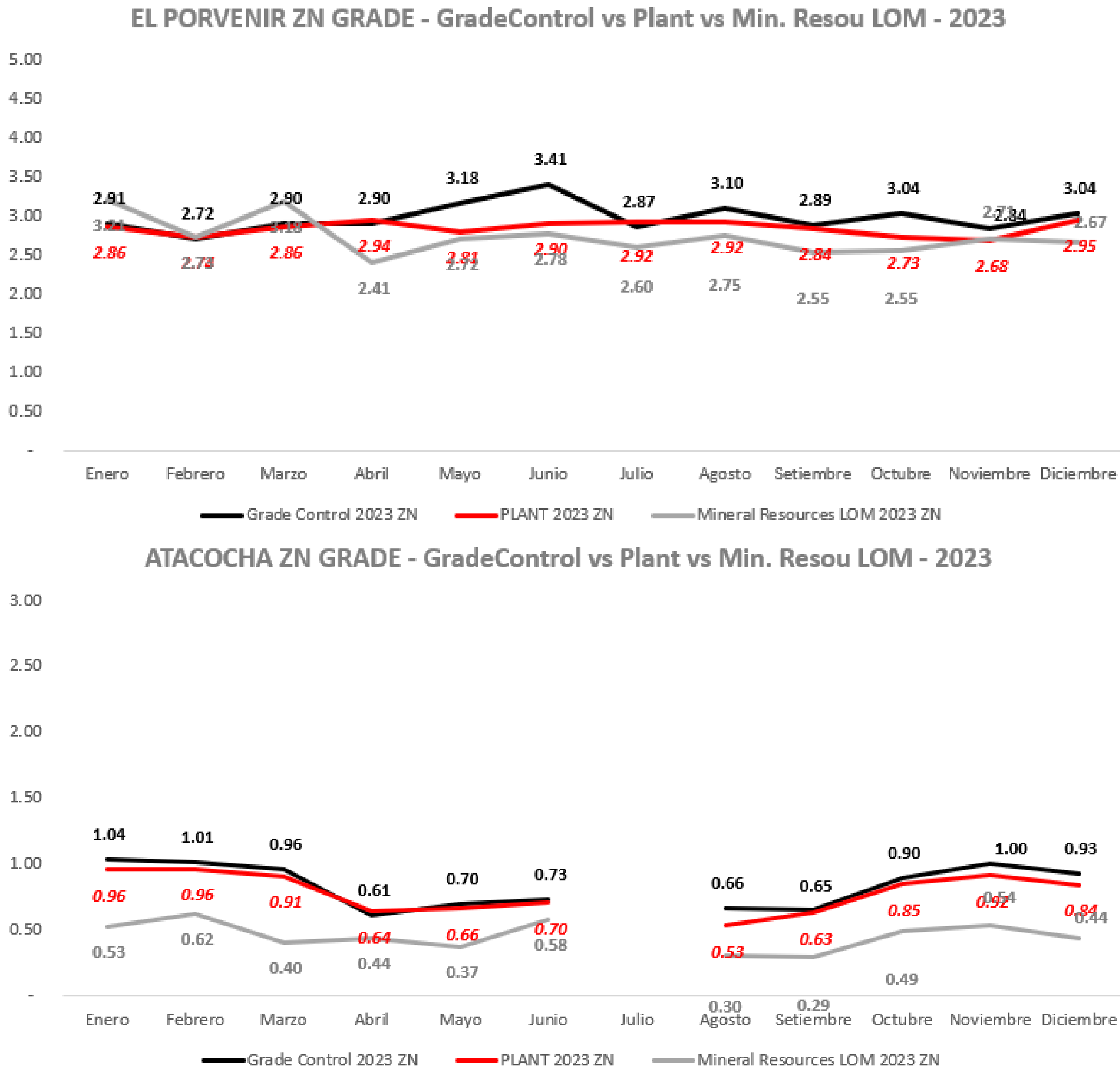
Zn STF shows similar behaviour at Atacocha. However, Pb, Cu, and Au at Atacocha exhibit higher monthly variations, ranging between -21% and 42%. Despite the higher variations, the average STFs for 2023 for these variables are -6%, 6%, and 4% for Pb, Cu, and Au, respectively.

For El Porvenir, the LTF also demonstrates expected minor fluctuations around zero for most of the elements, except for Cu, which had an average of 26% at EOY 2023. Conversely, Atacocha's LTF displays wider variations for grade variables due to the reconciliation methodology, with annual variations ranging between 72% and 218%.

Grade Control models for El Porvenir and Atacocha UG incorporate channel and infill drill holes, while the San Gerardo Grade Control Model relies on blast hole data. Nexa's Technical Team attributes the increased grades mainly to opportunistic mining of ore within cross-strike mineralization structures, which are not adequately represented in the modelled mineralization, particularly within the LTM. Since the massive sulphides are visually identifiable, machine operators regularly identify such ore on the pit faces.

Figure 11-2 illustrates the Zn grades for the long- and short-term models, and the plant grades by month.

Figure 11-2: Zn Long- and Short-Term Grades and Plant Grade for El Porvenir (top) and Atacocha (bottom)

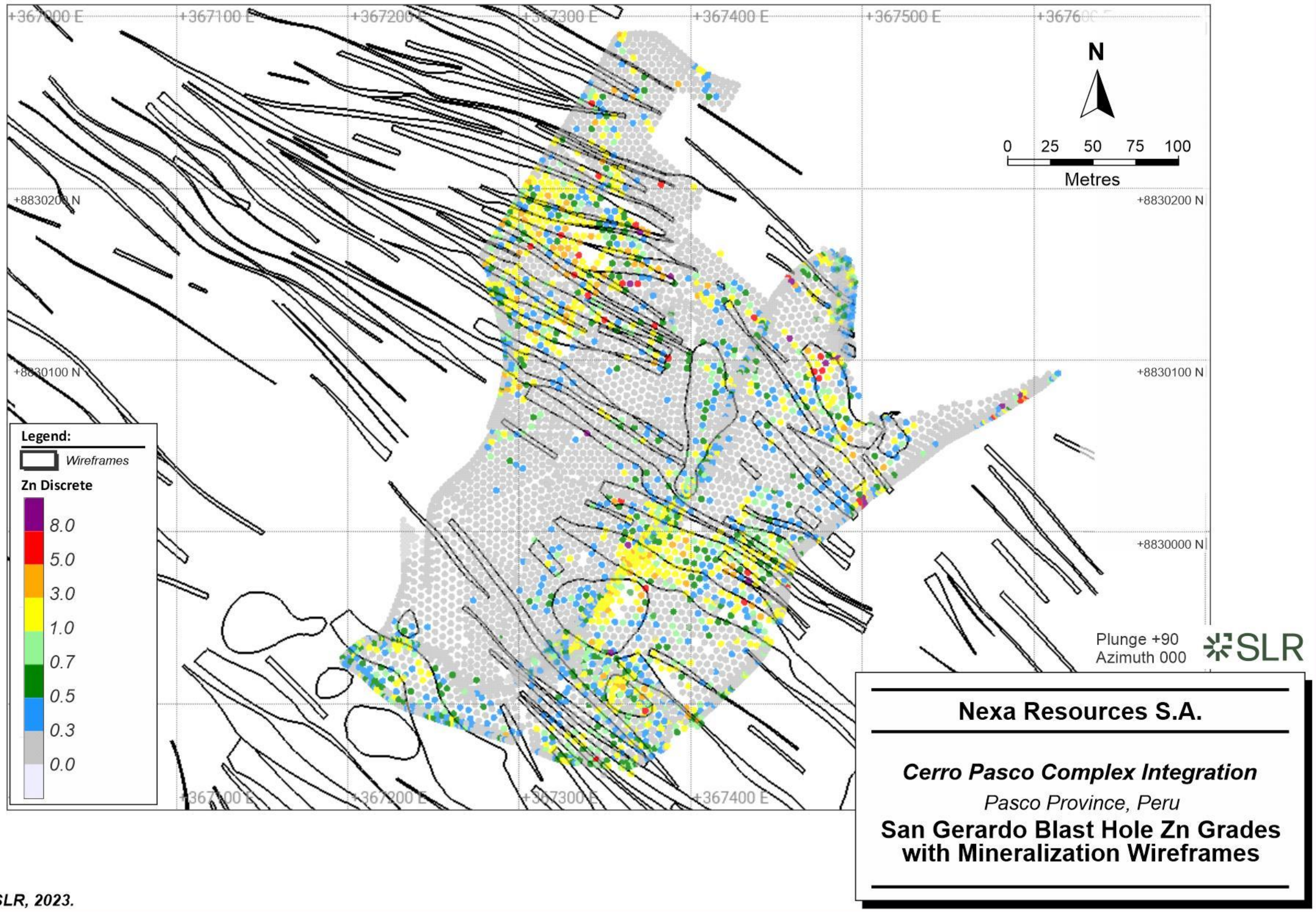


Of the three deposits, San Gerardo has the most comprehensive grade control dataset, due to its use of blast holes. Although the vertical holes are oriented parallel to the vertical mineralized structures, comparison of the San Gerardo LTM mineralization wireframes with the blast hole grades indicates significant differences (Figure 11-3). This includes reduced continuity of the along-strike structures and increased presence of across-strike structures, which is likely also the case at El Porvenir and Atacocha UG.

The QP recommends a thorough reconciliation between the underground production volumes and the mineralization wireframes. This would facilitate a better understanding of the reconciliation between the along-strike mineralization, and enable a more precise quantification of the proportion of the discrepancy stemming from opportunistic mining of ore from across-strike structures.

To refine the definition of mineralized extents, it is recommended that closer-spaced exploration and infill drilling be carried out ahead of production. This includes drilling at orientations better designed to intercept across-strike mineralized structures.

Figure 11-3: San Gerardo Blast Hole Zn Grades with Mineralization Wireframes



Source: SLR, 2023.

11.4 El Porvenir

11.4.1 Resource Database

The El Porvenir database closure date is January 31, 2023. Between then and the effective date of this report, 252 drill holes and 1,727 channels were completed (Table 11-6 and Figure 11-4). The QP reviewed the additional data and is of the opinion that it does not have a material impact on the estimated Mineral Resources. Most of the data consists of channels and infill drilling completed near to existing workings and largely confirms the existing interpretation. Several holes completed in the Integration Zone are largely outside of the existing mineralization domains.

Table 11-6: El Porvenir Data Completed After January 31,2023 Resource Database Closure

Type	Count	Length (m)
Channels	1,596	9,360
DDH	252	43,534

As discussed in Section 7.2.1, 21 drill holes were excluded from the El Porvenir resource database. Table 11-7 summarizes the drilling and channel sampling included within the El Porvenir resource database, following exclusions.

Table 11-7: El Porvenir Resource Database

Type	Count	Length (m)
Channels	17,478	119,715
DDH	5,431	900,536

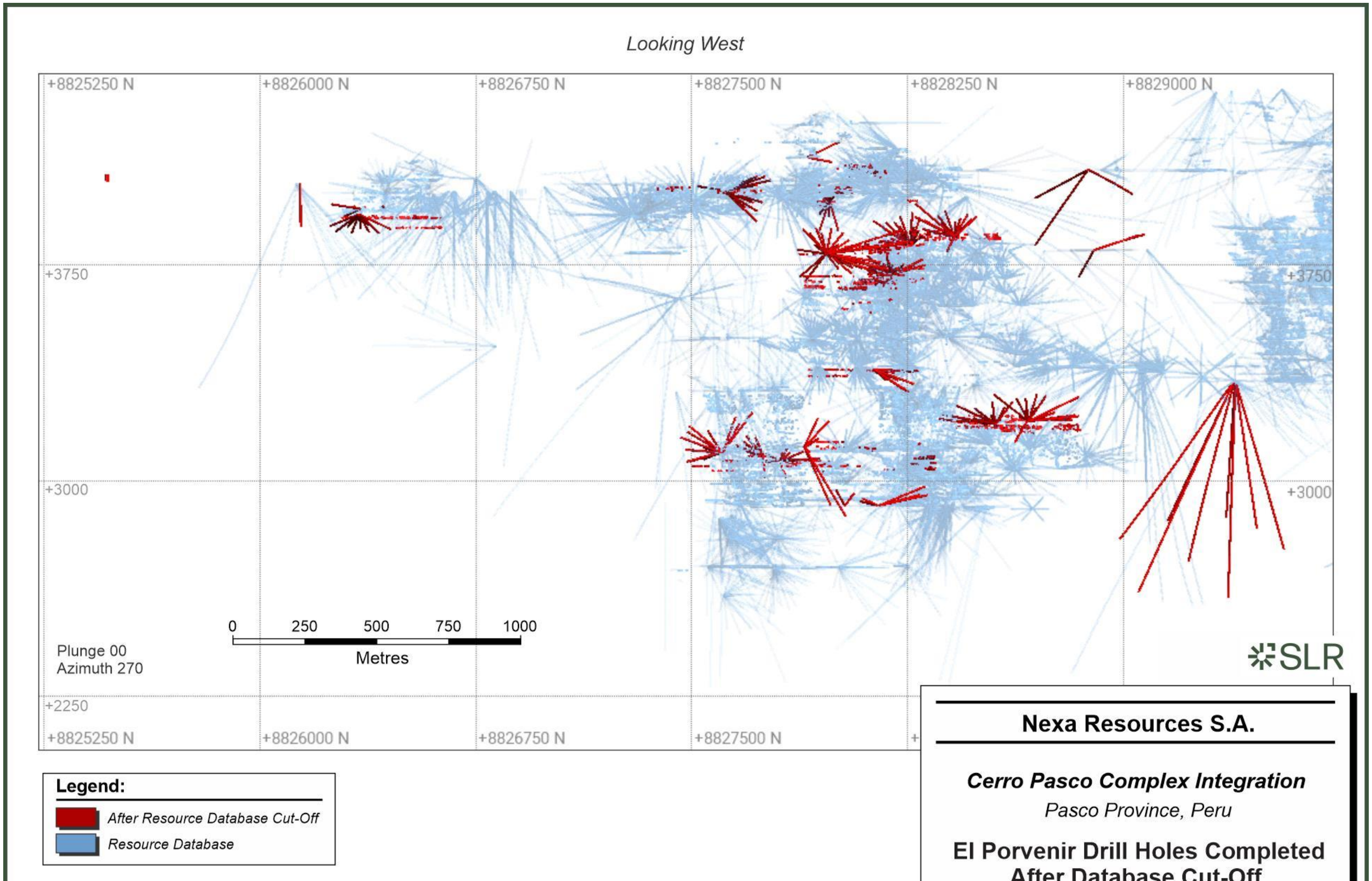
Table 11-8 summarizes the quantity of data in the provided resource database, filtered by the El Porvenir site.

Table 11-8: El Porvenir Resource Database Tables

Table	Count	Collars	Length (m)
Collar	22,909	22,909	-
Survey	153,334	22,909	-
Alteration	34,994	3,160	179,328
Geology	291,736	5,431	899,351
Litho	97,865	5,431	900,098
Assay	390,801	22,527	522,539
Structural	22,331	1,836	-
Mineralization	102,931	4,249	274,924
Geotechnical	12,902	601	111,537
Density	14,793	2,646	16,471

Table 11-9 summarizes the drilling and channel samples used to estimate the El Porvenir Mineral Resources, while Table 11-10 summarizes the density samples.

Figure 11-4: El Porvenir Drill Holes Completed After Database Cut-Off



Source: SLR, 2023.

Table 11-9: El Porvenir Resource Database Assay Summary Statistics

Analyte	Count	Length	Mean	StdDev	CV	Variance	Min	Q25	Median	Q75	Max
Zn (%)	390,595	522,211	1.84	4.35	2.37	18.94	0.00	0.02	0.11	1.14	63.35
Pb (%)	385,765	514,832	0.62	2.30	3.70	5.28	0.00	0.01	0.03	0.19	75.00
Cu (%)	382,903	510,619	0.13	0.33	2.49	0.11	0.00	0.01	0.02	0.14	35.00
Ag (g/t)	390,330	521,881	37.84	123.47	3.26	15,244.28	0.09	2.00	5.70	24.88	14,727.19
Au (g/t)	130,351	168,515	0.12	0.58	4.97	0.33	0.00	0.01	0.03	0.08	55.50
Length (m)	390,801	522,539	1.34	0.53	0.40	0.28	0.01	1.00	1.40	1.68	35.80

Table 11-10: El Porvenir Resource Database Density Summary Statistics

Analyte	Count	Length	Mean	StdDev	CV	Variance	Min	Q25	Median	Q75	Max
Density (g/cm^3)	14,793	16,471	2.94	0.46	0.16	0.21	0.85	2.69	2.81	3.23	6.17
Length (m)	14,793	16,471	1.11	0.49	0.44	0.24	0.20	0.85	1.10	1.50	6.40

11.4.2 Geological Interpretation

The El Porvenir UG Mineral Resource estimate relies on assay and geological interpretations conducted for each distinct mineralized domain. Geologists at El Porvenir built geological models utilizing assay results from drilling and channel sampling, alongside pertinent geological parameters. These models incorporate various geological domains, including rock types (such as sandstone, calcareous breccia, marble, and skarn), mineralization structure types (including veins, orebodies, and mantos), as well as structural and lithological features observed in underground workings and drill core logging data.

Based on observations of the drill core and underground mineralization exposures, discussions with the geologists on site, 3D data visualization, and statistical evaluations, the consensus regarding El Porvenir mineralization is that it is predominantly influenced by lithological and structural factors. The primary concentration of mineralization occurs within the “Porvenir 9”, “Don Ernesto”, “Exito”, “Veta Carmen Norte 3”, “Veta Progreso”, and “Sara” zones, while secondary occurrences are noted in the “Veta 5”, “Veta 1204”, “Veta 1204 Inferior”, “Veta 1204 Superior”, “Veta Carmen 1”, “Don Lucho”, and “SSM” domains. Additionally, there are minor mineralization occurrences in the “Veta VR” and “Integracion AT-EP” domains.

During the interpretation process, three main styles of mineralization were identified at the El Porvenir deposit:

- **Skarn:** mineralized zones of irregular to structurally controlled geometry, primarily contained within the Pucará Group, comprising garnet with associated metallic mineralization of galena, sphalerite, chalcopyrite, and Ag-bearing sulphosalts (i.e., tetrahedrite).
- **Structurally controlled zones** (i.e., veins): mineralization comprising galena, sphalerite, and Ag-bearing sulphosalts (i.e., tetrahedrite) with quartz, rhodochrosite, and pyrite that forms structurally controlled shoots with lengths of up to 150 m and vertical extents of up to 350 m.
- **Replacement**: lenses to irregular geometry contacts within the Pucará Group, comprising metallic mineralization of galena, sphalerite, chalcopyrite, and Ag-bearing sulphosalts (i.e., tetrahedrite), and lenses or “mantos” in stratabound galena, sphalerite, and pyrite mineralization hosted in the Goyllarisquizga sandstone.

Skarn bodies are highly irregular in geometry and structurally controlled by variable trends (north-south to northwest-southeast) around the Milpo stock. For the vein mineralization, at least three groups were identified:

- East-west striking.
- Replacement-style structures striking northwest-southeast dipping to the north.
- Veins associated with intrusive dikes striking northeast-southwest; dipping to the south, and for the “mantos”, a northwest trending with shallow dipping to the south was recognized.

Nexa executed the geological modelling of the El Porvenir deposit using Leapfrog Geo software. Contact surfaces were modelled upon drilling and channel sampling assay data, alongside structural and lithological controls gleaned from underground workings and drill core logging data. A total of 109 levels with underground mapping guided the modelling process, with polylines utilized to refine contacts in areas with sparse data and to replicate underground mapping for mineralization displacement adjustments. SLR observed that in certain locations, wireframes were not aligned with available drill hole and channel data but instead relied solely on polylines. Mineralization wireframes were not subject to a minimum mining thickness constraint due to the utilization of DSO shapes for reporting Mineral Resources.

Although extrapolation of the mineralization wireframes was generally limited to within approximately 30 m to 40 m from the last mineralized intercept, SLR noted that some domains were extended beyond this. Nonetheless, such extrapolations were deemed reasonable, and their extent was duly considered during the classification of Mineral Resources. Leapfrog's vein and intrusion tools were employed for modelling mineralization, with additional boundary control imposed using polylines as required. The modelled mineralized zones were subsequently exported to Datamine software for block model encoding.

A total of 522 individual mineralization domains comprising 23 mineralization groups were interpreted and modelled (Figure 11-6), with most group zones situated within the operational area. Figure 11-5 illustrates the modelled mineralization domains, with the 25 most significant in terms of Mineral Resource tonnage (approximately 46%) highlighted in red. For this TRS, these domains will be referred to as the main domains for El Porvenir.

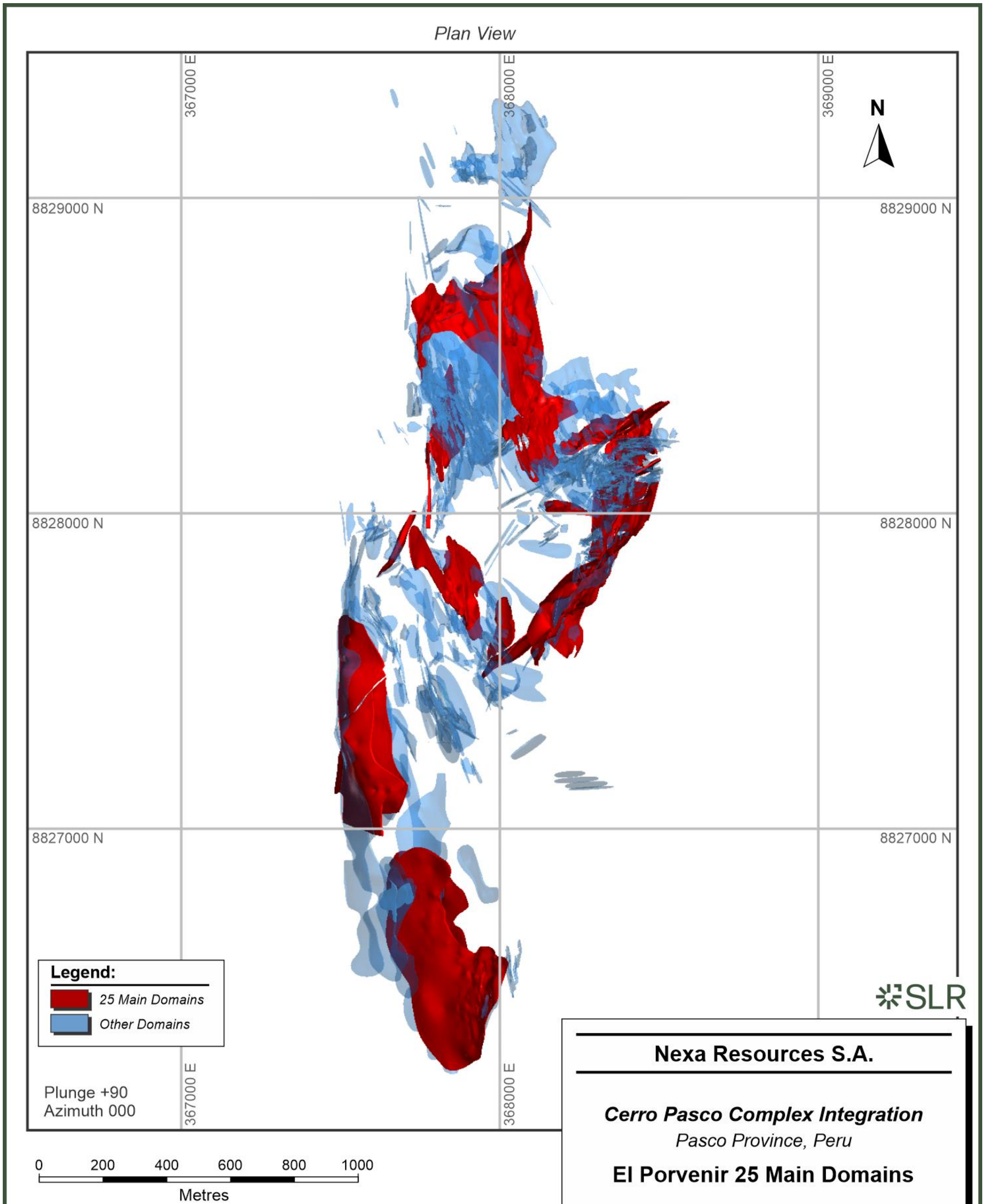
Upon thorough examination, SLR has assessed the mineralization wireframes of the El Porvenir underground mine and has deemed them suitable for Mineral Resource estimation. However, it was observed that numerous drill holes lacking assay data intersected the modelled wireframes. The rationale behind the absence of assays in these instances remains unclear, whether due to the absence of identified mineralization or other factors such as time constraints. Following estimation, Nexa excluded regions surrounding the non-assayed holes from the block model using an NN approach to delineate the influence area, which, as observed by SLR, resulted in irregularly shaped final domains in the block models. While this was not deemed to significantly impact the estimated Mineral Resources, SLR recommends that in future Mineral Resource updates, veins be set to pinch out upon non-assayed samples, to refine the grade estimate. The QP concurs with this recommendation.

SLR observed that certain mineralization wireframes, such as “wf_prog_3tr,” were solely based on polylines without snapping to drill hole and channel sample contacts. These discrepancies contributed to a large proportion of snapping inconsistencies between the intervals assigned to a domain (referred to as “OB” in the drill hole and block model) and the resultant OB wireframes. An assessment revealed that 91% of intervals assigned to an OB were accurately captured within a modelled OB, while 97% of waste intervals were appropriately classified as waste. Although most discrepancies were located outside the Mineral Resource constraining shapes, it is recommended that these discrepancies be rectified in future Mineral Resource updates.

Contact analysis conducted by SLR on the mineralization domains indicated effective separation between mineralized and unmineralized populations, as illustrated in Figure 11-7. Nonetheless, opportunities were identified in certain areas to extend wireframes to incorporate additional mineralized intercepts. Notably, the populations within the modelled mineralization demonstrated approximately lognormal distributions.

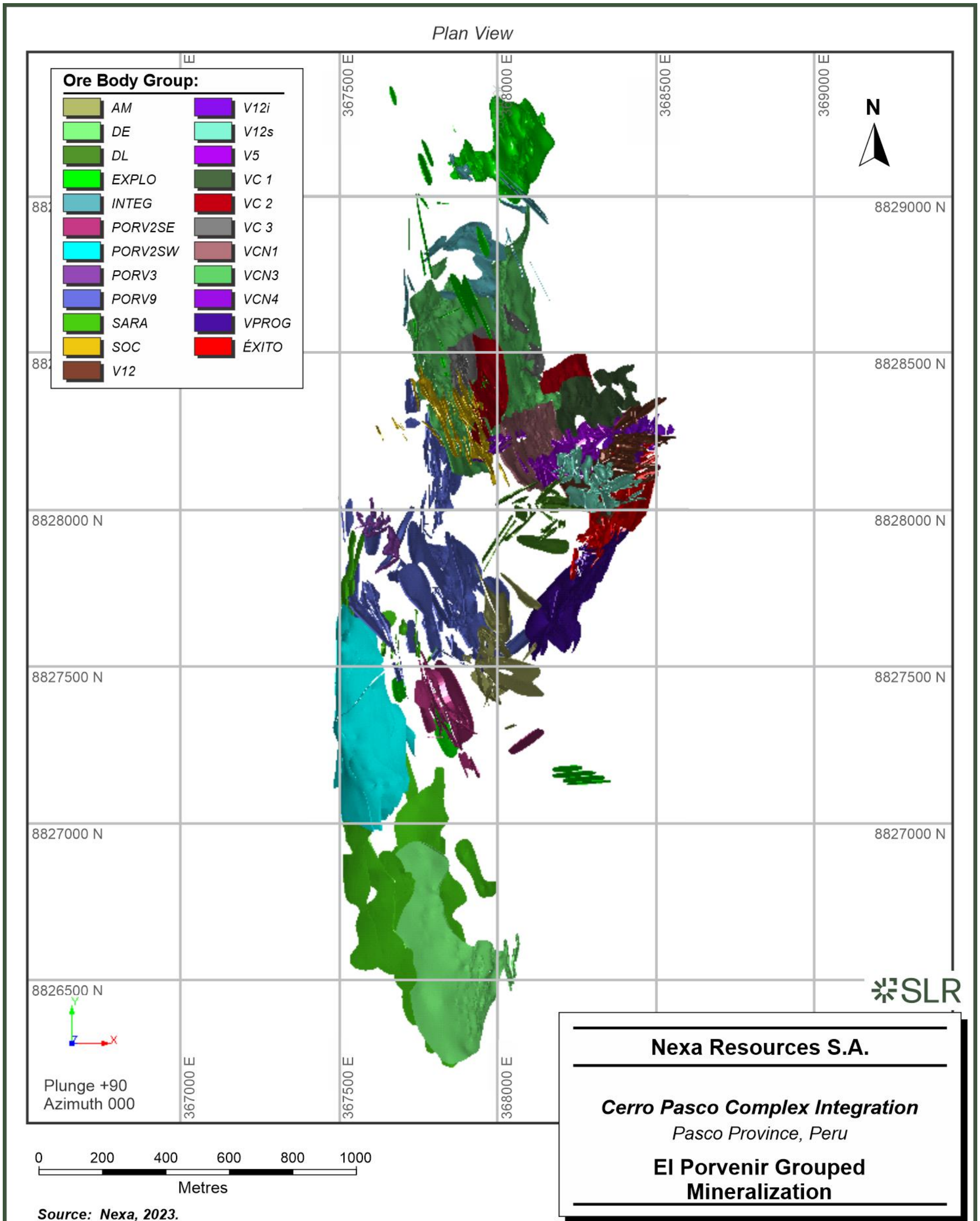
Nexa created Zn, Pb and Ag, and Cu estimation domain groups using several geological parameters, which include geological domains (lithological control and mineralization type), and the anisotropy and orientation of the estimation domains. A total of 93 Zn, 96 Pb, 89 Ag, and 88 Cu estimation domain groups were defined, and subsequently used for variography and capping, although estimation was completed within the individual domains.

Figure 11-5: El Porvenir 25 Main Domains



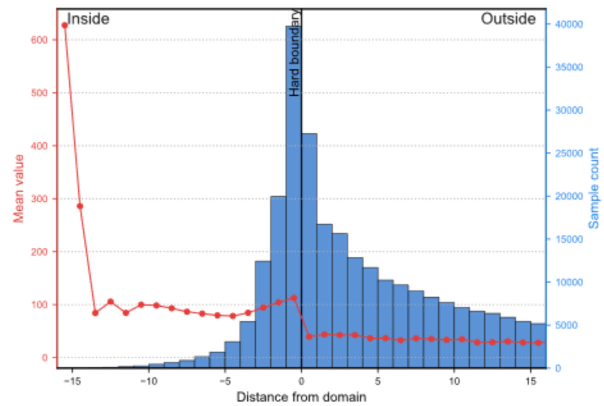
Source: SLR, 2023.

Figure 11-6: El Porvenir Grouped Mineralization

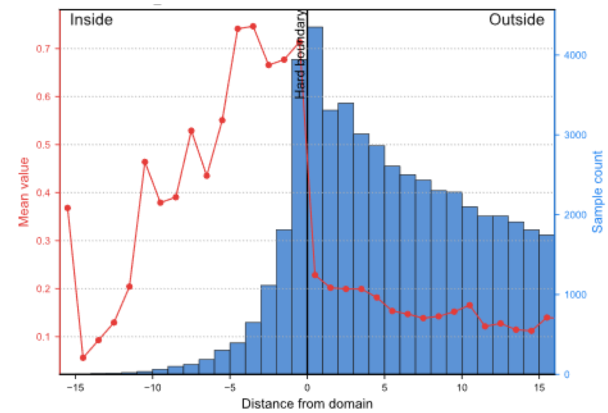


Source: Nexa, 2023.

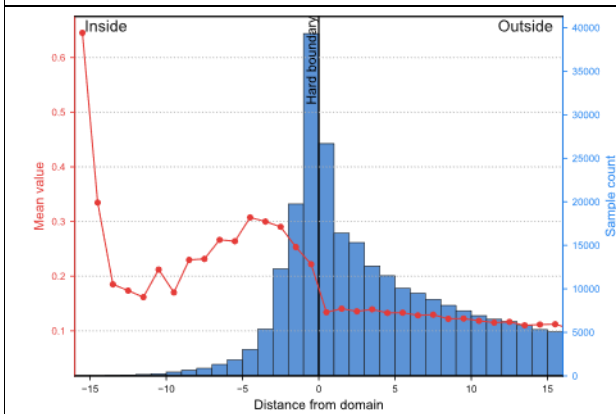
Figure 11-7: El Porvenir Underground Mineralization Contact Analysis



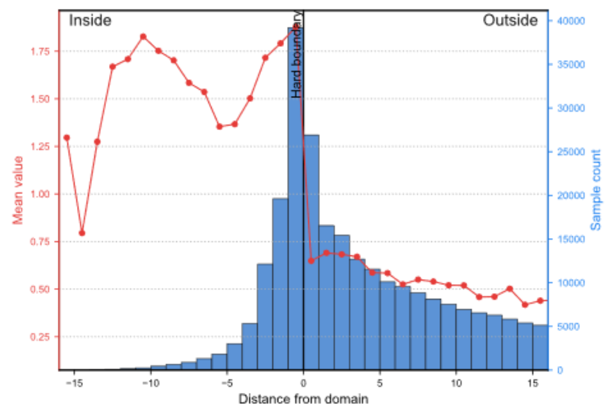
e) Ag



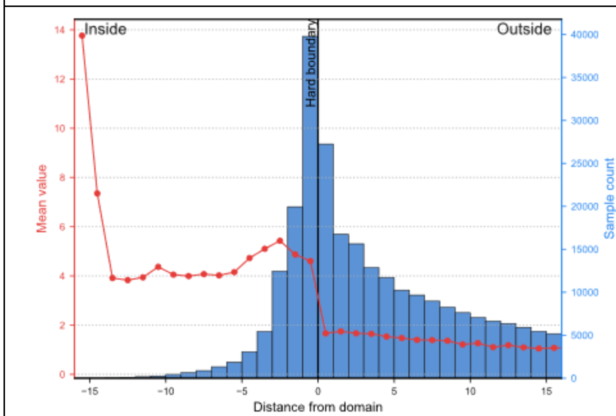
f) Au



g) Cu



h) Pb



i) Zn

11.4.3 Resource Assays

The database used for generating the mineralization wireframes consists of both drill holes and channel samples. For the exploratory data analysis (EDA) process, the database is exported from Leapfrog Geo and imported into Datamine Studio software. Non-sampled intervals are substituted by the half of the detection limits of the chemical elements. Univariate and bivariate statistics are then calculated for the assays, with separate assessments conducted for drill hole and channel samples due to their distinct natures.

For this TRS, Zn, Cu, Ag, and Pb, referred to as the main elements for El Porvenir, will be detailed in tables and figures, along with the 25 grade shells (main domains) that contribute most significantly to the Mineral Resource and Mineral Reserves, approximately 46% of the tonnage.

Table 11-11 presents the length-weighted statistics of the drill holes and channels combined.

Table 11-11: El Porvenir Assay Statistics (Length Weighted) for the Main Domains

Domain	Zn (%) - Assay (length weighted)						Cu (%) - Assay (length weighted)					
	Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
amsk14	97	2.75	4.25	1.55	0.00	21.32	97	0.41	0.55	1.34	0.00	2.91
de2	2,873	2.30	3.45	1.5	0.00	35.00	2,873	0.07	0.18	2.5	0.00	3.44
dl05	434	2.19	3.28	1.5	0.02	28.60	434	0.18	0.19	1.1	0.01	1.45
exiti1	53	3.35	6.89	2.06	0.01	29.96	53	0.92	0.85	0.92	0.01	6.25
exito	2,393	3.89	4.18	1.07	0.00	38.40	2,393	0.36	0.48	1.32	0.00	10.04
exitoa	905	3.37	4.07	1.21	0.00	42.50	905	0.52	0.5	0.95	0.00	5.18
ints26	148	4.41	5.61	1.27	0.00	26.84	148	0.15	0.17	1.15	0.00	0.94
p2sw1	217	0.84	1.22	1.45	0.00	11.41	217	0.03	0.06	2.13	0.00	1.39
p2sw2	249	0.89	1.15	1.29	0.00	9.52	249	0.03	0.12	3.61	0.00	2.24
por9	860	5.73	5.33	0.93	0.00	40.58	860	0.40	0.56	1.42	0.00	13.25
por928	83	4.86	5.59	1.15	0.00	25.60	83	0.25	0.32	1.29	0.00	2.7
por929	85	8.41	7.58	0.9	0.00	30.00	85	0.30	0.21	0.7	0.00	1.00
por95	86	3.10	6.08	1.96	0.00	41.45	86	0.15	0.18	1.19	0.00	1.01
por9p	1,767	4.68	5.83	1.25	0.00	41.95	1,767	0.30	0.28	0.94	0.00	2.23
por9q	383	4.77	7.10	1.49	0.00	42.38	383	0.35	0.59	1.69	0.00	10.55
por9v	88	7.07	7.09	1.00	0.04	31.35	88	0.46	1.12	2.42	0.00	16.55
por9w	47	3.96	5.48	1.38	0.13	24.00	47	0.31	0.31	0.99	0.01	1.30
prog	6,176	5.24	6.37	1.22	0.00	43.94	6,176	0.4	0.54	1.35	0.00	17.23
sara2	185	2.11	3.26	1.55	0.01	19.75	185	0.04	0.1	2.43	0.00	1.52
v12i1	2,743	7.41	6.96	0.94	0.00	50.00	2,743	0.27	0.51	1.91	0.00	12.29
v12ne	221	4.31	6.32	1.47	0.00	34.92	221	0.21	0.36	1.69	0.00	5.93

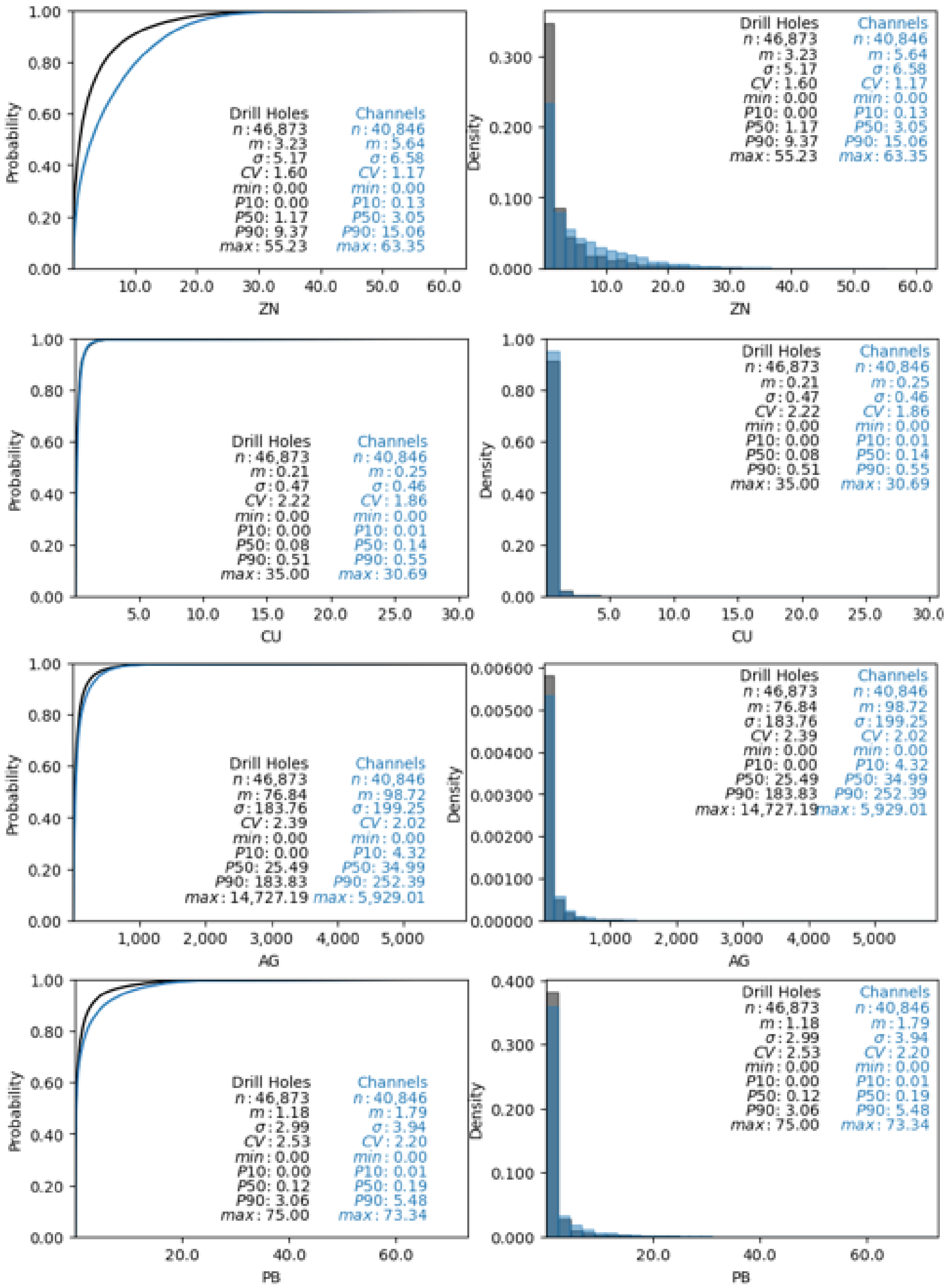
Domain	Zn (%) - Assay (length weighted)						Cu (%) - Assay (length weighted)					
	Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
v5i	3,317	7.15	6.60	0.92	0.00	63.35	3,317	0.40	0.46	1.15	0.00	13.12
vcarmen	1,368	5.53	7.81	1.41	0.00	44.47	1,368	0.09	0.14	1.63	0.00	1.90
vcn31	3,553	4.25	5.15	1.21	0.00	39.31	3,553	0.24	0.35	1.47	0.00	14.81
vcn3ei1	2,360	6.92	7.26	1.05	0.00	47.61	2,360	0.26	0.33	1.27	0.00	4.53

Domain	Ag (g/t) - Assay (length weighted)						Pb (%) - Assay (length weighted)					
	Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
amsk14	97	72.87	108.42	1.49	0.00	637.00	97	0.22	0.54	2.45	0.00	3.69
de2	2,873	265.22	499.08	1.88	0.00	6,760.00	2,873	3.61	5.18	1.43	0.00	57.66
dl05	434	77.40	103.1	1.33	2.00	1,100.44	434	1.02	2.58	2.52	0.00	24.2
exiti1	53	14.98	11.53	0.77	2.02	74.96	53	0.02	0.05	2.65	0.01	0.52
exito	2,393	75.60	87.9	1.16	0.00	2,032.30	2,393	0.97	2.13	2.21	0.00	31.16
exitoa	905	45.46	70.38	1.55	0.00	939.64	905	0.52	1.84	3.52	0.00	20.98
ints26	148	20.28	40.7	2.01	0.00	284.60	148	0.31	1.08	3.5	0.00	8.25
p2sw1	217	94.57	152.31	1.61	0.00	3,484.21	217	1.54	1.81	1.18	0.00	26.73
p2sw2	249	122.25	322.95	2.64	0.00	4,379.99	249	1.59	2.51	1.58	0.00	42.96
por9	860	22.57	121.86	5.4	0.00	2,715.98	860	0.21	1.32	6.23	0.00	17.17
por928	83	31.33	47.31	1.51	0.00	200.00	83	0.53	1.39	2.61	0.00	7.80
por929	85	64.27	74.78	1.16	0.00	307.92	85	1.29	3.78	2.94	0.00	25.50
por95	86	12.57	42.47	3.38	0.00	368.89	86	0.11	0.64	5.59	0.00	5.79
por9p	1,767	23.86	43.99	1.84	0.00	855.03	1,767	0.28	1.29	4.64	0.00	22.59
por9q	383	19.31	39.48	2.04	0.00	566.39	383	0.21	1.23	5.79	0.00	23.97
por9v	88	78.37	128.96	1.65	2.02	811.18	88	1.50	3.75	2.49	0.01	26.23
por9w	47	54.00	58.23	1.08	1.56	220.21	47	0.70	1.33	1.91	0.01	5.77

Domain	Ag (g/t) - Assay (length weighted)						Pb (%) - Assay (length weighted)					
	Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
prog	6,176	49.19	87.93	1.79	0.00	2,901.95	6,176	0.78	2.56	3.29	0.00	37.60
sara2	185	209.01	377.09	1.8	1.80	5640.00	185	2.50	5.9	2.36	0.02	58.28
v12i1	2,743	43.08	65.28	1.52	0.00	1,100.13	2,743	0.33	1.37	4.18	0.00	36.40
v12ne	221	128.07	150.29	1.17	0.00	786.92	221	2.56	4.58	1.79	0.00	28.09
v5i	3,317	41.64	66.15	1.59	0.00	1,060.63	3,317	0.48	2.39	4.97	0.00	73.34
vcarmen	1,368	258.4	377.57	1.46	0.00	4,965.00	1,368	3.72	5.68	1.53	0.00	36.65
vcn31	3,553	24.70	73.17	2.96	0.00	1,100.75	3,553	0.45	2.16	4.85	0.00	40.80
vcn3ei1	2,360	69.09	126.48	1.83	0.00	2,059.05	2,360	1.43	3.55	2.48	0.00	37.26

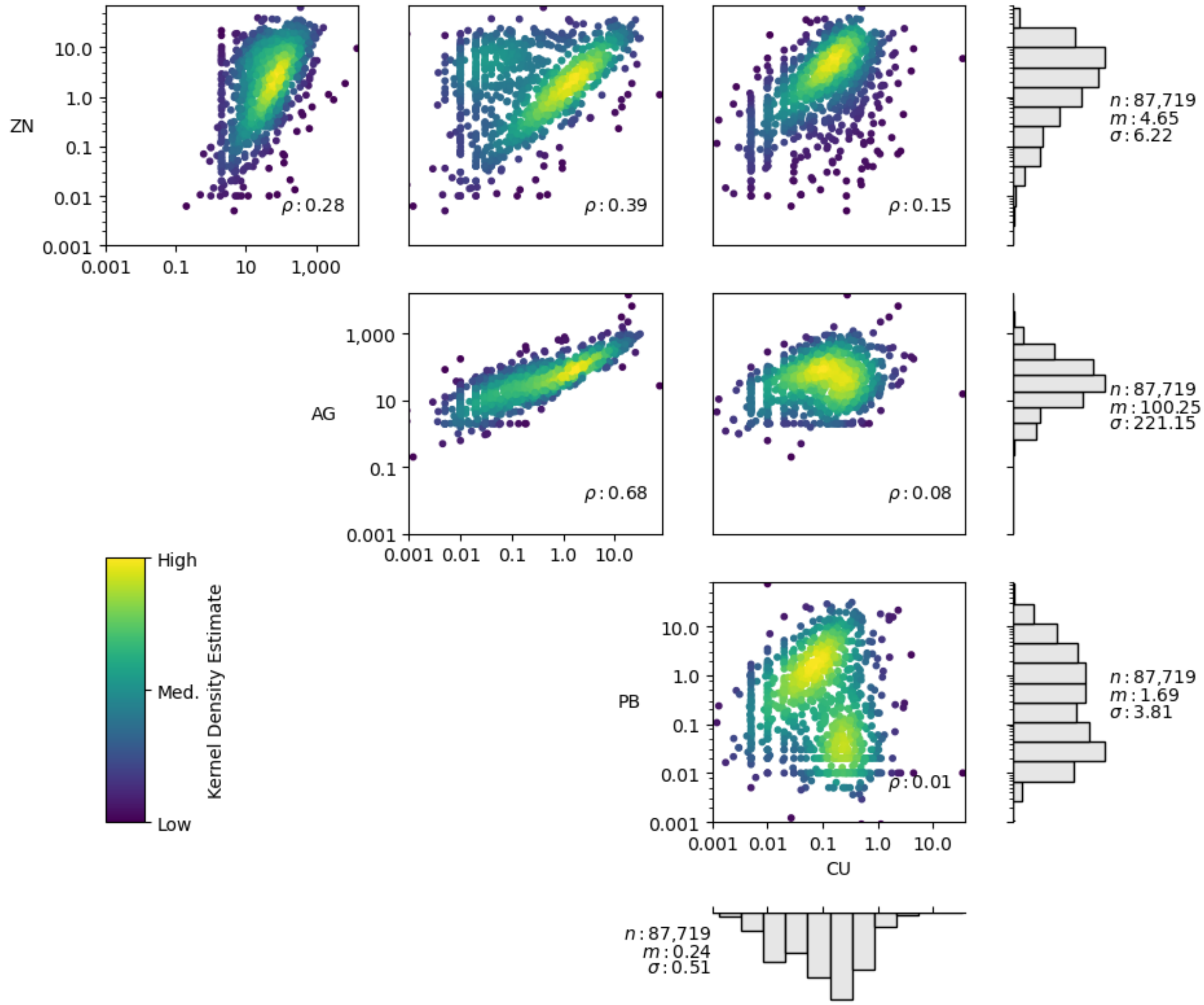
In the El Porvenir mineral deposit, approximately 53% of the samples are derived from drill holes, while 47% originate from channels samples. Statistical differences are noticeable between them, with channel samples exhibiting generally higher grades for the most part of the statistical population. Figure 11-8 illustrates the cumulative distribution functions (CDF) and histograms of the samples within the mineralization wireframes.

Figure 11-8: El Porvenir CDF and Histograms for the Drill Holes and Channels Samples



Given the polymetallic nature of the mineralization, a bivariate statistical analysis was conducted to evaluate the relationships between the variables. Figure 11-9 provides scatter plots for the main elements, alongside their correlation coefficients. Generally, stronger correlations are observed between Zn and Pb, as well as between Ag and Pb. Correlation between the remaining elements range from weak to negligible.

Figure 11-9: El Porvenir Scatter Plots for Zn, Ag, Pb, and Cu



11.4.4 Treatment of High Grade Assays

The main elements have a positively skewed distribution, as illustrated in Figure 11-4. Within these distributions, anomalous and extreme high grade values may be present, potentially impacting estimation accuracy and leading to a "blowing out" effect, smearing the high grades more than their actual continuity.

To address this issue and mitigate potential impacts, Nexa staff conducted a comprehensive assessment of the raw statistical distributions for the grouped mineralization domains. Probability plots and histograms were employed to identify anomalous values, particularly in the upper percentiles of the distribution. This evaluation was carried out separately for drill holes and channel samples. Any identified outliers were capped to ensure their influence on trend analysis and resource estimation was controlled.

Additionally, a second-level capping approach was implemented to further mitigate the influence of these values during the final estimation pass. Table 11-12 provides details of the top-cuts applied to both drill holes and channels for the main domains, as well as the second-level capping criteria utilized.

Table 11-12: El Porvenir Drill Hole (DDH), Channel (CHN), and the Second Level Top-Cut Values for the Main Elements

Domain	Zn DDH	Zn CHN	Zn 2nd Level	Cu DDH	Cu CHN	Cu CHN 2nd Level	Ag DDH	Ag CHN	Ag CHN 2nd Level	Pb DDH	Pb CHN	Pb CHN 2nd Level
amsk14	21.45	5.61	5.61	1.94	0.63	0.47	397.80	1,156.00	552.90	2.89	0.22	0.21
de2	15.95	16.64	10.44	0.56	1.24	0.33	1,196.00	2,030.00	1,396.00	16.20	18.46	16.39
dl05	19.93	12.36	9.50	1.01	0.59	0.43	839.00	355.40	273.40	15.04	6.58	3.82
exiti1	19.74	7.56	6.98	3.25	1.79	1.77	125.70	45.83	36.25	0.59	1.31	0.14
exito	23.40	18.98	14.52	2.11	1.57	1.13	552.40	342.60	280.70	12.86	11.63	7.00
exitoa	23.40	18.98	14.52	2.09	1.72	1.52	275.60	93.78	93.78	9.69	8.31	3.38
ints26	17.98	7.81	7.81	1.41	0.49	0.48	127.90	19.74	18.90	4.34	0.09	0.08
p2sw1	6.01	2.27	2.27	0.42	0.41	0.27	613.80	630.30	630.30	15.56	8.46	6.06
p2sw2	6.01	2.27	2.27	0.42	0.41	0.27	613.80	630.30	630.30	15.56	8.46	6.06
por9	33.61	24.32	17.26	3.63	1.24	0.87	806.60	145.10	47.07	10.98	6.30	0.21
por928	33.61	24.32	17.26	3.63	1.24	0.87	444.50	183.70	168.00	10.98	6.30	0.21
por929	33.61	24.32	17.26	3.63	1.24	0.87	444.50	183.70	168.00	23.61	14.24	7.85
por95	20.03	---	---	1.03	---	---	214.90	---	---	1.73	---	---
por9p	29.98	30.03	15.81	2.67	1.38	0.74	509.70	172.20	94.13	14.83	12.92	0.90
por9q	29.98	30.03	15.81	2.67	1.38	0.74	509.70	172.20	94.13	14.83	12.92	0.90
por9v	29.98	30.03	15.81	2.67	1.38	0.74	509.70	172.20	94.13	4.92	2.73	2.73
por9w	23.68	27.07	20.40	3.31	2.72	1.09	312.60	747.70	260.80	14.26	23.12	5.58
prog	23.68	27.07	20.40	3.31	2.72	1.09	312.60	747.70	260.80	14.26	23.12	5.58
sara2	15.95	16.64	10.44	0.56	1.24	0.33	1,196.00	2,030.00	1,396.00	16.20	18.46	16.39
v12i1	34.63	29.67	20.90	2.10	1.60	0.58	91.23	275.50	155.10	1.38	9.50	1.57
v12ne	23.29	21.42	18.00	1.21	0.61	0.58	841.00	483.20	435.40	16.14	12.12	11.00
v5i	20.76	30.22	19.17	1.64	2.09	0.98	72.65	320.80	159.50	5.88	33.59	2.38
vcarmen	35.82	29.57	17.16	1.07	0.52	0.26	1,533.00	939.10	718.30	25.57	24.70	11.97
vcn31	35.82	29.57	17.16	3.53	4.86	0.75	1,333.00	1,050.00	356.00	18.35	17.77	6.59
vcn3ei1	30.01	30.49	24.14	3.53	4.86	0.75	1,333.00	1,050.00	356.00	25.57	24.70	11.97

Table 11-13 shows the statistics for the capped samples, as well as the metal loss for each of the main mineralization domains.

Table 11-13: El Porvenir Capped Statistics for the Main Elements

Domain	Zn (%) capped - Length weighted									Cu (%) capped - Length weighted								
	Count	Mean	StdDev	CV	Min	Max	Uncapped Mean	Uncapped Max	Metal Loss	Count	Mean	StdDev	CV	Min	Max	Uncapped Mean	Uncapped Max	Metal Loss
amsk14	97	2.75	4.25	1.55	0.00	21.32	2.75	21.32	0.00%	97	0.39	0.47	1.21	0.00	1.94	0.41	2.91	-4.88%
de2	2,873	2.24	3.16	1.41	0.00	16.64	2.30	35.00	-2.61%	2,873	0.07	0.14	2.09	0.00	1.24	0.07	3.44	0.00%
dl05	434	2.13	2.93	1.37	0.02	19.93	2.19	28.60	-2.74%	434	0.17	0.16	0.93	0.01	1.01	0.18	1.45	-5.56%
exiti1	53	3.02	5.84	1.94	0.01	19.74	3.35	29.96	-9.85%	53	0.89	0.68	0.76	0.01	3.25	0.92	6.25	-3.26%
exito	2,393	3.86	4.03	1.04	0.00	23.40	3.89	38.40	-0.77%	2,393	0.34	0.36	1.04	0.00	2.11	0.36	10.04	-5.56%
exitoa	905	3.35	3.96	1.18	0.00	23.40	3.37	42.50	-0.59%	905	0.51	0.43	0.84	0.00	2.09	0.52	5.18	-1.92%
ints26	148	4.06	4.81	1.18	0.00	17.98	4.41	26.84	-7.94%	148	0.15	0.17	1.14	0.00	0.94	0.15	0.94	0.00%
p2sw1	217	0.81	1.02	1.26	0.00	6.01	0.84	11.41	-3.57%	217	0.03	0.05	1.74	0.00	0.41	0.03	1.39	0.00%
p2sw2	249	0.89	1.11	1.25	0.00	6.01	0.89	9.52	0.00%	249	0.03	0.05	1.97	0.00	0.42	0.03	2.24	0.00%
por9	860	5.71	5.23	0.92	0.00	33.61	5.73	40.58	-0.35%	860	0.38	0.41	1.07	0.00	3.63	0.40	13.25	-5.00%
por928	83	4.86	5.59	1.15	0.00	25.60	4.86	25.60	0.00%	83	0.25	0.32	1.29	0.00	2.70	0.25	2.70	0.00%
por929	85	8.41	7.58	0.90	0.00	30.00	8.41	30.00	0.00%	85	0.30	0.21	0.70	0.00	1.00	0.30	1.00	0.00%
por95	86	2.85	4.84	1.70	0.00	20.03	3.10	41.45	-8.06%	86	0.15	0.18	1.19	0.00	1.01	0.15	1.01	0.00%
por9p	1,767	4.65	5.69	1.22	0.00	30.03	4.68	41.95	-0.64%	1,767	0.29	0.27	0.91	0.00	2.10	0.30	2.23	-3.33%
por9q	383	4.71	6.85	1.45	0.00	29.98	4.77	42.38	-1.26%	383	0.33	0.46	1.38	0.00	2.67	0.35	10.55	-5.71%
por9v	88	7.04	7.01	1.00	0.04	29.98	7.07	31.35	-0.42%	88	0.39	0.53	1.36	0.00	2.67	0.46	16.55	-15.22%
por9w	47	3.96	5.46	1.38	0.13	23.68	3.96	24.00	0.00%	47	0.31	0.31	0.99	0.01	1.30	0.31	1.30	0.00%
prog	6,176	5.20	6.23	1.20	0.00	27.07	5.24	43.94	-0.76%	6,176	0.39	0.42	1.08	0.00	3.31	0.40	17.23	-2.50%
sara2	185	2.08	3.13	1.50	0.01	15.95	2.11	19.75	-1.42%	185	0.04	0.06	1.64	0.00	0.56	0.04	1.52	0.00%
v12i1	2,743	7.38	6.85	0.93	0.00	34.63	7.41	50.00	-0.40%	2,743	0.24	0.29	1.20	0.00	2.10	0.27	12.29	-11.11%
v12ne	221	4.18	5.82	1.39	0.00	23.29	4.31	34.92	-3.02%	221	0.20	0.24	1.21	0.00	1.21	0.21	5.93	-4.76%
v5i	3,317	7.10	6.38	0.90	0.00	30.22	7.15	63.35	-0.70%	3,317	0.39	0.33	0.86	0.00	2.09	0.40	13.12	-2.50%
vcarmen	1,368	5.52	7.75	1.40	0.00	35.82	5.53	44.47	-0.18%	1,368	0.08	0.12	1.44	0.00	1.07	0.09	1.90	-11.11%
vcn31	3,553	4.25	5.14	1.21	0.00	35.82	4.25	39.31	0.00%	3,553	0.23	0.23	1.00	0.00	3.53	0.24	14.81	-4.17%

Domain	Zn (%) capped - Length weighted									Cu (%) capped - Length weighted								
	Count	Mean	StdDev	CV	Min	Max	Uncapped Mean	Uncapped Max	Metal Loss	Count	Mean	StdDev	CV	Min	Max	Uncapped Mean	Uncapped Max	Metal Loss
vcn3ei1	2,360	6.89	7.12	1.03	0.00	30.49	6.92	47.61	-0.43%	2,360	0.26	0.33	1.27	0.00	4.53	0.26	4.53	0.00%

Domain	Ag (g/t) capped - Length weighted									Pb (%) capped - Length weighted								
	Count	Mean	StdDev	CV	Min	Max	Uncapped Mean	Uncapped Max	Metal Loss	Count	Mean	StdDev	CV	Min	Max	Uncapped Mean	Uncapped Maximum	Metal Loss
amsk14	97	70.02	96.79	1.38	0.00	397.80	72.87	637.00	-3.91%	97	0.21	0.49	2.32	0.00	2.89	0.22	3.69	-4.55%
de2	2,873	245.14	376.95	1.54	0.00	2,030.00	265.22	6,760.00	-7.57%	2,873	3.40	4.20	1.24	0.00	18.46	3.61	57.66	-5.82%
dl05	434	76.22	96.10	1.26	2.00	839.00	77.40	1,100.44	-1.52%	434	0.95	2.13	2.25	0.00	15.04	1.02	24.20	-6.86%
exiti1	53	14.98	11.53	0.77	2.02	74.96	14.98	74.96	0.00%	53	0.02	0.05	2.65	0.01	0.52	0.02	0.52	0.00%
exito	2,393	73.52	72.15	0.98	0.00	552.40	75.60	2,032.30	-2.75%	2,393	0.93	1.86	2.00	0.00	12.86	0.97	31.16	-4.12%
exitoa	905	41.97	53.73	1.28	0.00	275.60	45.46	939.64	-7.68%	905	0.47	1.43	3.03	0.00	9.69	0.52	20.98	-9.62%
ints26	148	17.84	29.68	1.66	0.00	127.90	20.28	284.60	-12.03%	148	0.27	0.85	3.18	0.00	4.34	0.31	8.25	-12.90%
p2sw1	217	89.59	105.52	1.18	0.00	630.30	94.57	3,484.21	-5.27%	217	1.53	1.70	1.11	0.00	12.21	1.54	26.73	-0.65%
p2sw2	249	95.75	126.31	1.32	0.00	630.30	122.25	4,379.99	-21.68%	249	1.54	1.93	1.25	0.00	15.56	1.59	42.96	-3.14%
por9	860	18.03	50.78	2.82	0.00	806.60	22.57	2,715.98	-20.12%	860	0.17	0.91	5.34	0.00	10.98	0.21	17.17	-19.05%
por928	83	31.33	47.31	1.51	0.00	200.00	31.33	200.00	0.00%	83	0.53	1.39	2.61	0.00	7.80	0.53	7.80	0.00%
por929	85	56.97	55.93	0.98	0.00	183.70	64.27	307.92	-11.36%	85	1.08	2.61	2.41	0.00	14.24	1.29	25.50	-16.28%
por95	86	10.86	29.23	2.69	0.00	214.90	12.57	368.89	-13.60%	86	0.07	0.27	4.08	0.00	1.73	0.11	5.79	-36.36%
por9p	1,767	22.26	31.84	1.43	0.00	315.39	23.86	855.03	-6.71%	1,767	0.26	1.10	4.18	0.00	14.01	0.28	22.59	-7.14%
por9q	383	19.25	38.68	2.01	0.00	509.70	19.31	566.39	-0.31%	383	0.20	1.03	5.16	0.00	14.83	0.21	23.97	-4.76%
por9v	88	72.88	102.45	1.41	2.02	509.70	78.37	811.18	-7.01%	88	0.93	1.55	1.67	0.01	4.92	1.50	26.23	-38.00%
por9w	47	54.00	58.23	1.08	1.56	220.21	54.00	220.21	0.00%	47	0.70	1.33	1.91	0.01	5.77	0.70	5.77	0.00%
prog	6,176	48.50	77.60	1.60	0.00	747.70	49.19	2,901.95	-1.40%	6,176	0.76	2.42	3.17	0.00	23.12	0.78	37.60	-2.56%
sara2	185	190.24	263.89	1.39	1.80	1,196.00	209.01	5,640.00	-8.98%	185	2.08	3.28	1.58	0.02	16.20	2.50	58.28	-16.80%
v12i1	2,743	41.00	51.55	1.26	0.00	275.50	43.08	1,100.13	-4.83%	2,743	0.30	1.00	3.33	0.00	9.50	0.33	36.40	-9.09%
v12ne	221	128.07	150.29	1.17	0.00	786.92	128.07	786.92	0.00%	221	2.39	3.95	1.65	0.00	16.14	2.56	28.09	-6.64%

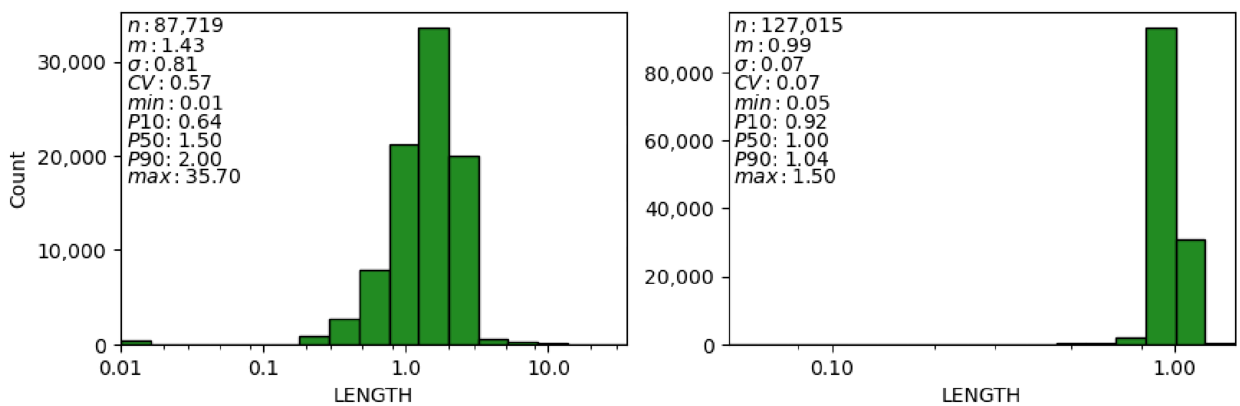
Domain	Ag (g/t) capped - Length weighted									Pb (%) capped - Length weighted								
	Count	Mean	StdDev	CV	Min	Max	Uncapped Mean	Uncapped Max	Metal Loss	Count	Mean	StdDev	CV	Min	Max	Uncapped Mean	Uncapped Maximum	Metal Loss
v5i	3,317	39.74	53.76	1.35	0.00	320.80	41.64	1,060.63	-4.56%	3,317	0.46	1.86	4.06	0.00	33.59	0.48	73.34	-4.17%
vcarmen	1,368	242.67	305.39	1.26	0.00	1,533.00	258.40	4,965.00	-6.09%	1,368	3.67	5.49	1.49	0.00	25.57	3.72	36.65	-1.34%
vcn31	3,553	24.70	73.17	2.96	0.00	1,100.75	24.70	1,100.75	0.00%	3,553	0.43	1.95	4.56	0.00	18.35	0.45	40.80	-4.44%
vcn3ei1	2,360	68.43	118.48	1.73	0.00	1,333.00	69.09	2,059.05	-0.96%	2,360	1.41	3.44	2.43	0.00	25.57	1.43	37.26	-1.40%

11.4.5 Compositing

The average sample length within the mineralized domains is 1.43 m, with most occurrences around 1.5 m. Nexa opted to composite the capped assays downhole to 1.0 m lengths, which corresponds to half of the parent block size height for the deposit. The remaining end lengths were then added to the previous interval. Composites were created within the mineralization domain wireframes and were flagged accordingly.

Figure 11-10 showcases the length histograms of both the raw and composited samples for reference.

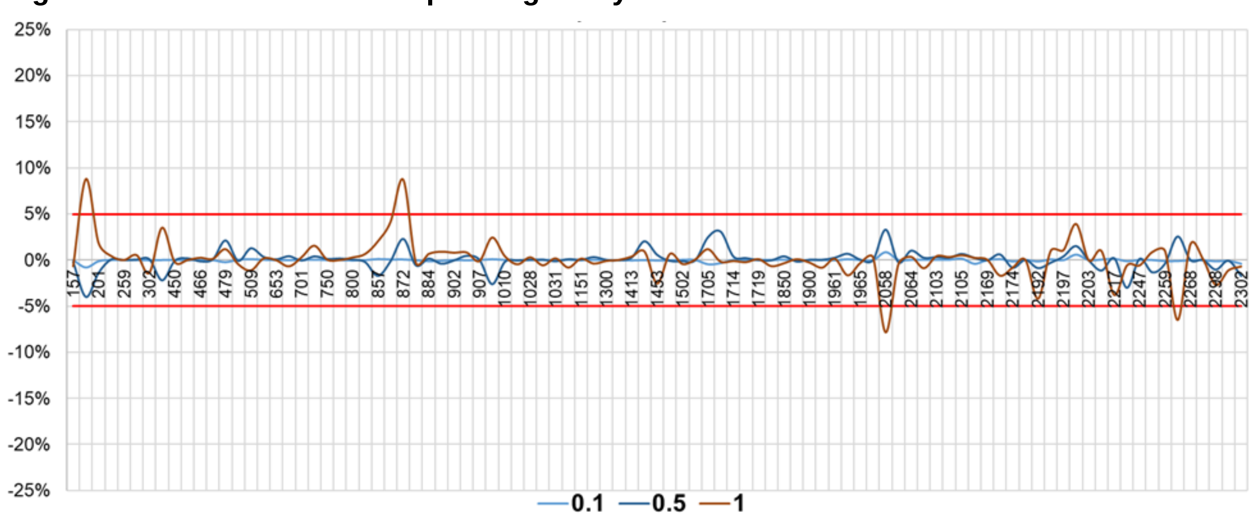
Figure 11-10: El Porvenir Raw (on the left) and Composited (on the right) Histograms



Unsampled core intervals were assigned grades equal to half of the detection limit value for each of the elements.

The composite length was selected based on analysis of three composite lengths (0.1 m, 0.5 m, and 1.0 m). Figure 11-11 illustrates a comparison of the mean Zn relative error between length-weighted raw assay mean versus composite mean by mineralization domain for the different composite lengths.

Figure 11-11: El Porvenir Compositing Analysis



Source: Nexa, 2023

Table 11-14 shows the summary length-weighted statistics for the capped variables for the main domains.

Table 11-14: Capped and Composited Statistics

Domain	Zn (%) Capped - Length weighted						Cu (%) Capped - Length weighted					
	Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
amsk14	121	2.75	3.87	1.41	0.00	18.00	121	0.39	0.44	1.13	0.00	1.89
de2	3,721	2.24	2.95	1.32	0.00	16.64	3,721	0.07	0.13	1.93	0.00	1.24
dl05	502	2.13	2.65	1.24	0.02	19.93	502	0.17	0.15	0.86	0.01	1.01
exiti1	74	3.02	5.49	1.82	0.02	19.74	74	0.89	0.63	0.71	0.01	2.67
exito	3,425	3.86	3.73	0.97	0.00	23.40	3,425	0.34	0.33	0.97	0.00	2.11
exitoa	1,165	3.35	3.59	1.07	0.00	20.85	1,165	0.51	0.40	0.79	0.00	2.09
ints26	180	4.06	4.33	1.07	0.00	17.98	180	0.15	0.15	1.05	0.00	0.76
p2sw1	284	0.81	0.95	1.17	0.00	6.01	284	0.03	0.04	1.65	0.00	0.36
p2sw2	334	0.89	1.01	1.14	0.00	5.23	334	0.03	0.05	1.82	0.00	0.41
por9	1,049	5.71	4.79	0.84	0.00	32.60	1,049	0.38	0.37	0.96	0.00	3.63
por928	152	4.86	5.42	1.12	0.00	25.60	152	0.25	0.30	1.20	0.00	2.64
por929	113	8.41	7.19	0.86	0.00	29.98	113	0.30	0.20	0.67	0.00	1.00
por95	101	2.85	4.46	1.56	0.00	19.77	101	0.15	0.16	1.07	0.00	0.97
por9p	2,626	4.65	5.41	1.16	0.00	30.03	2,626	0.29	0.25	0.86	0.00	2.10
por9q	472	4.71	6.20	1.32	0.00	29.98	472	0.33	0.43	1.27	0.00	2.58
por9v	84	7.04	6.12	0.87	0.09	29.98	84	0.39	0.47	1.19	0.00	2.18
por9w	60	3.96	4.72	1.19	0.13	20.84	60	0.31	0.28	0.90	0.01	1.30
prog	10,639	5.20	6.14	1.18	0.00	27.07	10,639	0.39	0.40	1.04	0.00	3.31
sara2	198	2.08	2.87	1.38	0.02	15.95	198	0.04	0.05	1.37	0.00	0.46
v12i1	4,914	7.38	6.71	0.91	0.00	34.63	4,914	0.24	0.28	1.16	0.00	2.10
v12ne	289	4.18	5.22	1.25	0.00	23.29	289	0.20	0.21	1.07	0.00	1.21

Domain	Zn (%) Capped - Length weighted						Cu (%) Capped - Length weighted					
	Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
v5i	6,269	7.10	6.30	0.89	0.00	30.22	6,269	0.39	0.33	0.85	0.00	2.09
vcarmen	1,735	5.52	7.05	1.28	0.00	32.07	1,735	0.08	0.11	1.30	0.00	1.07
vcn31	4,613	4.25	4.74	1.12	0.00	34.80	4,613	0.23	0.22	0.95	0.00	3.53
vcn3ei1	3,693	6.89	6.78	0.98	0.00	30.49	3,693	0.26	0.32	1.21	0.00	4.53

Domain	Ag (g/t) Capped - Length weighted						Pb (%) Capped - Length-weighted					
	Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
amsk14	121	70.02	90.15	1.29	0.10	397.8	121	0.21	0.44	2.11	0.00	2.89
de2	3,721	245.14	351.46	1.43	0.00	2030	3,721	3.40	3.91	1.15	0.00	18.46
dl05	502	76.22	82.59	1.08	2.00	674.19	502	0.95	1.89	2.00	0.00	15.04
exiti1	74	14.98	10.51	0.70	2.02	60.28	74	0.02	0.04	2.26	0.01	0.40
exito	3,425	73.52	66.56	0.91	0.00	501.51	3,425	0.93	1.73	1.86	0.00	12.86
exitoa	1,165	41.97	50.98	1.21	0.00	275.6	1,165	0.47	1.34	2.85	0.00	9.69
ints26	180	17.84	28.97	1.62	0.00	127.9	180	0.27	0.82	3.07	0.00	4.34
p2sw1	284	89.59	98.38	1.10	0.31	630.3	284	1.53	1.53	1.00	0.00	12.11
p2sw2	334	95.75	118.45	1.24	0.20	630.3	334	1.54	1.71	1.11	0.00	13.03
por9	1,049	18.03	44.22	2.45	0.00	806.6	1,049	0.17	0.80	4.66	0.00	10.98
por928	152	31.33	46.19	1.47	0.00	200	152	0.53	1.35	2.53	0.00	7.80
por929	113	56.97	55.30	0.97	0.00	183.7	113	1.08	2.60	2.40	0.00	14.24
por95	101	10.86	25.72	2.37	0.00	214.9	101	0.07	0.24	3.53	0.00	1.73
por9p	2,626	22.26	30.57	1.37	0.00	218.66	2,626	0.26	1.06	4.02	0.00	12.99
por9q	472	19.25	34.00	1.77	0.00	283.35	472	0.20	0.95	4.71	0.00	14.83
por9v	84	72.88	85.48	1.17	2.02	509.7	84	0.93	1.39	1.50	0.01	4.92
por9w	60	54.00	54.47	1.01	1.92	220.21	60	0.70	1.23	1.77	0.01	5.77

Domain	Ag (g/t) Capped - Length weighted						Pb (%) Capped - Length-weighted					
	Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
prog	10,639	48.50	76.52	1.58	0.00	747.7	10,639	0.76	2.38	3.12	0.00	23.12
sara2	198	190.24	234.10	1.23	7.40	1196	198	2.08	3.01	1.45	0.02	16.20
v12i1	4,914	41.00	51.30	1.25	0.00	275.5	4,914	0.30	1.00	3.31	0.00	9.50
v12ne	289	128.07	135.05	1.05	0.00	786.92	289	2.39	3.60	1.51	0.00	16.14
v5i	6,269	39.74	53.51	1.35	0.00	320.8	6,269	0.46	1.85	4.05	0.00	33.59
vcarmen	1,735	242.67	273.23	1.13	0.00	1,533	1,735	3.67	4.94	1.35	0.00	25.57
vcn31	4,613	24.70	69.09	2.80	0.00	1,100.75	4,613	0.43	1.82	4.28	0.00	18.35
vcn3ei1	3,693	68.43	113.02	1.65	0.00	1,050	3,693	1.41	3.28	2.32	0.00	24.70

11.4.6 Trend Analysis

11.4.6.1 Variography

Nexa staff generated downhole and directional variograms for each domain utilizing the one-metre composites for each variable. These variograms served to improve the understanding and quantification of spatial grade variability within the mineralization domains. Variograms were standardized and modelled using three spherical structures and served as a guide when selecting search ellipse ranges. **Figure** 11**-**12 illustrates the normal-score variograms for the "de2" domain.

Figure 11-12: Downhole and Directional Zn Experimental Variograms and Models for "de2" Domain

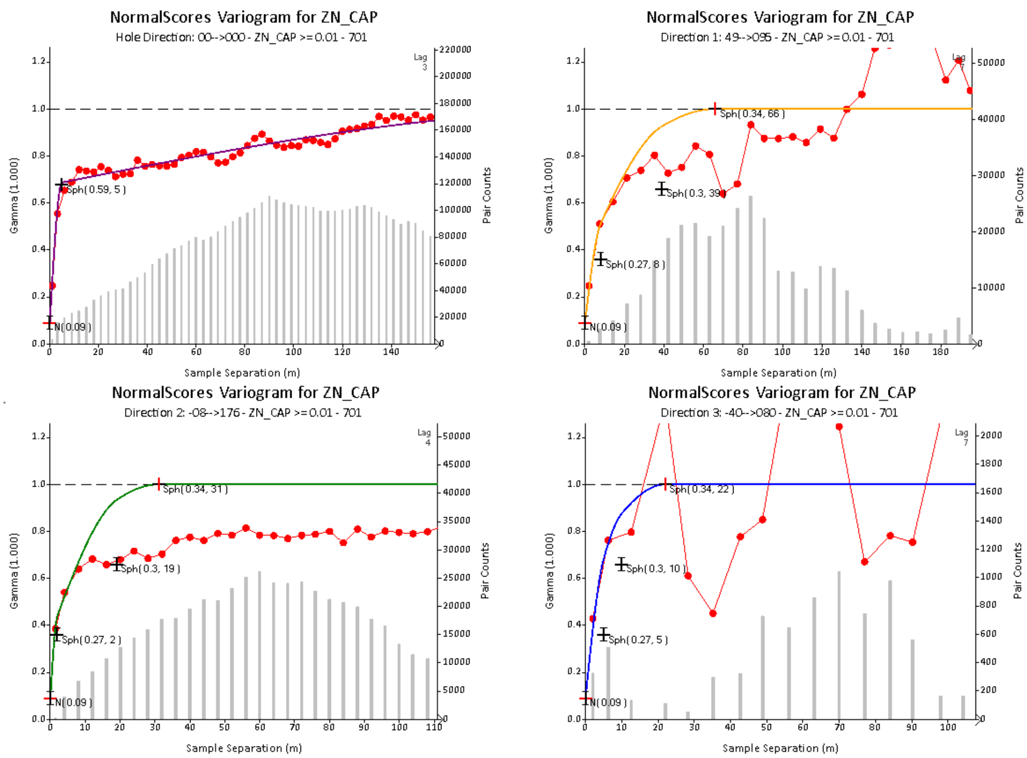


Table 11-15 presents the back-transformed variogram parameters for Zn corresponding to the 25 largest domain tonnage contributors to the Mineral Resource.

Table 11-15: El Porvenir Variogram Parameters for the Main Domains (Back-Transformed)

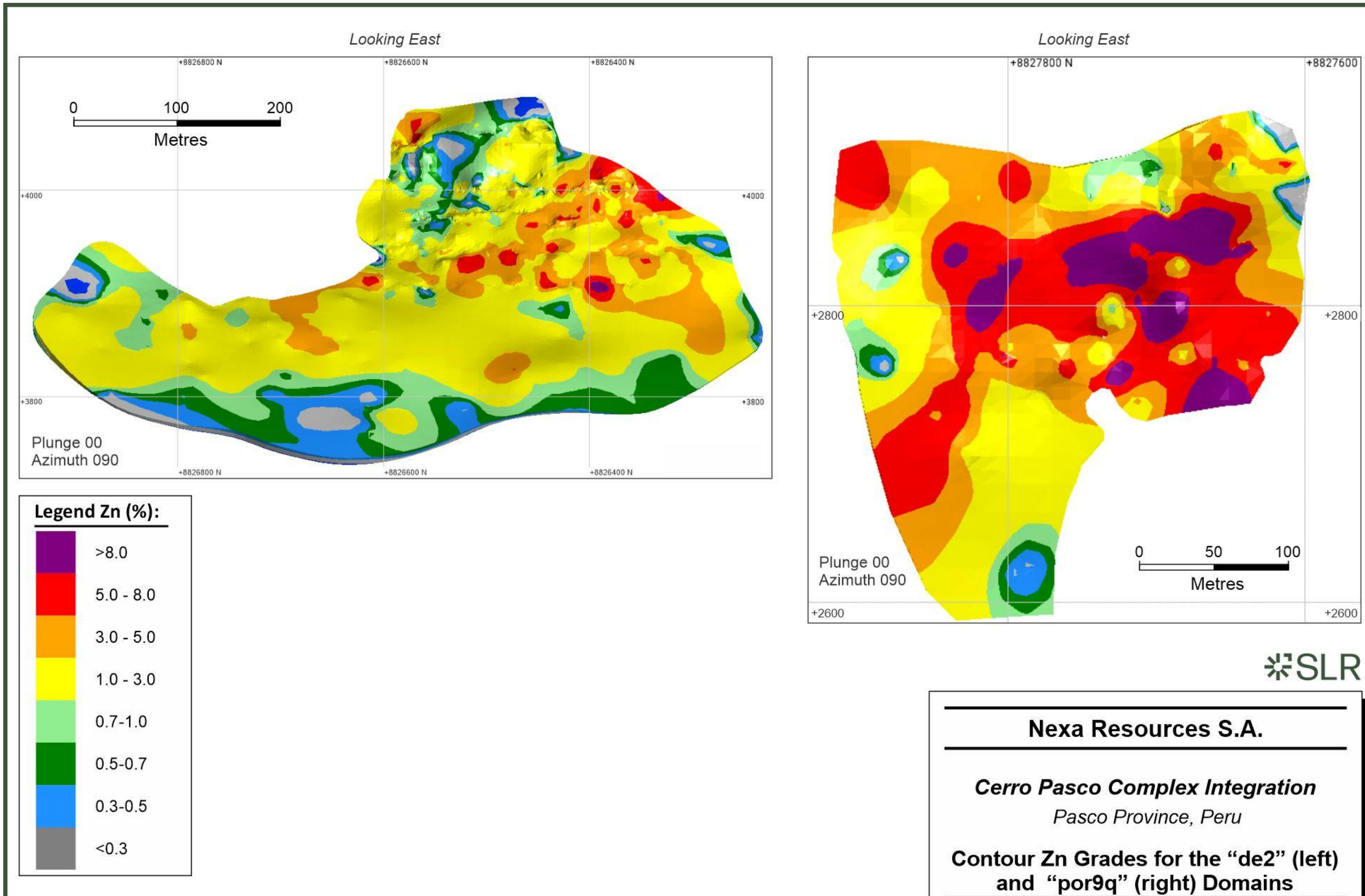
Domain	Datamine Rotation			Datamine Axis			Nugget Effect	Structure 1				Structure 2				Structure 3		
	VANGLE1	VANGLE2	VANGLE3	VAXIS1	VAXIS2	VAXIS3		ST1PAR1	ST1PAR2	ST1PAR3	C1	ST2PAR1	ST2PAR2	ST2PAR3	C2	ST3PAR1	ST3PAR2	ST3PAR3
amsk14	-115.506	67.731	-62.727	3	2	1	0.271	13	5	5	0.57	24	14	8	0.056	30	20	12
de2	5.34	48.974	168.308	3	2	1	0.118	8	2	5	0.337	39	19	10	0.297	66	31	22
dl05	146.781	62.009	-43.219	3	2	1	0.182	15	3	6	0.668	26	5	11	0.075	32	12	14
exiti1	-74.561	75.894	-44.561	3	2	1	0.031	16	30	10	0.667	19	32	17	0.164	31	33	18
exito	125.506	67.731	-117.273	3	2	1	0.069	5	4	4	0.506	26	9	16	0.288	37	26	19
exitoa	125.506	67.731	-117.273	3	2	1	0.069	5	4	4	0.506	26	9	16	0.288	37	26	19
ints26	139.107	48.59	139.107	3	2	1	0.048	9	15	3	0.579	27	21	9	0.183	34	26	11
p2sw1	-77.24	33.826	-127.005	3	2	1	0.249	10	14	8	0.362	25	20	14	0.199	45	21	18
p2sw2	-77.24	33.826	-127.005	3	2	1	0.249	10	14	8	0.362	25	20	14	0.199	45	21	18
por9	-106.74	58.525	-70.575	3	2	1	0.124	6	6	6	0.418	25	12	14	0.24	36	22	22
por928	-106.74	58.525	-70.575	3	2	1	0.124	6	6	6	0.418	25	12	14	0.24	36	22	22
por929	-106.74	58.525	-70.575	3	2	1	0.124	6	6	6	0.418	25	12	14	0.24	36	22	22
por95	105.725	29.499	78.492	3	2	1	0.095	6	4	4	0.449	29	15	7	0.22	35	20	12
por9p	132.727	67.731	25.506	3	2	1	0.145	21	7	10	0.653	44	16	12	0.1	52	23	16
por9q	132.727	67.731	25.506	3	2	1	0.145	21	7	10	0.653	44	16	12	0.1	52	23	16
por9v	132.727	67.731	25.506	3	2	1	0.145	21	7	10	0.653	44	16	12	0.1	52	23	16
por9w	130	70	-90	3	2	1	0.15	2	6	11	0.241	18	23	20	0.24	42	27	21
prog	130	70	-90	3	2	1	0.15	2	6	11	0.241	18	23	20	0.24	42	27	21
sara2	5.34	48.974	168.308	3	2	1	0.118	8	2	5	0.337	39	19	10	0.297	66	31	22
v12i1	104.561	75.894	44.561	3	2	1	0.186	12	8	11	0.549	26	18	18	0.13	37	25	23
v12ne	150	80	90	3	2	1	0.148	5	3	4	0.466	23	8	10	0.234	36	12	12
v5i	135.439	75.894	-44.561	3	2	1	0.152	10	4	6	0.445	28	13	25	0.192	52	40	29
vcarmen	142.727	67.731	-154.494	3	2	1	0.168	2	2	5	0.572	15	9	14	0.157	27	21	16
vcn31	142.727	67.731	-154.494	3	2	1	0.168	2	2	5	0.572	15	9	14	0.157	27	21	16
vcn3ei1	132.727	67.731	25.506	3	2	1	0.124	4	4	6	0.45	26	26	12	0.274	47	33	20

11.4.6.2 Grade Contouring

Grade contours play an important role in aiding the initial detection of preferential grade patterns within mineralization domains. A brief assessment was carried out for the “de2” and “por9q” domains to assess potential grade trends.

Figure 11-13 illustrates the Zn contours for these domains. While the “de2” domain exhibits no clear trend, the “por9q” domain shows a more distinct trend extending northward and down-dip.

Figure 11-13: Contour Zn Grades for the “de2” (left) and “por9q” (right) Domains



Source: SLR, 2023.

11.4.7 Search Strategy and Grade Interpolation Parameters

The final estimated values for Zn, Cu, Ag, and Pb grades at El Porvenir are determined by ID^3. Initially, the estimation process incorporates OK, ID^3, and NN interpolators, followed by an individual domain analysis to select between OK or ID^3 results. This selection is based on domain-specific criteria such as sample quantity, average difference between OK and ID^3 compared to NN, and domain size/volume. Variograms are defined based on estimation groups, allowing even domains with limited samples to be estimated via OK for comparison and validation purposes. Grade variables are not density or length-weighted during estimation.

To capture domain trends, dynamic anisotropy angles are calculated in Studio RM using domain wireframes. The estimation process includes three passes: the first pass utilizes search ellipse radii equivalent to variogram ranges for each variable; the second pass increases the radii by a factor of 1.5 to 2.5; and the third pass employs radii ten times larger than the first pass.

The minimum and maximum sample numbers typically range from eight to 12 for the first pass, six to eight for the second pass, and one to six for the third pass, with a maximum of two samples per drill hole. Minor adjustments are made as needed to improve the final estimation result. Table 11-16 presents the search parameters for Zn in the main estimation domains.

Table 11-16: El Porvenir Search Parameters for the Main Domains

Domain	Search Ellipse (m)			Pass 1	No. Composites		Pass 2	No. Composites		Pass 3	No. Composites		Max Per Hole
	X	Y	Z	S-Vol	Min	Max	S-Vol	Min	Max	S-Vol	Min	Max	
amsk14	25	14	15	1	8	12	2	6	8	10	1	6	2
de2	30	20	10	1	8	12	2	6	8	10	1	6	2
dl05	30	20	10	1	8	12	2	6	8	10	1	6	2
exiti1	30	20	10	1	8	12	2	6	8	10	1	6	2
exito	30	20	10	1	8	12	2	6	8	10	1	6	2
exitoa	30	20	10	1	8	12	2	6	8	10	1	6	2
ints26	26	16	10	1	8	12	2	6	8	10	1	6	2
p2sw1	30	20	10	1	8	12	2	6	8	10	1	6	2
p2sw2	65	18	6	1	6	16	2	6	16	10	1	4	2
por9	30	20	17	1	8	12	2	6	8	10	1	6	2
por928	30	20	10	1	8	12	2	6	8	10	1	6	2
por929	16	12	8	1	8	12	2	6	8	10	1	6	2
por95	30	20	10	1	8	12	2	6	8	10	1	6	2
por9p	30	20	10	1	8	12	2	6	8	10	1	6	2
por9q	30	20	10	1	8	12	2	6	8	10	1	6	2
por9v	30	20	10	1	8	12	2	6	8	10	1	6	2
por9w	30	20	10	1	8	12	2	6	8	10	1	6	2
prog	30	20	20	1	8	12	2	6	8	10	1	6	2
sara2	80	30	10	1	5	16	2	6	12	10	1	4	2

Domain	Search Ellipse (m)			Pass 1	No. Composites		Pass 2	No. Composites		Pass 3	No. Composites		Max Per Hole
	X	Y	Z	S-Vol	Min	Max	S-Vol	Min	Max	S-Vol	Min	Max	
v12i1	30	20	10	1	8	12	2	6	8	10	1	6	2
v12ne	30	20	10	1	8	12	2	6	8	10	1	6	2
v5i	30	20	10	1	8	12	2	6	8	10	1	6	2
vcarmen	30	20	10	1	8	12	2	6	8	10	1	6	2
vcn31	30	20	10	1	8	12	2	6	8	10	1	6	2
vcn3ei1	30	20	10	1	8	12	2	6	8	10	1	6	2

For the samples with missing values, half of the detection limit was used for the estimation, and for the final block model, the influence of theses samples was calculated in the blocks using NN, and those blocks were excluded from the block model.

The QP is of the opinion that the current search parameters are reasonable and provide an acceptable level of local precision for the estimate.

11.4.8 Bulk Density

A total of 2,909 density measurements were taken across the various zones within the El Porvenir deposit. These measurements provide data for 301 of the 522 mineralization domains and the capped values range from 2.69 t/m^3 and 4.34 t/m^3.

Density values are best correlated with the Zn grades, as demonstrated in Figure 11-14.

Figure 11-14: El Porvenir Density Correlation Matrix and Scatter Plots

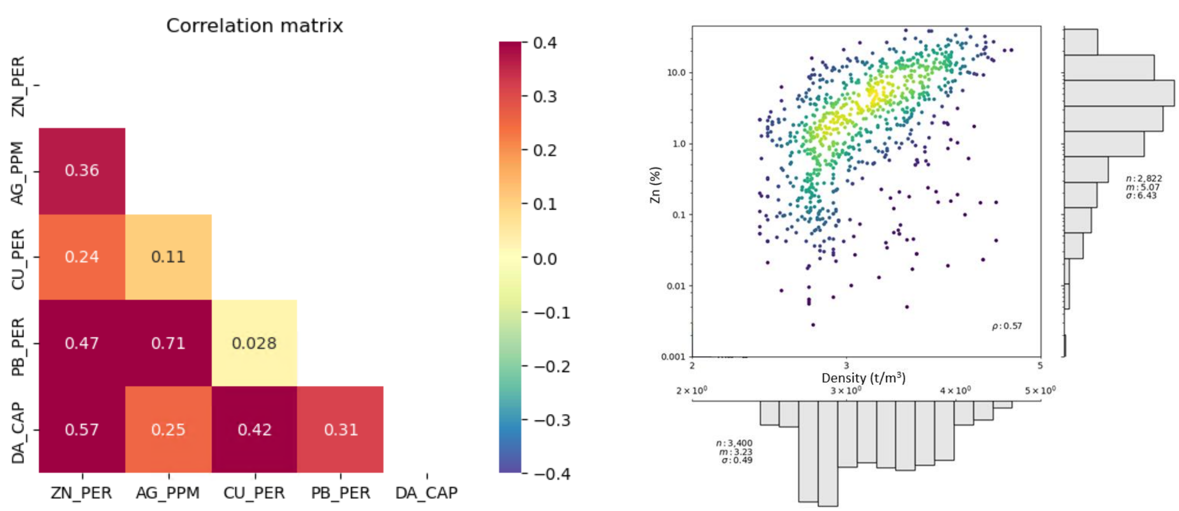
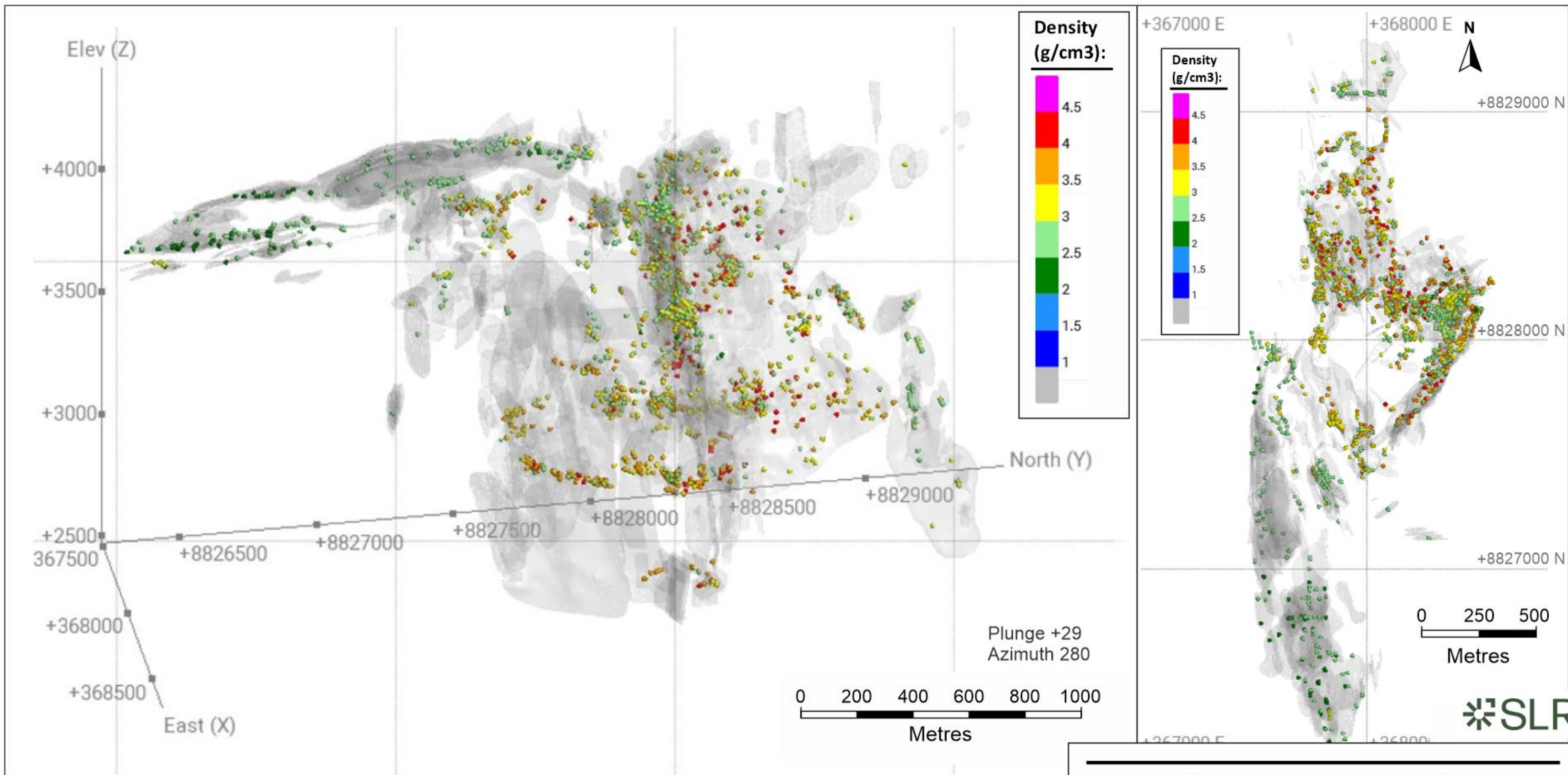


Figure 11-15 shows a plan and isometric view of density composites in relation to the mineralized domains, indicating relatively widespread coverage but with some significant gaps where mineralized bodies are lacking informing density samples, although the largest of these are located outside of the Mineral Resource and Mineral Reserve reporting shapes.

Figure 11-15: El Porvenir Density Composites



Nexa Resources S.A.

Cerro Pasco Complex Integration

Pasco Province, Peru

El Porvenir Density Composites

Source: SLR, 2023.

Considering the main domains, 17 of the 25 have density values, totalling 942 density samples. Figure 11-16 and Table 11-17 show the boxplots and statistics for density values of the 17 main domains with available density samples.

Figure 11-16: El Porvenir Boxplots Showing the Density Values for the Main Domains.

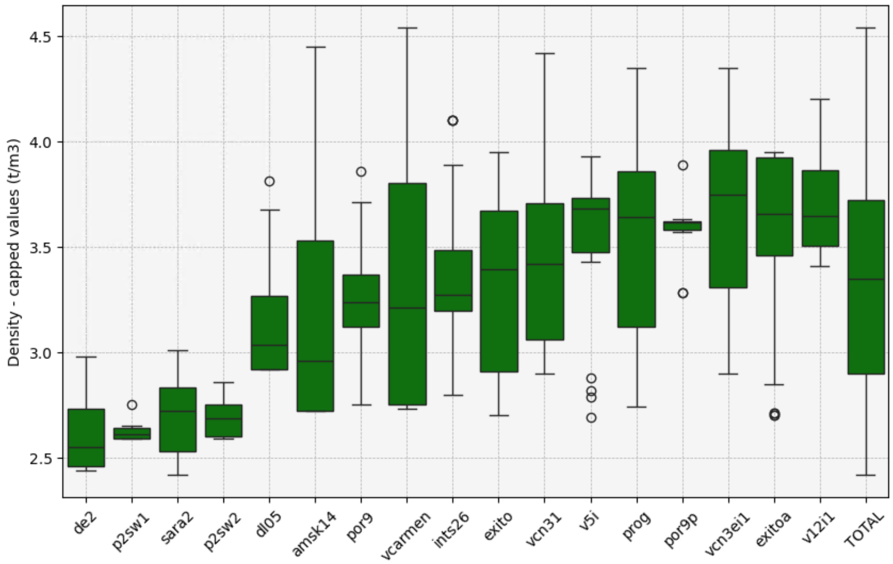


Table 11-17: El Porvenir Statistics of the Density Values for the Main Domains

Domain	Count	Mean (t/m³)	StdDev (t/m³)	Minimum (t/m³)	Maximum (t/m³)
de2	91	2.60	0.15	2.44	2.98
p2sw1	9	2.62	0.05	2.59	2.75
sara2	11	2.69	0.20	2.42	3.01
p2sw2	14	2.69	0.09	2.59	2.86
dl05	40	3.13	0.24	2.92	3.81
amsk14	25	3.25	0.61	2.72	4.45
por9	34	3.26	0.24	2.75	3.86
vcarmen	105	3.33	0.58	2.73	4.54
ints26	44	3.34	0.34	2.8	4.1
exito	85	3.34	0.39	2.7	3.95
vcn31	167	3.45	0.43	2.9	4.42
v5i	18	3.50	0.40	2.69	3.93
prog	108	3.52	0.49	2.74	4.35
por9p	10	3.57	0.18	3.28	3.89
vcn3ei1	54	3.62	0.45	2.9	4.35
exitoa	97	3.62	0.34	2.7	3.95

Domain	Count	Mean (t/m³)	StdDev (t/m³)	Minimum (t/m³)	Maximum (t/m³)
v12i1	30	3.68	0.22	3.41	4.2

Similar mineralization domains were grouped (previously shown in Figure 11-6) and an average density value calculated for each group (Table 11-18). To assign density values to the block model, a local ID^3 estimation method was used with a search neighbourhood radii equivalent to that applied to the Indicated Mineral Resources. For blocks situated beyond these radii or within domains lacking samples, the grouped domain's average density value was assigned.

Table 11-18: El Porvenir Grouped Domain Density Statistics

Group	No. Samples	Mean (t/m³)	StdDev (t/m³)	Minimum (t/m³)	Maximum (t/m³)
AM	113	3.27	0.52	2.49	4.63
DE	80	2.59	0.21	2.11	3.70
DL	72	3.11	0.40	2.31	4.25
EXPLO	120	2.97	0.38	2.39	4.38
INTEG	90	3.23	0.50	2.43	4.56
PORV2SE	50	2.86	0.28	2.47	3.84
PORV2SW	44	2.66	0.13	2.40	3.58
PORV3	49	2.88	0.24	2.23	4.38
PORV9	304	3.34	0.37	1.74	4.78
SARA	75	2.56	0.36	2.12	5.01
SOC	53	3.21	0.54	2.44	4.66
VCN1	207	3.31	0.65	2.28	4.74
VCN3	366	3.41	0.54	1.57	5.09
VCN4	23	3.14	0.50	2.63	4.38
VC1	17	3.69	0.75	2.55	4.76
VC2	88	3.24	0.55	2.43	4.89
VC3	70	3.41	0.68	2.57	5.18
VPROG	143	3.56	0.52	2.36	4.66
V12	328	3.17	0.39	2.35	4.30
V12i	47	3.69	0.39	2.72	4.48
V12s	208	2.93	0.43	2.52	5.98
V5	121	3.11	0.57	2.32	5.22
ÉXITO	241	3.50	0.49	2.62	5.36

11.4.9 Block Models

A non-rotated blocked model was generated in Studio RM with parent blocks size of 2 m x 2 m x 2 m and a minimum sub-cell size of 0.5 m x 0.5 m x 0.5 m. Sub-blocking took place at mineralization domain wireframe boundaries.

Table 11-19 shows the parameters of the block model.

Table 11-19: El Porvenir Blocked Model Definition

	X	Y	Z
Base Point	367,000	8,826,060	2,400
Boundary Size (m)	1,780	3,340	2,150
Number of Blocks	890	1,670	1,075
Parent Block (m)	2	2	2
Minimum Sub-Block (m)	0.5	0.5	0.5

11.4.10 Net Smelter Return and Cut-off Value

NSR values were calculated using the Mineral Resource metal prices, metallurgical recovery rates, transportation, treatment, and refining costs, for the different mining methods and regions of the mine. Metal prices applied to Mineral Resources are 15% greater than Mineral Reserves, which are derived from consensus long-term forecasts obtained from financial institutions, banks, and other reliable sources. The NSR value is denominated in US$/t and is computed for Mineral Resources to enable a meaningful comparison with production costs, helping to ascertain the economic viability of mining the mineralized material.

Currently, the mine yields Zn concentrate containing Ag, Pb concentrate containing Ag and Au, and Cu concentrate containing Ag and Au as saleable products. The payable metals in these concentrates include transportation costs, refining charges, deductions, and penalty elements, as outlined in sales agreements established between the mine and smelters or traders.

The NSR factors are determined based on the smelter terms and metal prices, detailed in Table 11-20.

Table 11-20: El Porvenir NSR Parameters

Item	Unit	Value		Item	Unit	Value
Plant Metallurgical Recovery*				Pb Concentrate Payable %		
Zn	%	89.21		Pb	%	95
Cu	%	14.60		Ag	%	95
Ag	%	77.51		Logistics and TC		
Pb	%	80.02		Zn concentrate	US$/t conc	356.63
Metal Prices				Cu concentrate	US$/t conc	279.33
Zn	US$/t	3,218.90		Pb concentrate	US$/t conc	221.10
Cu	US$/t	8,820.05		Integrated Zn		
Ag	US$/t	24.35		Conversion cost	US$/t Zn prod	655.83
Pb	US$/t	2,300.33		Premium	US$/t Zn prod	103.18
Zn Concentrate Payable %				Refining cost		
Zn	%	85		Au in Pb conc	US$/oz	10.00
Ag	%	70		Ag in Pb conc	US$/oz	1.00
Cu Concentrate Payable %				Ag in Cu conc	US$/oz	0.50
Cu	%	96.7				
Ag	%	90				

* Based on LOM average metal grades.

Nexa assessed supply and demand dynamics for Zn, Pb, and Cu, alongside consensus long-term (ten-year) metal price forecasts. The QP verified that the metal prices chosen for Mineral Reserve estimation align with independent forecasts provided by banks and other credible sources. Metal prices selected for Mineral Resource estimation purposes are set 15% higher, a standard practice within the industry.

The average NSR factors are derived by calculating the LOM revenue contribution from each metal, net of off-site costs and factors, and then dividing it by the reserve grade for that specific metal. These factors serve to highlight the relative economic significance of each metal unit to the mine's overall financial performance. For most metals, a variable recovery rate (as a function of head grade) was employed. Therefore, the average NSR factors should not be applied to head grades without considering the head grade and recovery.

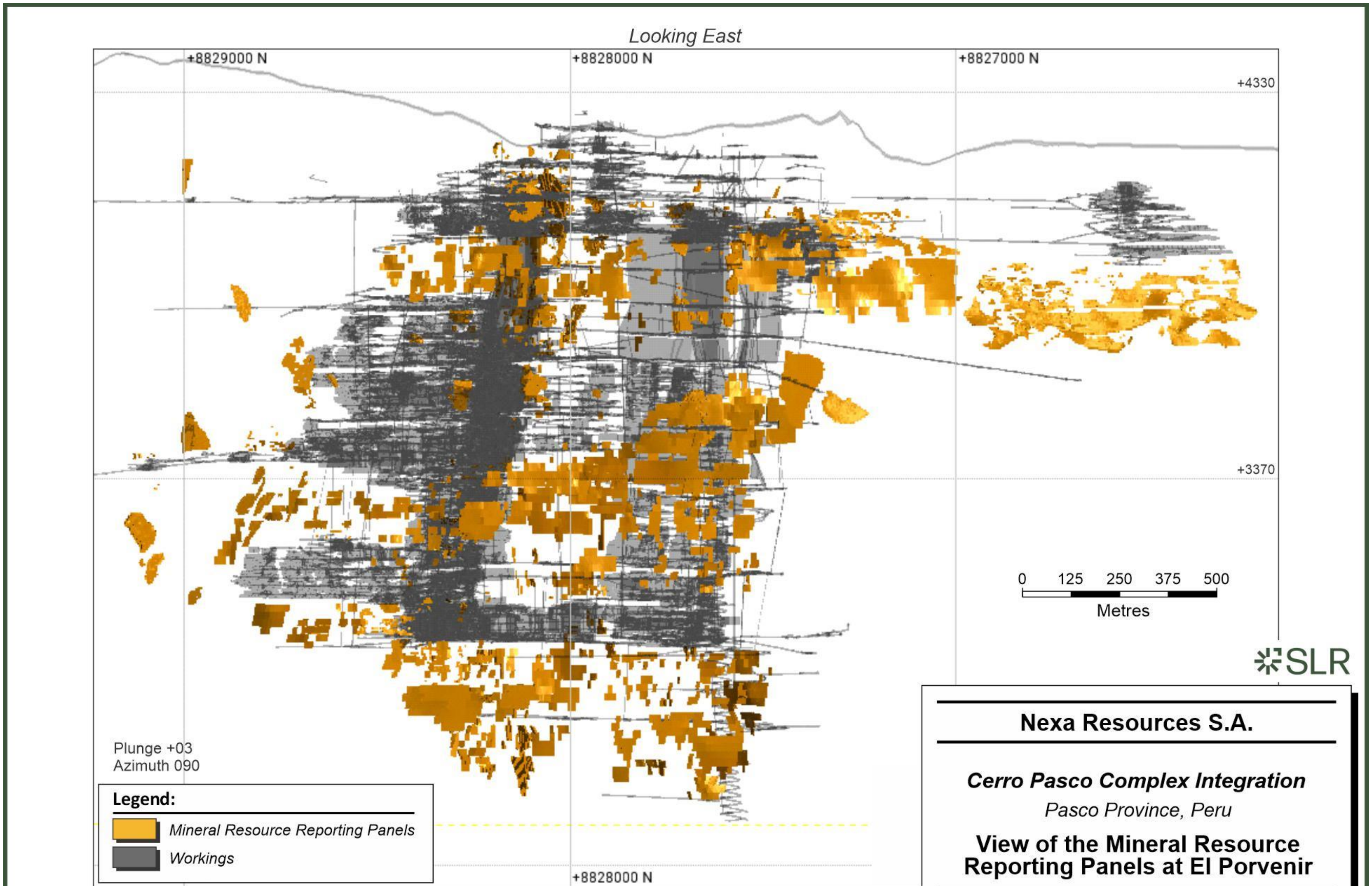
Various cut-off NSR values have been calculated for El Porvenir, contingent upon the mining zone and the chosen mining method, which can be either SLS or CAF. Each zone is subject to distinct material movement costs, determined by whether truck haulage, shaft, or a combination of both methods is employed. The break-even cut-off grade reflects direct and indirect mining costs, processing costs, as well as general and administrative (G&A) expenses, as presented in Table 11-21.

Table 11-21: El Porvenir Cut-off Value Calculation by Mining Zone and Method

Item	Unit	Value	Item	Unit	Value
SLS - Upper Zone			CAF - Upper Zone		
Mine cost	US$/t	50.24	Mine cost	US$/t	52.24
Development	US$/t	23.91	Development	US$/t	23.91
Plant costs	US$/t	10.43	Plant costs	US$/t	10.43
G&A	US$/t	6.37	G&A	US$/t	6.37
Cut-off Value	US$/t	67.04	Cut-off Value	US$/t	69.04
SLS - Intermediate Zone			CAF - Intermediate Zone		
Mine cost	US$/t	47.18	Mine cost	US$/t	49.95
Development	US$/t	23.91	Development	US$/t	23.91
Plant costs	US$/t	10.43	Plant costs	US$/t	10.43
G&A	US$/t	6.37	G&A	US$/t	6.37
Cut-off Value	US$/t	63.98	Cut-off Value	US$/t	66.25
SLS - Lower Zone			CAF - Lower Zone		
Mine cost	US$/t	46.97	Mine cost	US$/t	48.97
Development	US$/t		Development	US$/t	23.91
Plant costs	US$/t	10.43	Plant costs	US$/t	10.43
G&A	US$/t	6.37	G&A	US$/t	6.37
Cut-off Value	US$/t	63.77	Cut-off Value	US$/t	65.77
SLS - Mine Deepening Zone			CAF - Mine Deepening Zone		
Mine cost	US$/t	48.41	Mine cost	US$/t	50.41
Development	US$/t	23.91	Development	US$/t	23.91
Plant costs	US$/t	10.43	Plant costs	US$/t	10.43
G&A	US$/t	6.37	G&A	US$/t	6.37
Cut-off Value	US$/t	65.21	Cut-off Value	US$/t	67.21

Figure 11-17 illustrates the Mineral Resource panels calculated for El Porvenir, based on the NSR values discussed above.

Figure 11-17: View of the Mineral Resource Reporting Panels at El Porvenir



Source: SLR, 2023.

11.4.11 Classification

The Mineral Resource categories and classification criteria utilized in this TRS are consistent with the definitions outlined by the SEC in S-K 1300, with Mineral Resources assigned to Measured, Indicated, and Inferred categories. The following factors were considered for the classification:

- Confidence in the modelling of mineralization domains.
- Reliability of sampling data, including database integrity and absence of significant bias observed in QA/QC analysis results.
- Confidence in the estimation of block grades for the various metals.
- Variogram model parameters.
- Visual assessments of the geometries of mineralized domains in relation to drill hole spacing.
- Production experience in the deposit.

Three groups were established based on geology, grade continuity, and volume of the domains. The classification between the resource categories is based on the number of holes and the distances between them according to the variogram ranges. Separate classification interpolation passes were conducted to designate the resource categories for each group, these being:

Major Continuity Group (domains with volumes more than 95,000 m^3):

- Measured Mineral Resource: Composites from a minimum of three holes within a 25 m by 25 m by 12.5 m radii search.
- Indicated Mineral Resource: Composites from a minimum of three holes within a 50 m by 50 m by 25 m radii search.
- Inferred Mineral Resource: Composites from a minimum of two holes within a 100 m by 100 m by 50 m radii search.

Medium Continuity Group (domains with volumes between 20,000 m^3 and 95,000 m^3):

- Measured Mineral Resource: Composites from a minimum of three holes within a 20 m by 20 m by 10 m radii search.
- Indicated Mineral Resource: Composites from a minimum of three holes within a 50 m by 50 m by 25 m radii search.
- Inferred Mineral Resource: Composites from a minimum of two holes within a 100 m by 100 m by 50 m radii search.

Minor Continuity Group (domains with volumes less than 20,000 m^3):

- Measured Mineral Resource: Composites from a minimum of three holes within a 15 m by 15 m by 10 m radii search.
- Indicated Mineral Resource: Composites from a minimum of three holes within a 40 m by 40 m by 20 m radii search.
- Inferred Mineral Resource: Composites from a minimum of two holes within a 60 m by 60 m by 30 m radii search.

In addition to the criteria mentioned above, the classification of Measured Mineral Resources relies on data with low uncertainty levels, particularly in well-drilled areas, thereby enhancing confidence in geological modelling and grade estimation. The classification of Indicated Mineral Resources is based on data with varying levels of uncertainty, ranging from low to medium, typically supported by a minimum of three drill holes. For areas with fewer drill holes than Measured regions, particularly at mineralization boundaries, there is generally good to acceptable consistency between drill holes and underground geological mapping. Inferred Mineral Resources exhibit the lowest confidence level compared to Measured and Indicated categories, often confined to areas with sparse drilling. Nonetheless, results from estimation validation remain reasonable, providing support for the grade and tonnage estimates within these regions.

A post-processing clean-up script was applied to the classification model to reduce the "spotted dog" effect and to demonstrate a better continuity between categories. Figure 11-18 illustrates histograms showing the number of samples used for estimation, and the Mineral Resource classification related to the search pass.

Figure 11-18: Histograms Showing the Number of Samples Used for the Estimation (on the left), and the Estimation Search Volume (on the right)

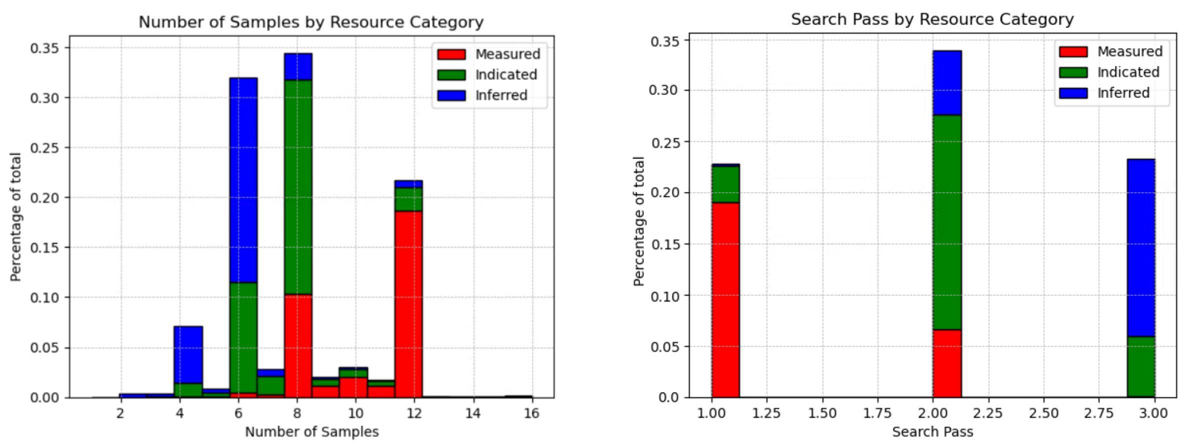
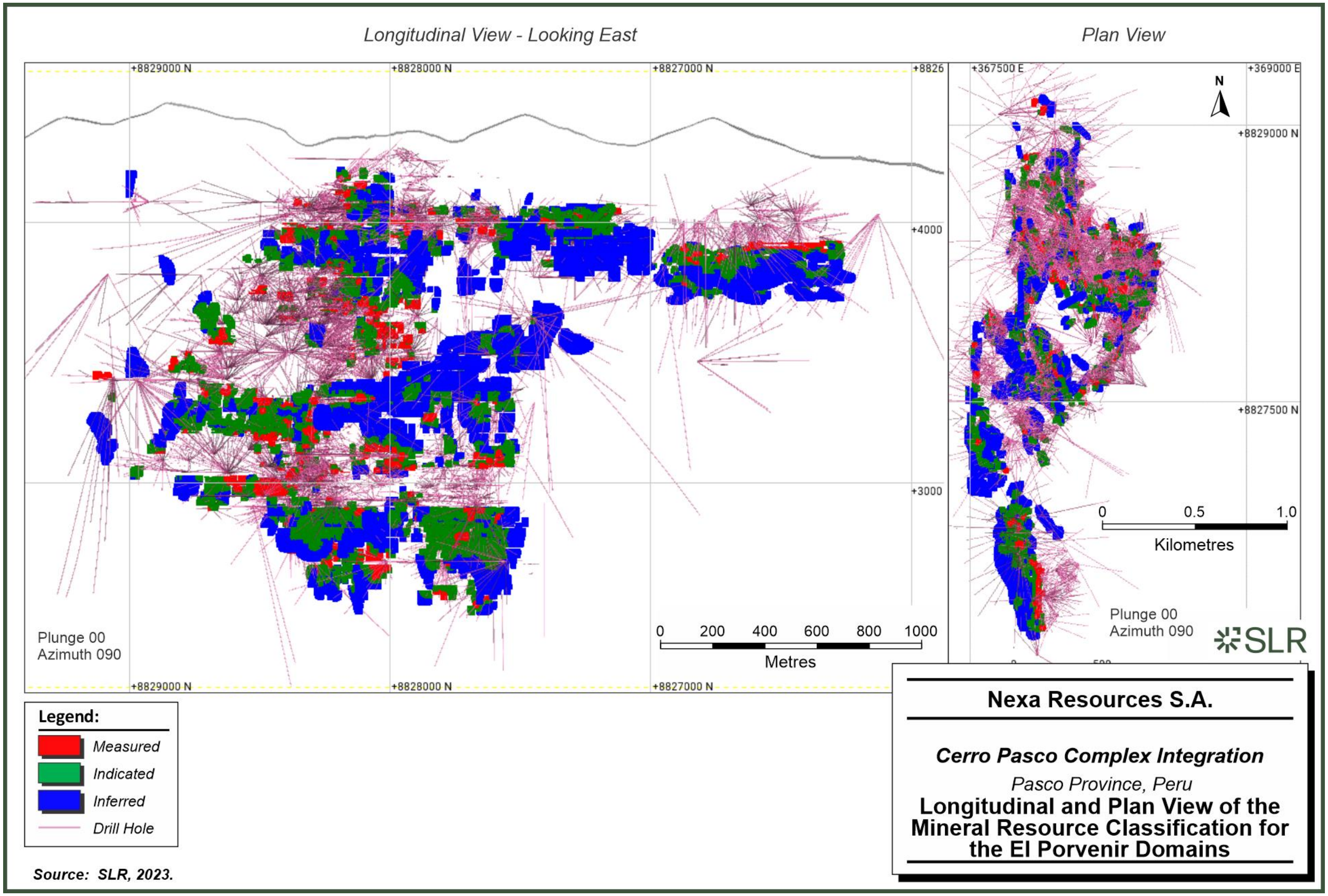


Figure 11-19 illustrates the Mineral Resource classification for the El Porvenir domains.

Figure 11-19: Longitudinal and Plan View of the Mineral Resource Classification for the El Porvenir Domains



Source: SLR, 2023.

The QP is of the opinion that employing various approaches tailored to the size of domains and the spatial variability of variograms is a more robust way to address the uncertainty associated with the resource estimation and geological modelling in the mineral deposit.

In a few regions, artifacts such as isolated drill holes with isolated Measured classifications (“spotted dog” effect) are observed, demonstrating inadequate post-processing. Though these artifacts constitute a small portion of the Mineral Resource classification, the QP recommends to enhance the post-processing workflow to mitigate these issues.

11.4.12 Block Model Validation

The QP performed several validations of the geological modelling and block model estimation, grade shell volume comparison against the previous version, visual inspections of the dynamic anisotropy angles, estimation statistics by search volume, global statistics, visual validations, and swath plots. These aim to confirm the consistency of the estimation process and the results.

SLR reviewed the files provided by Nexa staff, such as validation tables and figures, and performed extensive independent validations, including statistical correlations, visual validations, statistic validations, and swath plot analysis. The main checks are discussed in the following sections.

11.4.12.1 Global Statistics

Global statistics of the interpolated OK, ID^3, and NN grades were compared with those of the capped composites, assessing performance of the different estimators and confirming the estimate’s reproduction of the samples used for the estimation. Global statistics also help to identify inconsistencies in the estimation process.

Statistics for the main variables and domains are shown in Table 11-22. The capped and composited values are weighted by decluster weights.

Table 11-22: El Porvenir Statistical Comparison Between OK, ID^3, NN, and the Capped Composites

Domain	Zn (%) - OK			Zn (%) - ID3			Zn (%) - NN			Zn (%) - Composites		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum
amsk14	2.22	0.10	11.41	2.05	0.00	14.03	1.94	0.00	18.00	2.36	0.00	18.00
de2	1.40	0.01	12.24	1.33	0.01	15.89	1.29	0.00	16.64	1.81	0.00	16.64
dl05	2.24	0.25	13.87	2.25	0.03	19.70	2.30	0.02	19.93	2.02	0.02	19.93
exiti1	3.12	0.03	18.38	3.60	0.02	19.73	3.52	0.02	19.74	1.56	0.02	19.74
exito	3.75	0.03	17.39	3.61	0.02	21.06	3.70	0.00	23.40	3.43	0.00	23.40
exitoa	3.63	0.06	17.19	3.33	0.00	20.46	3.39	0.00	20.85	3.13	0.00	20.85
ints26	4.15	0.48	15.41	4.42	0.03	17.63	4.37	0.00	17.98	4.03	0.00	17.98
p2sw1	0.79	0.03	4.18	0.81	0.00	5.92	0.78	0.00	6.01	0.81	0.00	6.01
p2sw2	1.01	0.01	3.89	1.08	0.00	5.20	0.98	0.00	5.23	0.96	0.00	5.23
por9	6.82	0.01	26.27	6.85	0.00	28.58	6.79	0.00	32.60	6.53	0.00	32.60
por928	5.74	0.51	20.55	5.28	0.05	24.62	5.62	0.00	25.60	5.69	0.00	25.60
por929	7.73	1.44	24.46	9.62	0.80	29.21	11.08	0.00	29.98	9.20	0.00	29.98
por95	3.66	0.24	13.06	2.92	0.00	18.06	3.13	0.00	19.77	1.88	0.00	19.77
por9p	4.19	0.07	23.77	4.08	0.00	29.34	4.08	0.00	30.03	4.13	0.00	30.03
por9q	4.73	0.13	23.45	4.50	0.00	27.80	4.63	0.00	29.98	3.93	0.00	29.98
por9v	6.42	1.13	22.33	6.10	0.32	29.32	6.13	0.09	29.98	4.94	0.09	29.98
por9w	4.11	0.49	13.04	4.52	0.14	20.72	4.98	0.13	20.84	3.59	0.13	20.84
prog	4.53	0.00	23.30	4.39	0.00	26.98	4.37	0.00	27.07	3.96	0.00	27.07
sara2	1.54	0.07	9.04	1.73	0.03	15.79	1.85	0.02	15.95	1.67	0.02	15.95
v12i1	5.71	0.01	26.36	5.90	0.00	33.68	5.64	0.00	34.63	6.38	0.00	34.63
v12ne	4.67	0.40	17.85	4.61	0.04	22.86	4.36	0.00	23.29	4.38	0.00	23.29

Domain	Zn (%) - OK			Zn (%) - ID3			Zn (%) - NN			Zn (%) - Composites		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum
v5i	5.95	0.01	24.23	5.94	0.00	29.05	6.03	0.00	30.22	6.17	0.00	30.22
vcarmen	6.35	0.00	25.31	6.50	0.00	31.17	6.54	0.00	32.07	5.98	0.00	32.07
vcn31	4.13	0.06	22.81	4.21	0.01	31.40	4.28	0.00	34.28	3.64	0.00	34.80
vcn3ei1	6.63	0.03	26.05	6.64	0.00	30.05	6.69	0.00	30.49	6.45	0.00	30.49

Domain	Cu (%) - OK			Cu (%) - ID3			Cu (%) - NN			Cu (%) - Composites		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum
amsk14	0.34	0.03	1.56	0.48	0.00	1.84	0.50	0.00	1.89	0.34	0.00	1.89
de2	0.05	0.00	0.80	0.05	0.00	1.20	0.05	0.00	1.24	0.05	0.00	1.24
dl05	0.19	0.04	0.83	0.21	0.01	1.01	0.21	0.01	1.01	0.16	0.01	1.01
exiti1	0.93	0.18	1.82	0.91	0.03	2.12	0.89	0.01	2.40	1.18	0.01	2.67
exito	0.31	0.02	1.74	0.30	0.00	2.10	0.31	0.00	2.11	0.29	0.00	2.11
exitoa	0.45	0.03	1.73	0.46	0.00	2.06	0.47	0.00	2.09	0.45	0.00	2.09
ints26	0.15	0.01	0.59	0.15	0.00	0.67	0.16	0.00	0.76	0.16	0.00	0.76
p2sw1	0.02	0.00	0.16	0.02	0.00	0.32	0.02	0.00	0.36	0.02	0.00	0.36
p2sw2	0.02	0.00	0.19	0.02	0.00	0.30	0.02	0.00	0.41	0.03	0.00	0.41
por9	0.43	0.08	2.92	0.43	0.00	3.62	0.43	0.00	3.63	0.40	0.00	3.63
por928	0.34	0.02	1.57	0.28	0.01	2.21	0.27	0.00	2.64	0.28	0.00	2.64
por929	0.21	0.10	0.56	0.24	0.10	0.82	0.27	0.00	1.00	0.28	0.00	1.00
por95	0.17	0.01	0.60	0.15	0.00	0.78	0.16	0.00	0.97	0.13	0.00	0.97
por9p	0.33	0.01	1.46	0.32	0.00	1.68	0.31	0.00	2.10	0.33	0.00	2.10
por9q	0.34	0.00	2.05	0.33	0.00	2.39	0.36	0.00	2.58	0.43	0.00	2.58
por9v	0.34	0.03	1.54	0.32	0.00	1.82	0.34	0.00	1.94	0.29	0.00	2.18

Domain	Cu (%) - OK			Cu (%) - ID3			Cu (%) - NN			Cu (%) - Composites		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum
por9w	0.34	0.04	1.05	0.40	0.01	1.30	0.42	0.01	1.30	0.32	0.01	1.30
prog	0.34	0.00	2.56	0.34	0.00	3.30	0.34	0.00	3.31	0.33	0.00	3.31
sara2	0.03	0.00	0.28	0.03	0.00	0.34	0.04	0.00	0.46	0.04	0.00	0.46
v12i1	0.40	0.00	1.90	0.42	0.00	2.10	0.39	0.00	2.10	0.30	0.00	2.10
v12ne	0.22	0.02	0.89	0.22	0.00	1.21	0.21	0.00	1.21	0.18	0.00	1.21
v5i	0.40	0.02	1.85	0.41	0.00	1.92	0.41	0.00	2.09	0.41	0.00	2.09
vcarmen	0.09	0.00	0.70	0.09	0.00	1.04	0.10	0.00	1.07	0.09	0.00	1.07
vcn31	0.25	0.00	1.84	0.26	0.00	3.44	0.26	0.00	3.53	0.25	0.00	3.53
vcn3ei1	0.23	0.00	1.45	0.24	0.00	2.75	0.24	0.00	3.30	0.23	0.00	4.53

Domain	Ag (g/t) - OK			Ag (g/t) - ID3			Ag (g/t) - NN			Ag (g/t) - Composites		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum
amsk14	48.87	1.67	289.89	55.57	0.10	375.20	55.72	0.10	397.80	59.45	0.10	397.80
de2	166.71	3.66	1,495.40	167.65	0.30	1,973.91	169.17	0.00	2,030.00	180.52	0.00	2,030.00
dl05	80.36	14.91	374.65	78.43	2.00	556.82	78.27	2.00	674.19	65.02	2.00	674.19
exiti1	14.52	5.54	35.38	13.81	2.05	49.07	14.04	2.02	60.28	17.02	2.02	60.28
exito	72.95	6.63	311.86	74.08	0.28	409.02	74.59	0.00	501.51	65.39	0.00	501.51
exitoa	47.44	2.62	257.68	48.64	0.04	273.97	48.01	0.00	275.60	35.57	0.00	275.60
ints26	16.21	1.90	109.27	19.95	0.13	127.57	24.51	0.00	127.90	16.33	0.00	127.90
p2sw1	66.50	6.21	393.69	69.05	1.01	574.36	68.85	0.31	630.30	64.58	0.31	630.30
p2sw2	76.78	13.52	442.21	77.46	0.39	563.24	73.08	0.20	630.30	75.45	0.20	630.30
por9	19.43	1.37	333.13	19.16	0.01	469.31	19.76	0.00	539.33	22.14	0.00	806.60
por928	42.76	2.31	115.16	24.13	0.49	155.06	22.32	0.00	176.67	27.71	0.00	200.00
por929	25.21	7.58	136.55	25.72	6.22	169.42	28.78	0.00	183.70	42.57	0.00	183.70

Domain	Ag (g/t) - OK			Ag (g/t) - ID3			Ag (g/t) - NN			Ag (g/t) - Composites		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum
por95	7.60	1.49	130.66	7.58	0.08	151.92	7.95	0.00	214.90	8.77	0.00	214.90
por9p	21.38	1.48	156.48	21.83	0.01	208.43	21.26	0.00	218.66	19.14	0.00	218.66
por9q	20.63	0.90	182.30	20.34	0.02	280.33	21.60	0.00	283.35	16.09	0.00	283.35
por9v	77.29	12.17	349.66	61.94	2.23	431.16	62.35	2.02	509.70	60.55	2.02	509.70
por9w	61.60	8.04	190.94	69.44	4.41	219.19	72.54	3.76	220.21	49.80	1.92	220.21
prog	46.14	0.00	616.10	43.20	0.00	723.26	41.79	0.00	747.70	40.63	0.00	747.70
sara2	157.69	22.95	988.81	163.65	10.77	1,195.37	172.73	7.40	1,196.00	163.77	7.40	1,196.00
v12i1	28.07	0.33	248.54	27.81	0.00	274.07	27.28	0.00	275.50	34.64	0.00	275.50
v12ne	140.71	3.89	561.26	159.53	0.38	783.45	152.22	0.00	786.92	141.74	0.00	786.92
v5i	30.62	1.52	256.99	29.93	0.02	306.32	30.57	0.00	320.80	32.14	0.00	320.80
vcarmen	254.51	0.00	1,166.86	257.89	0.00	1,495.17	262.12	0.00	1,533.00	303.41	0.00	1,533.00
vcn31	21.52	0.74	481.82	21.06	0.03	724.78	22.54	0.00	1,100.75	19.78	0.00	1,100.75
vcn3ei1	75.19	1.44	653.16	78.37	0.08	829.11	79.02	0.00	1,050.00	77.59	0.00	1,050.00

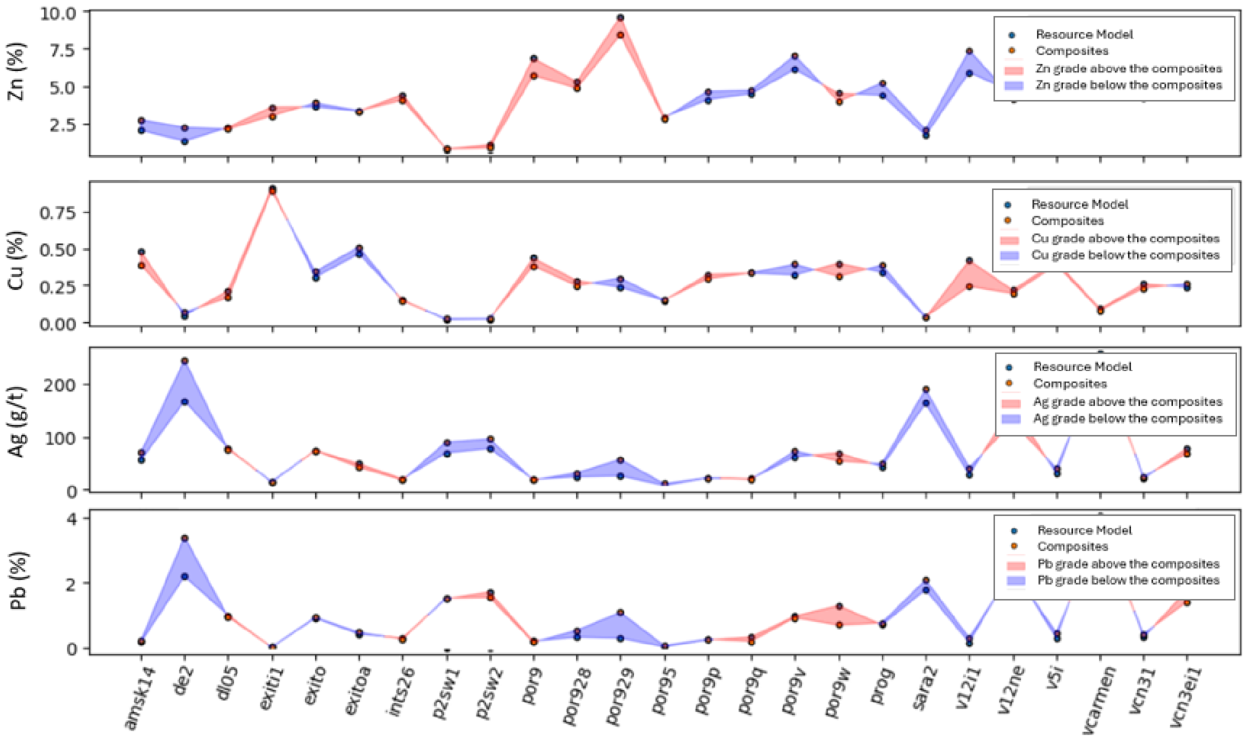
Domain	Pb (%) - OK			Pb (%) - ID3			Pb (%) - NN			Pb (%) - Composites		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum
amsk14	0.24	0.02	1.54	0.17	0.00	2.52	0.14	0.00	2.89	0.23	0.00	2.89
de2	2.20	0.10	15.19	2.19	0.01	18.17	2.14	0.00	18.46	2.47	0.00	18.46
dl05	1.06	0.02	10.81	1.00	0.01	14.88	0.95	0.00	15.04	0.79	0.00	15.04
exiti1	0.01	0.01	0.03	0.01	0.01	0.04	0.02	0.01	0.04	0.03	0.01	0.40
exito	0.90	0.00	10.14	0.91	0.00	12.35	0.94	0.00	12.86	0.86	0.00	12.86
exitoa	0.51	0.00	8.07	0.42	0.00	9.37	0.40	0.00	9.69	0.29	0.00	9.69
ints26	0.23	**0.00**	3.73	0.30	0.00	4.33	0.43	0.00	4.34	0.23	0.00	4.34

Domain	Pb (%) - OK			Pb (%) - ID3			Pb (%) - NN			Pb (%) - Composites		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum
p2sw1	1.37	0.21	7.14	1.50	0.01	12.00	1.49	0.00	12.11	1.27	0.00	12.11
p2sw2	1.55	0.09	7.20	1.71	0.00	12.84	1.53	0.00	13.03	1.39	0.00	13.03
por9	0.19	0.01	7.39	0.20	0.00	9.60	0.23	0.00	10.98	0.24	0.00	10.98
por928	0.86	0.00	5.23	0.33	0.00	6.47	0.34	0.00	7.80	0.49	0.00	7.80
por929	0.27	0.00	9.74	0.30	0.00	12.14	0.29	0.00	14.24	0.62	0.00	14.24
por95	0.03	0.01	0.90	0.03	0.00	1.21	0.03	0.00	1.73	0.05	0.00	1.73
por9p	0.25	0.01	8.74	0.24	0.00	12.48	0.24	0.00	12.99	0.19	0.00	12.99
por9q	0.33	0.01	7.46	0.33	0.00	14.67	0.32	0.00	14.83	0.14	0.00	14.83
por9v	1.18	0.04	4.16	0.97	0.01	4.92	0.94	0.01	4.92	0.99	0.01	4.92
por9w	0.87	0.02	4.61	1.29	0.01	5.73	1.29	0.01	5.77	0.47	0.01	5.77
prog	0.77	0.00	19.12	0.70	0.00	23.07	0.66	0.00	23.12	0.70	0.00	23.12
sara2	1.62	0.10	10.84	1.78	0.02	15.48	1.90	0.02	16.20	1.98	0.02	16.20
v12i1	0.17	0.00	7.87	0.16	0.00	9.26	0.17	0.00	9.50	0.23	0.00	9.50
v12ne	2.22	0.02	13.19	2.45	0.01	16.05	2.43	0.00	16.14	2.62	0.00	16.14
v5i	0.31	0.00	27.07	0.30	0.00	29.00	0.32	0.00	33.59	0.36	0.00	33.59
vcarmen	3.94	0.00	15.21	4.06	0.00	23.00	4.10	0.00	24.84	4.03	0.00	25.57
vcn31	0.32	0.00	10.57	0.32	0.00	17.64	0.35	0.00	18.35	0.30	0.00	18.35
vcn3ei1	1.67	0.00	16.46	1.77	0.00	23.54	1.79	0.00	24.70	1.78	0.00	24.70

As expected, the comparisons of the OK and ID^3 estimates with the NN estimate show less variation than a comparison with the capped composites. The most significant disparities are noted in the “por929” and “por95” domains for both comparisons, against NN and the capped composites. Visual assessments indicate a reasonable correspondence between samples and estimated blocks, with further investigation suggesting that this reflects the distribution of samples throughout the domain, which is highly clustered in certain instances.

Figure 11-20 illustrates the comparison between final main grades estimated in the block model and the capped and composited samples. In general, the estimated grades and composites show good agreement, while differences observed do not suggest any consistent bias.

Figure 11-20: El Porvenir Final Grade Variables and Capped and Composited Samples Comparison



SLR observes that these variations fall within the expected range, and the larger discrepancies may be attributed to either the degree of sample clustering or the dynamic anisotropy angles. To some extent, the decluster weights for the capped and composited samples may also impact these variations.

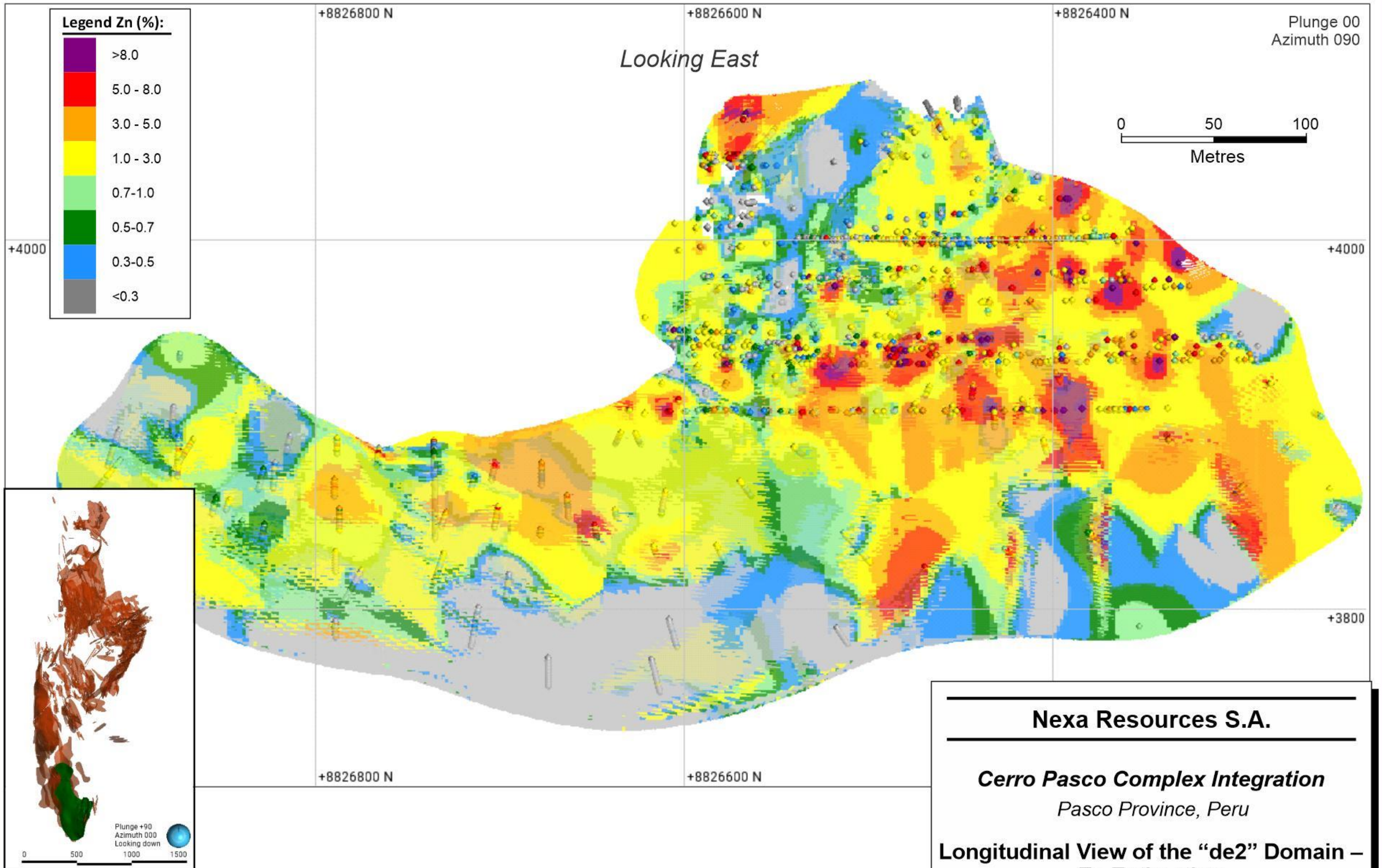
11.4.12.2 Visual Validation

The QP conducted random checks across various estimation domains, comparing the samples utilized for estimation with the block model. Particular emphasis was placed on the main domains owing to their significance for Mineral Resources and Mineral Reserves.

Overall, the block grades correspond well with the surrounding samples. However, in certain areas, particularly those with limited information, some artifacts were observed. These included grade stripes exhibiting abrupt transitions between high and low grade areas. Some of these artifacts can be seen in Figure 11-21.

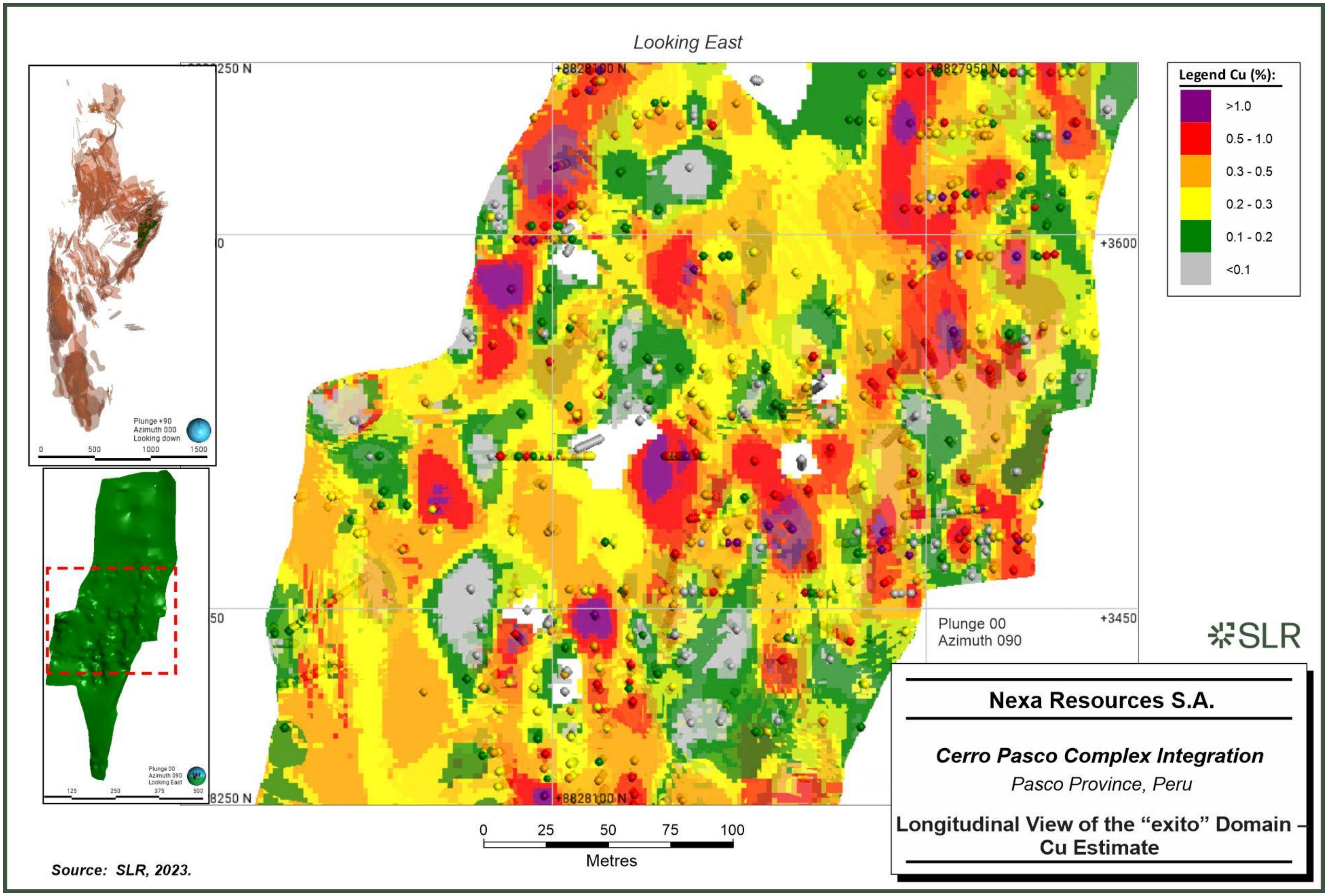
Figure 11-21 and Figure 11-22 show longitudinal sections of some of the main veins for Zn and Cu, “de2” and “exito”, respectively.

Figure 11-21: Longitudinal View of the "de2" Domain – Zn Estimation



Source: SLR, 2023.

Figure 11-22: Longitudinal View of the "exito" Domain – Cu Estimation



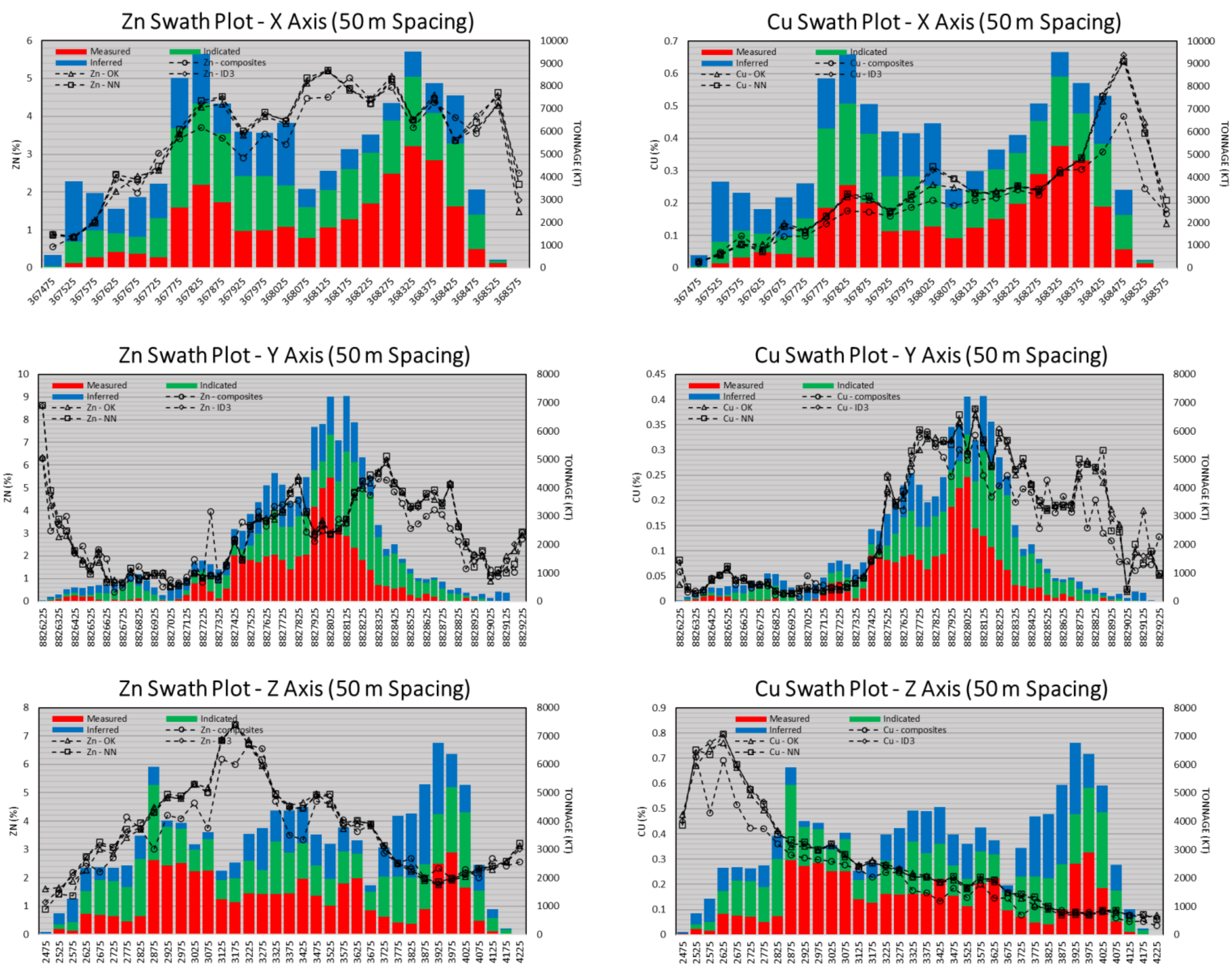
Source: SLR, 2023.

SLR observes that the visual artifacts beforementioned do not significantly affect the Mineral Resource assessment. However, the QP is of the opinion that there is room for improvement in the estimation workflow to prevent or minimize such instances. Enhancements to the dynamic anisotropy angles and adjustments to the minimum and maximum samples utilized in the estimation process may help mitigate these occurrences.

11.4.12.3 Swath Plots

Swath plots were generated for the entire block model to evaluate the global grade trend within the mineral deposit. Figure 11-23 illustrates swath plots for Zn and Cu in the X, Y, and Z directions.

Figure 11-23: El Porvenir Swath Plots for Zn and Cu



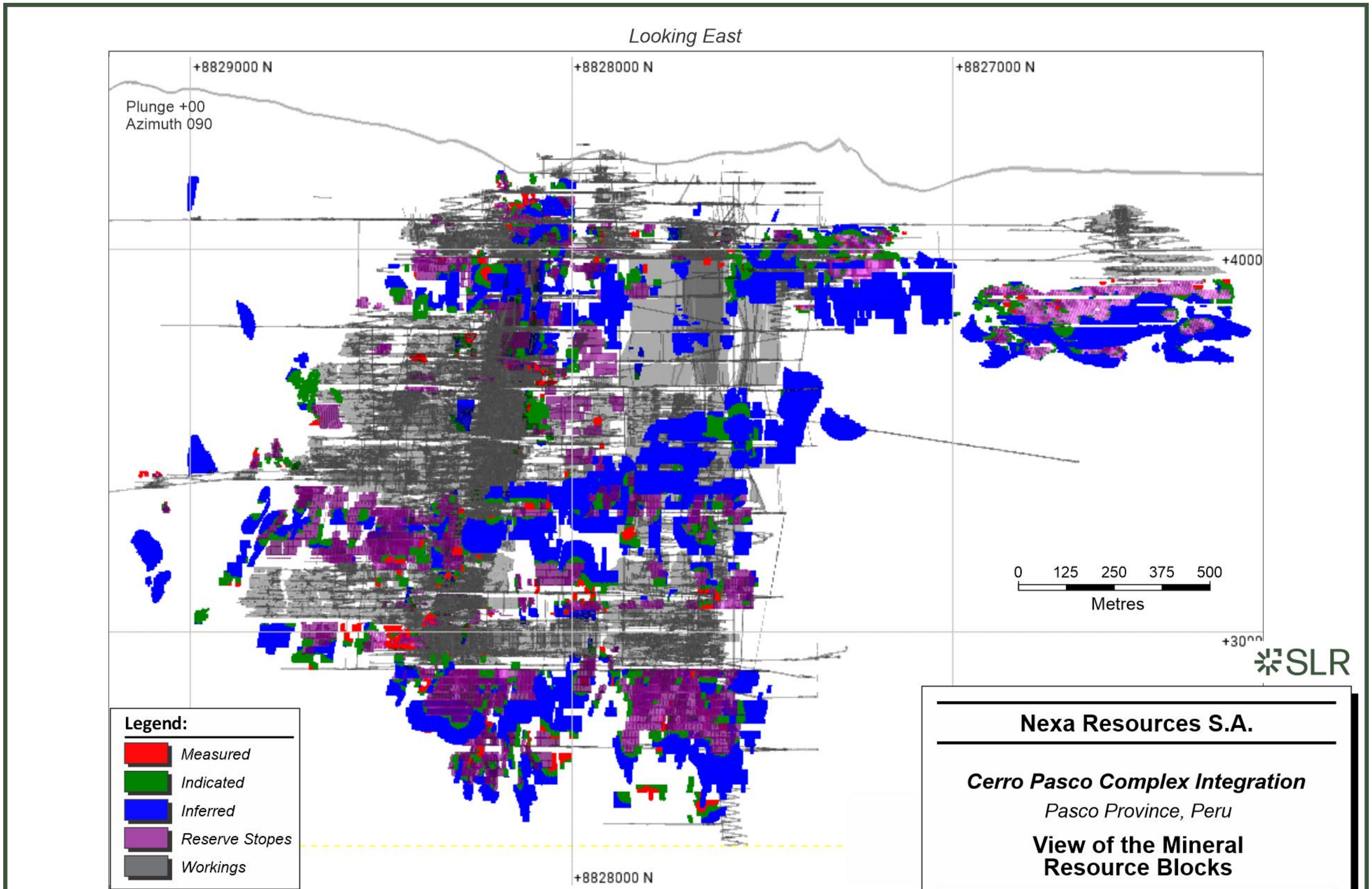
Overall, the trend in capped and composited grades is reflected by the estimated grades. Similar discrepancies in average grades between the capped composites and block grades, as discussed previously, are also evident in these charts. The charts reveal a consistent positive bias in the estimation, which is attributed to the use of decluster weights for the average calculation of capped and composited grades. SLR conducted an analysis of the capped and composited grade averages, both with and without decluster weights, employing different decluster methodologies. It was concluded that this apparent bias stems from limitations in the cell decluster method. A more suitable approach would involve calculating decluster weights for each individual grade shell, which is expected to yield a better fit with the estimated grades.

11.4.13 Mineral Resource Reporting

Mineral Resources have been classified in accordance with the definitions for Mineral Resources in S-K 1300, which are consistent with Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM (2014) definitions).

Mineral Resources are reported exclusive of Mineral Reserves, within underground resource reporting shapes calculated as described in Section 11.4.10, using a minimum thickness of 4.0 m. Figure 11-24 illustrates the Mineral Resource blocks.

Figure 11-24: View of the Mineral Resource Blocks



Source: SLR, 2023.

In the QP's opinion, the assumptions, parameters, and methodology used for the El Porvenir Mineral Resource estimate are appropriate for the style of mineralization and mining methods. The QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, political, or other relevant factors that could significantly affect the El Porvenir Mineral Resource at the Cerro Pasco operation.

The QP is of the opinion that with consideration of the recommendations summarized in Sections 1 and 23 of this TRS, any issues relating to all relevant technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work

Mineral Resources with an effective date of December 31, 2023 for El Porvenir underground mine are shown in Table 11-23 on an 83.48% Nexa attributable ownership basis and Table 11-24 on a 100% ownership basis:

Table 11-23: El Porvenir Underground Mine: Summary of Mineral Resources (on an 83.48% Nexa Attributable Ownership Basis) – December 31, 2023

Category	Tonnage (Mt)	Grade				Contained Metal			
		Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Zn (000 t)	Cu (000 t)	Ag (000 oz)	Pb (000 t)
Measured	0.55	3.47	0.27	57.7	0.95	19.1	1.5	1,030	5.3
Indicated	2.69	3.25	0.20	63.2	0.97	87.4	5.3	5,460	26.0
M&I	**3.24**	**3.29**	**0.21**	**62.2**	**0.97**	**106.5**	**6.8**	**6,483**	**31.3**
Inferred	9.23	3.83	0.24	82.9	1.32	353.6	22.1	24,602	121.9

Notes:

1. The definitions for Mineral Resources in S-K 1300 were followed for Mineral Resources which are consistent with CIM (2014) definitions.
2. Mineral Resources are estimated at an NSR cut-off value of US$66.04/t, calculated based on the LOM costs. It represents the average NSR for both the SLS (that ranges from US$63.77/t to US$67.04/t) and for CAF (that ranges from US$65.77/t to US$69.04/t).
3. Mineral Resources are estimated using average long-term metal prices of Zn: US$ 3,218.90/t (US$1.46/lb), Pb: US$2,300.33/t (US$1.04/lb), Cu: US$ 8,820.05/t (US$4.00/lb), and Ag: US$24.35/oz.
4. Metallurgical recoveries are based on historical processing data: 89.2% for Zn, 80.0% for Pb, 14.6% for Cu, and 77.5% for Ag.
5. Bulk density is assigned based on rock type and averages 3.13 t/m^3.
6. Mineral Resources were depleted according to actual production as of September 30, 2023, and forecast production to the effective date of December 31, 2023.
7. The minimum thickness for the resource panels are 4.0 m for CAF and 3 m for SLS.
8. Mineral Resources are exclusive of Mineral Reserves.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Mineral Resources are constrained by optimized underground reporting shapes.
11. Numbers may not add due to rounding.

Table 11-24: El Porvenir Underground Mine: Summary of Mineral Resources (on a 100% Ownership Basis) – December 31, 2023

Category	Tonnage (Mt)	Grade				Contained Metal			
		Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Zn (000 t)	Cu (000 t)	Ag (000 oz)	Pb (000 t)
Measured	0.66	3.47	0.27	57.7	0.95	22.9	1.8	1,225	6.3
Indicated	3.22	3.25	0.20	63.2	0.97	104.7	6.4	6,540	31.2
M&I	**3.88**	**3.29**	**0.21**	**62.2**	**0.97**	**127.6**	**8.2**	**7,765**	**37.5**
Inferred	11.06	3.83	0.24	82.9	1.32	423.6	26.5	29,471	146.0

Notes:

1. The definitions for Mineral Resources in S-K 1300 were followed for Mineral Resources which are consistent with CIM (2014) definitions.
2. Mineral Resources are estimated at an NSR cut-off value of US$66.04/t, calculated based on the LOM costs. It represents the average NSR for both the SLS (that ranges from US$63.77/t to US$67.04/t) and for CAF (that ranges from 65.77 to 69.04).
3. Mineral Resources are estimated using average long-term metal prices of Zn: US$ 3,218.90/t (US$1.46/lb), Pb: US$2,300.33/t (US$1.04/lb), Cu: US$ 8,820.05/t (US$4.00/lb), and Ag: US$24.35/oz.
4. Metallurgical recoveries are based on historical processing data: Zn (89.2%), Pb (80.0%), Cu (14.6%), and Ag (77.5%).
5. Bulk density is assigned based on rock type and averages 3.13 t/m^3.
6. Mineral Resources were depleted according to actual production as of September 30, 2023, and forecast production to the effective date of December 31, 2023.
7. The minimum thickness for the resource shapes are 4.0 m for CAF and 3 m for SLS.
8. Mineral Resources are exclusive of Mineral Reserves.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Mineral Resources are constrained by optimized underground reporting shapes.
11. Numbers may not add due to rounding.

11.5 Atacocha (San Gerardo) Open Pit

11.5.1 Resource Database

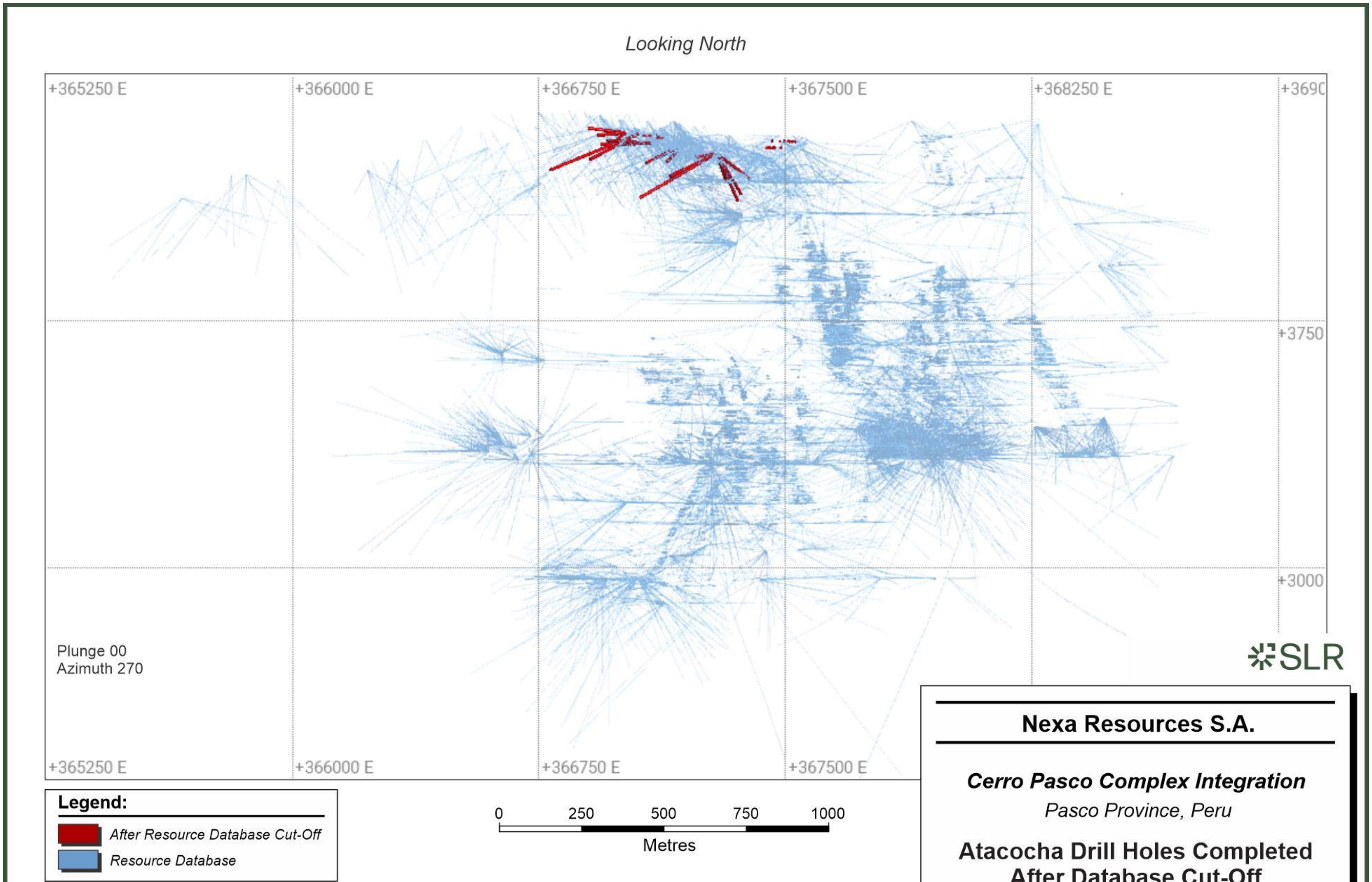
Although the Atacocha OP and UG Mineral Resources were estimated separately, a unified resource database was utilized. All drilling and sampling data available within the Atacocha concession were included in the resource database, except for data completed after the closure date of the database.

The Atacocha database closure date was January 31, 2023. Subsequent to this date and up to the effective date of the TRS, 32 channels and 18 DDH were completed in the San Gerardo open pit area (Table 11-25 and Figure 11-25). The QP reviewed the additional data and is of the opinion that it would not have a material impact on the estimated Mineral Resources.

Table 11-25: Atacocha Data Completed After Resource Database Closure

Type	Count	Length (m)
Channels	32	106
DDH	18	2,942

Figure 11-25: Atacocha Drill Holes Completed after Database Cut-Off



Source: SLR, 2023.

Table 11-26 summarizes the drilling and channel sampling used to estimate Mineral Resources at the Atacocha mineral deposit.

Table 11-26: Atacocha Resource Database

Type	Count	Length
Channels	69,122	262,065
DDH Holes	5,153	883,875
RC Holes	35	8,687

Table 11-27 summarizes the quantity of data in the provided resource database, filtered by the Atacocha site.

Table 11-27: Atacocha Resource Database Tables

Table	Count	Holes	Length (m)
collar	74,310	74,310	-
survey	117,574	74,310	-
alteration	38,939	2,658	228,488
geology	141,202	5,188	892,066
litho	99,924	5,188	892,563
assay	518,145	74,146	687,400
structural	20,289	1,243	-
mineralisation	88,901	3,324	361,620
geotech	4,875	127	27,784
density	7,612	2,902	7,211

Table 11-28 summarizes the statistics of the drilling and channel samples used to estimate the Atacocha Mineral Resources, while Table 11-29 summarizes the statistics for the density samples.

Table 11-28: Atacocha Resource Database Assay Summary Statistics

Analyte	Count	Length	Mean	StdDev	CV	Variance	Min	Q25	Median	Q75	Max
ZN_PER	518,088	687,327	2.31	5.08	2.20	25.85	0.00	0.03	0.17	1.41	60.00
PB_PER	518,143	687,398	1.01	2.99	2.96	8.92	0.00	0.01	0.04	0.29	70.35
CU_PER	518,145	687,400	0.19	0.49	2.61	0.24	0.00	0.01	0.03	0.16	40.00
AG_PPM	518,145	687,400	47.69	125.91	2.64	15,853.83	0.09	2.02	5.29	23.02	6,236.25
AU_GR	242,034	298,014	0.13	1.00	7.55	0.99	0.00	0.02	0.04	0.10	171.50
Length	518,145	687,400	1.33	0.54	0.41	0.30	0.05	1.00	1.35	1.50	12.10

Table 11-29: Atacocha Resource Database Density Summary Statistics

Analyte	Count	Length	Mean	StdDev	CV	Variance	Min	Q25	Median	Q75	Max
GE_gcm3	7,612	7,211	2.93	0.44	0.15	0.19	1.41	2.68	2.78	3.21	5.73
Length	7,612	7,211	0.95	0.52	0.55	0.27	0.10	0.30	1.00	1.44	2.60

11.5.2 Geological Interpretation

The 2023 Mineral Resource estimation included a full review of the mineralized domains previously modelled in 2021, in 3D, section, and plan views by the QP and by SLR. Mineralized wireframes were constructed using the interpretations on cross sections and plans generated by the mine geologists. The strike of some mineralized domains was modified based on the observations and interpretations from these sections.

Mineralized wireframes within the operational area of the pit were reinterpreted in consideration of sectional interpretation, bench mapping, blast holes, and mining polygons. Mineralization was generally not extrapolated beyond 30 m to 40 m from the last composite. SLR noted that some domains were extended beyond this, however, distance from composites was also considered during classification of Mineral Resources. The southern part of the pit was revised for 2023 with the same procedures used in 2022.

Eight lithological domains were modelled: skarn, San Gerardo intrusive, hydrothermal breccia, tectonic breccia, marble, sandstone, limestone, and conglomerate.

Two main mineralization types were modelled: "fault" type mineralization modelled using the Leapfrog vein tool, and "brecciation" type mineralization modelled using the Leapfrog intrusion tool (Figure 11-26). The first group is mostly composed of narrow tabular planes oriented northwest-southeast, with steep angles of inclination. The second group are massive mineralized bodies, rounded in shape, which usually possess greater volume than the fault-controlled veins.

Interpretation of the 220 mineralized wireframes was completed in consideration of other geological parameters including structural type (mineralized body and vein), type of emplacements (hydrothermal gap, structural, and replacement), lithological control (fault or brecciation), and the anisotropy and orientation of the mineralization. A minimum NSR cut-off value of US$15.66/t was used when interpreting the mineralized wireframes, although considering as low as US$10.00/t in some cases, depending on the mineralization continuity.

Drill holes lacking assays were treated as barren and veins were set to pinch out when modelling the mineralization domains.

The modelled mineralization consists of eleven large groups (Figure 11-27), mostly vein systems and a small number of bodies: "Asuncion Vein System", "Chercher Vein System", "OB10 Vein System", "Lizzy Vein System", Vetas V Vein System", "Vetas Norte Vein System", "Rubi Vein System", "Claudia Vein System", "Zoe Vein System", "Milpo-Atacocha Vein System" and mineralized bodies called "Cuerpos". These groups were used as the basis for establishing average density values.

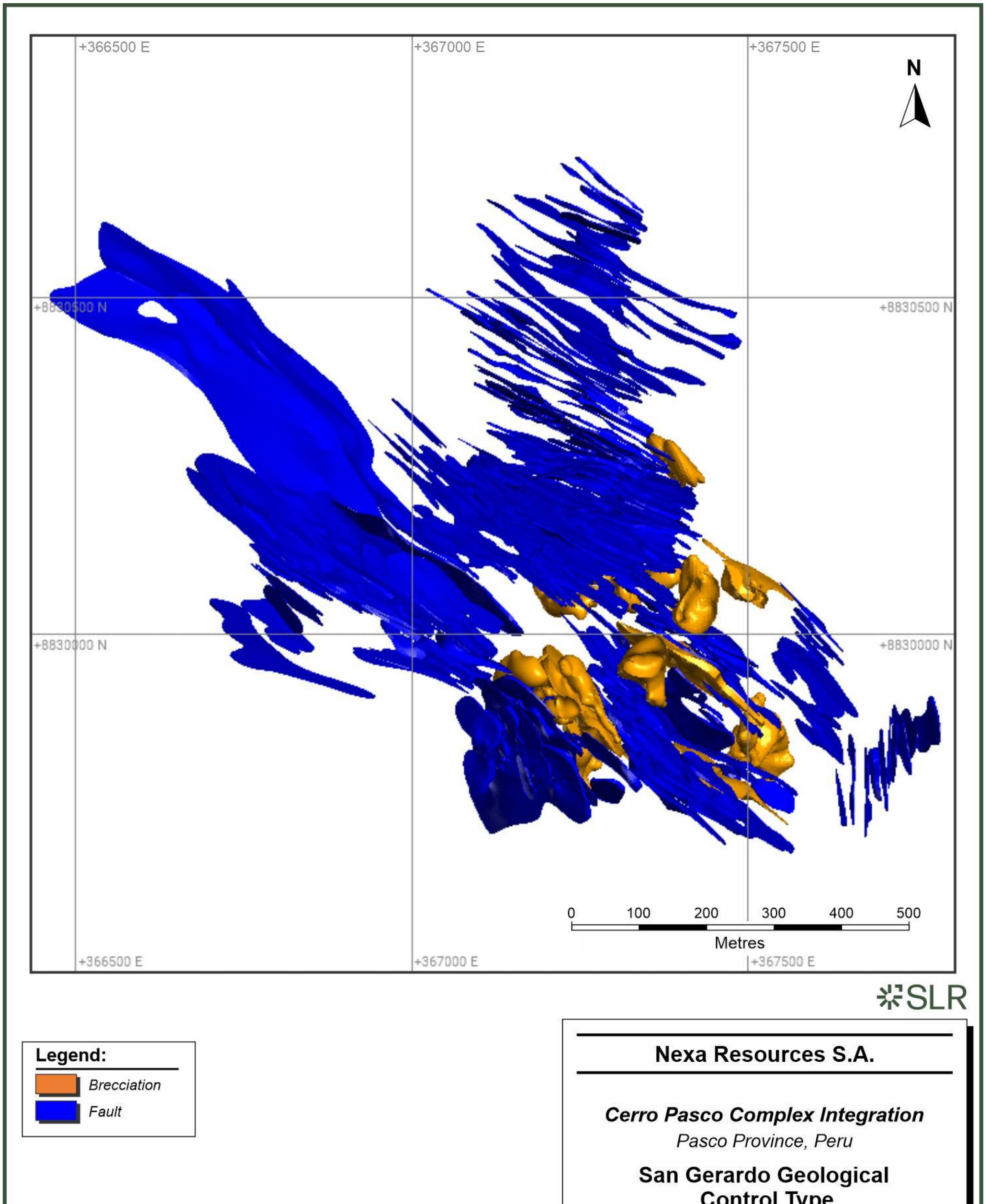
Each orebody containing more than 200 representative samples and with a coefficient of variation (CV) greater than 1.8 was split into high grade and low grade sub-domains using the intrusion tool in Leapfrog (Figure 11-28). The individual high grade cut-off values were based on the distribution within each domain and the variable in question. SLR observed that some of the resulting high and low grade sub-domain volumes were supported by as few as one drill hole and sometimes resulted in discontinuous shapes. Although SLR considers the sub-domains acceptable for use in the estimate, SLR recommends that the sub-domaining be improved in future Mineral Resource updates, particularly as hard boundaries are applied to the sub-domains. The QP agrees with this recommendation.

Each of the modelled mineralization wireframes was treated as a separate estimation domain for Zn, Pb, Cu, Ag, and Au, except for where the high grade and low grade sub-domains were implemented on a case-by-case basis for the different variables.

In the estimation nomenclature, the estimation process considers “OB” as the name of each mineralization domain, “COD_OB” as the numerical code for each mineralization domain and “C_DOM” as the numerical code for each estimation domain. “C_ANIS” refers to an initial grouping of mineralization domains based on structural anisotropy, while “C_ESTIM” refers to a subsequent sub-grouping used for variography.

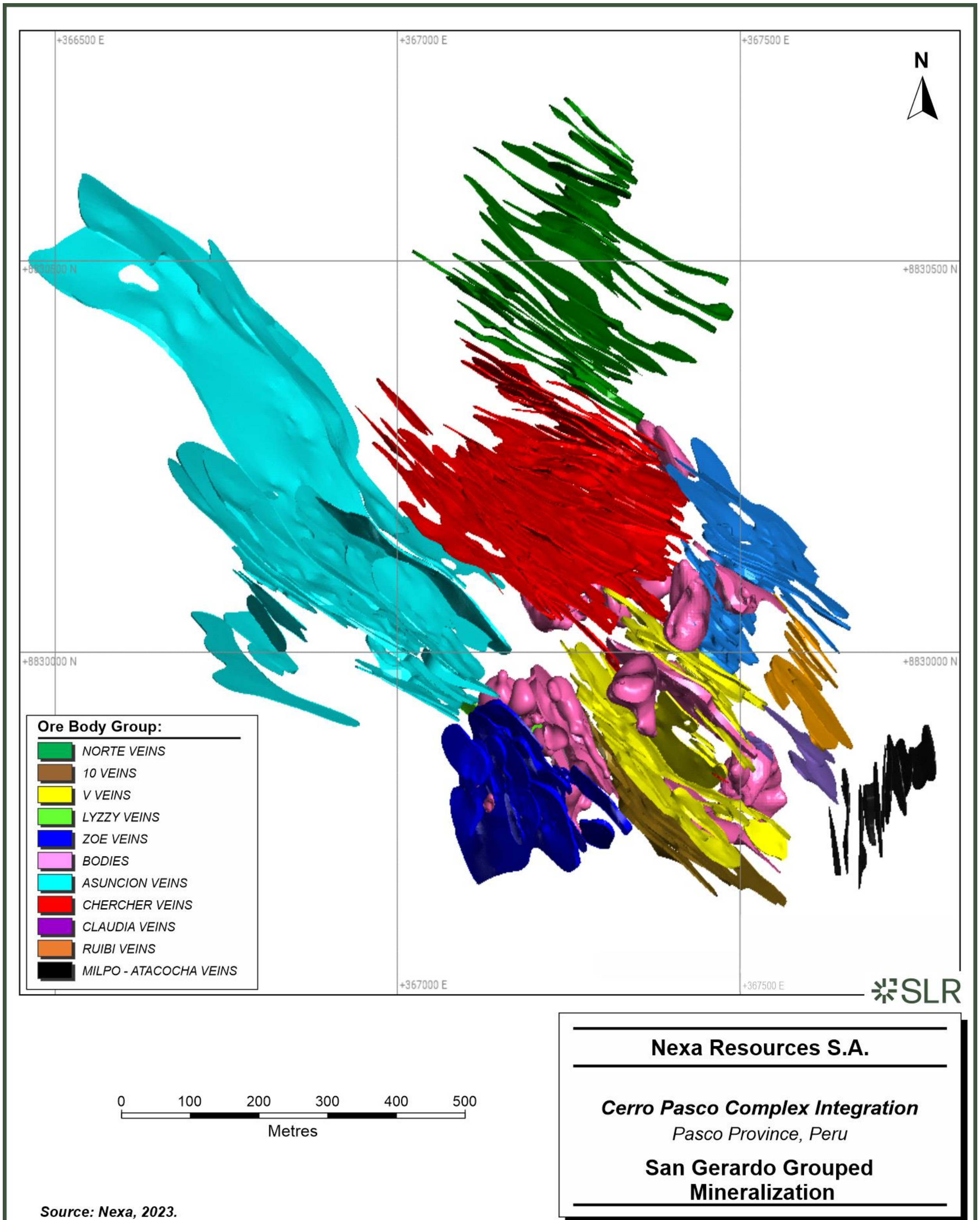
The 25 largest contributors to the San Gerardo Mineral Resources are shown in red in Figure 11-29.

Figure 11-26: San Gerardo Geological Control Type



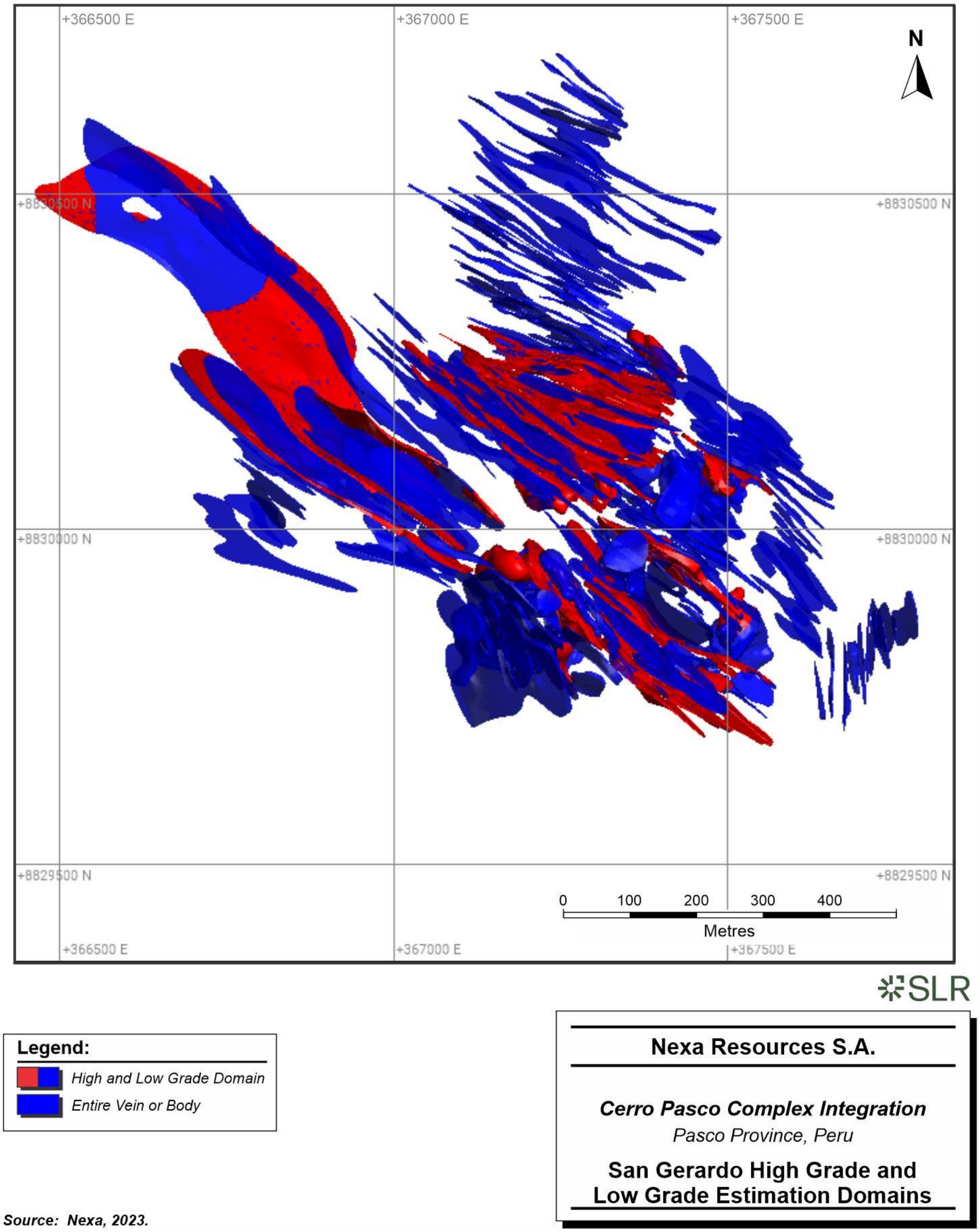
Source: Nexa, 2023.

Figure 11-27: San Gerardo Grouped Mineralization



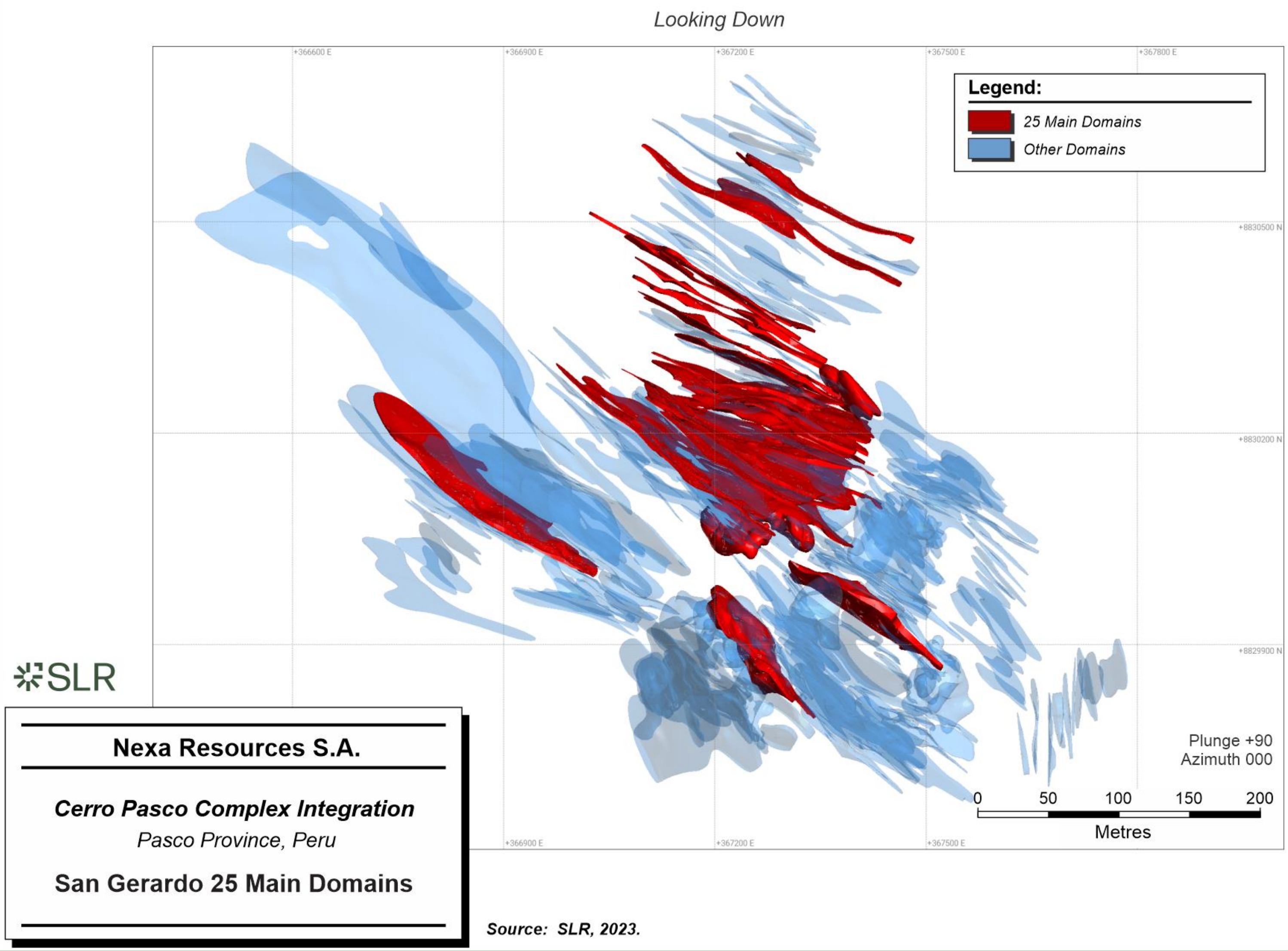
Source: Nexa, 2023.

Figure 11-28: San Gerardo High Grade and Low Grade Estimation Domains



Source: Nexa, 2023.

Figure 11-29: San Gerardo 25 Main Domains



Source: SLR, 2023.

The QP reviewed the mineralization wireframes for the San Gerardo open pit and considers them acceptable for the estimation of Mineral Resources. Unlike the approach taken for Atacocha UG and El Porvenir, mineralization wireframes for the San Gerardo model pinch out for non-assayed drill holes. Although this has resulted in some isolated holes in the resulting domains, this is not considered to have a material impact on Mineral Resources and is considered preferable to the subsequent post-processing of the domains undertaken for Atacocha UG and El Porvenir.

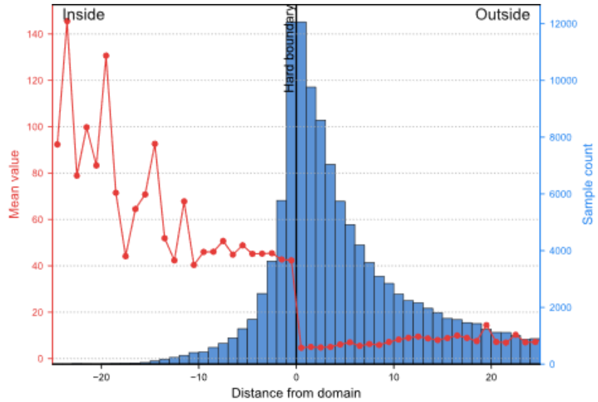
It was identified that mineralized bodies crossing the arbitrary model boundary between the Atacocha UG and OP models had not been modelled as continuous shapes. This is most obvious in the San Gerardo “wf_10_2r” and Atacocha UG “OB_10” intrusion-style wireframes, however, it is noted that several veins have also not been modelled across the boundary. This is not considered to have a material impact on estimated Mineral Resources but should be addressed in future Mineral Resource updates.

Extrapolation of the wireframes was considered reasonable and was subsequently considered during Mineral Resource classification.

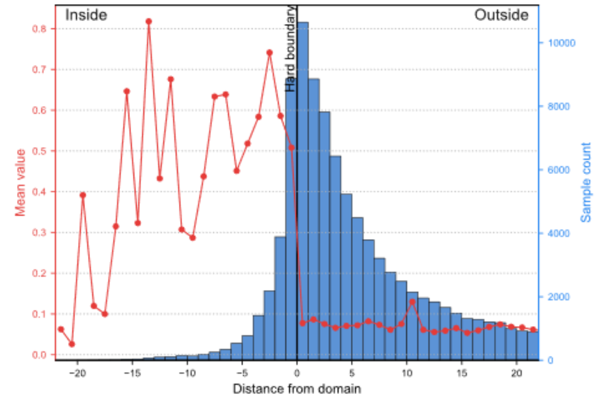
An analysis of snapping discrepancies showed that 99% of intervals assigned to an OB were correctly modelled as such, while 99% of waste intervals were correctly modelled. This is considered acceptable by the QP, especially as many of the discrepancies were located outside of the Mineral Resource constraining reporting shapes.

Contact analysis completed by SLR on the mineralization domains indicates that they are generally effective in separating mineralized and unmineralized populations (Figure 11-30), although it was identified in some areas that opportunities existed to extend the wireframes to include additional mineralized intercepts. The populations within the modelled mineralization were approximately lognormal.

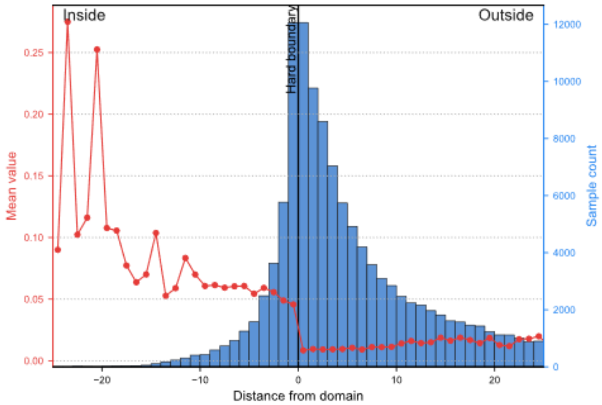
Figure 11-30: San Gerardo Mineralization Contact Analysis



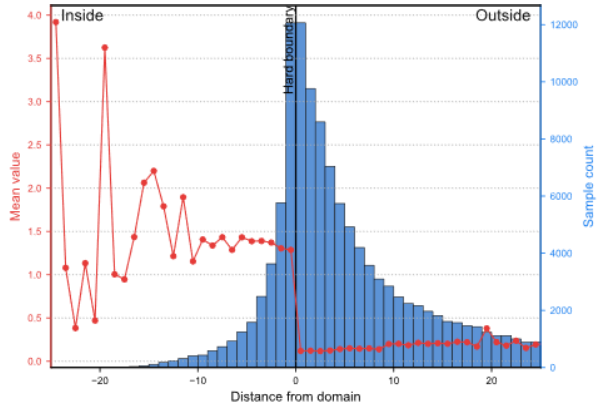
a) Ag



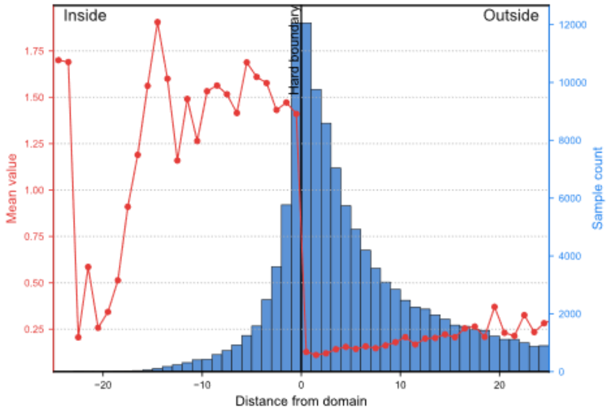
b) Au



c) Cu



d) Pb



e) Zn

11.5.3 Resource Assays

The database flagged and used for generating the mineralization wireframes consists of both drill holes and channel samples. For the EDA process, the database is exported from Leapfrog Geo and imported into Datamine Studio software. Non-sampled intervals are substituted with the half of the detection limits of the chemical elements.

For the purpose of this TRS, Zn, Au, Ag, and Pb, referred to as the main elements for San Gerardo, will be detailed in tables and figures, along with the 25 grade shells (main domains) that contribute most significantly to the Mineral Resource and Mineral Reserves, approximately 46% of the tonnage.

Table 11-30 presents the length-weighted statistics of the drill holes and channels combined.

Table 11-30: San Gerardo Assay Statistics (Length-Weighted) for the Main Domains

Domain Code	Orebody	Zn (%) - Assay (2 m composites)						Ag (g/t) - Assay (2 m composites)					
		Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
asu8	208	213	1.08	1.5	1.39	0	9.62	213	57.93	158.54	2.74	0.4	1393.04
che1	301	194	1.49	2.57	1.72	0	19.03	194	33.4	59.17	1.77	0.27	545.55
che2	302	276	1.34	2.77	2.07	0	26.36	276	35.98	243.04	6.76	0.1	4475.79
che3	303	504	2.75	4.47	1.63	0.01	31.67	504	21.39	35.32	1.65	0.31	356.57
che4	304	249	1.32	2.23	1.69	0	26.35	249	33.61	41.49	1.23	0.72	260.49
che6	306	922	1.54	2.49	1.62	0	21.01	922	37.08	67	1.81	0.1	730.29
che7	307	399	2.76	5.27	1.91	0	34.27	399	44.4	125.31	2.82	0.1	1809.87
che10	310	363	1.5	3.42	2.28	0	41.47	363	28.71	70.06	2.44	0.1	1163.89
che14	314	553	2.01	3.8	1.89	0.01	34.38	553	36.41	77.91	2.14	0.34	1855.16
che15	315	195	0.88	1.57	1.79	0	18	195	41.7	97.72	2.34	0.1	1296
che16	316	456	1.47	2.55	1.73	0	29.8	456	52.37	95.31	1.82	0.1	998.2
che22	322	17	1.38	1.01	0.74	0.04	4.31	17	25.77	20.01	0.78	2.02	92.69
che24	324	252	0.79	1.22	1.55	0.01	9.94	252	34.49	68.05	1.97	0.58	796.87
che27	327	179	1.26	2.84	2.25	0	26.8	179	41.11	66.42	1.62	0.2	646.01
n1	601	215	1.27	1.91	1.5	0	20.24	215	29.13	43.58	1.5	1.2	762.97
n2	602	378	0.89	1.81	2.03	0	30.89	378	28.64	44.43	1.55	0.1	507
n3	603	259	1.26	3.2	2.54	0	28.1	259	57.07	162.39	2.85	0.09	2056.56
n9	609	101	1.07	2.93	2.73	0	32.67	101	29.58	72.16	2.44	0.31	1011.43
n12	612	166	0.83	2.4	2.88	0	25.1	166	35.93	79.27	2.21	0.41	610.29
n22	622	85	0.89	1.55	1.74	0	10.26	85	41.63	89.54	2.15	0.69	667.85
cpo2	2002	1,500	1.33	2.32	1.74	0	30.95	1500	41.6	74.06	1.78	0.1	1046.32

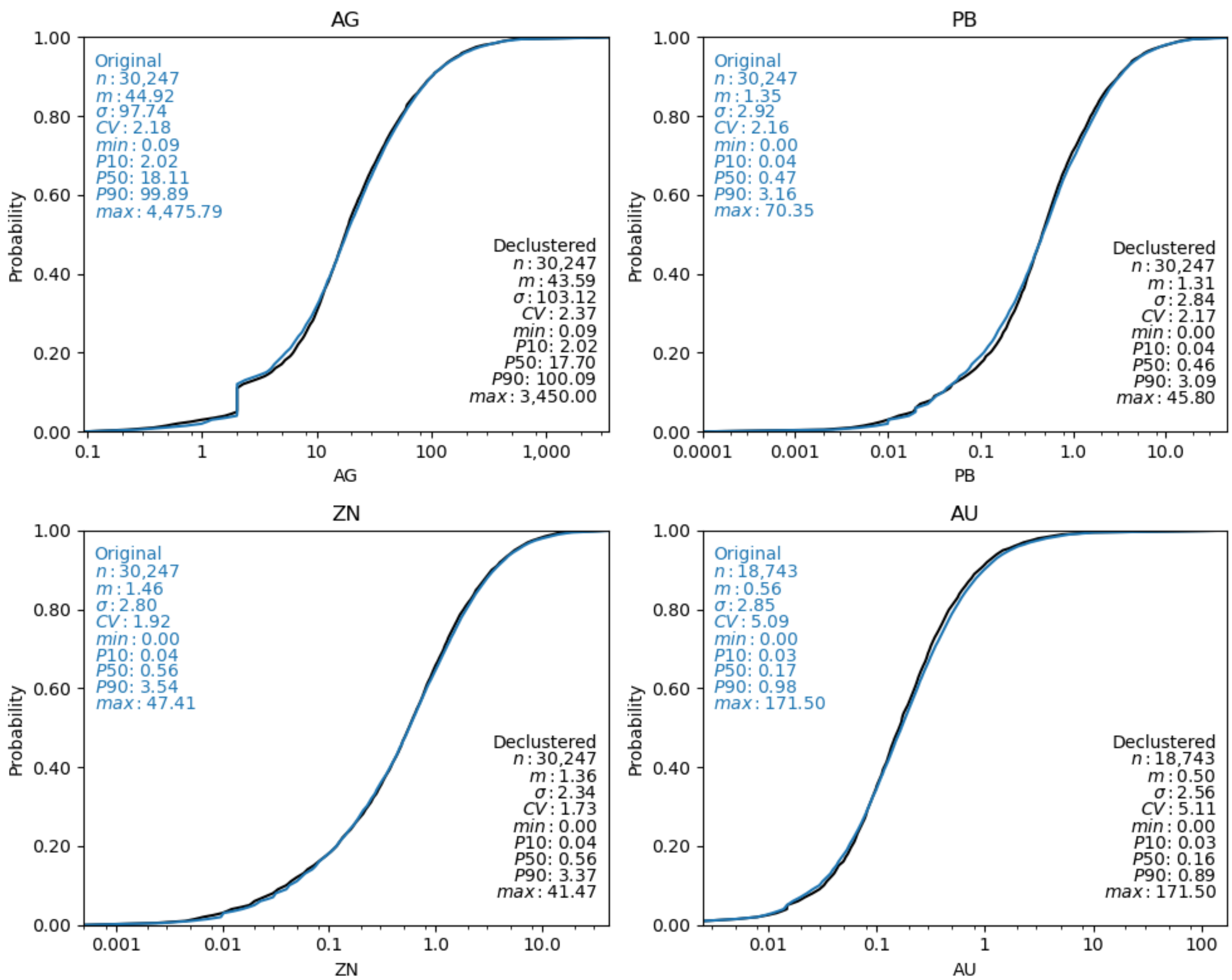
Domain Code	Orebody	Zn (%) - Assay (2 m composites)						Ag (g/t) - Assay (2 m composites)					
		Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
cpo5	2005	1,128	1.94	3.12	1.61	0	33.57	1128	43.17	59.2	1.37	1.01	540.89
cpo7	2007	294	3.54	4.1	1.16	0.03	22.04	294	11.53	38.7	3.36	2.02	442.6
cpo15	2015	735	1.39	1.99	1.43	0.01	25.04	735	24.47	48.45	1.98	0.62	781.32
cpo16	2016	909	0.78	1.47	1.89	0	15.46	909	66.55	95.41	1.43	1.58	1045.39

Domain Code	Orebody	Pb (%) - Assay (2 m composites)						Au (g/t) - Assay (2 m composites)					
		Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
asu8	208	213	1.53	3.21	2.1	0.01	33.5	213	0.37	1.05	2.83	0.02	16.5
che1	301	194	0.93	1.77	1.89	0	17.86	194	0.33	0.41	1.25	0	3.36
che2	302	276	0.61	1.57	2.58	0	19.66	276	0.63	2.09	3.31	0.01	23.1
che3	303	504	0.7	1.48	2.12	0.01	14.05	504	0.63	1.37	2.2	0.01	15.3
che4	304	249	1.04	1.56	1.49	0	12.47	249	0.33	0.36	1.1	0.01	3.38
che6	306	922	1.27	2.54	1.99	0	28.71	922	0.29	0.56	1.95	0	4.9
che7	307	399	1.46	3.07	2.11	0	28.67	399	1.05	9.47	9.03	0	128.4
che10	310	363	0.76	2.11	2.79	0	37.11	363	0.35	0.73	2.09	0.01	13.35
che14	314	553	1.03	1.89	1.84	0	16.46	553	0.66	1.22	1.84	0	9
che15	315	195	1.26	2.81	2.23	0	25.18	195	0.24	0.45	1.85	0	4.34
che16	316	456	1.63	3.59	2.21	0	45.8	456	0.43	1.28	2.95	0.01	25.4
che22	322	17	0.87	0.92	1.06	0.03	2.7	17	0.49	0.1	0.21	0.34	0.62
che24	324	252	1.17	2.36	2.02	0.01	33.9	252	0.65	3.27	5.06	0	54.3
che27	327	179	1.41	2.51	1.78	0	26.88	179	0.52	0.68	1.3	0.01	6.9
n1	601	215	1.09	1.52	1.39	0.01	20.22	215	0.75	2.97	3.98	0.01	42.5
n2	602	378	1.13	2.02	1.8	0	23.14	378	0.58	0.78	1.35	0	16
n3	603	259	1.95	4.6	2.36	0	34.91	259	0.88	5.26	5.95	0	78.6

Domain Code	Orebody	Pb (%) - Assay (2 m composites)						Au (g/t) - Assay (2 m composites)					
		Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
n9	609	101	0.98	1.78	1.82	0	20	101	0.34	0.52	1.5	0.01	5.71
n12	612	166	1.34	2.7	2.02	0	28.99	166	0.3	0.4	1.35	0	3.46
n22	622	85	1.12	1.6	1.43	0.01	8.54	85	1.63	12.16	7.46	0.01	115.7
cpo2	2002	1,500	1.29	2.68	2.08	0	42.44	1,500	0.37	1.69	4.53	0	42
cpo5	2005	1,128	1.35	2	1.48	0.01	24.33	1,128	0.34	0.93	2.77	0	8.4
cpo7	2007	294	0.29	1.5	5.18	0.01	18.86	294	0.53	0.56	1.05	0.04	3.4
cpo15	2015	735	0.81	2.02	2.49	0.01	25.59	735	0.27	0.38	1.39	0	2.82
cpo16	2016	909	1.51	3.1	2.05	0.01	33.05	909	0.44	0.9	2.06	0	10.45

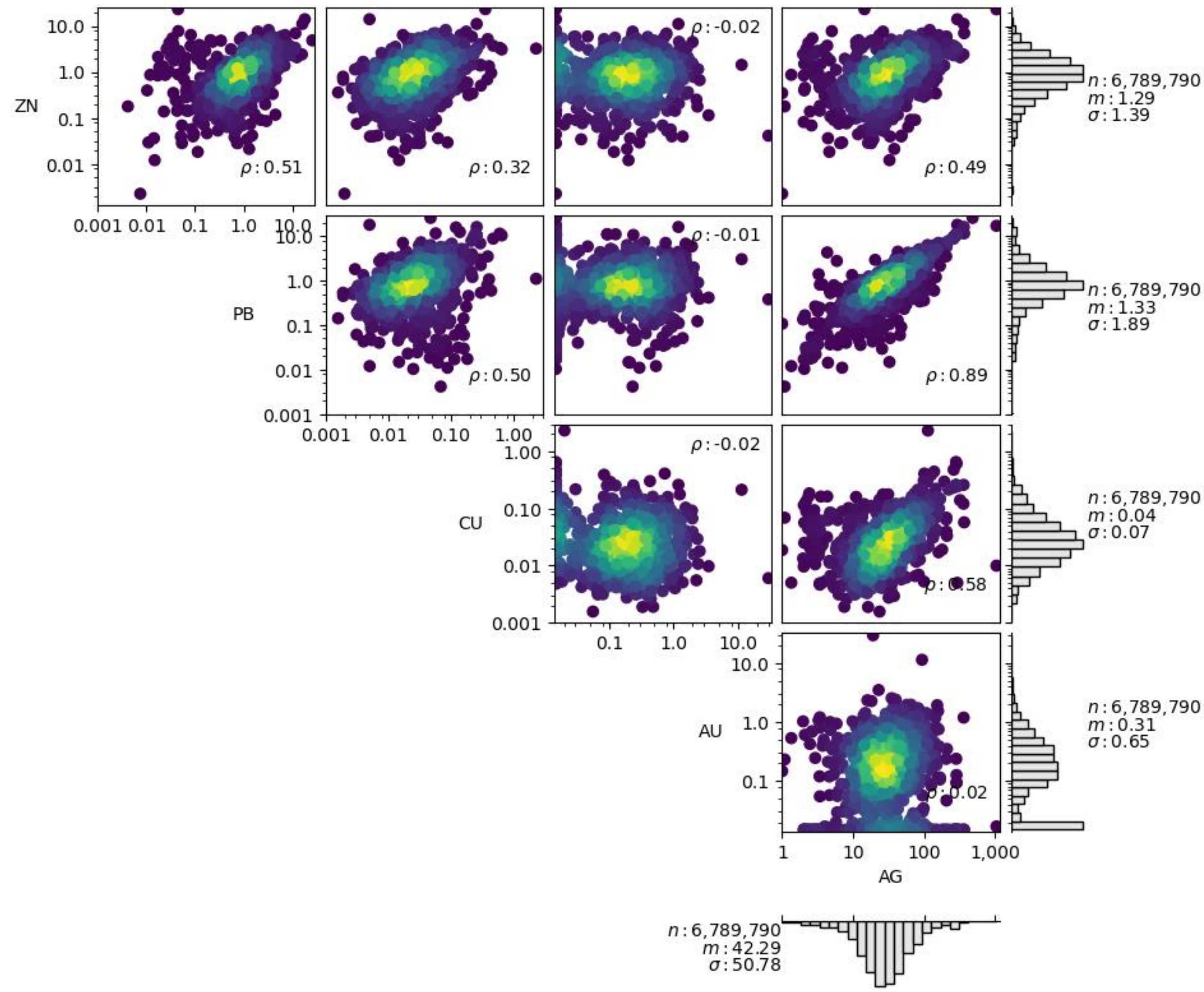
In the San Gerardo deposit, approximately 78% of the samples are derived from drill holes, which consist of RC and DDH from both surface and underground, while 22% originate from channel samples. Grade control is mainly based on blast hole sampling, which is not directly incorporated in the LTM, although is reportedly used in conjunction with bench mapping as a guide when constructing mineralization wireframes. Sampling is uneven across the open pit, as it is usually the case for mining operations. Figure 11-31 shows CDFs of the samples with and without declustering weights. The declustered statistics have a slightly lower mean for all variables, proving the preferential bias for sampling mineralized locations.

Figure 11-31: San Gerardo CDFs Comparing Declustered and Original data.



Given the polymetallic nature of the mineralization, a bivariate statistical analysis is conducted to evaluate the relationships between the variables. Figure 11-32 provides scatter plots for the main elements, in addition to their correlation coefficients. Generally, intermediate to strong correlations are observed between most elements, with the exception of Au, which is uncorrelated to other variables.

Figure 11-32: San Gerardo Scatter Plots between the Elements



11.5.4 Treatment of High Grade Assays

After completing 3D solid models, Nexa assesses the assay data contained inside the solid models to determine whether any additional domaining is required prior to capping. Typically, raw assay data are extracted from each domain and are then assessed using histograms and cumulative probability plots.

Where the assay distribution is positively skewed or approaches lognormal, erratic high grade values can have a disproportionate effect on the average grade of a deposit. One method of treating these outliers to reduce their influence on the average grade is to cap them at a specific grade level.

Atacocha staff evaluated the raw grades using log-probability plots to assess the influence of higher grades for each element using the estimation domains. The approach applied by Atacocha staff for restricting outliers was to identify a pronounced break in the probability curve that occurs above the 95th percentile.

A second capping level is applied for the third interpolation pass in channel composites to restrict the high grade influence.

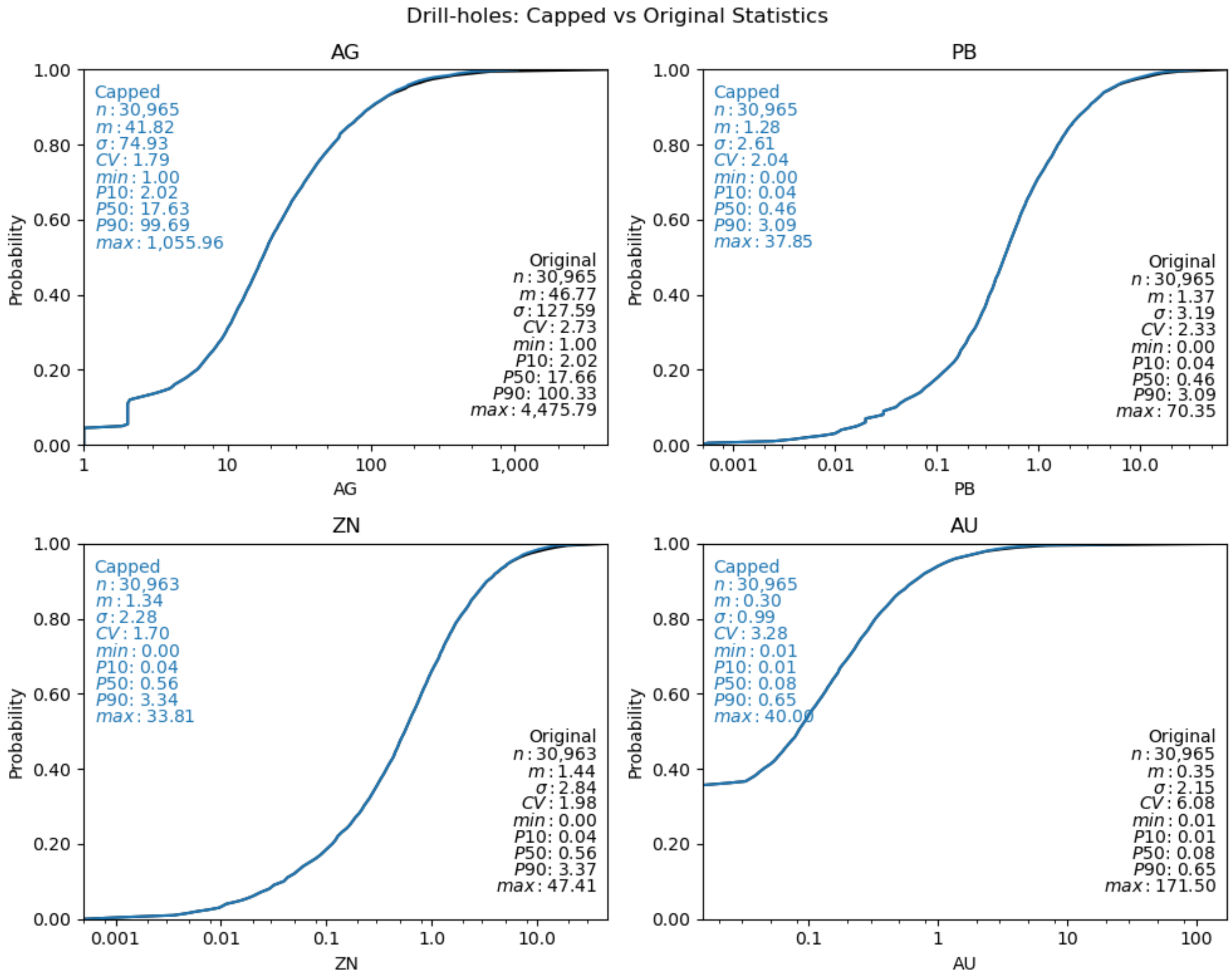
Table 11-31 lists the capping levels for drill hole, channel raw data determined for each high grade estimation for the main domains, and the second capping levels applied to samples used for the third interpolation pass.

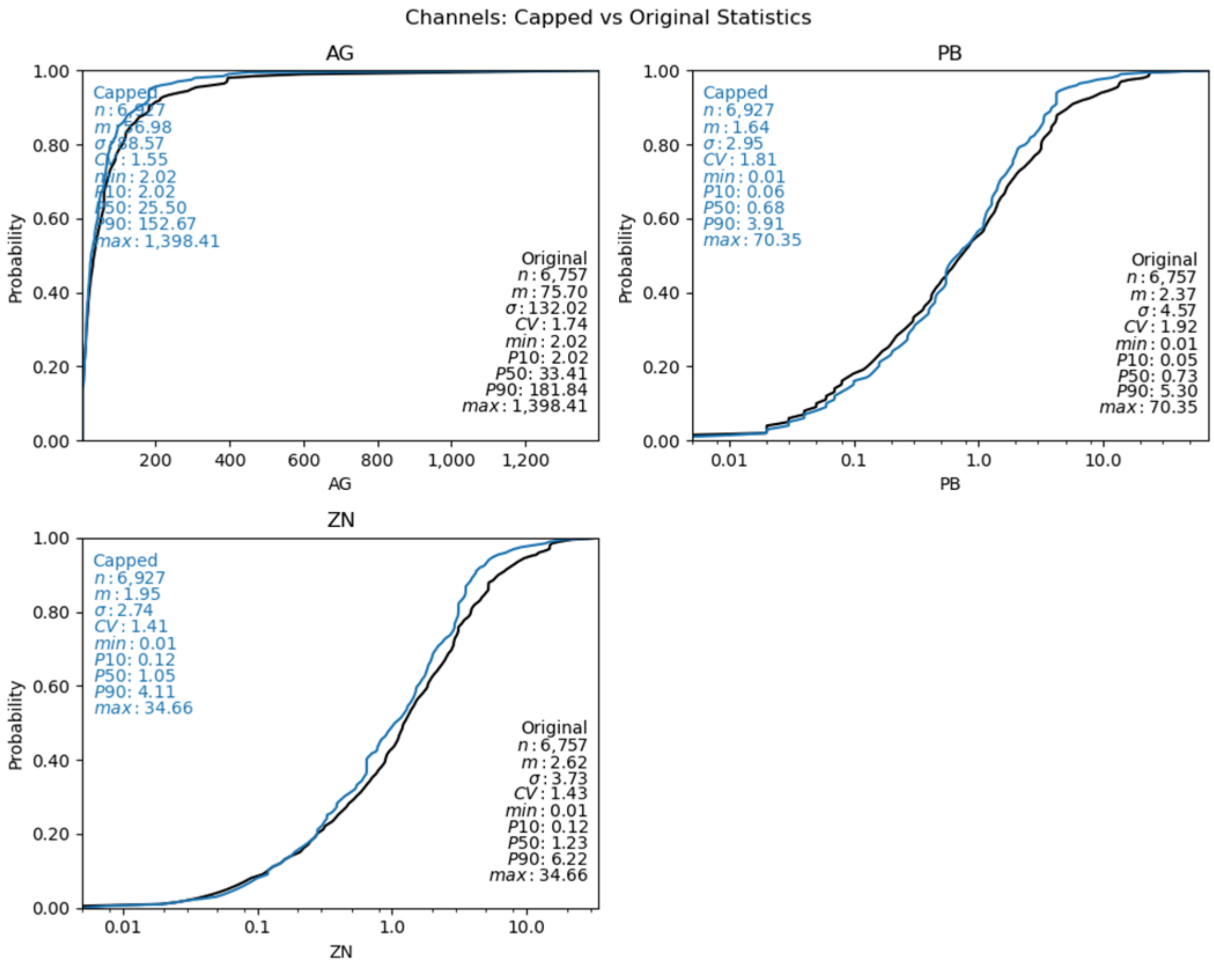
Table 11-31: San Gerardo DDH and CHNL First and Second Level Top-Cut Values

Domain	Zn DDH	Zn CHNL	Zn CHNL 2nd Level	Ag DDH	Ag CHNL	Ag CHNL 2nd Level	Pb DDH	Pb CHNL	Pb CHNL 2nd Level	Au DDH	Au CHN	Au CHN 2nd Level
asu8	7.20	-	-	690.00	-	-	12.50	-	-	6.00	-	-
che1	8.00	-	15.26	200.00	-	203.73	9.20	-	7.91	2.30	-	-
che2	15.00	12.00	9.57	500.00	75.00	46.66	14.00	-	1.72	14.50	-	-
che3	15.00	17.50	16.59	165.00	100.00	56.06	9.30	5.70	4.39	9.00	-	-
che4	11.00	-	6.33	145.00	140.00	136.17	7.00	-	4.35	1.60	-	-
che6	10.30	12.00	8.37	400.00	330.00	273.21	12.80	18.50	8.75	3.00	-	4.31
che7	8.00	26.00	25.32	680.00	270.00	243.23	16.00	14.50	12.96	10.00	-	1.28
che10	18.00	15.50	13.72	600.00	-	108.78	16.50	-	1.90	4.30	-	1.05
che14	14.50	22.00	12.94	450.00	255.00	159.39	11.00	12.50	5.94	5.60	-	0.25
che15	8.70	-	-	520.00	-	-	12.00	-	-	3.00	-	-
che16	10.40	6.00	5.98	540.00	350.00	239.31	18.00	11.50	5.15	8.00	-	0.78
che22	13.00	20.00	14.47	270.00	78.00	53.65	6.30	-	2.60	3.50	-	-
che24	6.00	-	-	420.00	-	-	16.50	-	-	12.00	-	-
che27	13.50	-	-	240.00	-	-	13.00	-	-	2.80	-	-
n1	8.00	-	-	200.00	-	-	7.00	-	-	5.00	-	-
n2	10.00	-	-	310.00	-	-	12.00	-	-	4.00	-	-
n3	13.00	-	-	850.00	-	-	18.00	-	-	20.00	-	-
n9	15.00	-	-	550.00	-	-	9.30	-	-	2.30	-	-
n12	7.00	-	-	340.00	-	-	15.00	-	-	-	-	-
n22	5.00	-	-	380.00	-	-	5.80	-	-	16.00	-	-
cpo2	10.00	12.00	6.61	730.00	380.00	175.02	27.00	9.20	4.52	9.00	-	-
cpo5	12.50	13.50	9.27	140.00	220.00	170.14	7.00	14.00	6.06	5.20	-	-
cpo7	13.20	17.00	16.32	-	160.00	139.23	13.00	-	4.63	-	-	-
cpo15	10.50	6.50	5.05	27.00	-	2.68	13.00	-	-	2.10	-	-
cpo16	7.50	2.10	1.33	500.00	370.00	301.95	16.50	9.30	6.84	6.60	-	-

Figure 11-33 shows the capping effect on overall distribution of grades for drill holes and channels within the San Gerardo open pit. Since channel distributions have higher grade-values on average, they are more affected by capping limits than the drill holes. Historically, channels from underground have not been assayed for Au in Atacocha, therefore the capping analysis for channels does not include Au.

Figure 11-33: San Gerardo Capping Effect on Drill Hole and Channel Distributions

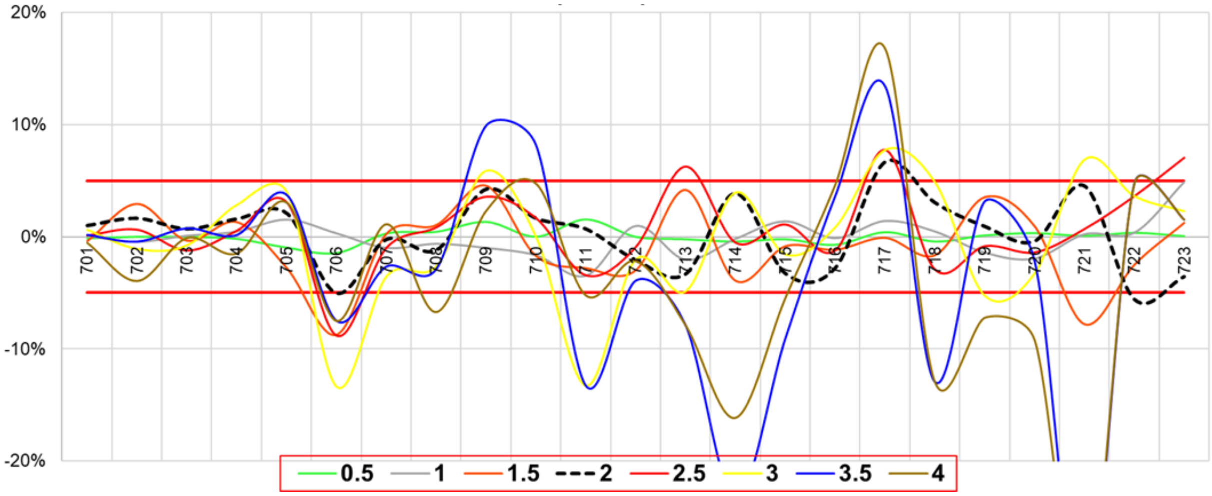




11.5.5 Compositing

The average length of samples within the mineralized domains is 1.16 m. Assay data was composited to two metre lengths, which corresponds to one third of the parent block heights. The composite length was selected based on the analysis of eight compositing lengths (0.5 m, 1.0 m, 1.5 m, 2.0 m, 2.5 m, 3.0 m, 3.5 m, and 4.0 m). Figure 11-34 illustrates a comparison of the mean relative error for Zn between length-weighted raw assay mean versus composite mean by mineralization domain for the different composite lengths.

Figure 11-34: San Gerardo Open Pit Zn Compositing Analysis



Source: Nexa, 2023

Figure 11-35 shows the drill hole sample distributions both before and after compositing to 2.0 m lengths. The QP finds that the composites acceptably reproduce the raw distributions, with only minor decreases observed in the averages of composited data distribution for Ag, Pb, and Zn. For Au, while neither the mean nor the variance undergoes significant changes, the composited distributions exhibit a relatively higher proportion of data with grades close to the detection limit.

Figure 11-35: San Gerardo Drilling Sample Distributions before and after Compositing to 2 m Length

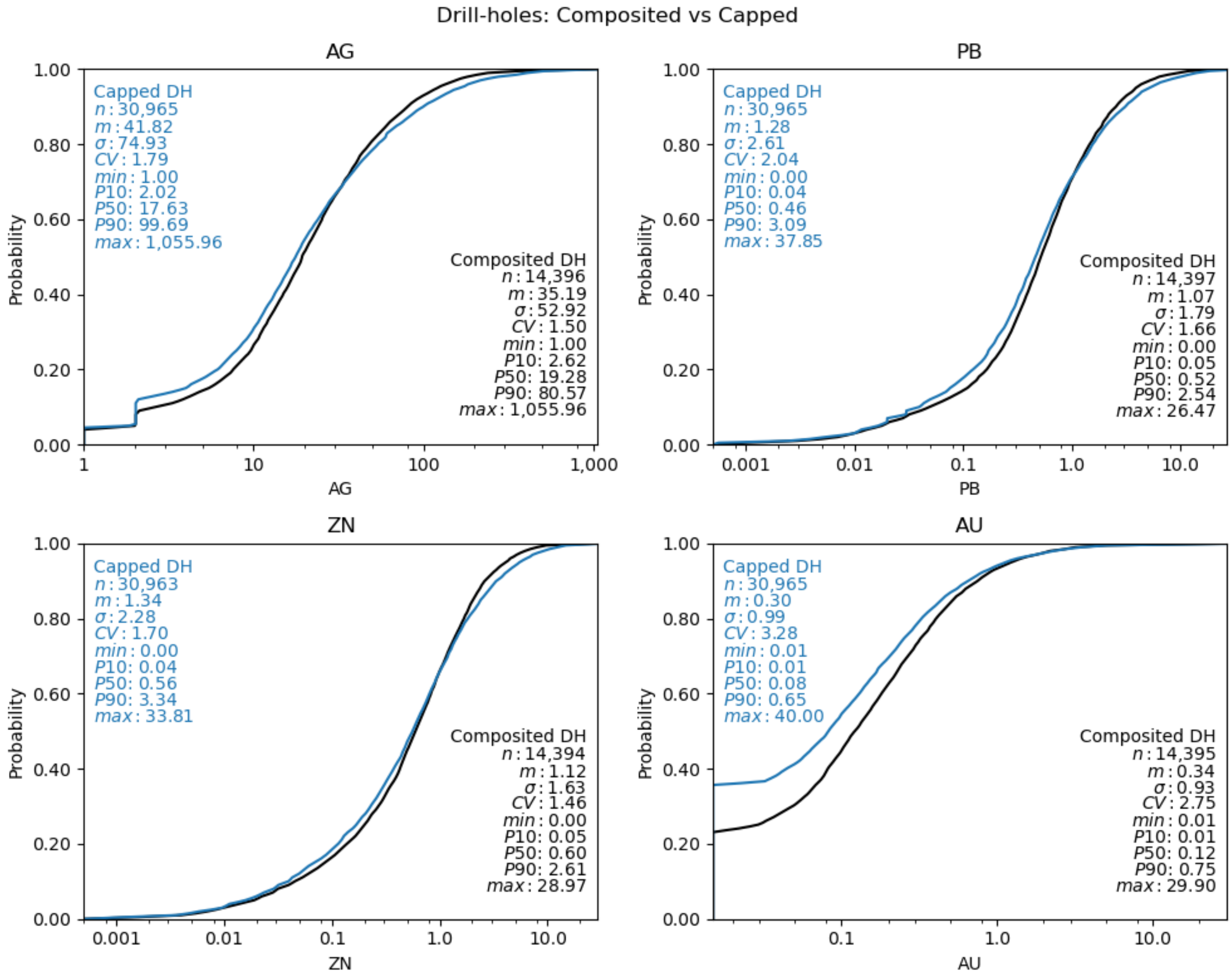


Table 11-32 shows the summary statistics for the 25 largest tonnage contributors to the Mineral Resource, before and after compositing. Summary statistics indicate that the composites are representative of the raw samples.

Table 11-32: San Gerardo Compositing Statistics for the 25 Main Domains

Domain	Domain Code	Zn (%) - Assay (2 m composites)						Au (g/t) - Assay (2 m composites)					
		Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
asu8	208	118	1.47	1.62	1.1	0.01	7.17	118	0.2	0.32	1.58	0.01	3.74
che1	301	125	1.52	1.9	1.25	0	11.73	125	0.2	0.23	1.15	0.01	1.19
che2	302	179	1.89	2.8	1.48	0	12.6	179	0.42	1.36	3.24	0.01	11.95
che3	303	333	2.08	3.12	1.5	0	17.01	333	0.22	0.43	2.01	0.01	5.05
che4	304	161	1.09	1.79	1.64	0	8.27	161	0.19	0.22	1.15	0.01	1.13
che6	306	562	1.36	1.8	1.33	0	10.3	563	0.18	0.35	1.97	0.01	2.63
che7	307	244	1.99	2.85	1.43	0	25.47	244	0.37	0.66	1.79	0.01	5.72
che10	310	214	1.47	2.12	1.44	0	16.54	213	0.2	0.35	1.7	0.01	3.24
che14	314	350	2.08	2.72	1.31	0	14.8	350	0.27	0.62	2.27	0.01	4.82
che15	315	117	0.77	1.06	1.37	0	4.66	117	0.27	0.38	1.42	0.01	2.14
che16	316	257	1.18	1.47	1.25	0	8.68	257	0.26	0.49	1.88	0.01	5.82
che22	322	349	1.46	2.25	1.54	0	14.72	348	0.16	0.29	1.88	0.01	3.5
che24	324	164	0.78	0.88	1.12	0	4.21	164	0.38	0.85	2.2	0.01	6.73
che27	327	125	1.83	2.8	1.53	0.01	12.94	125	0.34	0.39	1.12	0.01	2.67
n1	601	136	1.66	1.86	1.12	0.01	8	136	0.37	0.54	1.46	0.01	5
n2	602	243	1.03	1.09	1.06	0	8.12	243	0.38	0.43	1.14	0.01	2.71
n3	603	157	1.91	2.76	1.45	0	12.05	157	0.5	1.33	2.66	0.01	18.15
n9	609	62	1.89	3.68	1.95	0	15	62	0.31	0.3	0.96	0.01	1.57
n12	612	108	0.94	1.2	1.28	0	6.5	108	0.25	0.34	1.34	0.01	1.29
n22	622	53	0.77	0.91	1.17	0	4.26	53	0.58	1.34	2.3	0.01	8.65
cpo2	2002	946	1.01	1.34	1.32	0	10.63	948	0.18	0.42	2.35	0.01	5.4

Domain	Domain Code	Zn (%) - Assay (2 m composites)						Au (g/t) - Assay (2 m composites)					
		Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
cpo5	2005	765	1.6	2.09	1.3	0.01	13.5	765	0.12	0.29	2.41	0.01	4.23
cpo7	2007	183	3.35	3.07	0.92	0.1	16.13	183	0.16	0.37	2.34	0.01	2.52
cpo15	2015	422	1.12	1.31	1.16	0.01	7.78	424	0.07	0.16	2.34	0.01	1.4
cpo16	2016	507	0.78	1.14	1.47	0	7.5	507	0.12	0.32	2.61	0.01	6.13

Domain	Domain Code	Ag (g/t) - Assay (2 m composites)						Pb (%) - Assay (2 m composites)					
		Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
asu8	208	118	35.22	43.06	1.22	1	598.67	118	1.2	1.46	1.22	0.01	9.48
che1	301	125	29.19	30.5	1.04	1	163.2	127	0.93	1.21	1.29	0	6.08
che2	302	179	29.71	44.05	1.48	1	272.15	179	0.79	1.41	1.78	0	7.6
che3	303	333	21.46	30.14	1.4	1	165	333	0.88	1.61	1.83	0	9.3
che4	304	161	28.44	26.54	0.93	1	118.73	161	0.99	1.1	1.11	0	5.08
che6	306	562	33.22	41.39	1.25	1	330	562	1.08	1.48	1.38	0	16.17
che7	307	243	44.57	63.6	1.43	1	559.75	243	1.42	1.94	1.37	0	16
che10	310	214	29.55	37.83	1.28	1	192.27	213	0.81	1.16	1.44	0	8
che14	314	351	35.09	44.19	1.26	1	304.76	350	1.33	2.1	1.58	0	9.63
che15	315	117	36.79	41.95	1.14	1	229.6	117	0.95	1.1	1.16	0	6.65
che16	316	257	56.61	91.56	1.62	1	466.29	257	1.76	3.13	1.78	0	14.46
che22	322	348	18.67	21.93	1.17	1	270	348	0.56	0.74	1.32	0	6.3
che24	324	164	31.74	39.77	1.25	1	288.94	164	1.27	1.75	1.38	0.01	10.8
che27	327	125	47.2	38.32	0.81	1	141.69	125	1.9	2.02	1.06	0.01	8
n1	601	136	41.3	32.13	0.78	2.02	131.04	136	1.43	1.45	1.02	0.01	7
n2	602	243	27.01	26.11	0.97	1	194.97	243	0.88	1	1.15	0	8.47
n3	603	157	66.15	106.39	1.61	1	710.07	157	2.43	3.88	1.6	0	16.94

Domain	Domain Code	Ag (g/t) - Assay (2 m composites)						Pb (%) - Assay (2 m composites)					
		Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
n9	609	62	35.88	43.55	1.21	2.12	155.21	62	1.25	1.85	1.49	0	7.68
n12	612	108	31.81	38.24	1.2	1	226.19	108	1.03	1.29	1.25	0	12.13
n22	622	53	60.71	98.46	1.62	1	380	53	0.98	1.13	1.15	0.01	5.21
cpo2	2002	949	27.93	38.14	1.37	1	428.09	949	0.82	1.41	1.71	0	20.03
cpo5	2005	765	36.6	37.99	1.04	2.02	220	765	1.09	1.24	1.14	0.01	9.27
cpo7	2007	183	19.4	45.53	2.35	2.02	281.74	182	0.54	1.42	2.63	0.01	8.26
cpo15	2015	424	31.49	38.97	1.24	1.7	279.64	424	1.07	1.73	1.61	0	13
cpo16	2016	507	57.21	61.97	1.08	1.14	348.99	507	1.37	2.05	1.5	0.01	13.99

11.5.6 Trend Analysis

11.5.6.1 Variography

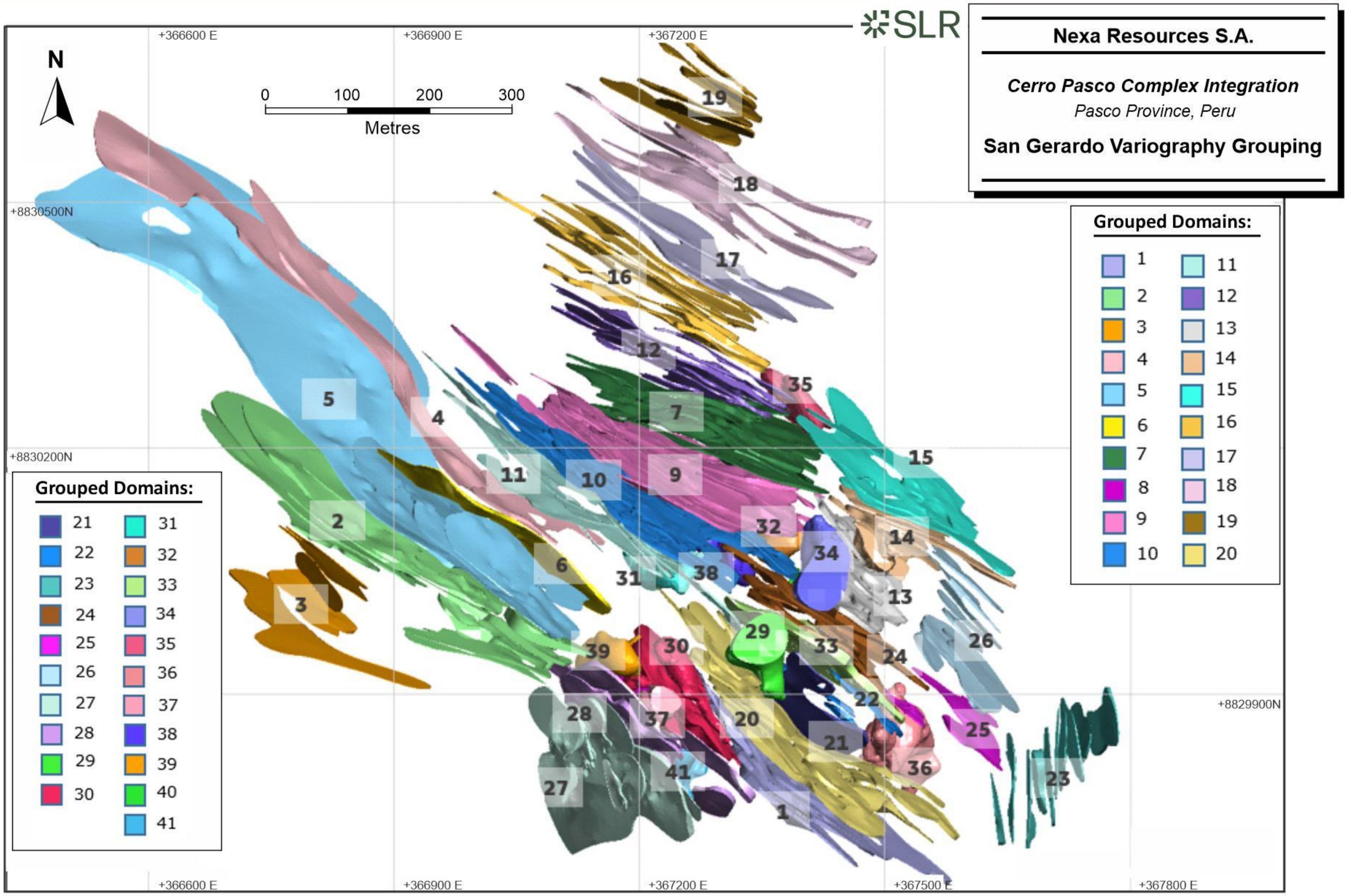
Variograms were used to characterize the spatial continuity of grade within the mineralization domains.

San Gerardo generated downhole and directional variograms using the two-metre capping and composite values in groups. Since the small number of samples inside each individual structure were insufficient to generate robust variograms, the structures were instead grouped according to their anisotropy and statistics. An initial “C_ANIS” grouping was based on structural anisotropy (Figure 11-36), which was then analyzed further using box plots to define a smaller grouping. The resulting grouping was assigned code “C_ESTIM” and used for the variography.

Variograms were standardized and modelled using two or three spherical structures in three directions. The variograms were used for OK interpolation and as a guide for selecting search ellipse ranges.

The results for variogram parameters for the 25 largest tonnage contributors to the San Gerardo Mineral Resource are tabulated in Table 11-33. An example of downhole and directional variogram models for the three main directions of continuity in C_ESTIM=306 is shown in Figure 11-37.

Figure 11-36: San Gerardo Variography Grouping



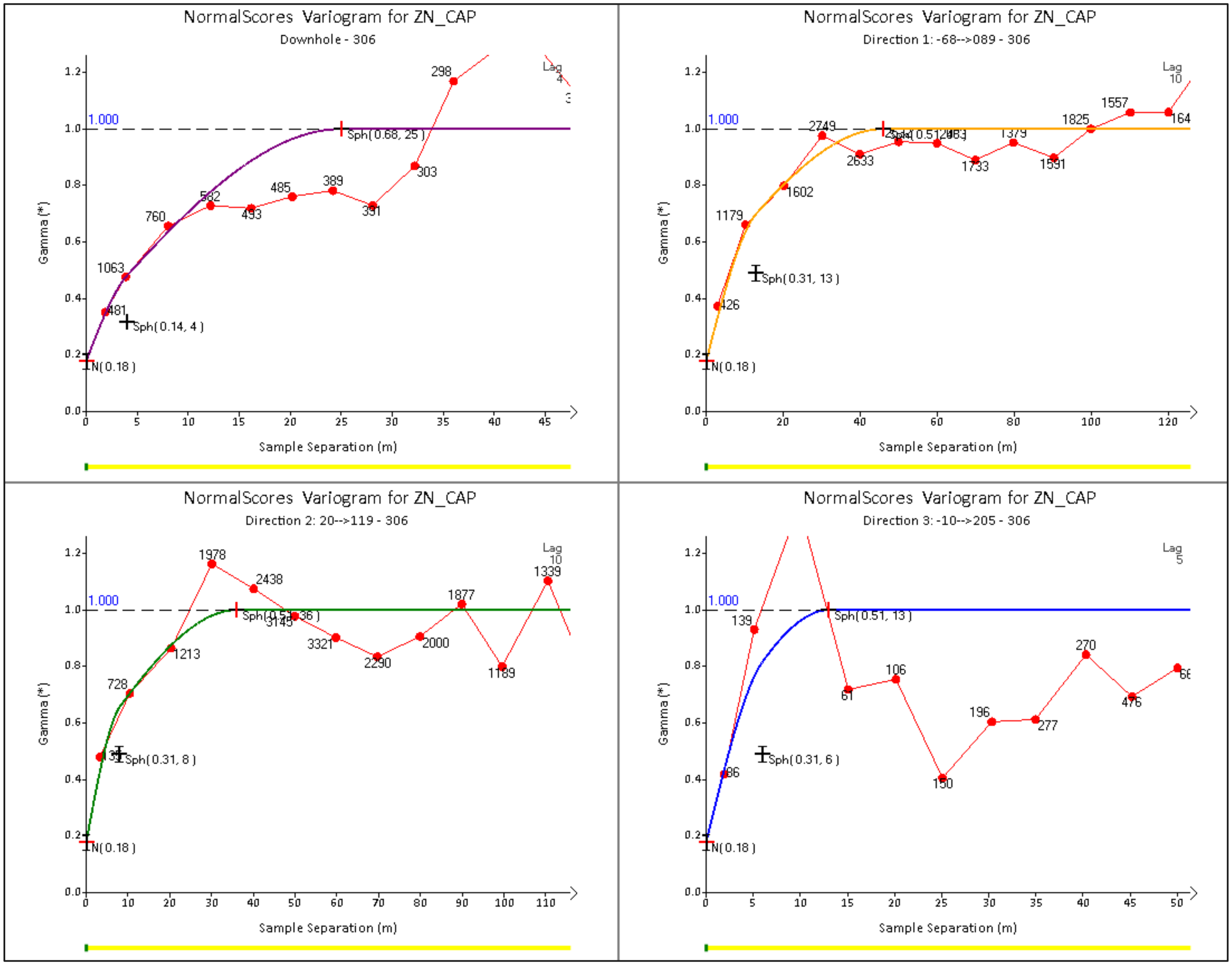
Source: Nexa, 2023.

Table 11-33: Atacocha Open Pit Zn Variogram Parameters for Main 25 Domains

Mineralization Domain	ESTIM	Datamine Rotation			Nugget	Structure 1				Structure 2			
		1	2	3		ST1PAR1	ST1PAR2	ST1PAR3	C1	ST2PAR1	ST2PAR2	ST2PAR3	C2
asu8	207	-27.73	-67.73	-154.49	0.21	3	15	9	0.29	40	32	20	0.50
che1	322	6.53	-69.41	-104.35	0.19	17	9	7	0.39	58	35	20	0.42
che10	306	-0.51	-67.73	-117.27	0.24	13	8	6	0.38	46	36	13	0.39
che14	314	-5.42	-65.19	-128.08	0.28	11	4	10	0.35	58	36	20	0.37
che15	316	-0.51	-67.73	-117.27	0.19	11	18	8	0.28	52	40	22	0.54
che16	316	-0.51	-67.73	-117.27	0.19	11	18	8	0.28	52	40	22	0.54
che2	322	6.53	-69.41	-104.35	0.19	17	9	7	0.39	58	35	20	0.42
che22	322	6.53	-69.41	-104.35	0.19	17	9	7	0.39	58	35	20	0.42
che24	324	46.30	-78.83	-63.26	0.21	8	11	18	0.42	34	26	20	0.37
che27	324	46.30	-78.83	-63.26	0.21	8	11	18	0.42	34	26	20	0.37
che3	303	-6.30	-78.83	-116.74	0.17	24	32	16	0.35	50	38	22	0.48
che4	322	6.53	-69.41	-104.35	0.19	17	9	7	0.39	58	35	20	0.42
che6	306	-0.51	-67.73	-117.27	0.24	13	8	6	0.38	46	36	13	0.39
che7	314	-5.42	-65.19	-128.08	0.28	11	4	10	0.35	58	36	20	0.37
cpo15	2015	45.00	-70.00	-90.00	0.19	53	32	25	0.17	60	45	26	0.64
cpo16	2016	-30.65	-69.41	-166.53	0.15	43	10	17	0.50	66	40	34	0.35
cpo2	2002	31.98	-74.21	-108.68	0.17	29	12	12	0.38	40	20	15	0.45
cpo5	2005	79.56	-75.89	-44.56	0.15	11	10	6	0.56	34	24	14	0.30
cpo7	2007	71.30	-78.83	-63.26	0.20	15	21	6	0.13	40	34	20	0.66
n1	602	21.42	-59.62	-99.93	0.26	8	10	8	0.43	50	28	16	0.31
n12	612	-140.02	-44.78	97.05	0.20	11	7	5	0.28	50	30	20	0.52
n2	602	21.42	-59.62	-99.93	0.26	8	10	8	0.43	50	28	16	0.31

Mineralization Domain	ESTIM	Datamine Rotation			Nugget	Structure 1				Structure 2			
		1	2	3		ST1PAR1	ST1PAR2	ST1PAR3	C1	ST2PAR1	ST2PAR2	ST2PAR3	C2
n22	602	21.42	-59.62	-99.93	0.26	8	10	8	0.43	50	28	16	0.31
n3	602	21.42	-59.62	-99.93	0.26	8	10	8	0.43	50	28	16	0.31
609	612	-140.02	-44.78	97.05	0.20	11	7	5	0.28	50	30	20	0.52

Figure 11-37: Downhole and Directional Zn Experimental Variograms and Models for Estimation Group C_ESTIM=306



11.5.6.2 Grade Contouring

Grade contours play an important role in aiding the initial detection of preferential grade patterns within mineralization domains. A brief assessment was carried out for Zn within the “che16” domain (Orebody=316) to assess potential grade trends (Figure 11-38). While grades are generally much higher in the lower portion, the domain exhibits no clear trend.

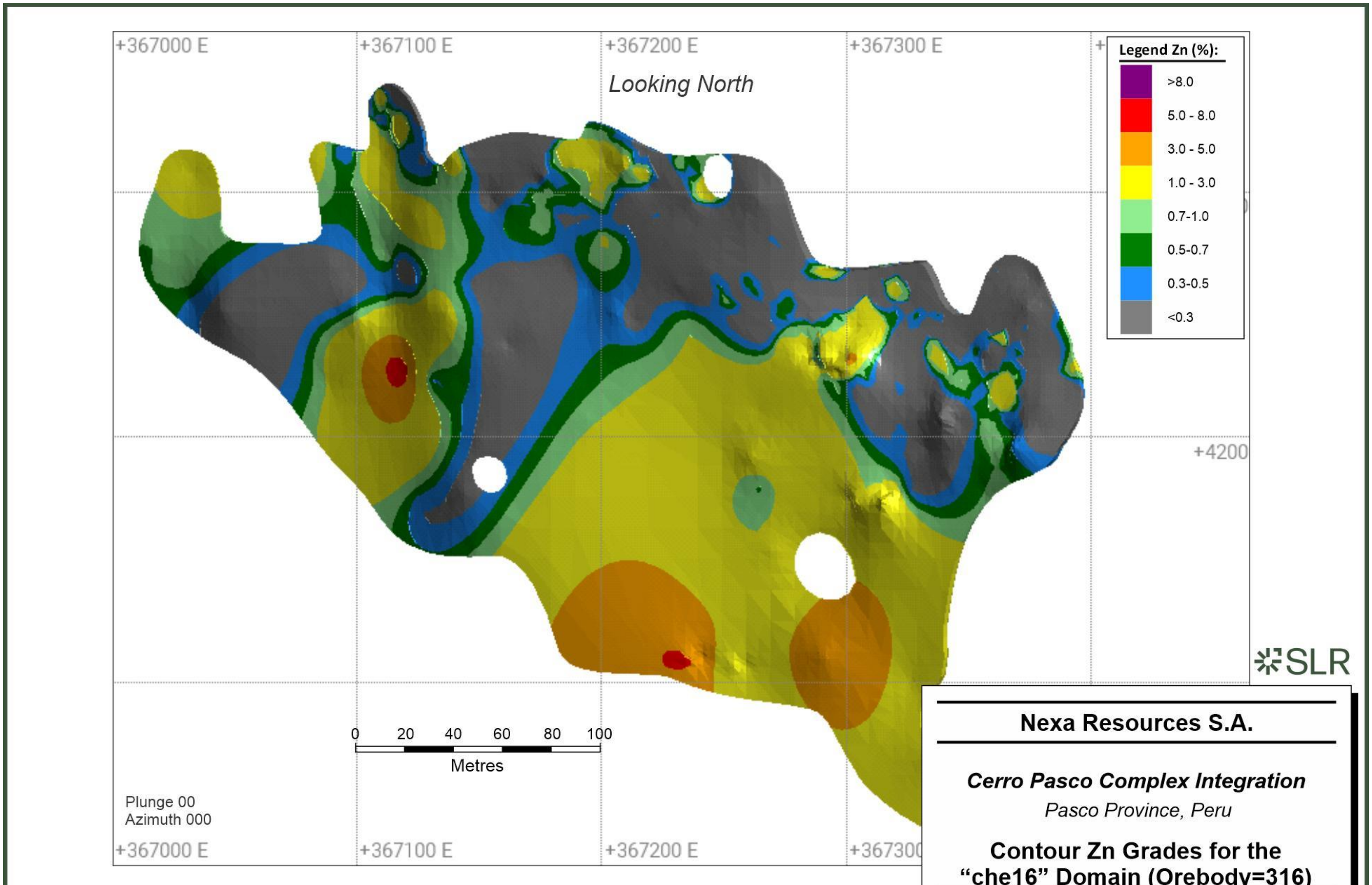
11.5.7 Search Strategy and Grade Interpolation Parameters

The final estimated values for Zn, Au, Ag, and Pb grades at San Gerardo are determined by OK or ID^3. Initially, the estimation process incorporates OK, ID^3, and NN interpolators, followed by an individual domain analysis to select between OK and ID^3 results. This selection is based on domain-specific criteria such as sample quantity, average difference between OK and ID^3 compared to NN, and domain size/volume. Variograms are defined based on estimation groups, allowing even domains with limited samples to be estimated via OK for comparison and validation purposes. Grade variables are not density or length-weighted during estimation.

To capture domain trends, dynamic anisotropy angles are calculated in Studio RM using domain wireframes. The estimation process includes three passes: the first pass utilizes search ellipse radii equivalent to variogram ranges for each variable; the second pass increases the radii by a factor of 1.5 to 10; and the third pass employs radii 10 to 30 times larger than the first pass.

The minimum and maximum sample numbers range from two to 15 for the first pass, one to 12 for the second pass, and one to 10 for the third pass, with a maximum of two samples per drill hole. Minor adjustments are made as needed to improve the final estimation result (Figure 11-38).

Figure 11-38: Contour Zn Grades for the "che16" Domain (Orebody=316)



Source: SLR, 2023.

Table 11-34: San Gerardo Zn Search Parameters for Main 25 Domains

Mineralization Domain	C_DOM	Search Ellipse			Pass 1	No. Composites		Pass 2	No. Composites		Pass 3	No. Composites	
		1	2	3	S-Vol	Min	Max	S-Vol	Min	Max	S-Vol	Min	Max
asu8	2080	40	32	15	1	7	15	2	6	10	20	3	6
che1	3010	32	25	10	1	10	15	2	9	10	20	3	5
che10	3100	45	30	15	1	4	8	2	3	6	30	1	2
che10	3101	35	22	15	1	7	14	2.2	4	7	20	3	4
che14	3140	30	20	10	1	6	10	2	5	8	20	3	5
che14	3141	30	22	10	1	9	15	2	7	10	20	3	6
che15	3150	32	20	11	1	8	15	2	7	10	20	3	6
che16	3160	36	24	13	1	9	15	2	8	10	20	3	6
che2	3020	30	18	10	1	6	15	2	5	8	20	3	5
che2	3021	32	18	10	1	8	15	2	7	10	20	3	6
che22	3220	28	18	10	1	6	15	2	5	8	20	3	5
che22	3221	30	19	12	1	10	15	2	9	10	20	3	6
che24	3240	31	19	12	1	10	15	2	8	10	20	3	6
che27	3270	25	15	10	1	7	15	2	5	10	20	3	6
che3	3030	28	19	12	1	10	15	2	8	10	20	3	5
che4	3040	32	20	12	1	9	15	2	7	10	20	3	6
che6	3060	32	23	12	1	9	12	2	7	10	20	3	6
che7	3070	53	38	25	1	5	12	2	4	8	20	3	5
che7	3071	36	24	12	1	10	15	2	9	10	20	3	6
cpo15	20150	30	20	10	1	9	15	2	8	10	20	3	5
cpo16	20160	30	20	15	1	10	15	2	9	10	20	3	5

Mineralization Domain	C_DOM	Search Ellipse			Pass 1	No. Composites		Pass 2	No. Composites		Pass 3	No. Composites	
		1	2	3	S-Vol	Min	Max	S-Vol	Min	Max	S-Vol	Min	Max
cpo2	20020	32	22	12	1	10	15	2	9	10	20	3	5
cpo5	20050	26	22	10	1	9	15	2	8	10	20	3	5
cpo7	20070	30	22	10	1	8	15	2	8	10	20	3	5
n1	6010	28	23	13	1	8	15	2	7	10	20	3	10
n12	6120	34	26	12	1	8	15	2	6	10	20	3	10
n2	6020	28	23	14	1	7	15	2	6	10	20	3	10
n22	6220	32.5	17	8.5	1	4	7	2	3	4	20	1	3
n3	6030	33	27	15	1	6	15	2	5	10	20	3	10
n9	6090	30	20	10	1	8	14	2	5	10	20	3	10

11.5.8 Bulk Density

A total of 5,748 density measurements were taken in San Gerardo, 1,107 of those occurring within 137 of the 220 mineralized bodies.

In a quantitative analysis, the density values are better correlated with the Zn grades, as demonstrated in Figure 11-39.

Figure 11-39: San Gerardo Correlation Matrix between Density and Other Elements (left) and Scatter Plot between Density and Zn (right)

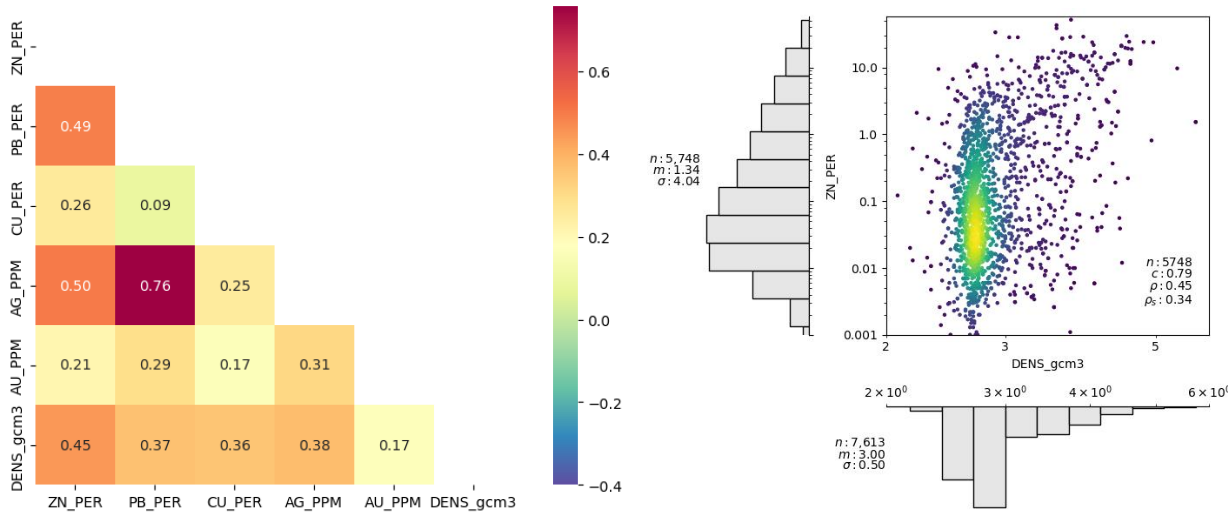
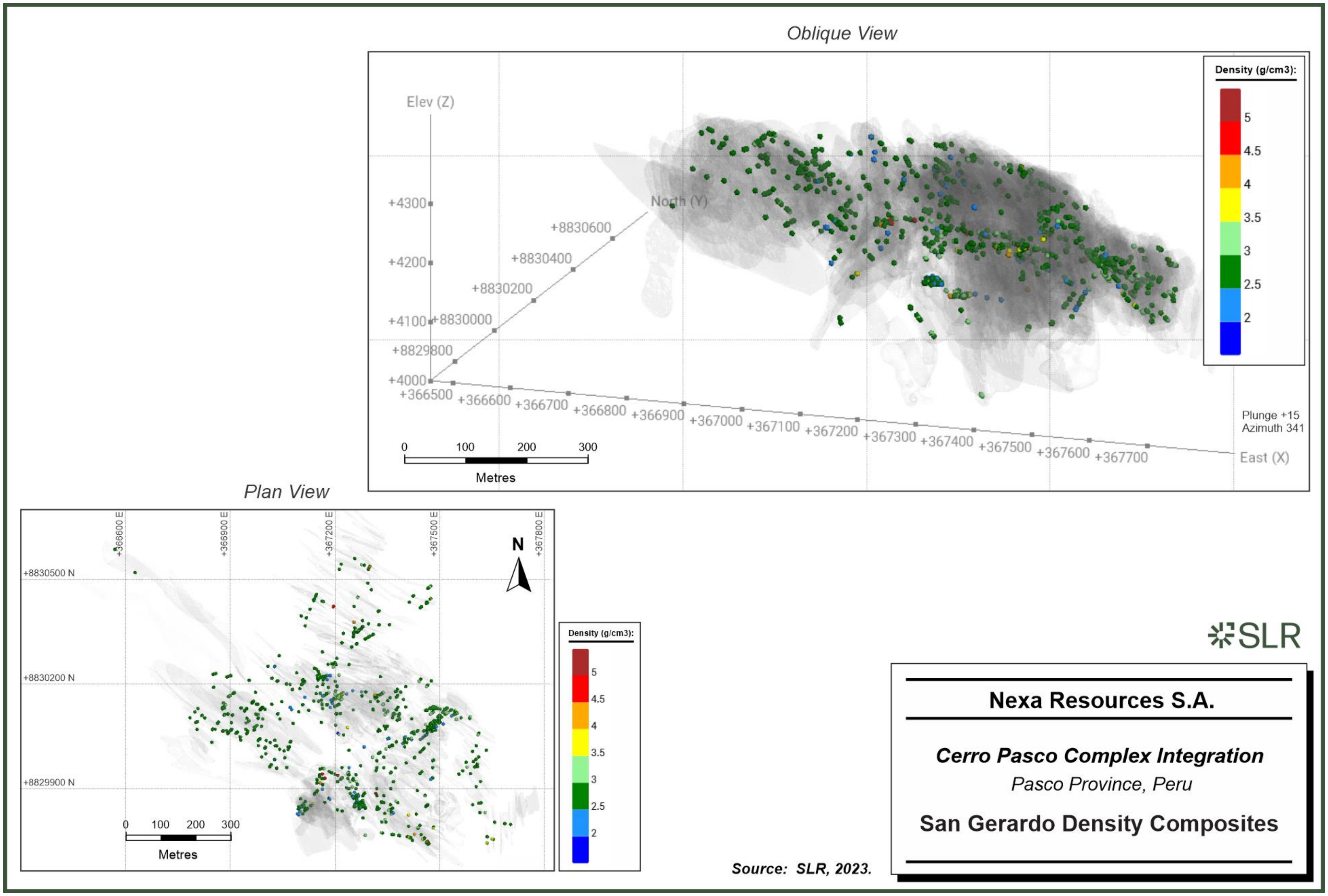


Figure 11-40 shows a plan and isometric view of density composites in relation to the mineralized domains, indicating relatively widespread coverage but with some significant gaps where mineralized bodies are lacking informing density samples, although the largest of these are located outside of the Mineral Resource shell and Mineral Reserve pit design.

Figure 11-40: San Gerardo Density Composites



Source: SLR, 2023.

Of the 25 main domains, 23 have density values, totalling 282 density samples. Table 11-35 shows the statistics for the density values for the 23 domains. Density values do not exhibit significant variance across different domains, having means between 2.6 g/cm³ and 2.95 g/cm³.

Table 11-35: San Gerardo Open Pit Density Statistics

Orebody	Count	Mean (g/cm³)	StdDev (g/cm³)	CV	Minimum (g/cm³)	Maximum (g/cm³)
asu8	26	2.75	0.12	0.04	2.54	3.07
che1	7	2.71	0.08	0.03	2.62	2.86
che10	14	2.9	0.2	0.07	2.68	3.41
che14	14	2.77	0.24	0.09	2.49	3.55
che15	9	2.64	0.12	0.05	2.46	2.83
che16	16	2.66	0.17	0.06	2.44	3.03
che2	6	2.8	0.29	0.1	2.59	3.42
che22	13	2.77	0.06	0.02	2.68	2.84
che24	3	2.72	0.04	0.01	2.69	2.78
che27	4	2.67	0.04	0.01	2.63	2.73
che3	5	2.75	0.08	0.03	2.65	2.87
che4	1	2.67	0	0	2.67	2.67
che6	11	2.8	0.11	0.04	2.68	3.06
che7	10	2.68	0.07	0.03	2.48	2.76
cpo16	5	2.71	1.09	0.4	1.41	4
cpo2	15	2.82	0.21	0.07	2.53	3.24
cpo5	3	2.72	0.09	0.03	2.62	2.83
n1	6	2.71	0.13	0.05	2.61	2.95
n12	17	2.98	0.11	0.04	2.78	3.17
n2	40	2.81	0.18	0.07	2.51	3.4
n22	18	2.75	0.22	0.08	2.58	3.33
n3	31	2.94	0.57	0.19	2.48	4.65
n9	8	2.76	0.09	0.03	2.64	2.94

Similar mineralization domains were grouped (previously shown in Figure 11-27) and an average density value calculated for each group (Table 11-36). To assign density values to the block model, a local ID^3 estimation method was used with a search neighbourhood radii equivalent to that applied to the Indicated Mineral Resources. For blocks situated beyond these radii or within domains lacking samples, the grouped domain's average density value was assigned.

Table 11-36: San Gerardo Grouped Density Statistics

Group	Mean (g/cm^3)	CV	Minimum (g/cm^3)	Maximum (g/cm^3)
10	134	5.07	2.84	2.41
ASUNCION	190	3.29	2.74	2.29
CHERCHER	278	4.55	2.72	1.41
VETA1	185	3.38	2.78	2.25
ZOE	53	4.19	2.66	2.2
GLOBAL	1086	5.58	2.77	1.41
VETASN	118	4.78	2.86	2.48
VETASV	94	5.58	2.76	2.4
CLAUDIA	6	3.09	2.79	2.69
RUBI	18	3.17	2.81	2.55
MA	10	3.59	2.89	2.6

Although the QP recommends the acquisition of additional density data to provide improved coverage and enable a more robust spatial estimate, the approach used by Nexa site team is considered acceptable for estimating Mineral Resources.

11.5.9 Block Models

A sub-blocked model was generated with parent blocks size of 4 m x 4 m x 6 m and a minimum sub-cell size of 0.5 m x 0.5 m x 0.5 m. Sub-blocking took place at mineralization domain wireframe boundaries (Table 11-37).

The sub-blocked model was re-blocked for the reporting of Mineral Resource, with block sizes equal to the parent blocks (Table 11-38). The re-blocked grades were assigned based on tonnage weighting the original block grades, and the geology and other codes were assigned based on majority rules.

Table 11-37: San Gerardo Open Pit Sub-Blocked Model Definition

	X	Y	Z
Base Point	366,461.5	8,829,676	4,390
Boundary Size (m)	1,328	1,036	390
Parent Block (m)	4	4	6
Minimum Sub-Block (m)	0.5	0.5	0.5

Table 11-38: San Gerado Open Pit Re-Blocked Model Definition

	X	Y	Z
Base Point	366,400	8,829,400	4,408
Boundary Size (m)	1,600	1,500	408
Parent Block (m)	4	4	6

11.5.10 Net Smelter Return and Cut-off Value

An NSR value was calculated using the Mineral Resource metal prices, metallurgical recovery rates, transportation, treatment, and refining costs. Metal prices applied to Mineral Resources are 15% greater than Mineral Reserves, which are derived from consensus long-term forecasts obtained from financial institutions, banks, and other reliable sources. The NSR value is denominated in US$/t and is computed for Mineral Resources to enable a meaningful comparison with production costs, helping to ascertain the economic viability of mining the mineralized material.

Currently, the mine yields Zn concentrate containing Zn and Ag, and Pb concentrate containing Pb, Ag, and Au as saleable products. The payable metals in these concentrates include transportation costs, refining charges, deductions, and penalty elements, as outlined in sales agreements established between the mine and smelters or traders.

The NSR factors are determined based on the smelter terms and metal prices, detailed in Table 11-39.

Table 11-39: San Gerardo NSR Cut-off Value Parameters

Item	Unit	Value
Plant Metallurgical Recovery*		
Zn	%	70.44
Pb	%	83.97
Ag	%	75.76
Au	%	65.46
Zn Concentrate Payable %		
Zn	%	85
Ag	%	70
Pb Concentrate Payable %		
Pb	%	95
Ag	%	95
Au	%	95
Metal Prices		
Zn	US$/t	3,218.90
Pb	US$/t	2,300.33
Cu	US$/t	8,820.05
Ag	US$/oz	24.35
Au	US$/oz	1,875.57
Open Pit Costs		
Mine cost	US$/t ore	6.23
	US$/t waste	2.27
Plant costs	US$/t	10.65
G&A	US$/t	5.56
Cut-off Value	US$/t	22.44

* Based on LOM average metal grades.

11.5.11 Classification

Definitions for resource categories used in this TRS are those defined by the SEC in S-K 1300. Mineral Resources are classified into Measured, Indicated, and Inferred categories.

The following factors were considered when classifying the Mineral Resources:

- Confidence in modelling of mineralization domains.
- Reliability of sampling data, including database integrity and lack of significant bias observed in QA/QC analysis results.

- Confidence in estimation of block grades for the various metals.
- Variogram model parameters.
- Visual assessments of the geometries of mineralized domains in relation to drill hole spacing.
- Production experience in the deposit.

Two classification groups were defined based on geology and grade continuity. Blocks were classified as Measured, Indicated, and Inferred according to the number of holes and distances to holes determined by variogram ranges. Separate classification interpolation passes were run to flag the resource categories for each group:

Major Continuity Zones:

- Measured Mineral Resource: Composites from a minimum of three holes within a 25 m by 25 m by 12 m radii search.
- Indicated Mineral Resource: Composites from a minimum of three holes within a 50 m by 50 m by 25 m radii search.
- Inferred Mineral Resource: Composites from a minimum of two holes within a 100 m by 100 m by 50 m radii search.

Minor Continuity Zones:

- Measured Mineral Resource: Composites from a minimum of three holes within a 20 m by 20 m by 10 m radii search.
- Indicated Mineral Resource: Composites from a minimum of three holes within a 40 m by 40 m by 20 m radii search.
- Inferred Mineral Resource: Composites from a minimum of two holes within a 80 m by 80 m by 40 m radii search.

A post-processing, clean-up script was applied to the classification model to reduce a "spotted dog" effect and to demonstrate continuity between samples. **Figure** 11**-**41 shows histogram validations of the classification based on the distance of each block to its closest sample for the major, medium, and minimum continuity domains, respectively. The figure shows the number of samples and search passes used to estimate blocks by resource category. The data exhibits the expected trend, where Measured blocks are estimated using more samples within a shorter distance, with the opposite effect happening for Inferred category. However, overlaps occur for all categories, for example Measured blocks are estimated on the third pass and/or with five samples or less.

Figure 11-42 shows a vertical and plan view of the Mineral Resource classification applied at San Gerardo.

During review, SLR observed artifacts such as isolated drill holes used to support classification, resulting in a “spotted dog” effect in some areas. In addition, it was observed that drilling and channel samples completed along strike of the mineralization had been used to support the Mineral Resource classification, which SLR recommends should be discontinued. The QP concurs with this recommendation.

The QP considers the Mineral Resource classification applied to the San Gerardo deposit to be acceptable, however, recommends that the approach be improved in future Mineral Resource estimates to remove artifacts.

Figure 11-41: San Gerado Histogram of Number of Samples and Search Pass by Class

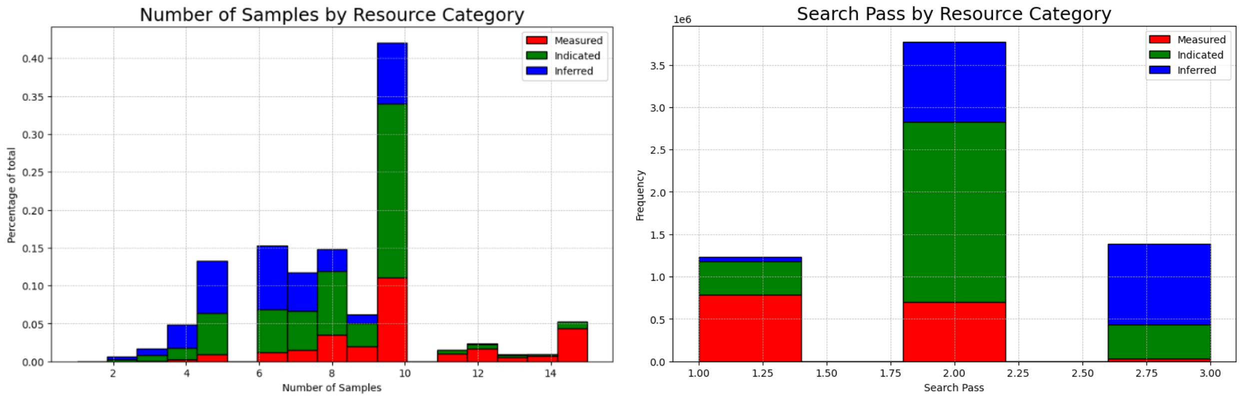
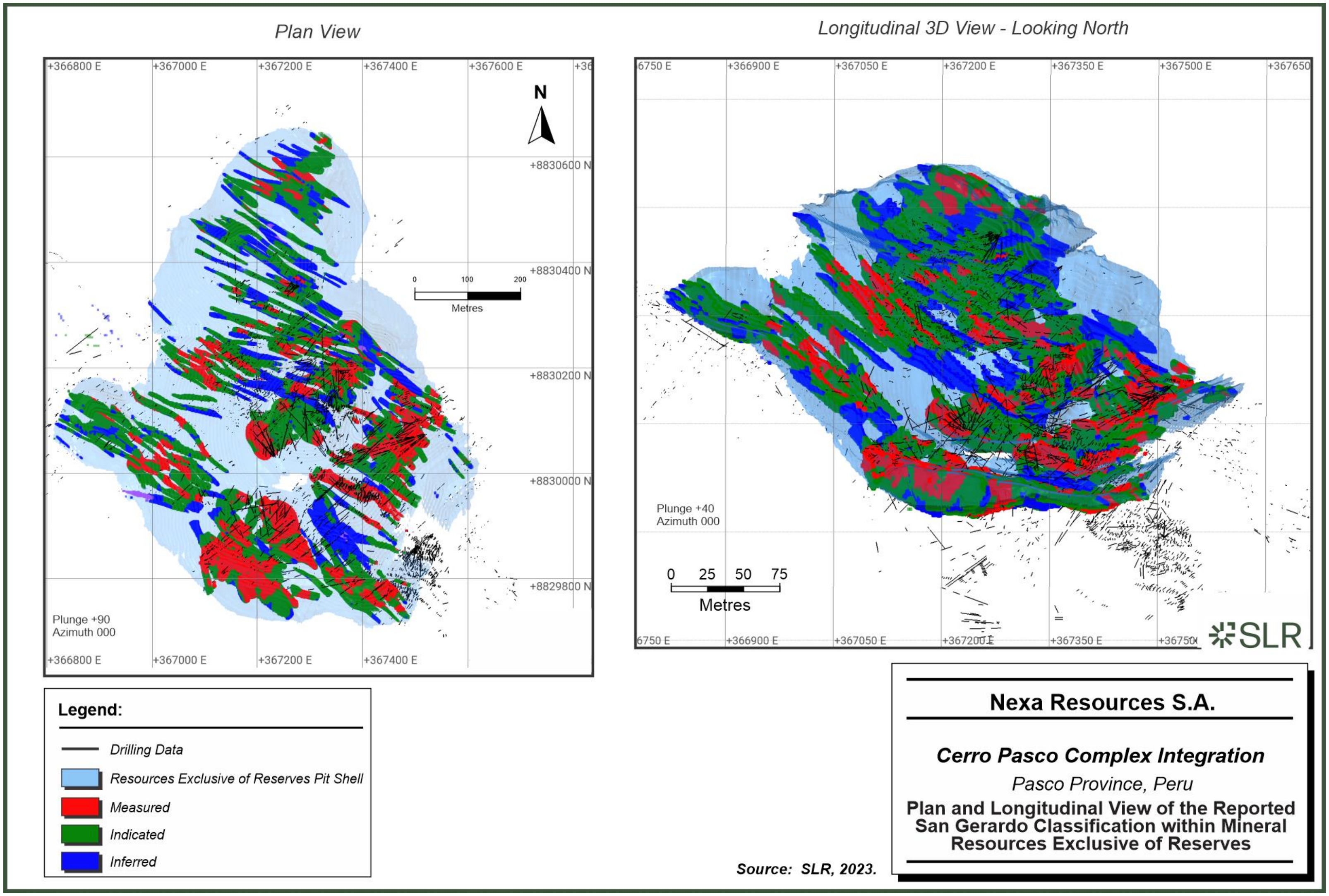


Figure 11-42: Plan and Longitudinal View of the Reported San Gerardo Classification within Mineral Resources Exclusive of Mineral Reserves



Source: SLR, 2023.

11.5.12 Block Model Validation

Nexa staff and the QP perform several validations of the geological modelling and block model estimation, including grade shell volume comparison against the previous version, visual inspections of the dynamic anisotropy angles, estimation statistics by search volume, global statistics, visual validations, and swath plots. These aim to confirm the consistency of the estimation process and the results.

SLR reviewed the files provided by Nexa staff, such as validation tables and figures, and performed extensive independent validations, including statistical correlations, visual validations, statistic validations, and swath plot analysis. The main checks are discussed in the following sections.

11.5.12.1 Global Statistics

Global statistics of the interpolated OK, ID^3 grades were compared with those of the NN estimation, which serves as a reference, assessing performance of the different estimators and confirming the estimate's reproduction of the samples used for the estimation. Global statistics also help to identify inconsistencies in the estimation process.

Statistics for the main variables within the 25 main domains are shown in Table 11-40.

Table 11-40: San Gerardo Statistical Comparison Between OK, ID^3, NN, and the Capped Composites

Domain	Au (g/t) - OK				Au (g/t) - ID^3				Au (g/t) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
asu8	0.2	0.89	0.03	1.52	0.2	1.09	0.02	2.58	0.19	1.37	0.01	2.05
che1	0.2	0.72	0.01	0.78	0.2	0.88	0.01	1.02	0.19	1.14	0.01	1
che10	0.23	1.09	0.01	1.7	0.23	1.19	0.01	2.15	0.24	1.46	0.01	2.59
che14	0.33	1.03	0.01	2.53	0.3	1.31	0.01	3.93	0.29	1.67	0.01	2.72
che15	0.22	0.75	0.02	1.37	0.25	1.16	0.02	2.13	0.26	1.26	0.01	2.14
che16	0.34	1.11	0.01	3.45	0.33	1.33	0.01	4.53	0.32	1.66	0.01	3.88
che2	0.46	1.29	0.01	4.7	0.44	1.71	0.01	8.57	0.44	2.18	0.01	6.07
che22	0.24	0.95	0.01	1.3	0.22	1.08	0.01	1.87	0.23	1.36	0.01	3.5
che24	0.36	0.95	0.03	2.59	0.35	1.15	0.02	3.59	0.33	1.75	0.01	6.73
che27	0.39	0.48	0.06	1.27	0.37	0.66	0.02	1.4	0.37	1.01	0.01	1.86
che3	0.23	1.06	0.01	1.63	0.23	1.21	0.01	2.51	0.23	1.44	0.01	2.94
che4	0.18	0.8	0.01	0.8	0.19	0.9	0.01	0.95	0.19	1.12	0.01	0.96
che6	0.22	1.13	0.01	1.68	0.23	1.26	0.01	2.51	0.23	1.73	0.01	2.63
che7	0.33	1	0.01	2.8	0.35	1.23	0.01	4.99	0.33	1.81	0.01	5.72
cpo15	0.12	1.52	0.01	1.02	0.09	1.66	0.01	1.29	0.09	1.79	0.01	1.11
cpo16	0.15	1.45	0.01	2.31	0.15	1.63	0.01	3.43	0.15	1.95	0.01	2.78
cpo2	0.24	1.22	0.01	2.51	0.24	1.39	0.01	3.74	0.24	1.7	0.01	2.89
cpo5	0.22	0.96	0.01	2	0.25	1.08	0.01	2.76	0.25	1.26	0.01	2.41
cpo7	0.24	1.23	0.01	1.75	0.28	1.33	0.01	2.18	0.31	1.55	0.01	2.39
n1	0.43	0.74	0.06	2.58	0.43	1.21	0.02	4.92	0.43	1.61	0.01	5
n12	0.03	0.83	0	0.15	0.03	1.11	0	0.2	0.02	1.57	0	0.2

Domain	Au (g/t) - OK				Au (g/t) - ID3				Au (g/t) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
n2	0.01	0.64	0	0.14	0.01	1.1	0	0.22	0.01	1.26	0	0.13
n22	0.04	1.03	0	0.2	0.04	1.21	0	0.22	0.04	1.32	0	0.22
n3	0.04	0.94	0	0.31	0.04	1.41	0	0.44	0.04	1.64	0	0.39
n9	0.03	0.75	0	0.12	0.02	0.79	0	0.13	0.03	1.46	0	0.2

Domain	Zn (%) - OK				Zn (%) - ID3				Zn (%) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
asu8	1.18	0.53	0.11	4.45	1.1	0.78	0.03	6.93	1.17	1.19	0.01	7.17
che1	1.64	0.64	0.05	7.28	1.57	0.79	0.03	7.67	1.57	1.17	0	7.42
che10	1.54	0.87	0.02	8.58	1.57	1.03	0.01	11.64	1.4	1.42	0	13.18
che14	2.04	0.77	0.03	9.6	2.01	0.89	0.01	10.82	1.98	1.16	0	13.12
che15	0.66	0.85	0.04	3.69	0.75	1.09	0.02	4.64	0.7	1.38	0	4.66
che16	1.3	0.7	0.04	5.33	1.35	0.86	0.01	6.9	1.36	1.14	0	7
che2	1.51	1	0.01	9.36	1.46	1.04	0.01	11.77	1.51	1.28	0	12.6
che22	1.4	0.93	0.02	9.21	1.34	1.04	0.01	10.02	1.4	1.38	0	12.62
che24	0.85	0.58	0.06	2.75	0.81	0.71	0.05	3.64	0.87	1.09	0	4.21
che27	1.31	0.82	0.1	7.37	1.47	1.16	0.05	10.16	1.5	1.43	0.01	8.49
che3	2.14	0.85	0.1	11.81	2.23	0.82	0.02	14.71	2.15	1.25	0	17.01
che4	1.16	0.79	0.1	6.09	1.16	1.15	0.03	7.88	1.1	1.71	0	8
che6	1.28	0.67	0.04	6.96	1.27	0.85	0.01	9.13	1.24	1.17	0	9.2
che7	2.34	0.97	0.04	16.15	2.36	1.17	0.01	23.15	2.54	1.79	0	25.34
cpo15	1.27	0.56	0.08	5.72	1.37	0.62	0.02	7.23	1.33	0.97	0.02	7.47
cpo16	0.79	0.91	0.01	5.75	0.82	0.97	0	6.88	0.81	1.23	0	6.5
cpo2	1.02	0.78	0.05	6.63	1.01	0.89	0.02	7.85	0.98	1.29	0	9.56

Domain	Zn (%) - OK				Zn (%) - ID3				Zn (%) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
cpo5	1.5	0.7	0.05	7.34	1.44	0.76	0.06	8.07	1.38	1.13	0.01	10.13
cpo7	3.27	0.47	0.79	13.92	3.28	0.54	0.28	15.77	3.39	0.7	0.33	13.23
n1	1.22	0.5	0.19	4.05	1.45	0.81	0.03	6.44	1.48	1.02	0.02	5.38
n12	0.84	0.73	0.03	4.59	0.92	1.07	0.02	6	0.98	1.21	0.01	4.9
n2	0.89	0.45	0.11	2.93	0.95	0.76	0.01	4.61	1.1	1.03	0.01	4.64
n22	0.89	0.54	0.07	2.61	0.93	0.66	0.02	3.24	0.84	0.97	0	3.02
n3	1.39	0.78	0.07	8.81	1.6	1.23	0.01	11.43	1.8	1.4	0	11.39
n9	1.38	0.88	0.17	8.72	1.19	0.91	0.01	9.91	1.72	1.88	0	15

Domain	Pb (%) - OK				Pb (%) - ID3				Pb (%) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
asu8	1.17	0.59	0.09	5.84	1.08	0.84	0.03	7.52	1.18	1.23	0.01	7.12
che1	1	0.9	0.01	5.03	1.02	0.97	0	5.96	0.99	1.15	0	6.08
che10	0.71	0.77	0.01	4.3	0.71	0.92	0	6.24	0.7	1.26	0	6.66
che14	1.16	0.88	0.01	7.5	1.1	0.9	0	9.22	1.2	1.52	0	9.63
che15	0.92	0.64	0.09	3.78	1	0.78	0.04	5.17	0.9	1.11	0	5.26
che16	1.57	0.88	0.03	7.61	1.61	1.04	0	9.55	1.68	1.23	0	10.03
che2	0.6	0.92	0.01	4.3	0.58	1.04	0.01	5.88	0.61	1.26	0.01	4.99
che22	0.64	0.79	0.01	3.27	0.62	0.84	0	3.56	0.64	1.12	0	6.3
che24	1.24	0.74	0.03	6.99	1.23	0.8	0.06	8.24	1.14	1.09	0.02	7.22
che27	1.53	0.71	0.06	4.73	1.57	0.86	0.06	5.68	1.65	1.08	0.01	5.85
che3	0.76	1.17	0.02	7.69	0.72	1.23	0.02	9.11	0.79	1.61	0	9.3
che4	0.91	0.75	0.12	3.77	0.88	0.86	0.01	4.77	0.97	1.17	0	5.08
che6	1.11	0.8	0	6.81	1.11	0.91	0	8.77	1.09	1.23	0	9.03

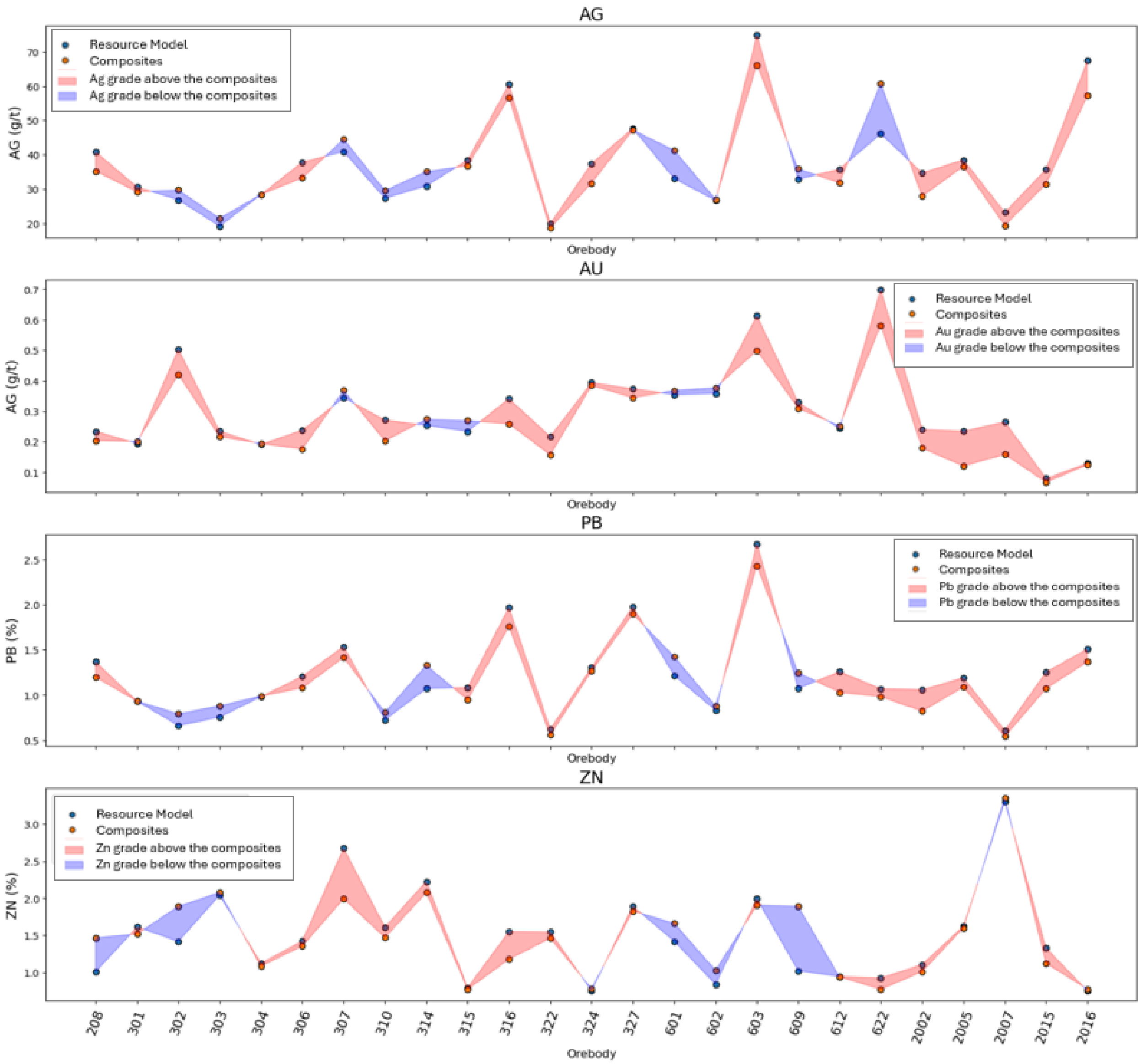
Domain	Pb (%) - OK				Pb (%) - ID^3				Pb (%) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
che7	1.49	0.93	0.01	8.59	1.5	1.03	0	9.84	1.4	1.39	0	16
cpo15	1.23	0.92	0.01	8.28	1.28	1.08	0.01	10.38	1.29	1.31	0.01	10.66
cpo16	1.5	0.78	0.03	8.86	1.5	0.89	0.03	10.51	1.44	1.35	0.01	10.98
cpo2	0.91	1.08	0.01	10.38	0.92	1.26	0	12.53	0.9	1.64	0	16.97
cpo5	1.16	0.56	0.09	4.96	1.13	0.65	0.04	5.64	1.09	0.96	0.01	8.21
cpo7	0.54	1.82	0.02	5.42	0.64	2.14	0.02	7.21	0.65	2.26	0.01	4.97
n1	1.17	0.34	0.1	3.13	1.24	0.68	0.02	5.36	1.27	0.88	0.03	4.28
n12	1.15	0.59	0.08	6.49	1.15	0.84	0.05	8.36	0.99	1.31	0.01	9.79
n2	0.85	0.46	0.12	3.65	0.82	0.74	0	6.24	0.88	0.97	0	4.7
n22	1.13	0.58	0.24	3.68	1.21	0.73	0.05	4.51	1.24	0.94	0.01	3.37
n3	2.04	0.76	0.13	11.67	2.34	1.14	0.02	16.3	2.23	1.44	0	16.24
n9	1.06	0.52	0.22	4.22	0.94	0.61	0.01	5.01	1.19	1.38	0	7.68

Domain	Ag (g/t) - OK				Ag (g/t) - ID^3				Ag (g/t) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
asu8	32.57	0.62	3.95	232.11	31.02	0.84	1.28	392.75	32.16	1.19	1	508.34
che1	31.26	0.72	1.21	114.39	31	0.86	1.01	135.44	30.35	0.99	1	133.25
che10	26.64	0.74	2.46	98.72	26.44	0.91	1.09	154.97	26.02	1.22	1	165.46
che14	35.16	0.61	1.35	177.42	34.44	0.78	1.02	254.18	33.67	1.21	1	304.76
che15	33.99	0.63	2.89	113.41	36.67	0.69	1.77	150.37	35.03	0.95	1	140.84
che16	48.62	0.79	1	245.28	50.87	0.89	1	349.41	51.05	1.12	1	335.99
che2	24.47	0.55	4.92	125.01	23.96	0.76	2.02	203.7	24.61	1.01	1	145.68
che22	21.58	0.56	2.16	127.41	20.66	0.68	2.1	146.56	21.22	1	1	270
che24	37.67	0.59	6.49	132.77	37.94	0.66	4.1	204.24	35.85	1.03	1	236.24

Domain	Ag (g/t) - OK				Ag (g/t) - ID^3				Ag (g/t) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
che27	43.31	0.5	7.92	101.05	42.58	0.63	5.37	121.5	44.78	0.82	1	126.34
che3	20.24	0.86	1.78	140.15	20.03	0.87	1.51	162.13	20.43	1.23	1	165
che4	26.16	0.46	7.3	77.33	26.62	0.65	1.91	103.15	26.75	0.87	1	109.05
che6	34.47	0.75	1	182.35	34.22	0.86	1	248.08	34.72	1.07	1	232.69
che7	42.83	0.87	1.18	314.63	42.3	1.11	1	390.09	39.87	1.52	1	521.76
cpo15	36.04	0.79	1.93	170.84	37.14	0.88	1.93	196.31	38.97	1.08	1.9	212.82
cpo16	61.42	0.56	4.73	231.33	61.62	0.62	2.35	279.3	55.18	0.89	2.02	318.64
cpo2	31.08	0.92	1.32	274.48	30.95	1.01	1	299.14	29.65	1.24	1	316.17
cpo5	37.84	0.51	3.37	155.32	36.47	0.6	2.02	200.54	35.33	0.91	2.02	220
cpo7	23.15	1.38	2.02	203.98	26.72	1.71	2.02	244.96	26.87	1.82	2.02	167.17
n1	33.48	0.28	9.02	69.1	35.73	0.56	2.23	108.77	38.23	0.73	2.02	109.03
n12	33.29	0.59	5.16	141.04	34.3	0.85	4.36	178.11	29.01	1.3	1	202.28
n2	23.73	0.44	5.98	86.07	25.07	0.6	1.02	141.63	25.74	0.73	1	115.88
n22	52.74	0.76	9.33	238.11	56.33	1.18	2.84	376.02	67.29	1.46	1	380
n3	58.17	0.92	6.64	371.22	66.7	1.19	1.24	502.56	60.54	1.42	1	458.49
n9	33.75	0.39	8.65	88.75	31.24	0.63	3.73	121.15	37.34	1.06	6.79	155.21

Figure 11-43 illustrates the comparison between final grades estimated in the block model and the capped and composited samples. In general, the estimated grades and composites show good agreement, while the differences observed do not suggest any consistent bias or errors of great magnitude.

Figure 11-43: San Gerardo Final Grade Variables and Capped and Composited Samples Comparison

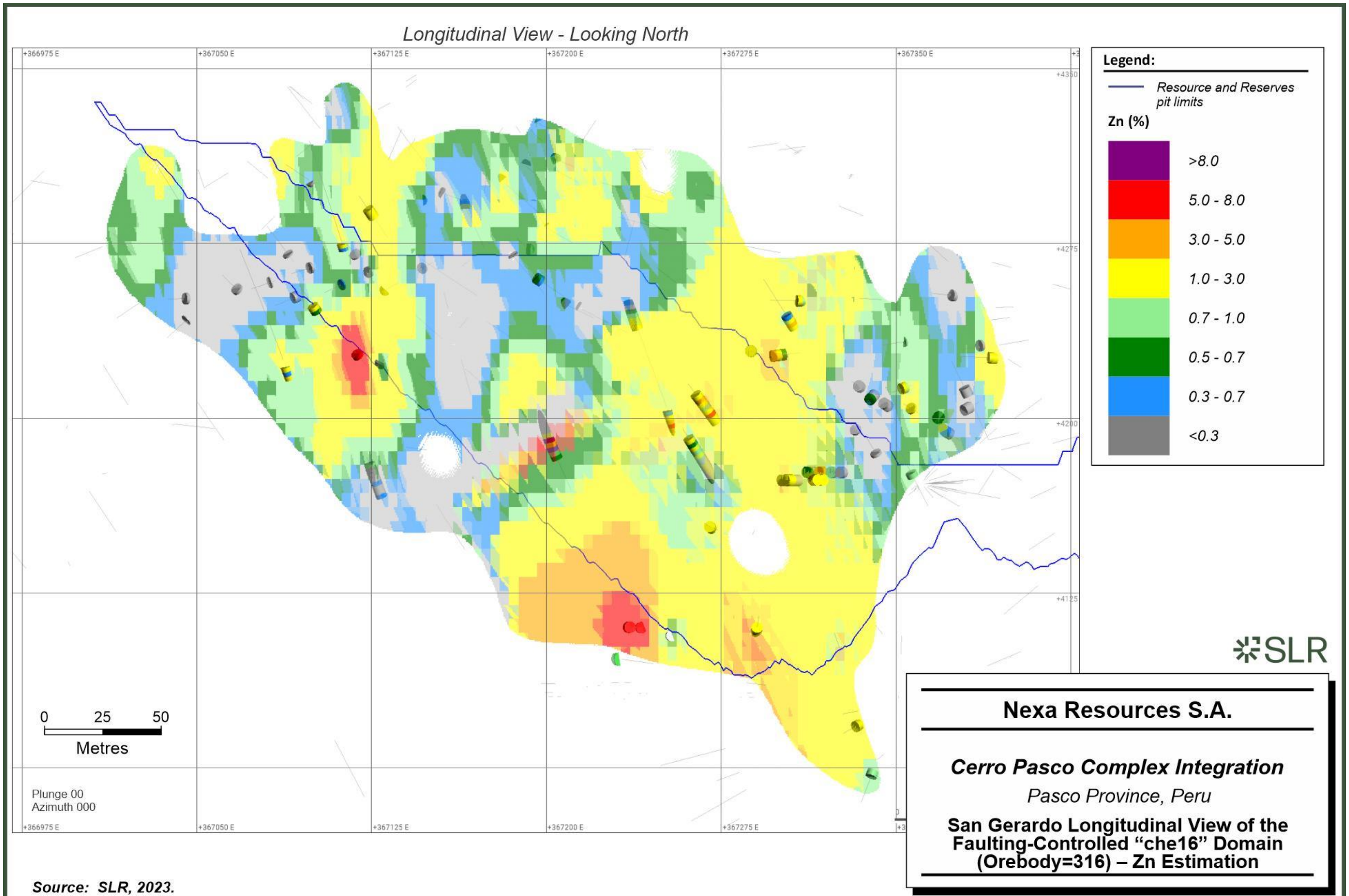


11.5.12.2Visual Validation

SLR conducted random checks across various estimation domains, comparing the samples utilized for estimation with the block model. Particular emphasis was placed on the main domains owing to their significance for Mineral Resources and Mineral Reserves.

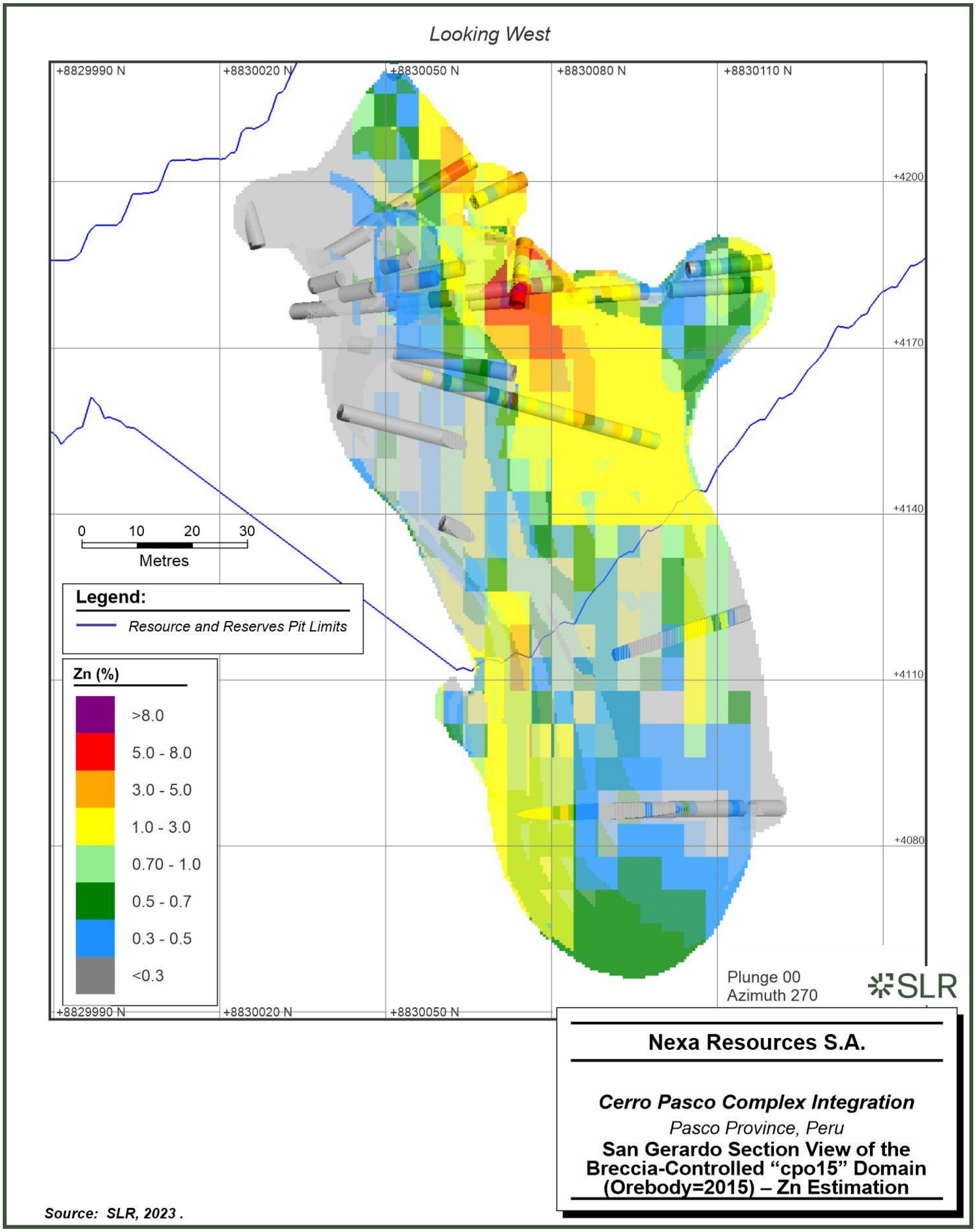
A visual comparison on longitudinal section along two veins found good overall correlations between the blocks and composite grades. Example longitudinal sections for the fault-controlled “che16” domain and breccia “cpo15” domain are shown in Figure 11-44 and Figure 11-45, respectively. These demonstrate that block grades generally reflect the surrounding sample data, with good local reproduction of sample grades in both types of mineralization. Fault-controlled domains are more prone to exhibit visual artifacts in estimated grades due to their thin, tabular, and occasionally folded shape. However, the breccia-type mineralization is more massive and greater in volume than the fault-controlled veins, and therefore accounts for most of the Mineral Resource tonnage.

Figure 11-44: San Gerardo Longitudinal View of the Faulting-Controlled "che16" Domain (Orebody=316) – Zn Estimation



Source: SLR, 2023.

Figure 11-45: San Gerardo Section View of the Breccia-Controlled "cpo15" Domain (Orebody=2015) – Zn Estimation



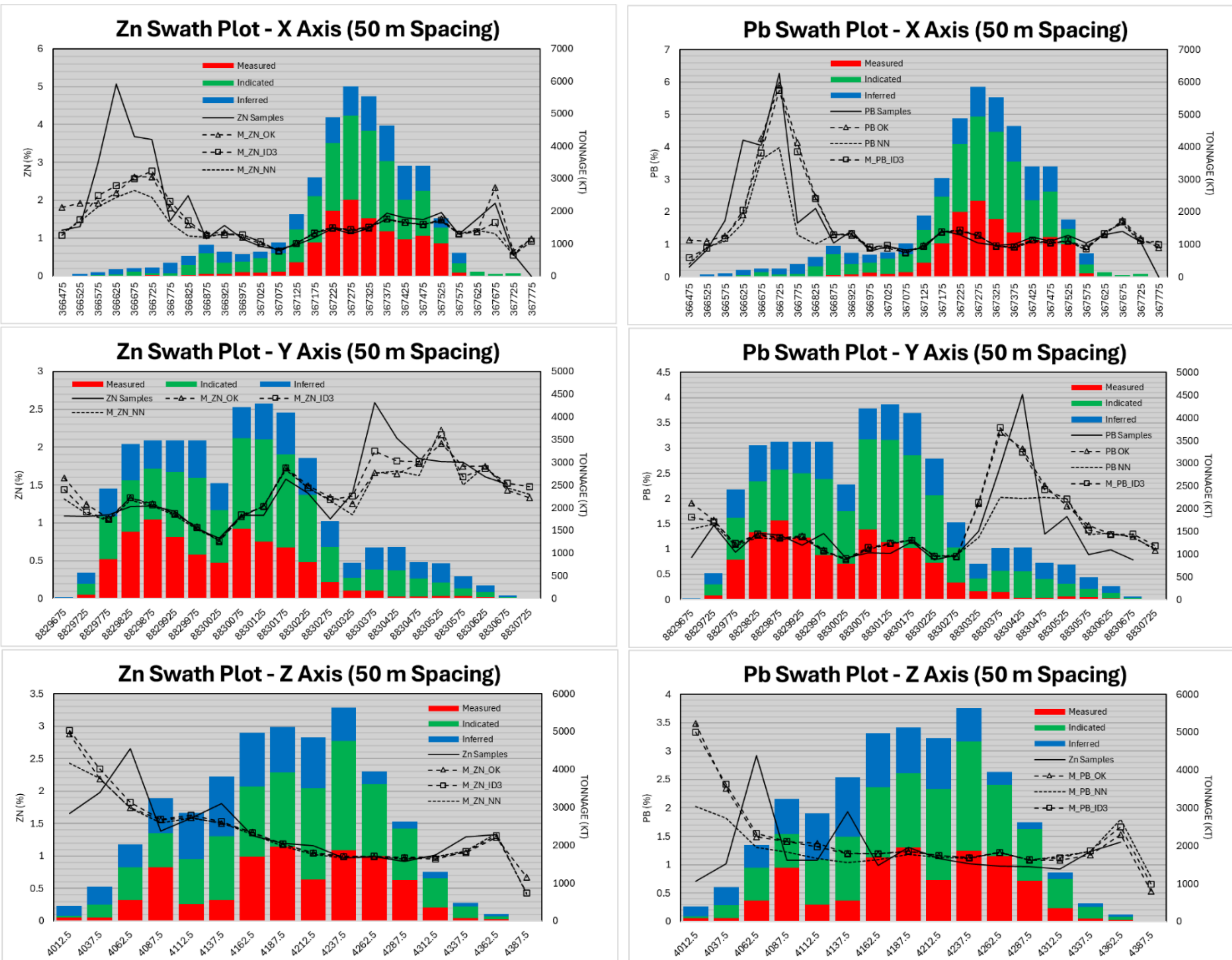
Source: SLR, 2023 .

11.5.12.3 Swath Plots

Swath plots were generated for the entire block model to evaluate global grade trends within the mineral deposit. Figure 11-46 illustrates swath plots for Zn and Pb in the X, Y, and Z directions.

In general, the estimated OK and ID^3 block grades show good agreement with the NN block grades and composite grades. The largest divergences are often observed in regions of the model with few blocks and contributing little tonnage to the Mineral Resource.

Figure 11-46: San Gerardo Swath Plots for Zn and Pb

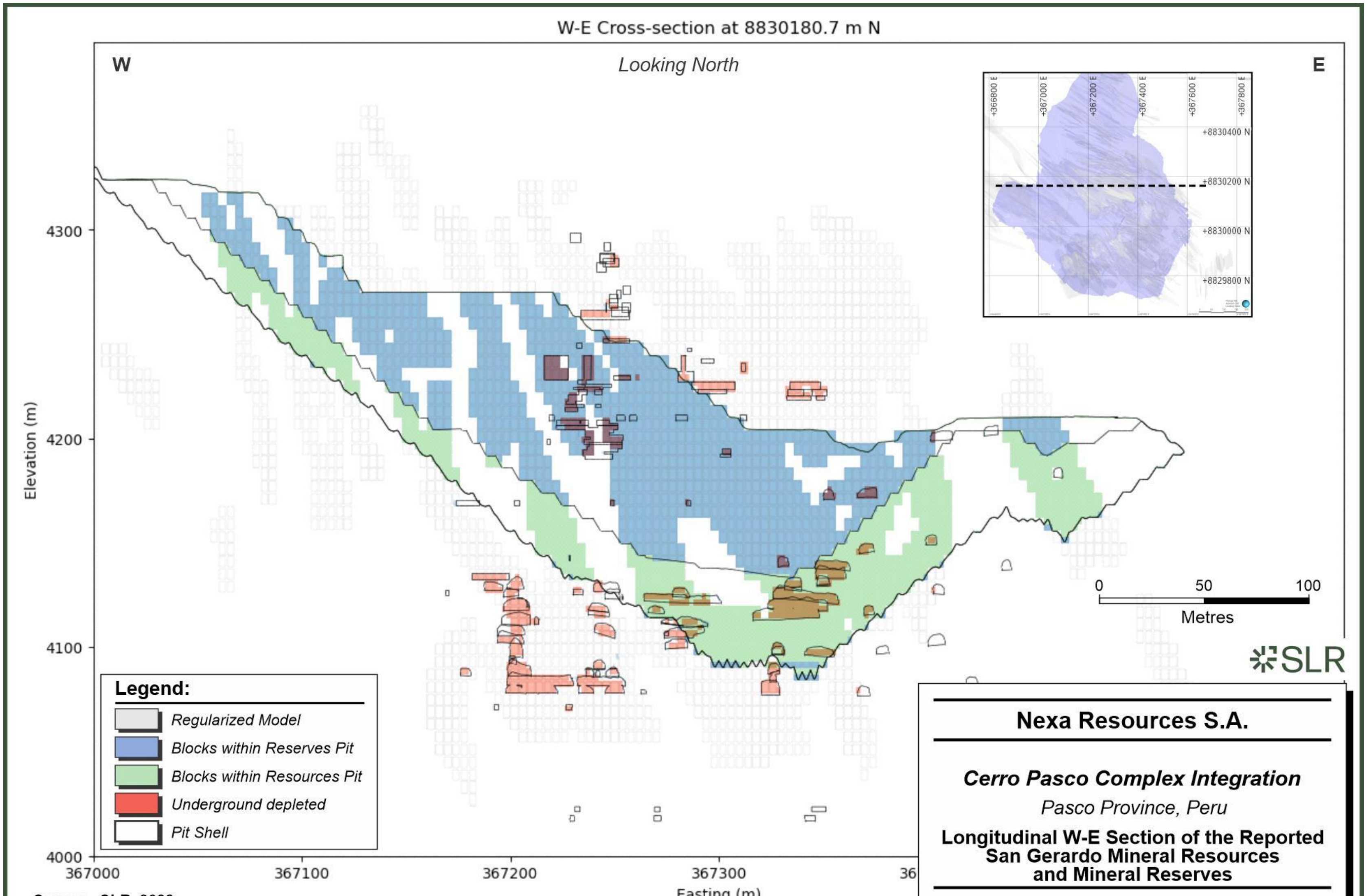


11.5.13 Mineral Resource Reporting

Mineral Resources have been classified in accordance with the definitions for Mineral Resources in S-K 1300, which are consistent with CIM (2014) definitions.

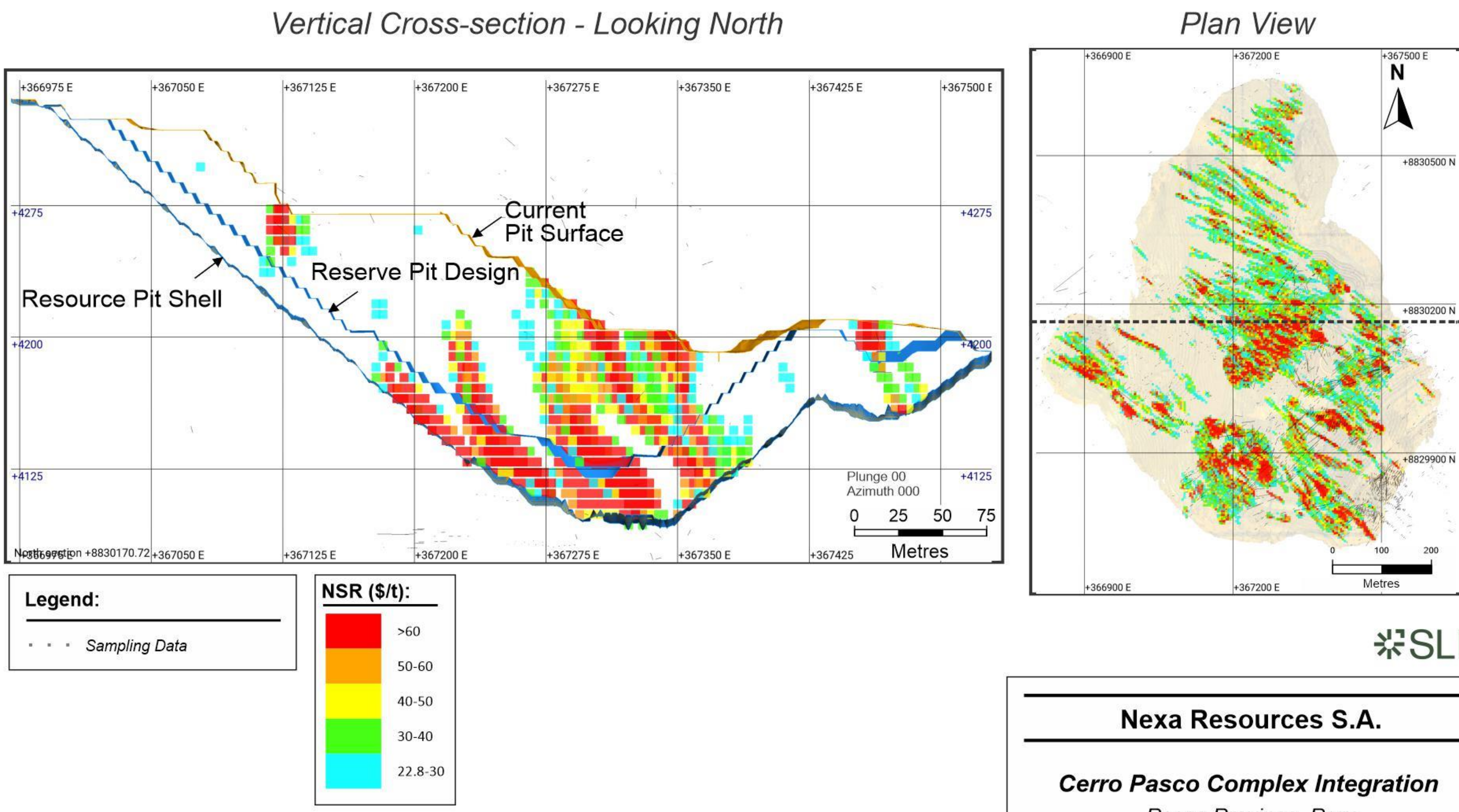
Figure 11-47 shows an example west-east section through the San Gerardo Mineral Resource and Mineral Reserve, while Figure 11-48 illustrates NSR values of the San Gerardo Mineral Resource inclusive of Mineral Reserve.

Figure 11-47: Longitudinal W-E Section of the Reported San Gerardo Mineral Resources and Mineral Reserves



Source: SLR, 2023.

Figure 11-48: San Gerardo Plan and Longitudinal Views of the NSR Values Above Cut-Off for Mineral Resources Inclusive of Reserves



Nexa Resources S.A.

Cerro Pasco Complex Integration

Pasco Province, Peru

San Gerardo Plan and Vertical Views of the NSR Values above Cut-Off for Mineral Resources Inclusive of Reserves

Source: SLR, 2023.

In the QP's opinion, the assumptions, parameters, and methodology used for the San Gerardo Mineral Resource estimate are appropriate for the style of mineralization and mining methods.

The QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, political, or other relevant factors that could significantly affect the San Gerardo Mineral Resource.

The QP is of the opinion that with consideration of the recommendations summarized in Sections 1 and 23 of this TRS, any issues relating to all relevant technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work.

Mineral Resources with an effective date of December 31, 2023 for San Gerardo are summarized in Table 11-41 on a 75.96% Nexa attributable ownership basis and Table 11-42 on a 100% ownership basis.

Table 11-41: San Gerardo Open Pit Mine: Summary of Mineral Resources (75.96% Nexa Attributable Ownership Basis) – December 31, 2023

Category	Tonnage (Mt)	Grade				Contained Metal			
		Zn (%)	Ag (g/t)	Pb (%)	Au (g/t)	Zn (kt)	Ag (koz)	Pb (kt)	Au (koz)
Measured	1.37	1.28	31.4	0.87	0.19	17.5	1,381	11.9	8.4
Indicated	2.95	1.05	29.0	0.90	0.24	30.9	2,747	26.5	22.7
Total Measured + Indicated	**4.31**	**1.12**	**29.8**	**0.89**	**0.22**	**48.4**	**4,128**	**38.4**	**31.1**
Inferred	1.29	1.27	32.7	1.15	0.22	16.4	1,358	14.9	9.1

Notes:

1. The definitions for Mineral Resources in S-K 1300 were followed for Mineral Resources which are consistent with CIM (2014) definitions.
2. The NSR cut-off value is calculated based on the LOM costs: US$22.44/t.
3. Mineral Resources are estimated using average long-term metal prices of Zn: US$3,218.90/t (US$1.46/lb), Pb: US$2,300.33/t (US$1.04/lb), Cu: US$8,820.05/t (US$4.00/lb), Ag: US$24.35/oz, and Au: US$1,875.57.
4. Metallurgical recoveries are based on historical processing data: Zn (70.4%), Pb (84.0%), Ag (75.8%), and Au (65.5%).
5. Bulk density was assigned based on rock type and averages 2.76 t/m^3.
6. Mineral Resources were depleted according to actual production as of September 30, 2023, and forecast production to the effective date of December 31, 2023.
7. The minimum height for resource reporting is 6.0 m.
8. Mineral Resources are exclusive of Mineral Reserves.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Mineral Resources are constrained within an optimized reporting pit shell.
11. Numbers may not add due to rounding.

Table 11-42: San Gerardo Open Pit Mine: Summary of Mineral Resources (100% Ownership Basis) – December 31, 2023

Category	Tonnage (Mt)	Grade				Contained Metal			
		Zn (%)	Ag (g/t)	Pb (%)	Au (g/t)	Zn (kt)	Ag (koz)	Pb (kt)	Au (koz)
Measured	1.80	1.28	31.4	0.87	0.19	23.0	1,818	15.7	11.00
Indicated	3.88	1.05	29.0	0.90	0.24	40.7	3,616	34.9	29.9
Total Measured + Indicated	**5.68**	**1.12**	**29.8**	**0.89**	**0.22**	**63.8**	**5,434**	**50.6**	**40.9**
Inferred	1.70	1.27	32.7	1.15	0.22	21.6	1,787	19.6	12.0

Notes:

1. The definitions for Mineral Resources in S-K 1300 were followed for Mineral Resources which are consistent with CIM (2014) definitions.
2. The NSR cut-off is calculated based on the LOM costs: US$22.44/t.
3. Mineral Resources are estimated using average long-term metal prices of Zn: US$3,218.90/t (US$1.46/lb), Pb: US$2,300.33/t (US$1.04/lb), Cu: US$8,820.05/t (US$4.00/lb), Ag: US$24.35/oz, and Au: US$1,875.57.
4. Metallurgical recoveries are based on historical processing data: Zn (70.4%), Pb (84.0%), Ag (75.8%), and Au (65.5%).
5. Bulk density was assigned based on rock type and averages 2.76 t/m^3.
6. Mineral Resources were depleted according to actual production as of September 30, 2023, and forecast production to the effective date of December 31, 2023.
7. Mineral Resources are exclusive of Mineral Reserves.
8. The minimum height for resource reporting is 6.0 m.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Mineral Resources are constrained within an optimized reporting pit shell.
11. Numbers may not add due to rounding.

11.6 Atacocha Underground

11.6.1 Resource Database

Although the San Gerardo and Atacocha UG Mineral Resources were estimated separately, a combined resource database was used. The database is discussed in Section 11.5.1.

While a small quantity of exploration work has been completed at Atacocha after the January 31, 2023 resource database closure date, the additional data is limited to the San Gerardo open pit area and does not affect Atacocha UG.

11.6.2 Geological Interpretation

The Atacocha UG Mineral Resource estimate is based on assay and geological interpretation for each individual mineralized domain. Geological models were built by Atacocha geologists using the drilling and channel sampling assay results, as well as the structural and lithological controls observed in underground workings and drill core logging data. Geological model for lithological domains and the mineralization model were built using Leapfrog Geo software with some adjustments performed in Datamine software.

Eight lithological domains were modelled for Atacocha UG: skarn, intrusive, siliceous breccia, massive silica, marble, sandstone, limestone, and basalt. Three other domains were modelled which contain potentially economic mineralization: skarn, siliceous/massive breccia, and limestone replacement.

The mineralization wireframes were originally built based on information from mineralized zones and mapping within the underground levels and extrapolated. No minimum mining thickness was used. Once these solids were created, explicit modelling techniques were used to adjust the boundaries of the initial mineralization wireframes. The final mineralization wireframes were verified with drilling information on level plan views every 20 m. A total of 239 mineralization wireframes were modelled using a US$15/t NSR cut-off value to determine whether any given sample intersection would be considered for inclusion in a mineralized domain. Nexa calculated an NSR value for all assay intervals that takes into account all four economic metals (Zn, Pb, Cu, and Ag).

During the modelling process, three styles of mineralization were identified at the Atacocha deposit:

- **Skarn:** mineralized zones of irregular to structurally controlled geometry, primarily contained within the Pucará Group, comprising garnet with associated metallic mineralization of galena, sphalerite, chalcopyrite, and Ag-bearing sulphosalts (i.e., tetrahedrite).
- **Replacement:** lenses to irregular geometry contacts within the Pucará Group, comprising metallic mineralization of galena, sphalerite, chalcopyrite, and Ag- bearing sulphosalts (i.e., tetrahedrite).
- **Structurally controlled zones** (i.e., veins): mineralization comprising galena, sphalerite, and Ag-bearing sulphosalts (i.e., tetrahedrite) with quartz, rhodochrosite, and pyrite that forms structurally controlled shoots with lengths of up to 150 m and vertical extents of up to 350 m.

Mineralized domain wireframes were constructed based upon the geologists' interpretation of the mineralization observed in the underground workings and extrapolated approximately 40 m from the last mineralized drill hole intercept. SLR reviewed the mineralized domains and noted that some domains were extended further, however, extrapolation was generally considered reasonable and the degree of extrapolation was considered during classification of Mineral Resources. SLR also identified that some very small OB wireframes had been constructed, with volumes less than 1,000 m^3.

Drill holes lacking assays were not treated as barren and veins were allowed to pass through the modelled mineralization domains. The rationale behind the absence of assays in these instances remains unclear, whether due to the absence of identified mineralization or other factors such as time constraints. Following estimation, regions around the non-assayed holes were removed from the final block model by an NN approach to delineate the influence area, however, SLR observed that this produced unusually shaped final domains in the block models. While this was not deemed to significantly impact the estimated Mineral Resources, SLR recommends that veins be set to pinch out upon non-assayed samples, to refine the grade estimate in future Mineral Resource updates. The QP agrees with this recommendation.

Figure 11-49 shows the lithological control types for each of the 239 modelled mineralization domains. Figure 11-50 highlights the 25 main domain contributors to Mineral Resource tonnage.

Mineralization domains were grouped into 67 groups, which were used for variography, capping, and to determine average density values (Figure 11-51). These were created in consideration of geological zones (Atacocha, San Gerardo, and Santa Bárbara), type of structures (mineralized body or vein), type of emplacements (exoskarn, distal skarn, and endoskarn), type of lithological controls (contact, fault, brecciation, intrusive, contact fault), and the anisotropy and orientation of the mineralization domains.

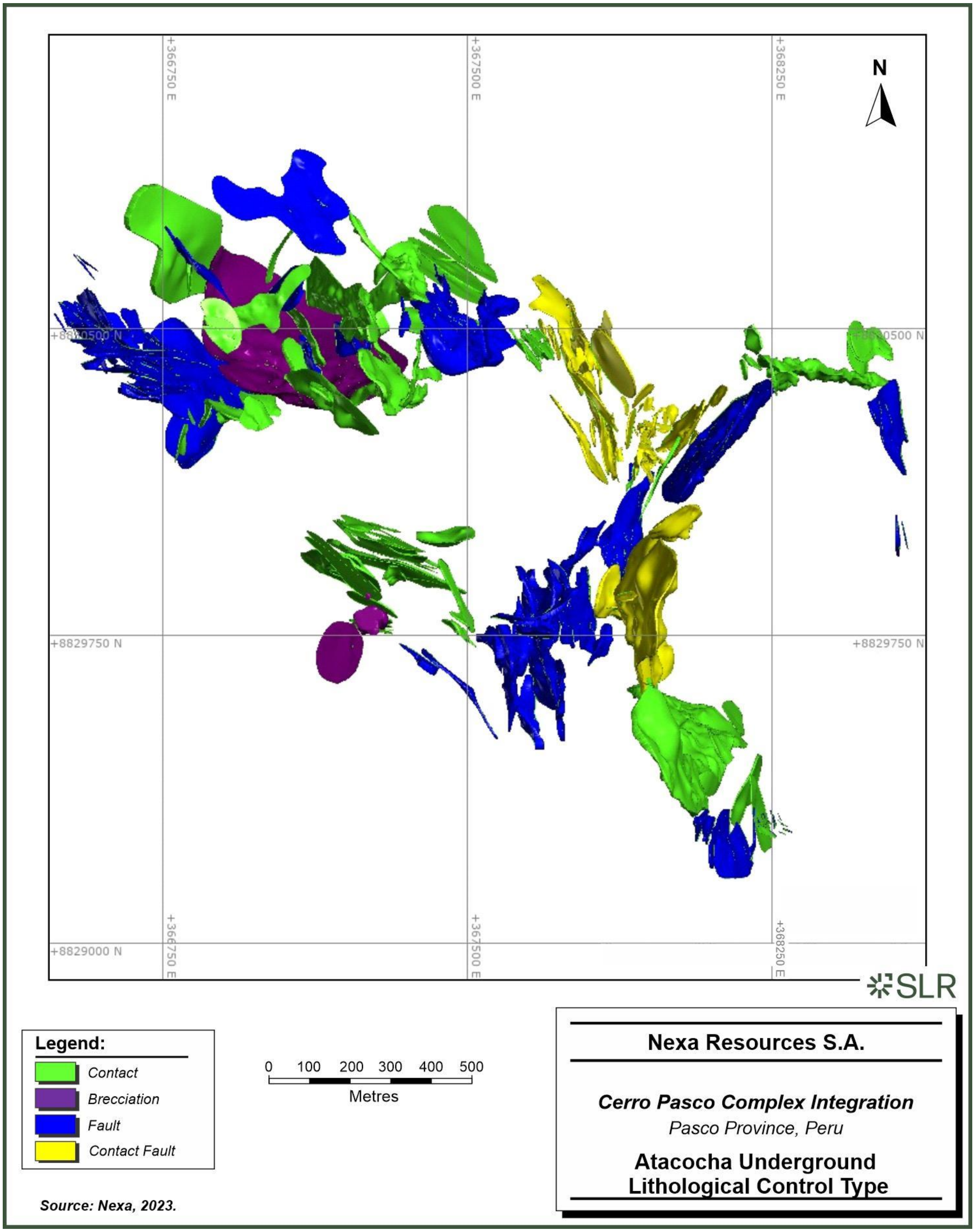
The nomenclature used in the estimation process considers “OB” as the name of each mineralization domain, “COD_OB” as the numerical code for each mineralization domain, and “C_ESTIM” as the numerical code for grouped domains. Unlike San Gerado, no high grade/low grade sub-domains were established.

An analysis of snapping discrepancies showed that 96% of intervals assigned to an OB were correctly modelled as such, while 87% of waste intervals were correctly modelled. This is considered acceptable by the QP, especially as many of the discrepancies were located outside of the Mineral Resource constraining reporting shapes. The QP recommends, however, that snapping be improved in future Mineral Resource updates.

Contact analysis completed by SLR on the mineralization domains indicates that they are generally effective in separating mineralized and unmineralized populations (Figure 11-52), although it was identified in some areas that opportunities existed to extend the wireframes to include additional mineralized intercepts. In particular, Cu and Ag consistently display a tail of low grade values outside of the mineralized zones. The populations within the modelled mineralization were approximately lognormal.

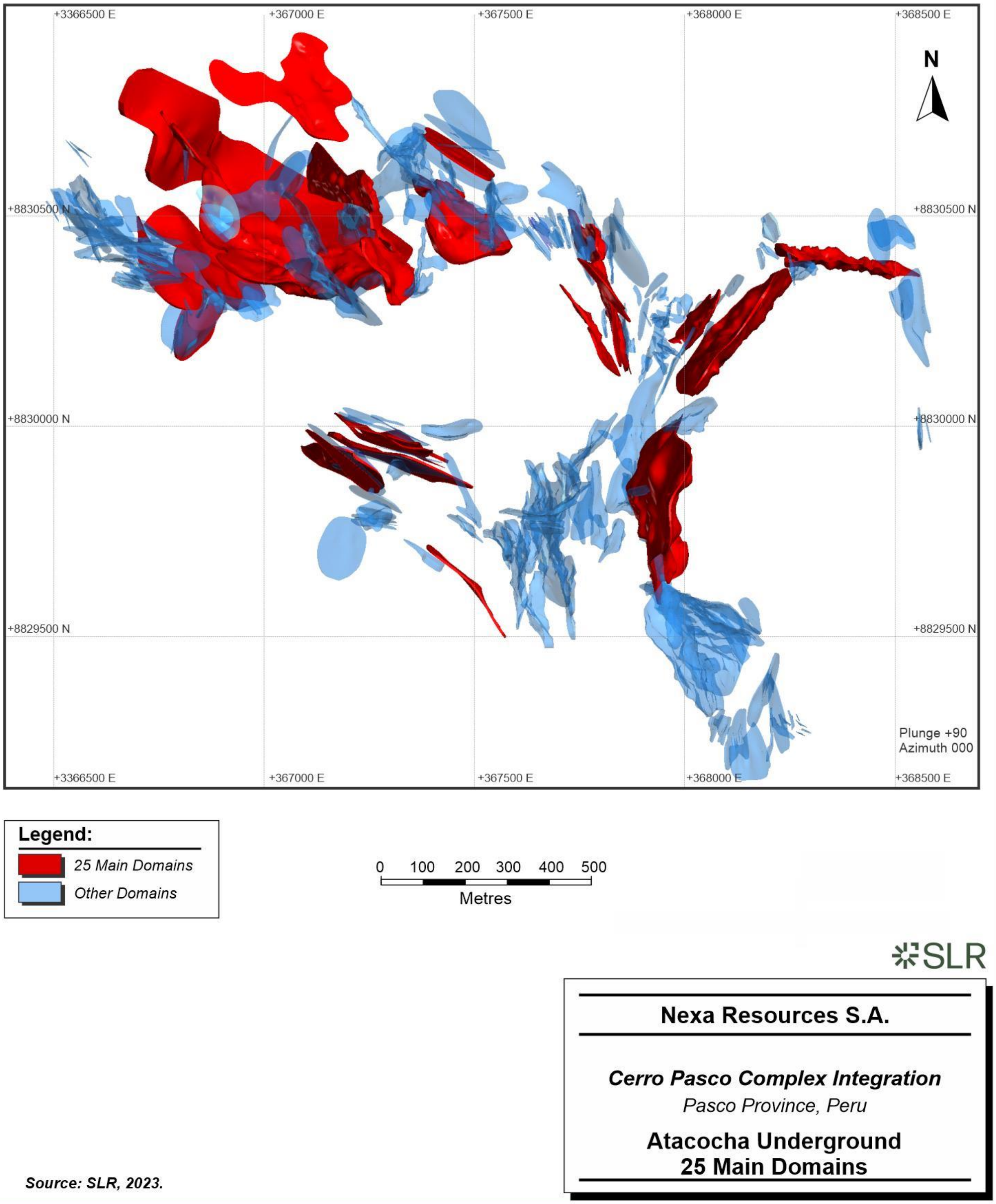
The QP considers that the modelled mineralization domains are suitable for the estimation of Mineral Resources.

Figure 11-49: Atacocha Underground Lithological Control Type



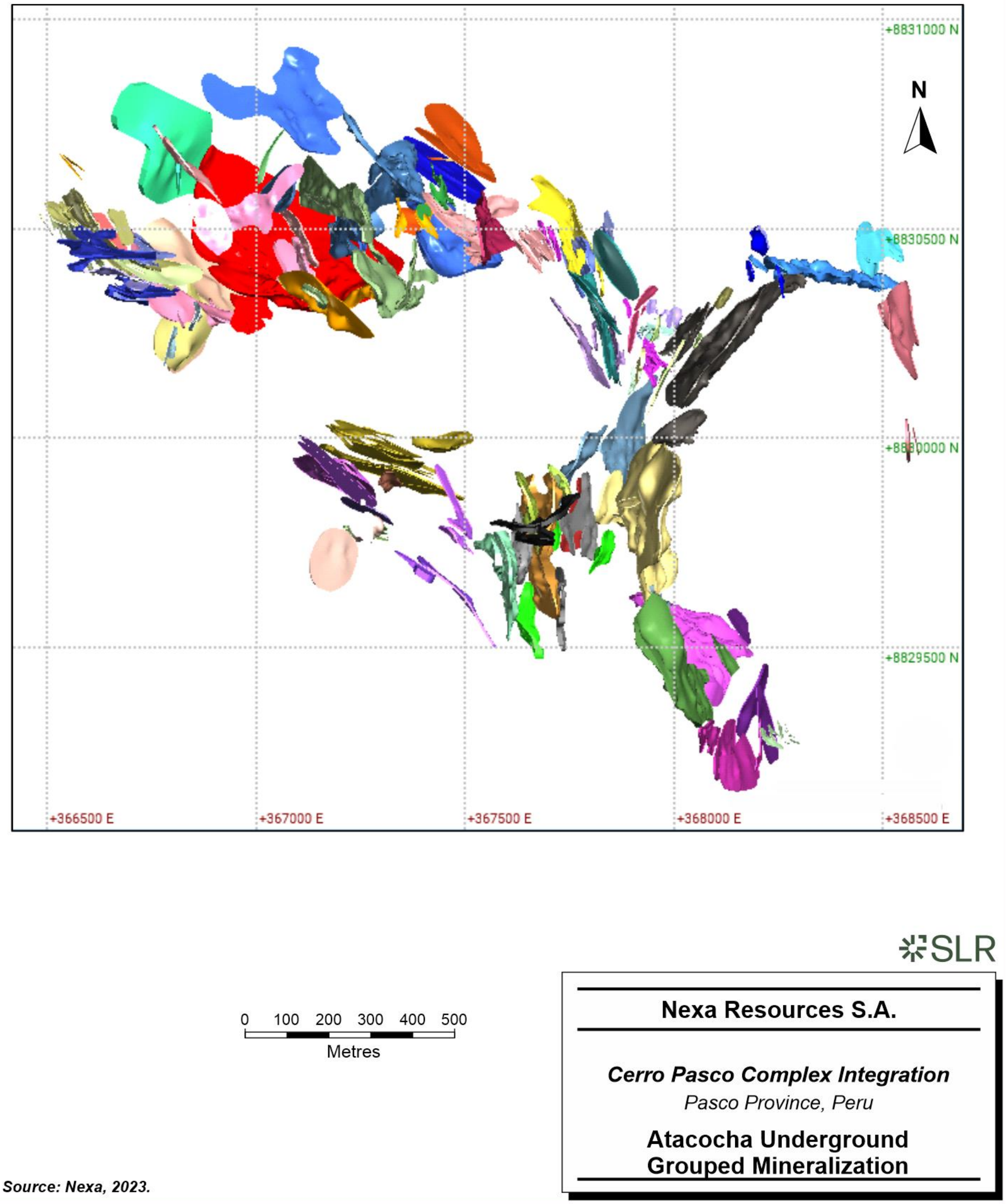
Source: Nexa, 2023.

Figure 11-50: Atacocha Underground 25 Main Domains



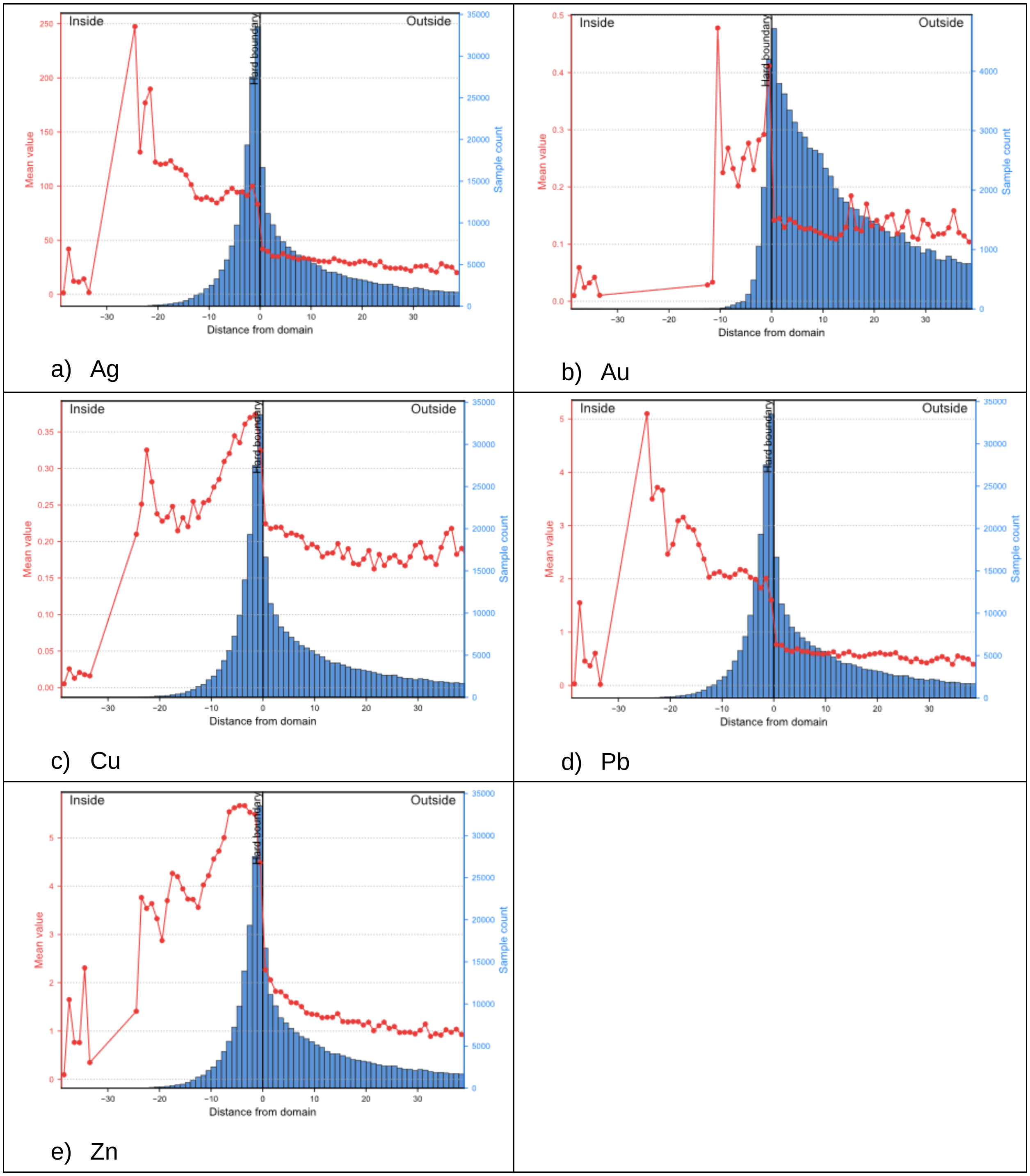
Source: SLR, 2023.

Figure 11-51: Atacocha Underground Grouped Mineralization



Source: Nexa, 2023.

Figure 11-52: Atacocha Underground Mineralization Contact Analysis



a) Ag

b) Au

c) Cu

d) Pb

e) Zn

11.6.3 Resource Assays

After completing 3D solid models, Nexa assess the assay data contained inside the solid models to determine whether any additional domaining is required prior to capping. Typically, raw assay data are extracted from each domain and are then assessed using histograms and cumulative probability plots.

For the EDA process, the database is exported from Leapfrog Geo and imported into Datamine Studio software. Non-sampled intervals are substituted with the detection limits of the chemical elements.

For the purpose of this TRS, Zn, Cu, Ag, and Pb, referred to as the main elements, will be detailed in tables and figures, along with the 25 grade shells (main domains) that contribute most significantly to the Mineral Resource and Mineral Reserves, approximately 75% of the volume.

Table 11-43 presents the length-weighted statistics of the drill holes and channels combined.

Table 11-43: Atacocha Underground Assay Statistics (Length Weighted) for the Main Domains

Domain Code	Orebody	Zn (%) - Assay (length weighted)						Cu (%) - Assay (length weighted)					
		Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
13	150	1,638	6.5	8.87	1.36	0.01	52.34	1,638	0.43	0.72	1.69	0	9.66
13b	152	2,276	7.77	9.36	1.21	0.01	48.54	2,276	0.42	0.83	1.97	0.01	17.02
13r8	180	18	6.95	4.4	0.63	0.08	13.09	18	0.36	0.35	0.95	0.03	1.17
13r72	182	71	4.81	5.81	1.21	0.01	20.93	71	0.58	0.88	1.54	0.01	4
13u	186	2,086	6.18	7.25	1.17	0	47.08	2,086	0.45	0.9	1.97	0	19.28
13w	188	33	5.91	8.74	1.48	0.01	36.48	33	0.41	0.53	1.28	0.01	1.92
18	300	165	3.16	4.68	1.48	0.01	34.23	165	0.25	0.33	1.3	0.01	3.1
18b	302	65	2.56	2.49	0.97	0.23	12.83	65	0.23	0.17	0.72	0.03	0.78
18f	306	131	3.14	3.3	1.05	0.09	24.4	131	0.28	0.25	0.9	0.01	1.63
23	350	568	3.32	3.84	1.15	0.02	29.94	568	0.21	0.26	1.24	0.01	3.95
91	400	15	7.98	5.81	0.73	0.3	18.3	15	0.32	0.18	0.56	0.11	0.71
251	450	94	5.45	7.22	1.33	0.01	40.92	94	0.74	1.15	1.56	0.01	6.88
251c	453	61	4.57	5.65	1.24	0.05	28.63	61	0.65	0.72	1.11	0.02	3.68
251d	454	31	7.09	10.25	1.45	0.59	33.84	31	0.97	0.86	0.89	0.08	2.87
ani	500	170	3.51	4.17	1.19	0.05	22.28	170	0.3	0.49	1.6	0.01	3.48
ania	501	146	5.2	6.34	1.22	0.17	54.67	146	0.36	0.51	1.41	0.01	4.15
cher	550	55	9.81	9.58	0.98	0.01	27.15	55	0.83	2.64	3.19	0.01	15.38
cne	600	661	2.93	4.66	1.59	0.02	40.28	661	0.25	0.47	1.9	0.01	5.74
ing	750	159	6.18	7.28	1.18	0.01	37.53	159	0.59	1.3	2.2	0.01	12.2
sb	950	4,207	6.11	6.53	1.07	0.01	42.77	4,207	0.35	0.5	1.42	0.01	8.13
sga	1001	35	11.62	12.79	1.1	0.11	48.54	35	0.24	0.22	0.94	0.01	0.87

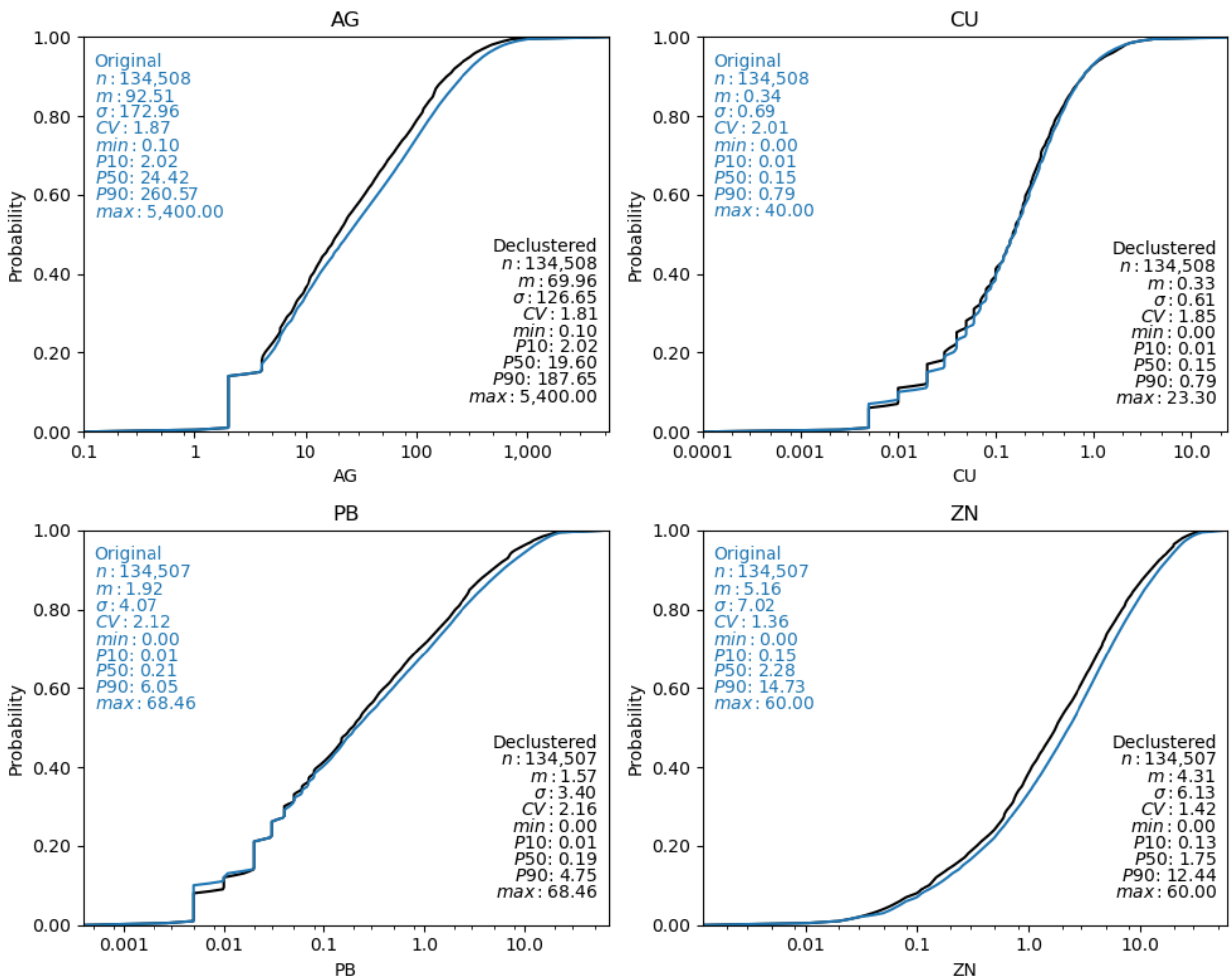
Domain Code	Orebody	Zn (%) - Assay (length weighted)						Cu (%) - Assay (length weighted)					
		Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
sge	1005	871	5.79	7.83	1.35	0.01	36.45	871	0.34	0.68	1.98	0.01	7.46
sgf	1006	157	12.59	11.68	0.93	0.01	41.38	157	0.45	0.72	1.6	0.01	5.53
sgg	1007	53	8.06	8.96	1.11	0.04	36.12	53	0.45	0.46	1.02	0.01	2.13
sgq	1017	10	4.98	7.51	1.51	0.04	28.6	10	0.34	0.59	1.75	0.01	2

Domain Code	Orebody	Ag (g/t) - Assay (length weighted)						Pb (%) - Assay (length weighted)					
		Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
13	150	1,638	97.91	134.38	1.37	1	1,461.55	1,638	2.06	4.61	2.23	0.01	63.89
13b	152	2,276	113.55	141.5	1.25	2.02	1,652.84	2,276	2.66	4.67	1.76	0.01	32.02
13r8	180	18	55.8	65.76	1.18	2.02	215.24	18	1.23	2.74	2.22	0.01	8.14
13r72	182	71	58.58	84.53	1.44	2.02	317.26	71	0.67	1.86	2.76	0.01	8.11
13u	186	2,086	130.56	162.87	1.25	0.1	2,235.41	2,086	2.42	4.37	1.8	0	42.65
13w	188	33	64.96	50.85	0.78	2.02	254.74	33	0.28	0.33	1.19	0.02	1.82
18	300	165	115.85	153.08	1.32	2.02	1,065.45	165	2.5	3.53	1.41	0.01	19.49
18b	302	65	144.35	189.45	1.31	1.99	1,304.88	65	2.37	3.1	1.31	0.01	18.29
18f	306	131	125.21	114.91	0.92	2.02	602.79	131	2.38	2.26	0.95	0.01	13.33
23	350	568	103.69	161.3	1.56	1.99	1,711.19	568	2.19	2.97	1.35	0.01	21.02
91	400	15	188.71	169.82	0.9	2.78	646.33	15	1.96	3.57	1.82	0.01	11.57
251	450	94	72.56	80.2	1.11	2.02	390.97	94	0.35	0.75	2.12	0.01	5.15
251c	453	61	73.6	73	0.99	2.02	494.23	61	0.59	1.63	2.74	0.02	10.51
251d	454	31	73.01	45.49	0.62	5.91	175.73	31	0.33	0.61	1.88	0.01	3.5
ani	500	170	37.99	79.02	2.08	2.02	545.21	170	0.95	2.43	2.56	0.01	17.59
ania	501	146	87.26	150.33	1.72	2.02	1,118.85	146	2.49	4.17	1.67	0.02	29.07

Domain Code	Orebody	Ag (g/t) - Assay (length weighted)						Pb (%) - Assay (length weighted)					
		Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
cher	550	55	135.32	116.45	0.86	1.61	403.72	55	4.99	8.52	1.71	0	38.7
cne	600	661	21.42	29.12	1.36	2.02	246.65	661	0.8	1.68	2.1	0.01	19.77
ing	750	159	60.34	95.59	1.58	2.02	807.45	159	0.51	1.8	3.5	0.01	17.7
sb	950	4,207	166.88	240.3	1.44	1	3,165.09	4,207	4.35	5.87	1.35	0.01	44.18
sga	1001	35	56.47	60.69	1.07	2.02	257.85	35	0.58	1.91	3.27	0.02	11.11
sge	1005	871	112.34	213.11	1.9	0.27	3,800.84	871	2.48	4.38	1.77	0	32.6
sgf	1006	157	108.68	158.55	1.46	1	893.03	157	2.3	5.01	2.18	0.01	21.76
sgg	1007	53	155.81	237.43	1.52	1	1,152.69	53	2.74	3.75	1.37	0.02	18.66
sgq	1017	10	74.39	71.14	0.96	2.02	200.31	10	0.15	0.28	1.82	0.01	1.04

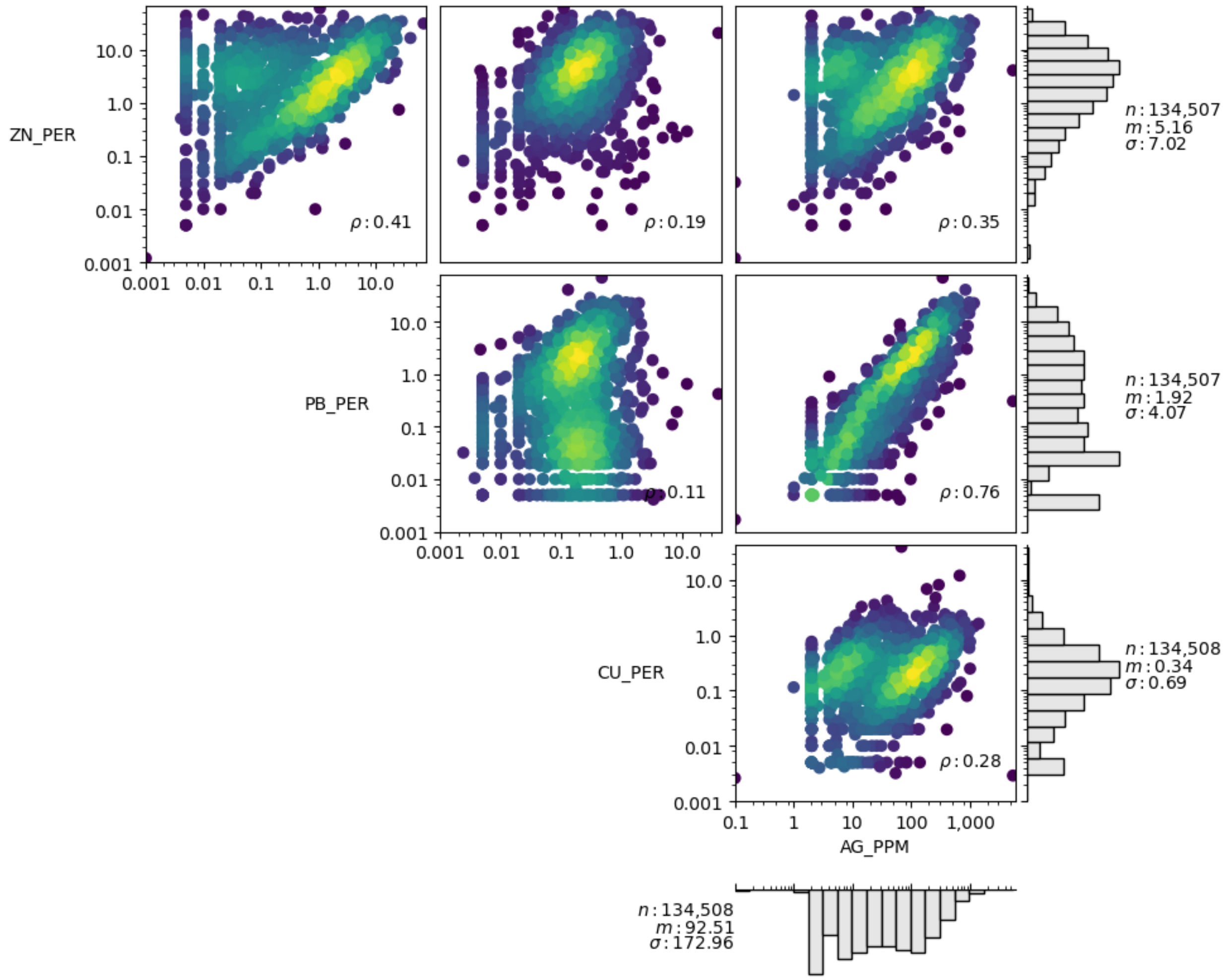
In the Atacocha underground deposit, approximately 80% of the samples are derived from drill holes, which consist of diamond drilling from both surface and underground, while 20% originate from channel samples. Sampling is naturally denser within developed galleries and mined stopes, as it is usually the case for underground mining. Figure 11-53 shows CDFs for the samples, with and without declustering weights. The declustered statistics have a lower mean for most variables, except for Cu, confirming the preferential bias for sampling mineralized areas.

Figure 11-53: Atacocha Underground CDF Main Elements, Comparing Declustered and Original Data.



Given the polymetallic nature of the mineralization, a bivariate statistical analysis is conducted to evaluate the relationships between the variables. Figure 11-54 shows scatter plots for the main elements, alongside their correlation coefficients. Generally, intermediate correlations are observed for most elements, apart from Cu, which shows less correlation.

Figure 11-54: Atacocha Underground Scatter Plots



11.6.4 Treatment of High Grade Assays

Where the assay distribution is skewed positively or approaches lognormal, erratic high grade values can have a disproportionate effect on the average grade of a deposit. One method of treating these outliers to reduce their influence on the average grade is to cut or cap them at a specific grade level.

Atacocha staff evaluated the raw grades using log-probability plots to assess the influence of higher grades for each element using estimation domains. The approach, applied by Atacocha staff, for restricting outliers was to identify a pronounced break in the probability curve that occurs above the 95th percentile.

A second capping level for the third interpolation pass in channel composites was applied to restrict the high grade influence.

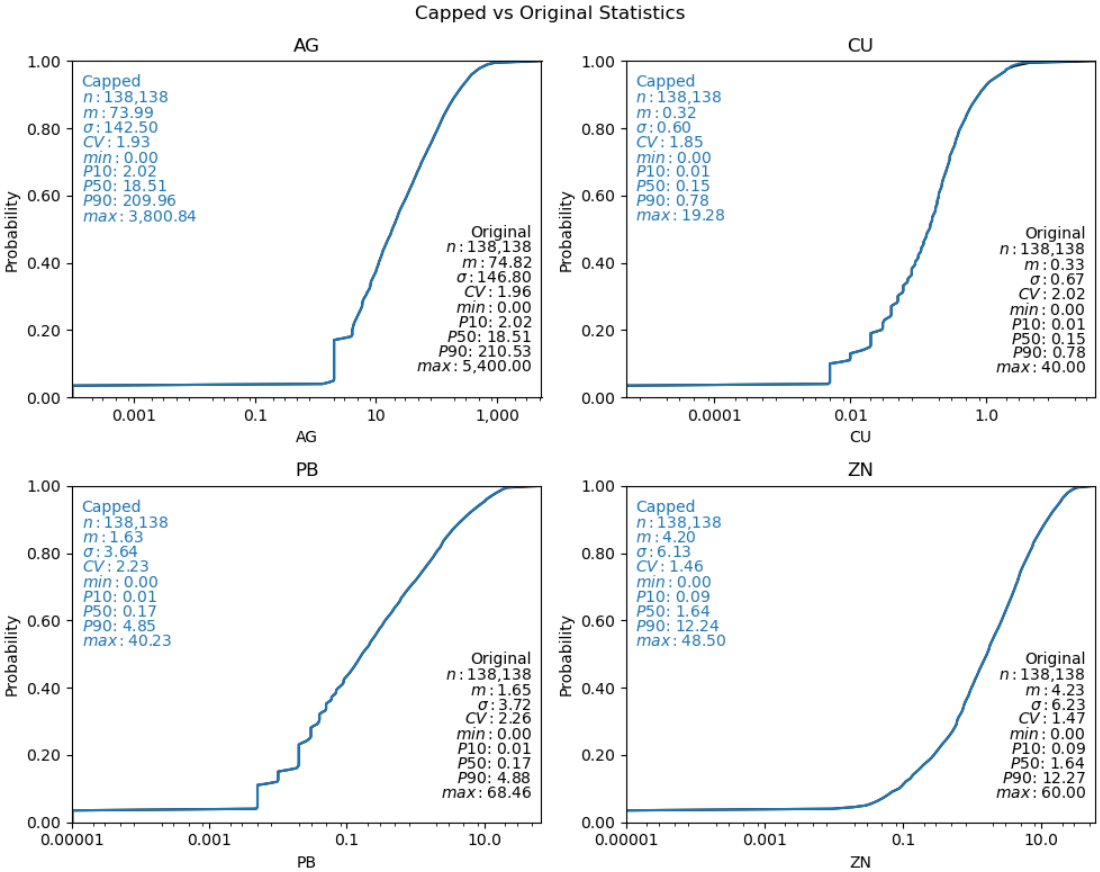
Table 11-44 lists the capping levels for drill hole ("CAPD"), channel ("CAPC") raw data determined for each estimation domain, and the second capping levels applied to samples used for the third interpolation pass.

Table 11-44: Atacocha Underground DDH, CHNL, and Second Level Top-Cut Values

Domain	Zn DDH	Zn CHNL	Zn 2nd Level	Ag DDH	Ag CHNL	Ag CHNL 2nd Level	Pb DDH	Pb CHNL	Pb CHNL 2nd Level	Cu DDH	Cu CHNL	Cu CHNL 2nd Level
13	36	46.2	27.1	620	590	118	10.6	-	1.97	9.4	-	1.33
18	17.9	15.8	13.5	551	637	585.8	14	14	13.91	2.5	1	0.69
23	20.17	18	12.13	710	798	511.6	10.6	15	8.38	-	2.4	1.07
91	-	12.71	12.41	-	215	185.7	-	14	7.49	-	1.07	0.685
251	-	-	-	230.2	-	-	1.788	-	-	4.41	-	-
13b	-	48.5	28.54	-	-	521.1	-	-	5.8	-	18	2.1
13r72	37.2	22	12.1	662	980	254.1	19.8	22.4	5.4	9.4	6	1.7
13r8	31.1	40	19.7	748	1,194	392.3	20.5	24.5	10.5	8.1	13.1	3.2
13u	32.5	41.5	21.9	-	1,232	545.2	20.4	22.2	13.3	5	6	1.5
13w	32.5	41.5	21.9	-	1,232	545.2	20.4	22.2	13.3	5	6	1.5
18b	15.86	10.83	9.6	1,243	1,399	651.8	15.5	15.6	10.06	1.32	-	0.62
18f	17.9	15.8	13.5	551	637	585.8	14	14	13.91	2.5	1	0.69
251c	-	-	-	230.2	-	-	1.788	-	-	4.41	-	-
251d	-	-	-	230.2	-	-	1.788	-	-	4.41	-	-
ani	20.35	18.93	11.46	400	420	88.06	-	18.91	3	9.42	-	0.88
ania	20.35	18.93	11.46	400	420	88.06	-	18.91	3	9.42	-	0.88
cher	5	-	2.5	270	-	175	-	-	4	0.6	-	0.16
cne	16	18	10	115	150	34	3	5	0.77	1.2	0.8	0.49
ing	28	-	-	310	-	-	10	-	-	1.8	-	-
sb	23	30	17	715	700	200	14	23	7	4	4.7	0.99
sga	15	-	-	-	-	-	6.6	-	-	2.5	-	-
sge	26	-	-	570	-	-	12.7	-	8.7	4.3	-	-
sgf	26	-	-	570	-	-	12.7	-	8.7	4.3	-	-
sgg	26	-	-	570	-	-	12.7	-	8.7	4.3	-	-
sgq	12.6	30	15.8	-	-	-	14	18	12	2	2.7	1

Figure 11-55 shows the capping effect on overall distribution of grades for drill holes and channels together within Atacocha UG. The capped distributions show only minor reductions in their means.

Figure 11-55: Atacocha Underground Capping Effect on Drill Hole and Channel Distributions



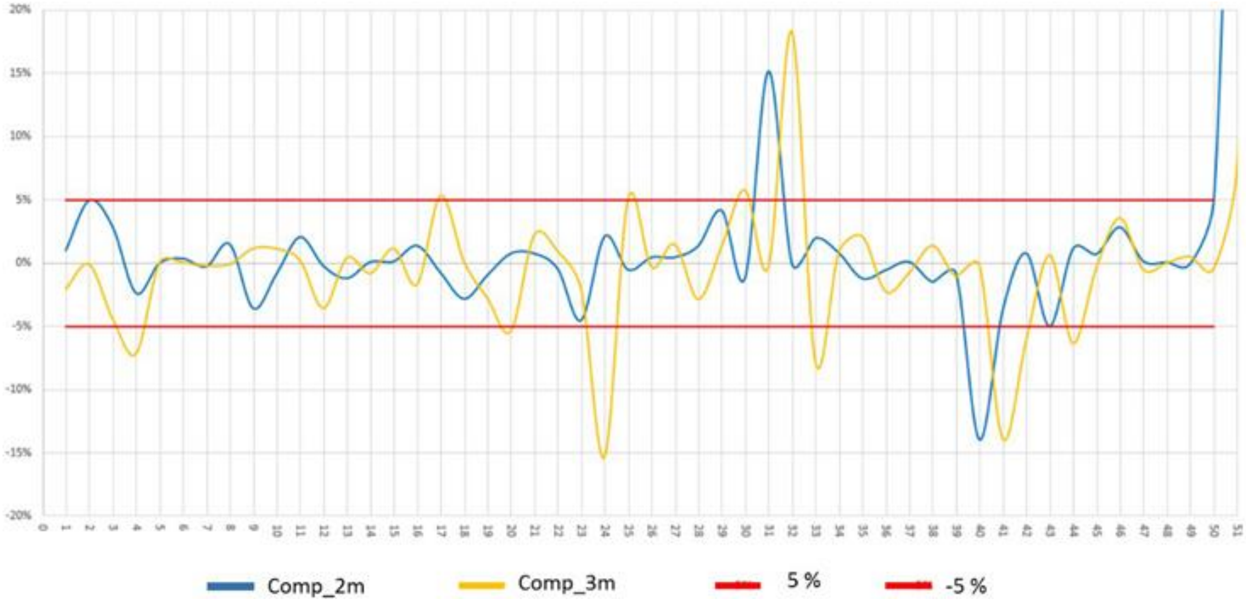
11.6.5 Compositing

The average length of samples within the mineralized domains is 1.50 m. Capped sample data was composited to two metre lengths, which corresponds to half of the parent block size height for the deposit.

The composite length was selected based on analysis of four composite length levels (1 m, 2 m, 3 m, and 4 m). Figure 11-56 illustrates a comparison of the mean relative error of Zn between length-weighted raw assay mean versus composite mean, by mineralization domain for the different composite lengths.

Atacocha staff generated statistics to compare the distribution of the raw assays and the composites (Figure -11-57). An approximately less than two percent increase in means after compositing was observed.

Figure 11-56: Atacocha Underground Compositing Analysis



Source: Nexa, 2023

Figure -11-57: Sample Distributions before and after Compositing to 2 m Length

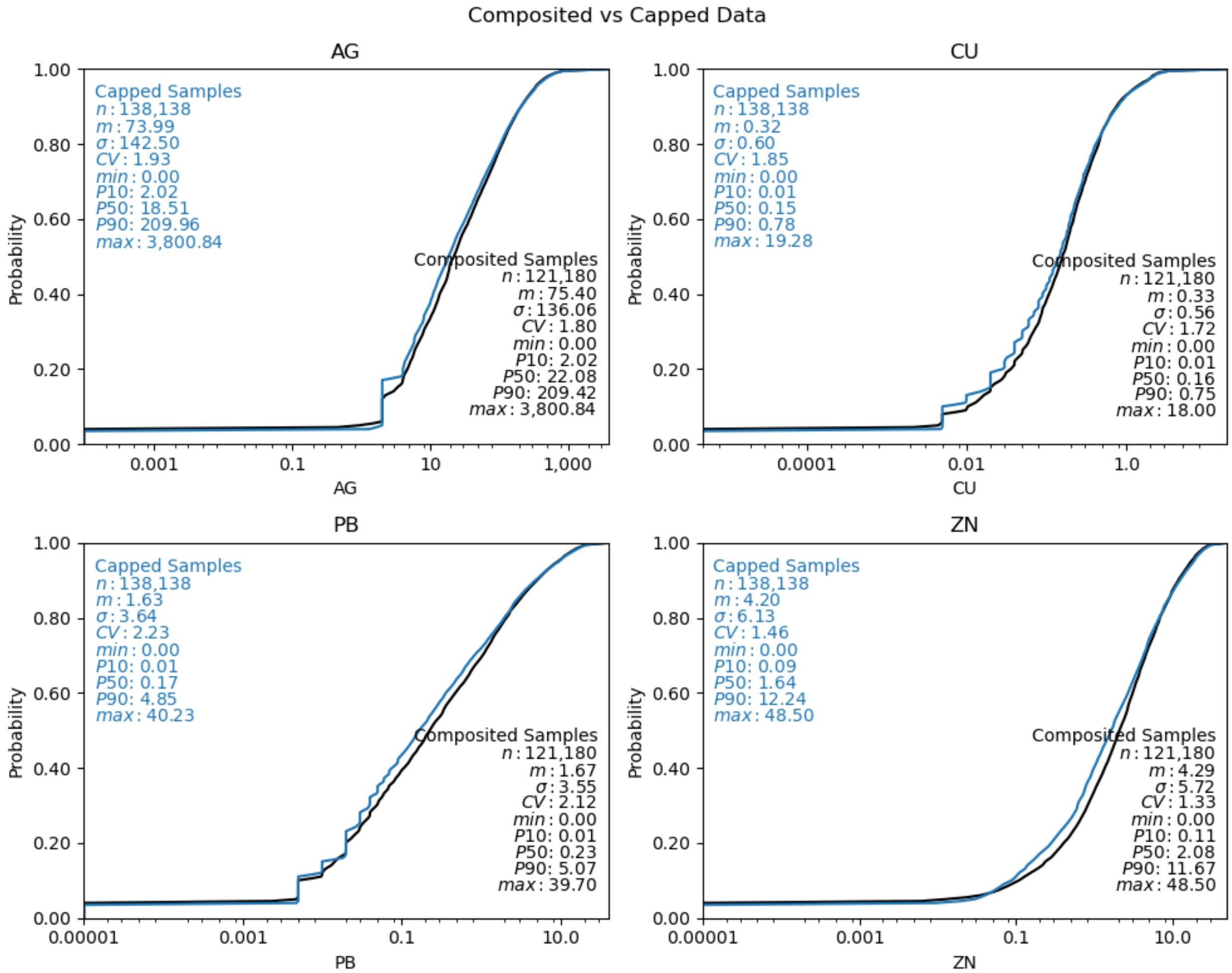


Table 11-45 shows the summary statistics for the 25 largest domain contributors to the Mineral Resource tonnage, before and after compositing.

Table 11-45: Atacocha Underground Compositing Statistics for the 25 Main Domains

Domain	Zn (%) - Assay (2 m composites)						Cu (%) - Assay (2 m composites)					
	Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
13	3,711	4.07	5.94	1.46	0	46.2	3,711	0.44	0.65	1.48	0	7.01
13b	5,960	8.02	8.72	1.09	0	48.5	5,960	0.53	1.32	2.47	0	18
13r72	93	3.27	3.36	1.02	0	22.3	93	0.17	0.24	1.47	0	1.47
13r8	459	4.21	4.73	1.12	0	40	459	0.07	0.11	1.61	0	1.54
13u	4,577	4.76	6.7	1.41	0	41.5	4,577	0.46	0.59	1.3	0	6
13w	1,533	5.41	4.6	0.85	0	34.27	1,533	0.05	0.06	1.12	0	1.04
18	671	2.74	2.94	1.07	0	17.9	671	0.45	0.45	1.01	0	2.5
18b	319	2.09	1.61	0.77	0	7.72	319	0.11	0.06	0.54	0	1.09
18f	100	1.62	1.9	1.17	0	9.3	100	0.22	0.34	1.53	0	1.7
23	823	2.6	3.37	1.29	0	18	823	0.19	0.26	1.4	0	2.38
251	103	5.93	7.77	1.31	0	28.95	103	0.4	0.32	0.8	0	1.23
251c	19	3.63	5.02	1.38	0	25.93	19	0.71	0.74	1.03	0	2.98
251d	12	4.08	4.51	1.1	0.45	16.47	12	1.85	1.41	0.76	0.04	3.58
91	91	1.35	1.06	0.79	0	12.13	91	0.11	0.11	1.07	0	0.97
ani	314	4.36	2.45	0.56	0	20.01	314	0.2	0.17	0.85	0	2.03
ania	1,363	4.25	3.3	0.78	0	20.35	1,363	0.23	0.22	0.96	0	4.9
cher	47	0.61	0.65	1.06	0.02	5	47	0.07	0.03	0.35	0.01	0.47
cne	4,993	3.5	2.95	0.84	0	18	4,993	0.18	0.18	0.98	0	1.2
ing	89	2.66	2.98	1.12	0.04	15.07	89	0.13	0.16	1.2	0.01	0.96
sb	6,448	3.59	4.1	1.14	0	29.99	6,448	0.33	0.39	1.19	0	4.7
sga	61	4.78	4.89	1.02	0	13.79	61	0.51	0.46	0.91	0	2.07

Domain	Zn (%) - Assay (2 m composites)						Cu (%) - Assay (2 m composites)					
	Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
sge	54	6.78	7.13	1.05	0.01	23.7	54	1.1	1	0.91	0.07	4.24
sgf	41	3.01	4.97	1.65	0.03	26	41	0.71	1	1.41	0.03	4.3
sgg	37	7.26	6.12	0.84	0.06	16.69	37	1.49	0.82	0.55	0.01	3.37
sgq	6	7.2	3.87	0.54	2.51	11.82	6	0.53	0.15	0.28	0.02	0.76

Domain	Ag (g/t) - Assay (2 m composites)						Pb (%) - Assay (2 m composites)					
	Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
13	3,711	47.14	64.57	1.37	0	620	3,711	0.57	1.34	2.33	0	12.21
13b	5,960	152.86	182.94	1.2	0	3,800.84	5,960	1.2	2.84	2.37	0	39.7
13r72	93	18.62	33.23	1.78	0	313.99	93	0.3	0.81	2.65	0	12.85
13r8	459	55.13	52.22	0.95	0	979.01	459	1.61	1.82	1.14	0	23.35
13u	4,577	118.56	142.55	1.2	0	1232	4,577	2.3	4.14	1.8	0	22.2
13w	1,533	217.25	202.82	0.93	0	1232	1,533	4.4	4.03	0.92	0	22.2
18	671	68.65	80.75	1.18	0	607.33	671	0.57	1.22	2.12	0	14
18b	319	89.98	74.09	0.82	0	1243	319	1.3	1.1	0.85	0	10.73
18f	100	34.76	47.91	1.38	0	375.18	100	0.5	0.76	1.52	0	5.82
23	823	88.62	117.45	1.33	0	790.51	823	1.26	2.02	1.61	0	15
251	103	19.04	18.09	0.95	0	88.76	103	0.12	0.22	1.77	0	1.17
251c	19	34.23	34.19	1	0	177.99	19	0.07	0.1	1.38	0	0.47
251d	12	83.69	53.53	0.64	4.63	215	12	0.28	0.34	1.22	0.03	1.26
91	91	21.32	11.18	0.52	0	202.4	91	0.98	0.56	0.57	0	11.23
ani	314	40.08	33.43	0.83	0	344.57	314	0.97	0.75	0.77	0	10.63
ania	1,363	23.18	31.87	1.38	0	364.33	1,363	0.77	1.44	1.87	0	16.28
cher	47	39.24	10.11	0.26	2.02	212.46	47	0.77	0.7	0.91	0.01	7.16

Domain	Ag (g/t) - Assay (2 m composites)						Pb (%) - Assay (2 m composites)					
	Count	Mean	StdDev	CV	Min	Max	Count	Mean	StdDev	CV	Min	Max
cne	4,993	10.18	13.34	1.31	0	150	4,993	0.17	0.37	2.18	0	5
ing	89	27.13	33.64	1.24	2.02	218.17	89	0.86	1.28	1.48	0.01	7.79
sb	6,448	27.78	53.84	1.94	0	707.39	6,448	0.78	1.8	2.33	0	23
sga	61	52.09	39.31	0.75	0	1,251.5	61	0.11	0.09	0.8	0	6.6
sge	54	187.19	125.78	0.67	13.7	492.23	54	1.02	1.21	1.19	0.11	7.12
sgf	41	102.7	109.85	1.07	2.42	486.94	41	1.52	1.25	0.82	0.02	9.5
sgg	37	54.22	37.27	0.69	13.07	535	37	0.29	0.53	1.81	0	12.45
sgq	6	7.18	1.59	0.22	1.8	10.98	6	0.01	0	0.37	0.01	0.09

11.6.6 Trend Analysis

11.6.6.1 Variography

Atacocha staff generated downhole and directional variograms using the two metre composite values building a variogram for each estimation domain and each element. The variograms were used to support the characterization and quantification of the variance of mineralization within the spatial continuity of the mineralization domains being analyzed.

Variograms were standardized and modelled using two spherical structures in three directions. The variograms were used for OK interpolation and as a guide for selecting search ellipse ranges.

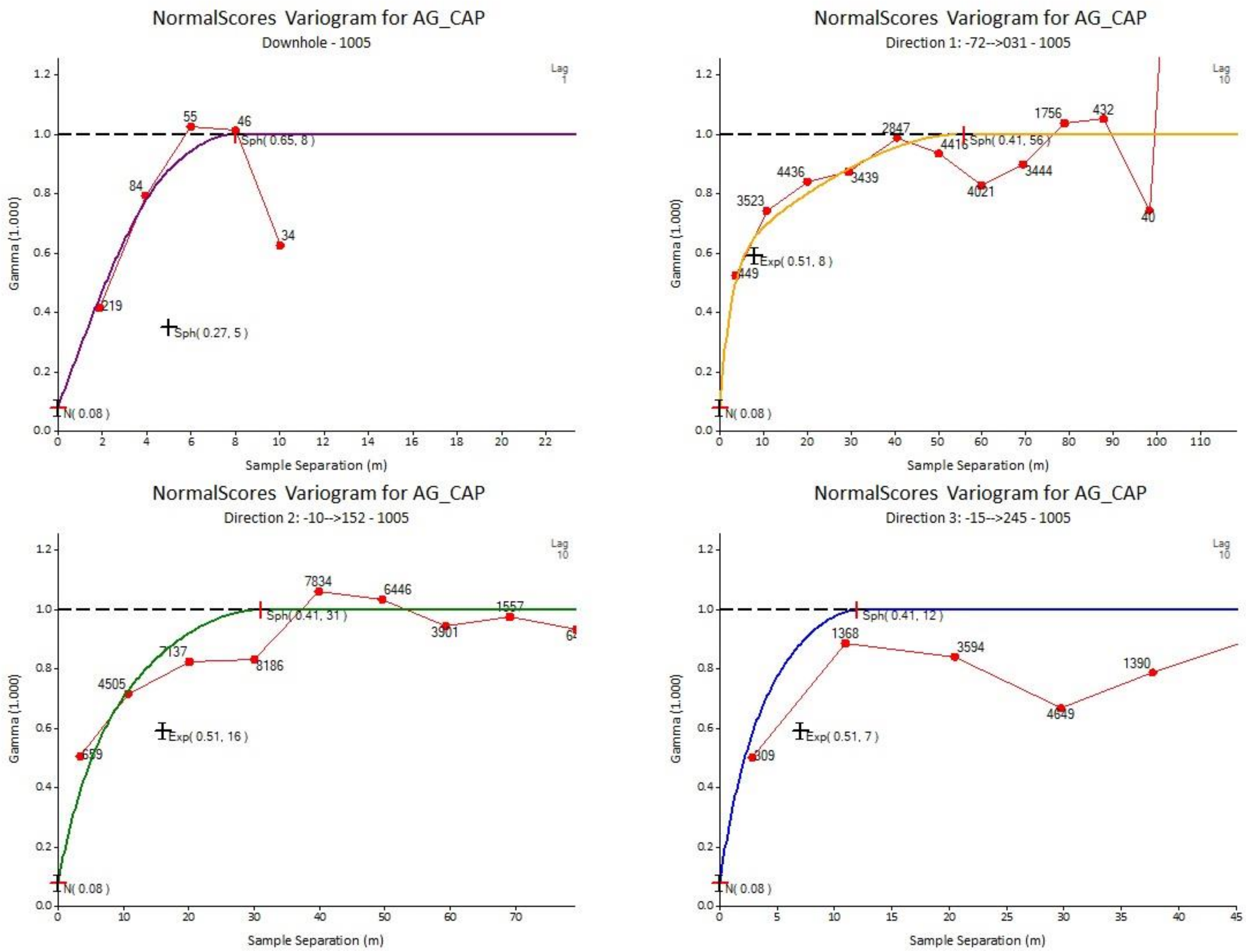
The results for variogram parameters for the 25 largest domain tonnage contributors to the Mineral Resource are tabulated in Table 11-46. An example of downhole and directional variogram models for the three main directions of continuity is shown in Figure 11-58.

Table 11-46: Atacocha Underground Zn Variogram Parameters for Main 25 Domains

Domain	ESTIM	Datamine Rotation V-ANGLE			Nugget	Structure 1				Structure 2			
		1	2	3		ST1PAR1	ST1PAR2	ST1PAR3	C1	ST2PAR1	ST2PAR2	ST2PAR3	C2
13	150	-134.36	-54.47	-53.95	0.17	7	8	13	0.29	33	23	17	0.55
18	300	-100.82	39.82	-96.52	0.10	31	12	4	0.66	33	21	20	0.25
23	350	28.08	65.19	-35.42	0.13	21	13	10	0.37	42	27	13	0.50
91	400	-14.01	-68.91	-135.99	0.20	21	28	10	0.30	32	32	16	0.50
251	450	84.01	68.91	-135.99	0.17	45	44	10	0.46	59	48	16	0.37
13b	152	52.86	47.73	-67.37	0.17	15	24	8	0.25	34	30	10	0.58
13r72	156	79.03	61.10	-122.38	0.14	13	6	6	0.51	31	32	20	0.35
13r8	153	-153.02	74.21	108.68	0.19	11	9	8	0.55	42	50	11	0.25
13u	157	130.00	75.00	180.00	0.16	8	15	4	0.54	50	38	14	0.30
13w	157	130.00	75.00	180.00	0.16	8	15	4	0.54	50	38	14	0.30
18b	301	67.33	-24.90	95.51	0.28	62	12	13	0.24	65	49	20	0.48
18f	300	-100.82	39.82	-96.52	0.10	31	12	4	0.66	33	21	20	0.25
251c	450	84.01	68.91	-135.99	0.17	45	44	10	0.46	59	48	16	0.37
251d	450	84.01	68.91	-135.99	0.17	45	44	10	0.46	59	48	16	0.37
ani	500	148.02	-74.21	-71.32	0.19	11	7	11	0.29	26	23	14	0.52
ania	500	148.02	-74.21	-71.32	0.19	11	7	11	0.29	26	23	14	0.52
cher	550	30.00	-5.00	-90.00	0.22	24	10	5	0.32	41	50	10	0.47
cne	600	10.00	-65.00	-90.00	0.11	13	12	8	0.41	36	22	17	0.48
ing	750	-118.07	41.56	-30.79	0.25	65	45	6	0.27	88	69	10	0.49
sb	950	-90.00	90.00	-90.00	0.12	25	12	14	0.40	63	66	28	0.48
sga	1000	8.52	31.32	-60.35	0.29	48	37	16	0.56	76	63	20	0.16
sge	1003	20.00	-75.00	-90.00	0.17	6	4	3	0.37	33	19	13	0.46

Domain	ESTIM	Datamine Rotation V-ANGLE			Nugget	Structure 1				Structure 2			
		1	2	3		ST1PAR1	ST1PAR2	ST1PAR3	C1	ST2PAR1	ST2PAR2	ST2PAR3	C2
sgf	1003	20.00	-75.00	-90.00	0.17	6	4	3	0.37	33	19	13	0.46
sgg	1003	20.00	-75.00	-90.00	0.17	6	4	3	0.37	33	19	13	0.46
sgq	1005	-59.27	-72.04	147.05	0.10	10	9	5	0.42	44	27	12	0.48

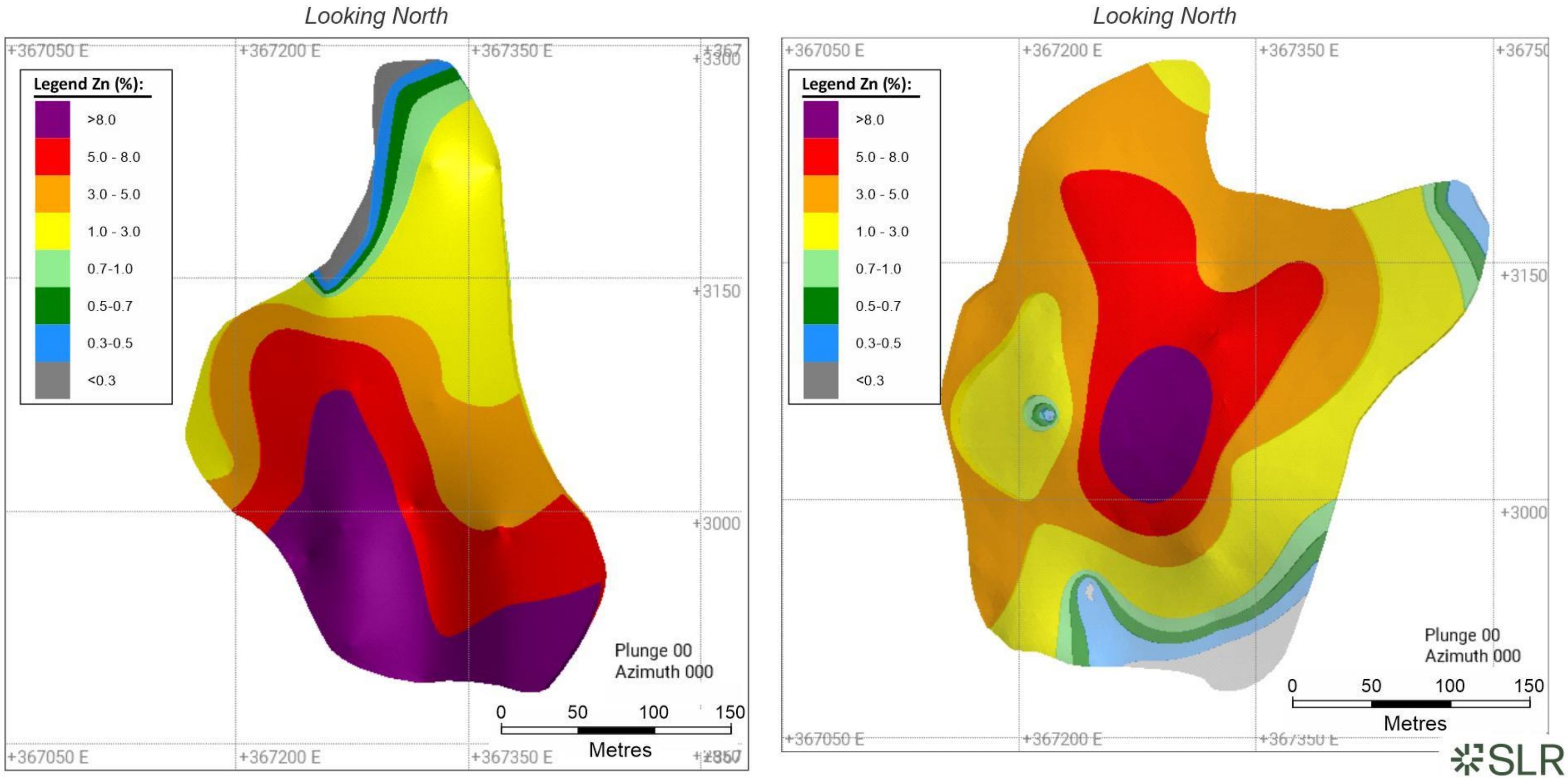
Figure 11-58: Downhole and Directional Zn Experimental Variograms and Models for Estimation Group 1005.



11.6.6.2 Grade Contouring

Grade contours play an important role in aiding the initial detection of preferential grade patterns within mineralization domains. A brief assessment was carried out for Zn within the “sgg” and “sge” domains to assess potential grade trends (Figure 11-59). Grades exhibit a strong vertical trend and vertical anisotropy within the “sgg” domain. Grades are concentrated towards the central portion of the “sge” domain, which exhibits a slight vertical anisotropy.

Figure 11-59: Contour Zn Grades for the "sge" Domain (Orebody=1005) (left) and "sgg" Domain (Orebody=1007) (right)



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Cerro Pasco Complex Integration

Pasco Province, Peru

Contour Zn Grades for the "sge" Domain (Orebody=1005) (left) and "sgg" Domain (Orebody=1007) (right)

Source: SLR, 2023.

11.6.7 Search Strategy and Grade Interpolation Parameters

Orientation of the search ellipse and search parameters were based on the modelled variograms and the geometry of the modelled mineralization wireframes.

The final estimated values for Zn, Cu, Ag, and Pb grades at Atacocha UG are determined by OK and ID^3. Initially, the estimation process incorporates OK, ID^3, and NN interpolators, followed by an individual domain analysis to select between OK or ID^3 results. This selection is based on domain-specific criteria such as sample quantity, average difference between OK and ID^3 compared to NN, and domain size/volume. Variograms are defined based on estimation groups, allowing even domains with limited samples to be estimated via OK for comparison and validation purposes. Grade variables are not density or length-weighted during estimation.

To capture domain trends, dynamic anisotropy angles are calculated in Studio RM using domain wireframes. The estimation process includes three passes: the first pass utilizes search ellipse radii equivalent to variogram ranges for each variable; the second pass increases the radii by a factor of 1.25 to 3; and the third pass employs radii 10 to 100 times larger than the first pass.

The minimum and maximum sample numbers range from two to 25 for the first pass, two to 20 for the second pass, and two to 20 for the third pass, with a maximum of two samples per drill hole. Minor adjustments are made as needed to improve the final estimation result (Table 11-47).

Table 11-47: Atacocha Underground Zn Search Parameters for Main 25 Domains

Mineralization Domain	C_ESTIM	Search Ellipse (m)			Pass 1	No. Composites		Pass 2	No. Composites		Pass 3	No. Composites	
		1	2	3	S-Vol	Min	Max	S-Vol	Min	Max	S-Vol	Min	Max
13	150	23	13	7.5	1	6	16	2	6	16	20	2	8
18	300	25	15.5	10	1	6	16	2	6	16	20	2	8
23	350	17	12.5	6.5	1	6	16	2	6	16	10	2	8
91	400	18	30	8	1	6	16	2	6	16	20	2	8
251	450	30	30	8	1	4	8	2	6	16	20	2	8
13b	152	39.5	34	6	1	6	16	2	4	8	20	2	4
13r72	156	13.5	13	10	1	6	12	2	6	12	20	2	4
13r8	153	21	25	5.5	1	6	16	2	6	16	20	2	8
13u	157	25	19	7	1	6	16	2.5	4	8	10	1	3
13w	157	25	19	7	1	6	16	2	6	16	20	2	8
18b	301	15	10	8	1	10	15	2	6	10	10	4	10
18f	300	20	15	10	1	10	15	2	7	10	20	5	10
251c	450	30	30	8	1	6	16	2	6	16	10	2	8
251d	450	30	30	8	1	6	16	2	6	16	10	2	8
ani	500	25	10	7	1	10	20	2	7	15	10	5	15
ania	500	25	10	7	1	15	20	2	10	15	30	5	15
cher	550	20	25	5	1	6	16	2	4	8	40	1	3
cne	600	32	16	10	1	10	20	2	7	15	10	5	15
ing	750	15	25	10	1	6	16	2	6	16	20	1	8
sb	950	40	48	14	1	6	16	2	8	16	10	2	4
sga	1000	30	20	10	1	6	10	2	4	7	10	2	7

Mineralization Domain	C_ESTIM	Search Ellipse (m)			Pass 1	No. Composites		Pass 2	No. Composites		Pass 3	No. Composites	
		1	2	3	S-Vol	Min	Max	S-Vol	Min	Max	S-Vol	Min	Max
sge	1003	70	50	30	1	6	15	2	4	10	10	2	7
sgf	1003	70	50	30	1	6	10	2	4	7	10	2	7
sgg	1003	70	50	30	1	6	10	2	4	7	10	2	7
sgq	1005	50	30	20	1	3	10	2	2	7	10	2	7

11.6.8 Bulk Density

A total of 1,083 density measurements were taken within the underground mineralization zones and 2,853 density measurements, within the wall rock.

The density values vary from 1.54 g/cm^3 to 5.73 g/cm^3, with an approximate global average of 3.46 g/cm^3 within the mineralization and 2.89 g/cm^3 within the wall rock.

Density values are unevenly distributed across the main domains, and some of the domains either do not have any density measurement or have very few. The QP notes that density distributions per domain have low CV.

In a quantitative analysis, the density values are better correlated with the Zn and Pb grades, as demonstrated in Figure 11-60.

Figure 11-60: Atacocha Underground Correlation Matrix (left) and Scatter Plot between Density and Zn (right)

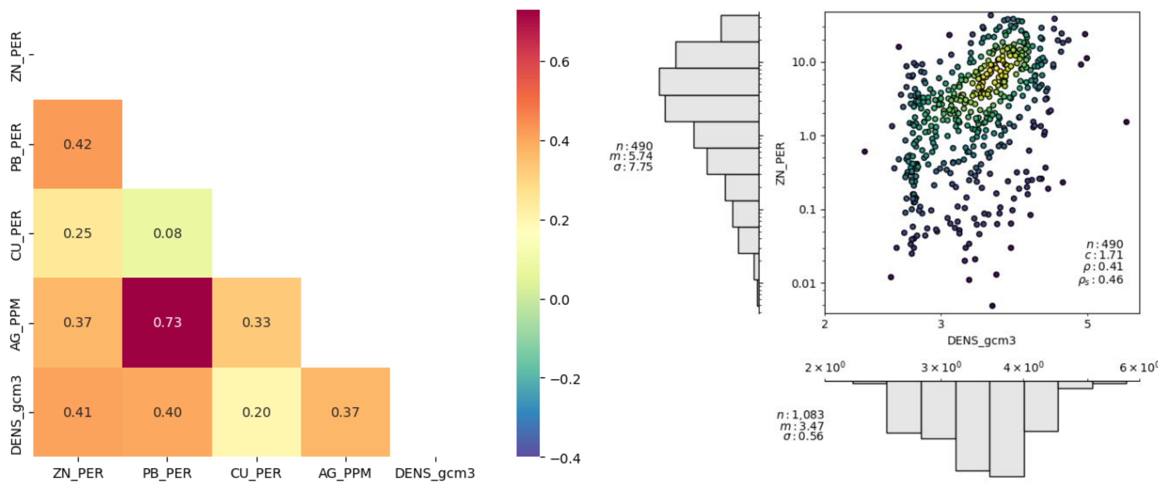
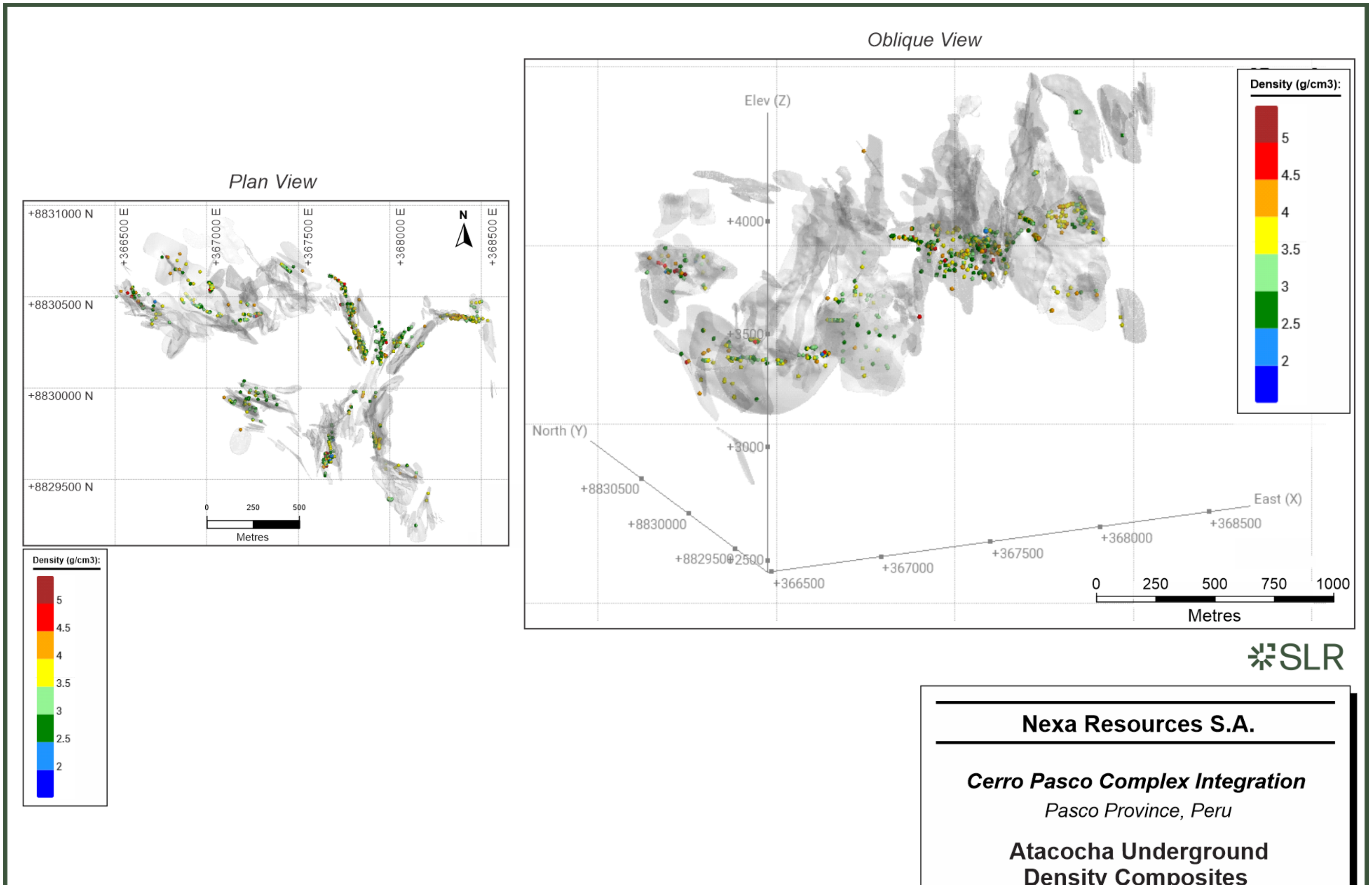


Figure 11-61 shows an isometric view of density composites in relation to the domains.

Figure 11-61: Atacocha Underground Density Composites



Source: SLR, 2023.

Of the 25 main domains, 18 have density values, totalling 655 density samples. Density varies across different domains, having means between 2.91 g/cm^3 and 4.03 g/cm^3.

Table 11-48 summarizes the density sample statistics of the main domains.

Table 11-48: Atacocha Underground Density Statistics of the Main Domains

Domain	Count	Mean	CV	Min	Max
13	95	3.4	0.14	2.37	4.66
13r72	12	3.46	0.05	3.19	3.7
13r8	8	3.53	0.2	2.55	4.31
18	120	3.56	0.14	2.67	4.59
18b	4	3.39	0.1	2.86	3.72
23	59	3.36	0.21	2.48	4.99
91	38	3.14	0.09	2.62	4.14
ani	33	3.54	0.13	2.68	4.37
ania	39	3.48	0.09	2.77	4.48
cne	102	3.71	0.13	1.54	4.8
ing	6	4.03	0.17	2.59	4.68
sb	87	3.69	0.12	2.68	4.51
sga	20	3.36	0.1	2.72	4.25
sge	16	3.37	0.09	2.63	3.87
sgf	7	3.42	0.12	3.03	4.16
sgg	8	2.91	0.08	2.68	3.49
sgq	1	3.98	0	3.98	3.98

Similar mineralization domains were grouped to form "C_ESTIM" domains (previously shown in Figure 11-27) and an average density value calculated for each group (Table 11-49). To assign density values to the block model, a local ID^3 estimation method was used with a search neighbourhood radii equivalent to that applied to the Indicated Mineral Resources. For blocks situated beyond these radii or within domains lacking samples, the grouped domain's average density value was assigned.

Table 11-49: Atacocha Underground Grouped Mean Density

C_Estim	Mean (g/cm^3)	C_Estim	Mean (g/cm^3)	C_Estim	Mean (g/cm^3)	C_Estim	Mean (g/cm^3)
100	2.73	253	3.30	505	3.17	1002	3.32
13	3.49	254	3.46	503	3.31	1003	3.27
151	3.60	255	3.51	506	3.39	1004	3.27
152	3.49	300	3.58	550	3.48	1005	3.37

C_Estim	Mean (g/cm^3)	C_Estim	Mean (g/cm^3)	C_Estim	Mean (g/cm^3)	C_Estim	Mean (g/cm^3)
153	3.92	301	3.33	600	3.74	1050	3.48
154	3.62	507	3.02	6050	3.69	1150	3.39
155	3.49	508	3.21	650	3.39	1151	3.06
156	3.44	350	3.37	750	3.49	11680	3.36
150	3.49	351	3.21	850	3.48	1152	3.42
1650	3.44	352	3.53	900	3.70	1153	3.87
1680	3.62	400	3.15	901	3.55	1154	2.90
157	4.04	401	3.36	903	3.72	1300	3.21
200	3.31	450	3.44	902	3.57	1350	3.21
201	3.30	4520	3.44	904	3.79	1401	3.30
250	3.28	500	3.80	950	3.79	1400	3.30
251	3.30	501	3.32	1000	3.32	1500	3.39
252	3.42	502	3.25	1001	3.47		

11.6.9 Block Models

A sub-blocked model was generated with parent blocks size of 2 m x 2 m x 2 m and a minimum sub-cell size of 0.5 m x 0.5 m x 0.5 m. Sub-blocking took place at mineralization domain wireframe boundaries (Table 11-50).

Table 11-50: Atacocha Underground Sub-Blocked Model Definition

	X	Y	Z
Base Point	366,480.5	8,829,157.5	4,378.5
Boundary Size (m)	2,108	1,780	1,932
Parent Block (m)	4	4	4
Minimum Sub-Block (m)	0.5	0.5	0.5

11.6.10 Net Smelter Return and Cut-off Value

An NSR value was calculated using the Mineral Resource metal prices, metallurgical recovery rates, transportation, treatment, and refining costs. Metal prices applied to Mineral Resources are 15% greater than Mineral Reserves, which are derived from consensus long-term forecasts obtained from financial institutions, banks, and other reliable sources. The NSR value is denominated in US$/t and is computed for Mineral Resources to enable a meaningful comparison with production costs, helping to ascertain the economic viability of mining the mineralized material.

Currently, the mine yields Zn concentrate containing Zn and Ag, Cu concentrate containing Cu and Ag, and Pb concentrate containing Pb and Ag as saleable products. The payable metals in these concentrates include transportation costs, refining charges, deductions, and penalty elements, as outlined in sales agreements established between the mine and smelters or traders.

The NSR factors are determined based on the smelter terms and metal prices, detailed in Table 11-51.

Table 11-51: Atacocha Underground NSR Cut-off Value Parameters

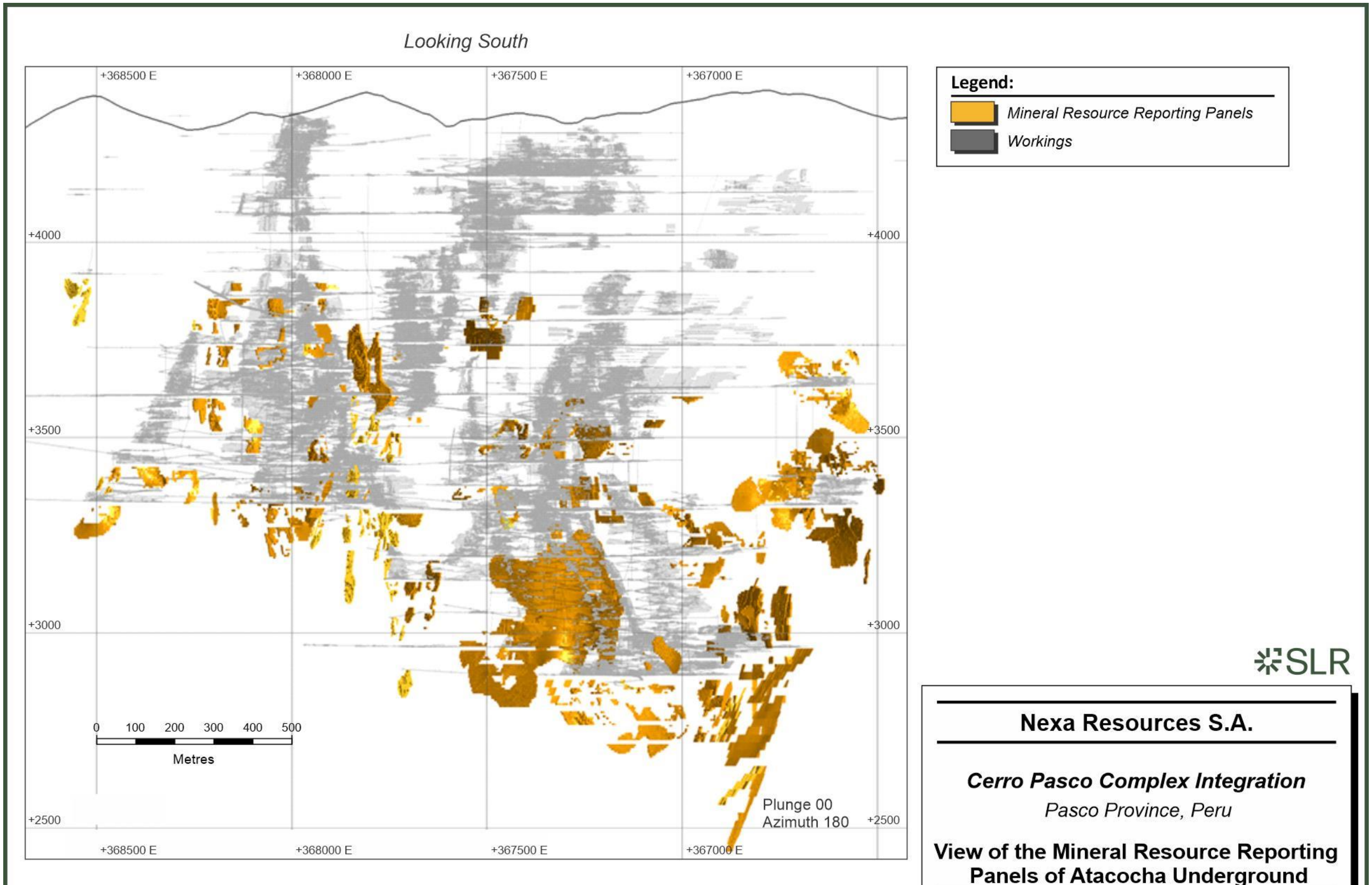
Item	Unit	Value
Plant Metallurgical Recovery		
Zn	%	89.30
Pb	%	80.02
Cu	%	15.73
Ag	%	77.51
Au	%	30.19
Zn Concentrate Payable %		
Zn	%	85
Ag	%	70
Cu Concentrate Payable %		
Cu	%	97
Ag	%	90
Pb Concentrate Payable %		
Pb	%	95
Ag	%	95
Metal Prices		
Zn	US$/t	3,218.90
Pb	US$/t	2,300.33
Cu	US$/t	8,820.05
Ag	US$/oz	24.35
SLS		
Mine cost	US$/t	52.20
Development	US$/t	23.91
Plant costs	US$/t	10.43
G&A	US$/t	6.37
Cut-off Value	US$/t	69.00
CAF		
Mine cost	US$/t	54.27
Development	US$/t	23.91
Plant costs	US$/t	10.43

Item	Unit	Value
G&A	US$/t	6.37
Cut-off Value	US$/t	71.07

* Based on LOM average metal grades.

Figure 11-62 illustrates the Mineral Resource panels calculated for Atacocha UG, based on the NSR discussed above.

Figure 11-62: View of the Mineral Resource Reporting Panels of Atacocha Underground



Source: SLR, 2023.

11.6.11 Classification

Two classification groups were defined based on geology and grade continuity. Blocks were classified as Measured, Indicated, and Inferred according to the number of holes and distances to holes determined by variogram ranges. Separate classification interpolation passes were run to flag the resource categories for each group:

Major Continuity Zones:

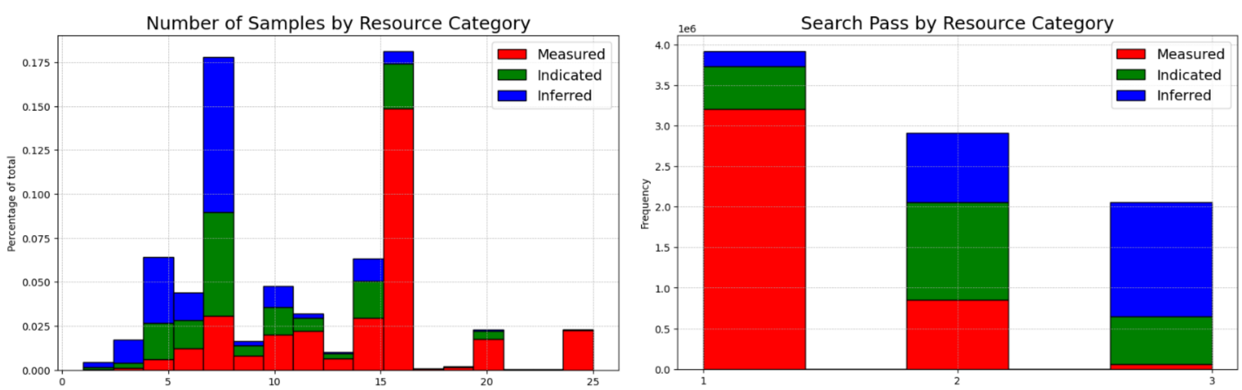
- Measured Mineral Resource: Composites from a minimum of three holes within a 26 m by 26 m by 13 m radii search.
- Indicated Mineral Resource: Composites from a minimum of three holes within a 51 m by 51 m by 26 m radii search.
- Inferred Mineral Resource: Composites from a minimum of two holes within a 102 m by 102 m by 51 m radii search.

Minor Continuity Zones:

- Measured Mineral Resource: Composites from a minimum of three holes within a 24 m by 24 m by 12 m radii search.
- Indicated Mineral Resource: Composites from a minimum of three holes within a 45 m by 45 m by 23 m radii search.
- Inferred Mineral Resource: Composites from a minimum of two holes within a 90 m by 90 m by 45 m radii search.

Figure 11-63 shows histogram validations of the classification based on the average number of samples and the search pass used to estimate each block by Mineral Resource category. The number of samples used is on average between five and 15 samples in most scenarios. The resource categories largely reflect the search passes, with most Measured blocks estimated on the first search pass, most Indicated blocks on the second pass, and most Inferred on the third. Despite this, there is a substantial spread of classes within the passes.

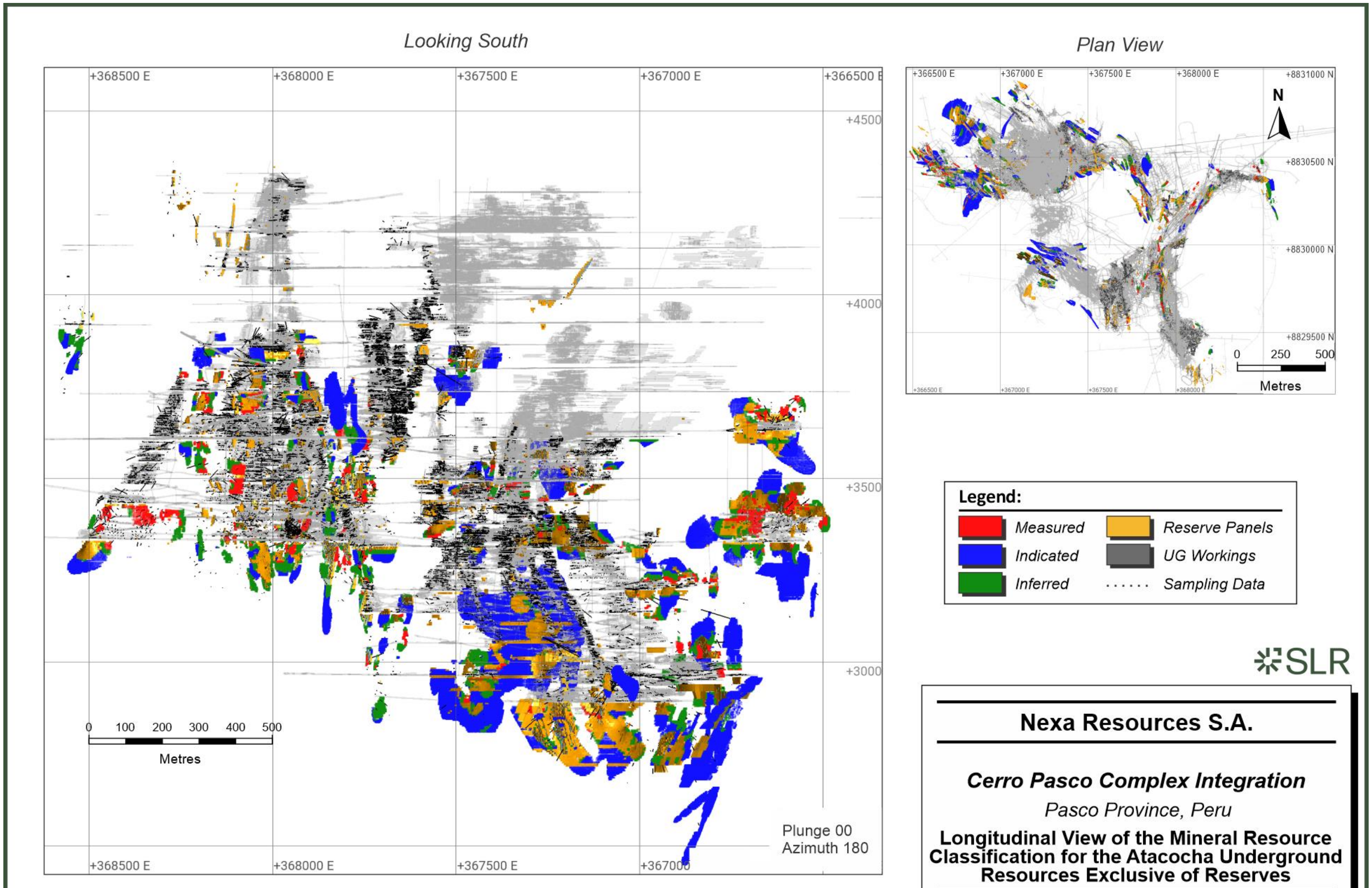
Figure 11-63: Atacocha Underground Histogram of Number of Samples and Search Pass by Class



The Mineral Resource classification applied to the Atacocha underground deposit is shown in Figure 11-64.

Although the QP considers the classification to be acceptable, the QP recommends that holes drilled parallel to mineralization be filtered out when calculating drill hole spacing for resource classification purposes.

Figure 11-64: Longitudinal View of the Mineral Resource Classification for the Atacocha Underground Resources Exclusive of Reserves



Source: SLR, 2023.

11.6.12 Block Model Validation

Nexa staff and the QP perform several validations of the geological modelling and block model estimation, including grade shell volume comparison against the previous version, visual inspections of the dynamic anisotropy angles, estimation statistics by search volume, global statistics, visual validations, swath plots, and others, aiming to certify the consistency of the estimation process and the results.

SLR reviewed the files provided by Nexa staff containing validation tables, and figures, as well as performed independent extensive validations, including statistical correlations, visual validations, statistic validations, and swath plot analysis. The main checks are discussed in the following sections.

11.6.12.1 Global Statistics

Global statistics of the interpolated OK and ID^3 were compared with those of an NN estimation which serves as the reference, assessing performance of the different estimators and confirming the estimate's reproduction of the samples used for the estimation. Global statistics also help to identify inconsistencies in the estimation process.

Statistics for the main variables within the 25 main domains are demonstrated in Table 11-52.

Table 11-52: Atacocha Statistical Comparison Between OK, ID^3, NN, and the Capped Composites

Domain	Cu (%) - OK				Cu (%) - ID^3				Cu (%) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
13	0.39	0.95	0	4.84	0.39	1.11	0	6.4	0.38	1.45	0	5.7
13b	0.43	1.63	0	15.02	0.42	1.63	0	14.23	0.42	2.37	0	18
13r72	0.19	0.78	0	0.73	0.21	1.01	0	0.89	0.21	1.28	0	1.47
13r8	0.05	1.28	0	0.7	0.06	1.65	0	0.68	0.06	2.15	0	1.02
13u	0.5	0.86	0	3.38	0.5	0.88	0	4.03	0.49	1.29	0	6
13w	0.05	0.74	0	0.36	0.05	0.78	0	0.43	0.05	1.3	0	1.04
18	0.44	0.67	0.01	2.13	0.45	0.74	0	2.29	0.47	0.99	0	2.39
18b	0.12	0.68	0.02	0.67	0.12	0.75	0	0.88	0.12	1.03	0	1.04
18f	0.13	0.68	0	0.96	0.13	0.96	0	1.26	0.16	1.48	0	1.38
23	0.2	0.73	0	1.19	0.19	0.85	0	1.33	0.19	1.38	0	2.38
251	0.24	0.75	0	1	0.26	0.9	0	1.14	0.25	1.14	0	1.13
251c	0.94	0.3	0.2	1.91	1.04	0.48	0	2.24	1.04	0.61	0	1.91
251d	1.93	0.23	0.2	3.15	1.97	0.54	0.08	3.47	1.97	0.66	0.2	3.15
91	0.22	0.55	0.02	0.68	0.24	0.69	0	0.91	0.26	1.03	0	0.97
ani	0.33	0.39	0.06	0.89	0.31	0.54	0.03	1.05	0.32	0.8	0	1.33
ania	0.35	0.48	0	3.67	0.36	0.63	0	4.76	0.33	0.95	0	3.15
cher	0.11	0.62	0.01	0.3	0.11	0.67	0.01	0.4	0.11	0.79	0.01	0.27
cne	0.22	0.6	0.02	0.91	0.21	0.68	0	1.17	0.22	0.97	0	1.2
ing	0.19	0.54	0.02	0.71	0.24	0.81	0.01	0.9	0.24	0.92	0.01	0.75
sb	0.34	0.67	0	2.63	0.34	0.72	0	2.89	0.33	1.03	0	4
sga	0.51	0.69	0.02	1.4	0.52	0.74	0	1.79	0.53	0.97	0	1.66

Domain	Cu (%) - OK				Cu (%) - ID^3				Cu (%) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
sge	1.29	0.59	0.15	3.45	1.28	0.74	0.07	4.02	1.24	0.82	0.07	3.56
sgf	0.85	0.58	0.12	3.35	0.81	0.96	0.07	4.06	0.71	1.22	0.07	3.81
sgg	0.98	0.29	0.19	2.97	0.98	0.55	0.01	3.35	0.97	0.68	0.01	3.12
sgq	0.31	0.26	0.09	0.68	0.33	0.52	0.02	0.7	0.22	1.1	0.02	0.67

Domain	Zn (%) - OK				Zn (%) - ID^3				Zn (%) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
13	3.61	1	0	31.36	3.48	1.14	0	36.2	3.26	1.54	0	45.53
13b	7.23	0.82	0	37.29	7.41	0.8	0	37.36	7.06	1.19	0	47.2
13r72	2.69	1.11	0	17.68	2.47	1.19	0	21.26	2.38	1.47	0	20.28
13r8	4.68	0.55	0.15	20.98	4.64	0.64	0	21.29	4.46	0.98	0	23.45
13u	5.35	0.95	0	35.24	5.35	1.01	0	34.76	5.04	1.43	0	41.5
13w	5.16	0.71	0.32	20.92	5.06	0.78	0	20.41	4.81	1.03	0	34.27
18	2.6	0.63	0.03	11.53	2.76	0.74	0.01	13.95	2.72	1.01	0	14.51
18b	1.66	0.46	0.15	5.17	1.67	0.54	0.01	6.66	1.55	0.83	0	7.72
18f	1.51	0.44	0.14	5.71	1.49	0.69	0.02	7.24	1.51	1.02	0	8.25
23	2.18	0.71	0	13.79	2.19	0.82	0	15.5	2.18	1.27	0	16.36
251	2.96	1.01	0	25.98	2.77	1.5	0	28.87	3.23	1.71	0	28.9
251c	3.38	0.62	0.46	22.25	4	0.86	0	23.46	4.22	0.97	0	14.33
251d	5.06	0.28	1.61	11.27	5.03	0.53	1.11	14.11	4.96	0.7	1.29	10.26
91	3.59	0.37	0.46	8.55	3.69	0.6	0	10.04	3.73	0.87	0	12.13
ani	3.49	0.41	0.69	14.03	3.65	0.54	0.25	14.83	3.74	0.79	0	18.93
ania	3.36	0.44	0.41	14.51	3.4	0.52	0.02	18.92	3.43	0.78	0	18.93
cher	1.45	0.65	0.05	4.41	1.5	0.69	0.03	5	1.58	0.83	0.02	5

Domain	Zn (%) - OK				Zn (%) - ID³				Zn (%) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
cne	3.11	0.47	0.22	12.92	3.23	0.54	0.02	13.57	3.15	0.79	0	18
ing	3.44	0.34	0.72	9.88	3.18	0.6	0.23	12.66	3.23	0.83	0.33	10.49
sb	3.76	0.71	0	22.39	3.81	0.72	0	22.61	3.71	1.12	0	27.4
sga	3.58	0.56	0.21	10.53	3.55	0.77	0.02	13.65	3.88	1.11	0	13.79
sge	6.09	0.58	0.44	15.14	5.88	0.79	0.01	18.48	5.74	0.92	0.01	17.78
sgf	3.95	0.8	0.16	16.83	3.52	1.32	0.05	24.37	3.04	1.67	0.07	20.19
sgg	4.34	0.33	0.8	10.31	4.27	0.68	0.06	16.68	3.94	1.07	0.06	16.69
sgq	5.47	0.29	2.99	9.95	5.39	0.4	2.51	10.81	4.91	0.46	2.51	9.93

Domain	Pb (%) - OK				Pb (%) - ID³				Pb (%) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
13	0.37	1.99	0	6.67	0.37	2.24	0	8.18	0.37	2.79	0	8.96
13b	1.44	1.25	0	18.39	1.43	1.3	0	17.64	1.4	2.09	0	39.7
13r72	0.44	2.25	0	7.74	0.3	2.7	0	11.01	0.26	4.74	0	12.85
13r8	1.95	0.56	0.04	12.1	1.92	0.61	0	11.24	1.76	0.89	0	12.5
13u	1.87	1.3	0	16.15	1.87	1.34	0	18.18	1.88	2.05	0	22.2
13w	4.26	0.65	0.15	14.77	4.1	0.72	0	17.56	4.19	1.1	0	22.2
18	0.93	1.27	0	11.38	1	1.41	0	11.74	1.05	1.93	0	14
18b	1.47	0.59	0.15	7	1.4	0.68	0.01	9.13	1.21	1.12	0	10.73
18f	0.83	0.72	0.03	4.16	1.02	1.12	0.01	5.81	1.13	1.36	0	5.82
23	1.27	0.85	0	9.05	1.3	0.95	0	9.63	1.26	1.6	0	11.2
251	0.06	0.94	0	0.82	0.06	1.31	0	0.99	0.07	1.66	0	0.77
251c	0.07	0.65	0.01	0.47	0.08	0.92	0	0.47	0.09	1.04	0	0.27
251d	0.22	0.33	0.03	0.9	0.21	0.68	0.03	1.1	0.2	0.86	0.03	0.73

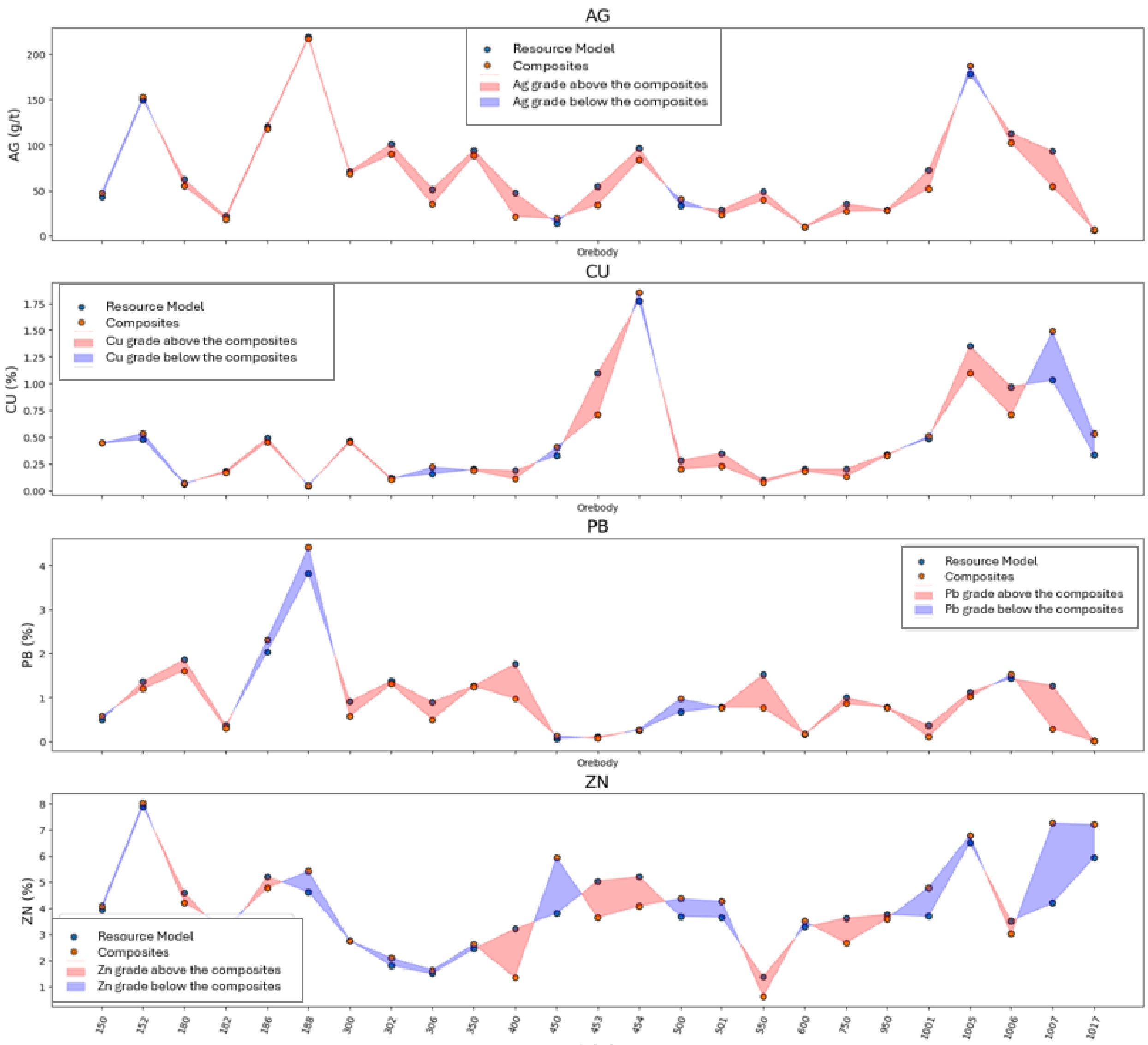
Domain	Pb (%) - OK				Pb (%) - ID³				Pb (%) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
91	1.76	0.34	0.27	5.2	1.96	0.65	0	6.11	1.91	0.99	0	6.94
ani	0.53	0.99	0.01	4.16	0.56	1.25	0	6.74	0.61	1.58	0	7.64
ania	0.72	1.22	0.01	7.76	0.73	1.46	0	11.56	0.79	1.99	0	12.32
cher	1.65	0.65	0.05	4.33	1.7	0.7	0.04	6.11	1.68	0.82	0.02	4.04
cne	0.14	1.11	0.01	2	0.14	1.25	0	2.59	0.14	1.92	0	2.82
ing	0.89	0.77	0.06	5.63	0.83	1.17	0.01	7.16	0.83	1.5	0.01	5.32
sb	0.74	1.45	0	12	0.77	1.54	0	13.35	0.7	2.41	0	23
sga	0.4	1.65	0.01	3.75	0.41	1.81	0	5.6	0.35	2.42	0	4.8
sge	1.15	0.58	0.17	4.63	1.11	0.95	0.12	6.59	1.08	1.22	0.12	5.71
sgf	1.21	0.35	0.29	5.3	1.24	0.75	0.02	7.06	1.35	0.95	0.02	6.66
sgg	1.86	0.7	0.01	7.49	1.72	1.32	0	12.45	1.68	1.97	0	12.45
sgq	0.02	0.58	0.01	0.07	0.03	0.99	0.01	0.09	0.03	1.05	0.01	0.09

Domain	Ag (g/t) - OK				Ag (g/t) - ID³				Ag (g/t) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
13	35.98	0.98	0.25	360.9	35.2	1.19	0.01	477.96	34.13	1.59	0	586.28
13b	138.57	0.78	0	1,446.77	139.89	0.78	0	1,552.39	140.29	1.34	0	3,800.84
13r72	17.28	1.34	0	211.25	15.89	1.27	0	181.12	15.45	1.92	0	199.68
13r8	61.88	0.58	1.28	478.32	61.3	0.6	0.02	372.67	56.84	0.85	0	485.84
13u	117.99	0.81	0	584.04	119.35	0.87	0	648.92	111.52	1.24	0	1232
13w	256.15	0.56	14.84	906.33	251.14	0.64	0.09	1,067.65	240.86	0.95	0	1232
18	68.56	0.78	1.32	437.48	73.49	0.94	0.19	460.22	73.57	1.35	0	551
18b	113.54	0.69	14.06	715.47	105.34	0.79	0.47	1,056.14	92	1.27	0	1243
18f	45.41	0.71	3.78	260.66	58.8	1.18	0.27	374.88	66.13	1.41	0	375.18

Domain	Ag (g/t) - OK				Ag (g/t) - ID^3				Ag (g/t) - NN			
	Mean	CV	Min	Max	Mean	CV	Min	Max	Mean	CV	Min	Max
23	93.76	0.59	0.48	400.91	94.33	0.71	0.48	501.41	89.89	1.18	0	567.87
251	11.2	0.64	0	66.47	12.18	0.77	0	76.67	12.19	0.94	0	66.64
251c	41.49	0.27	6.68	141.16	45.69	0.43	0	163.61	46.99	0.53	0	110.62
251d	98.36	0.23	10.04	179.72	99.34	0.55	7.6	206.78	98.9	0.66	10.04	176.28
91	54.21	0.44	6	149.84	57.44	0.6	0.05	193.2	60.77	0.93	0	202.4
ani	27.57	0.64	3.9	138.63	28.47	0.86	1.3	188.61	29.71	1.14	0	238.58
ania	26.13	0.92	1.86	232.91	26.82	1.08	0.04	248.98	26.02	1.53	0	312.9
cher	53.16	0.56	9.44	143.14	54.66	0.6	7.69	179.81	54.1	0.76	4.12	119.62
cne	10.43	0.63	0.99	76.05	10.48	0.73	0.12	98.95	10.71	1.09	0	95.39
ing	33.28	0.47	6.84	151.33	33.86	0.72	4.06	192	34.02	0.99	4.04	166.24
sb	29.51	1.22	0	460.37	29.62	1.22	0	439.57	27.77	2	0	700
sga	92.59	0.84	4.19	714.47	79.47	0.92	0.13	1,089.43	81.77	2.01	0	1251.5
sge	147.4	0.33	35.75	338.75	161.19	0.54	13.86	418	163.54	0.66	13.7	362.11
sgf	91.77	0.53	20.64	336.81	90.42	0.81	3.93	389.91	88.33	1.01	5.55	373.73
sgg	101.69	0.44	14.88	376.53	98.65	0.7	13.81	534.21	98.88	1.06	14.1	535
sgq	6.3	0.2	2.68	9.86	6.95	0.37	1.8	10.98	6.13	0.65	1.8	10.98

Figure 11-65 illustrates the comparison between final grades estimated in the block model and the capped and composited samples. In general, the estimated grades and composites show good agreement, while the differences do not suggest any consistent bias.

Figure 11-65: Atacocha Underground Final Block Grades and Capped and Composited Samples Comparison

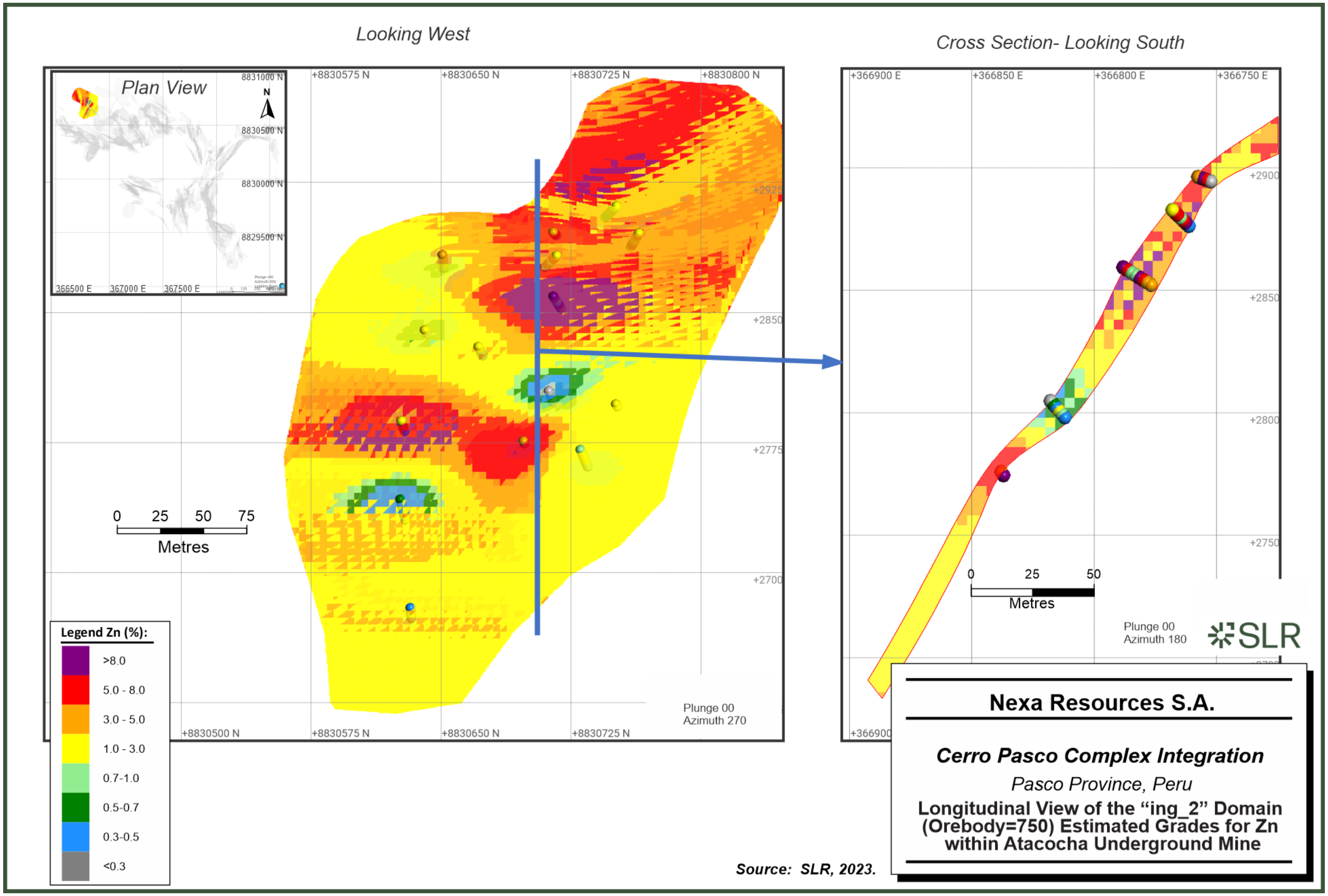


11.6.12.2Visual Validation

The QP conducted random checks across various estimation domains, comparing the samples utilized for estimation with the block model. Particular emphasis was placed on the main domains owing to their significance for Mineral Resources and Mineral Reserves.

A visual comparison on a longitudinal section along two veins found good overall correlations between the blocks and composite grades. Example longitudinal sections for the “ing_2” domain are shown in Figure 11-66 for Zn grades, demonstrating that block grades generally reflect the surrounding sample data, although some visual artifacts are observed - especially within vein-type tabular mineralized zones. The stripes in grade estimations appear more pronounced along the subtle folding of the vein and result from restriction of only two samples per drill hole combined with the short, 2 m length composites, resulting in estimation bias on the borders of domains and in areas with wide sample spacing.

Figure 11-66: Longitudinal View of the "ing_2" Domain (Orebody=750) Estimated Grades for Zn within Atacocha Underground Mine



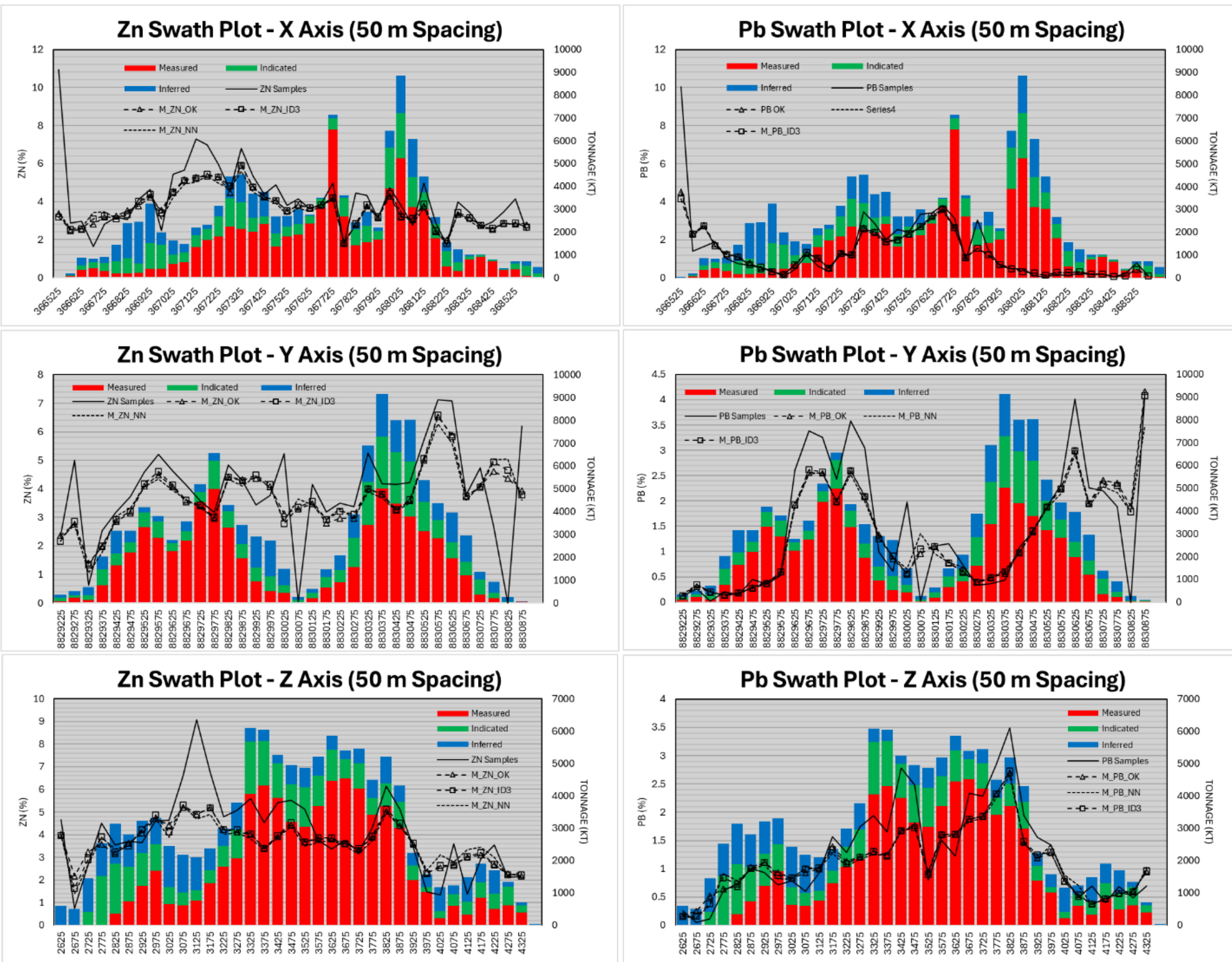
Source: SLR, 2023.

11.6.12.3Swath Plots

Swath plots were generated for the entire block model to evaluate global grade trends within the mineral deposit. Figure 11-67 shows swath plots for Zn and Pb in the X, Y, and Z directions.

In general, the estimated methods OK and ID^3 block grades correlate well with the NN block grades and composite grades. The largest divergences are often observed in borders or regions of the model with few blocks or samples, contributing little tonnage to the Mineral Resources.

Figure 11-67: Atacocha Underground Swath Plots for Zn and Pb



11.6.13 Mineral Resource Reporting

The same classification criteria were applied to the Atacocha OP (San Gerardo) and Atacocha UG Mineral Resources, and are discussed in Section 11.5.11.

In the QP's opinion, the assumptions, parameters, and methodology used for the Atacocha Underground Mineral Resource estimate are appropriate for the style of mineralization and mining methods. The QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, political, or other relevant factors that could significantly affect the Atacocha underground Mineral Resource.

The QP is of the opinion that with consideration of the recommendations summarized in Sections 1 and 23 of this TRS, any issues relating to all relevant technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work.

Figure 11-68 illustrates the Atacocha underground Mineral Resources exclusive of Mineral Reserves, coloured by NSR.

Mineral Resources with an effective date of December 31, 2023 for Atacocha UG are shown in Table 11-53 on a 75.96% Nexa attributable ownership basis and Table 11-54 on a 100% ownership basis.

Table 11-53: Atacocha Underground Mine: Summary of Mineral Resources (75.96% Nexa Attributable Ownership Basis)– December 31, 2023

Category	Tonnage (Mt)	Grade				Contained Metal			
		Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Zn (kt)	Cu (kt)	Ag (koz)	Pb (kt)
Measured	0.80	3.47	0.27	55.0	0.98	27.7	2.2	1,411	7.8
Indicated	1.91	3.30	0.36	54.9	0.92	63.2	6.9	3,381	17.6
Total Measured + Indicated	**2.71**	**3.35**	**0.33**	**55.0**	**0.94**	**90.8**	**9.0**	**4,792**	**25.4**
Inferred	6.12	4.09	0.56	77.3	1.21	250.4	34.3	15,214	74.1

Notes:

1. The definitions for Mineral Resources in S-K 1300 were followed for Mineral Resources which are consistent with CIM (2014) definitions.
2. The NSR cut-off is calculated based on the LOM costs: US$ 69.00/t for SLS and US$71.07/t for CAF.
3. Mineral Resources are estimated using average long-term metal prices of Zn: US$ 3,218.90/t (US$1.46/lb), Pb US$2,300.33/t (US$1.04/lb), and Ag US$ 24.35/oz.
4. Metallurgical recoveries are based on historical processing data: Zn (89.3%), Pb (80.0%), Cu (15.7%), Ag (77.5%), and Au (30.2%).
5. Bulk density was assigned based on rock type and averages 3.53 t/m^3.
6. Mineral Resources were depleted according to actual production as of September 30, 2023, and forecast production to the effective date of December 31, 2023.
7. Mineral Resources are exclusive of Mineral Reserves.
8. The minimum thickness for underground resource reporting panels is 4 m for CAF and 3 m for SLS.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Mineral Resources were constrained by optimized underground reporting shapes.
11. Numbers may not add due to rounding.

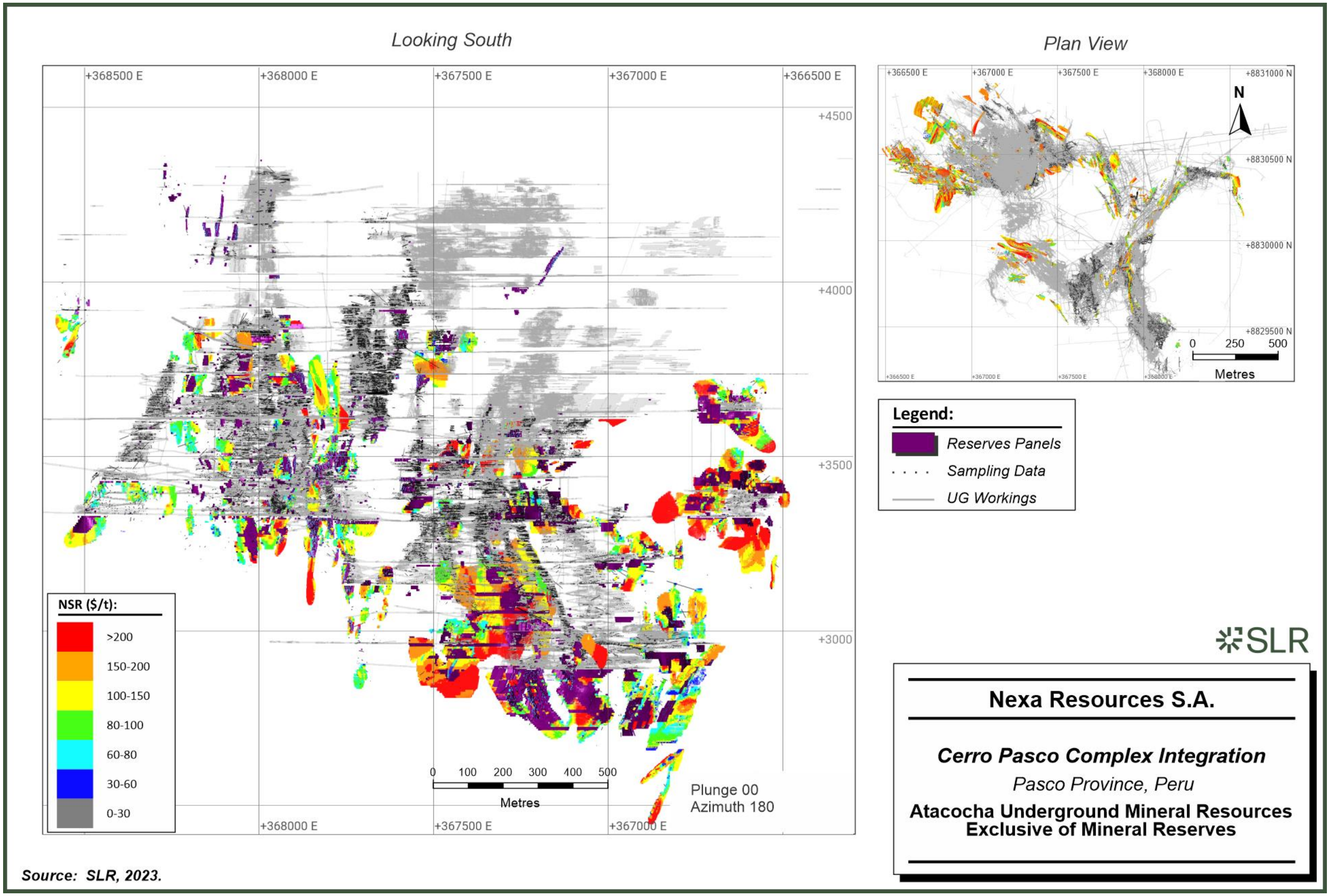
Table 11-54: Atacocha Underground Mine: Summary of Mineral Resources (100% Ownership Basis)– December 31, 2023

Category	Tonnage (Mt)	Grade				Contained Metal			
		Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Zn (000 t)	Cu (000 t)	Ag (000 oz)	Pb (000 t)
Measured	1.05	3.47	0.27	55.0	0.98	36.4	2.8	1,858	10.3
Indicated	2.52	3.30	0.36	54.9	0.92	83.2	9.1	4,450	23.2
Total Measured + Indicated	**3.57**	**3.35**	**0.33**	**55.0**	**0.94**	**119.6**	**11.9**	**6,308**	**33.5**
Inferred	8.06	4.09	0.56	77.3	1.21	329.7	45.1	20,029	97.5

Notes:

1. The definitions for Mineral Resources in S-K 1300 were followed for Mineral Resources which are consistent with CIM (2014) definitions.
2. The NSR cut-off is calculated based on the LOM costs: US$69.00/t for SLS and US$71.07/t for CAF.
3. Mineral Resources are estimated using average long-term metal prices of Zn: US$ 3,218.90/t (US$1.46/lb), Pb US$2,300.33/t (US$1.04/lb), and Ag US$ 24.35/oz.
4. Metallurgical recoveries are based on historical processing data: Zn (89.3%), Pb (80.0%), Cu (15.7%), Ag (77.5%), and Au (30.2%).
5. Bulk density was assigned based on rock type and averages 3.53 t/m^3.
6. Mineral Resources were depleted according to actual production as of September 30, 2023, and forecast production to the effective date of December 31, 2023.
7. Mineral Resources are exclusive of Mineral Reserves.
8. The minimum thickness for underground resource reporting panels is 4 m for CAF and 3 m for SLS.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Mineral Resources were constrained by optimized underground reporting shapes.
11. Numbers may not add due to rounding.

Figure 11-68: Atacocha Underground Mineral Resources Exclusive of Mineral Reserves



Source: SLR, 2023.

11.7 Mineral Resource Uncertainty

The classification of Mineral Resources serves to convey the degree of uncertainty inherent in the geological interpretation and estimation process, which is largely a function of the available data. In addition to the drill hole density and distribution, other factors such as drilling and sampling methodologies, QA/QC procedures, confidence in geological interpretation and grade continuity, metal prices, mining methods, and density measurements impact the levels of uncertainty associated with the Mineral Resource categories, and are considered in Mineral Resource classification.

Standard industry practices were followed for drilling, sampling, sample preparation and assay procedures, ensuring database integrity and representativeness. Analysis of the QC sample results confirm the absence of significant biases. Confidence in geological interpretation, modeling, and grade estimation is largely dependent on the available information such as drilling density and geological mapping. Varied drill hole spacing results in differing confidence levels, influencing variography, geological modeling, grade estimation, and consequently, the confidence in estimated metal grade and tonnage for each block. The uncertainty varies from high to low for the Measured, Indicated, and Inferred categories, reflecting the anticipated sensitivity of the estimate to the addition of new field data.

Adjustments to parameters such as estimation strategy, including the minimum and maximum number of drill holes and samples for estimation, handling of absent values/assays, and choice of estimation interpolator, are made based on geological information available and can be used to improve the reliability of local and global estimation. Nexa adopts a conservative approach by utilizing half of the detection limit for absent values/assays and excluding estimated blocks influenced by these samples, contributing to reduced estimation uncertainty.

Block model validation through comparison of different estimation techniques, swath plots, and visual validation against composites yields acceptable results across all Mineral Resource categories and indicates that the estimated grades are a reasonable representation of the available data. Nexa has systematically taken density measurements, however, there are insufficient samples for the estimation for all domains and for the majority of the blocks, which results in higher levels of uncertainty for the estimated tonnage. Average density is calculated and assigned for grouped mineralization domains, although density is also interpolated locally where data is available.

The metal prices used for Mineral Resource NSR calculation are set 15% higher than Mineral Reserve prices, reflecting consensus long-term forecasts from financial institutions, banks, and other sources, along with supply and demand dynamics for zinc, lead, silver, gold, and copper. The associated uncertainty pertains to commodity risk and reflects current forecasts.

The QP is of the opinion that the uncertainty levels related to geological modelling and estimation are adequately reflected in the Mineral Resource classification categories, providing sufficient support for the Mineral Resource estimate. Any necessary adjustments aimed at improvement are outlined in preceding chapters and should be addressed in future updates.

12.0 Mineral Reserve Estimates

12.1 Summary

The Mineral Reserve estimate for the Cerro Pasco Complex, including the El Porvenir and Atacocha underground and Atacocha (San Gerardo) open pit mines, with an effective date of December 31, 2023, is summarized in Table 12-1 and Table 12-2 on a Nexa attributable ownership basis and 100% ownership basis, respectively.

The SLR QPs are not aware of any risk factors associated with, or changes to, any aspects of the modifying factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate with the exception of the impacts of faults on the stope stability and equivalent linear overbreak/slough (ELOS) that have not been accounted for in the geotechnical empirical analyses for the underground mines. SLR has estimated the impact of an increase in ELOS/dilution, and has reduced the Mineral Reserve by 2%; see Section 12.3.2 for more detail.

Table 12-1: Summary of Cerro Pasco Complex Mineral Reserve Estimate (Nexa Attributable Basis) – December 31, 2023

Mine	Ownership (%)	Category	Tonnage (Mt)	Grade					Contained Metal					Recoveries				
				Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Au (g/t)	Zn (kt)	Cu (kt)	Ag (koz)	Pb (kt)	Au (koz)	Zn (%)	Cu (%)	Ag (%)	Pb (%)	Au (%)
El Porvenir UG	83.48%	Proven	3.27	4.09	0.24	75.2	1.29	---	133.8	7.9	7,907	42.0	---	89.21	14.60	77.51	80.01	---
		Probable	8.96	4.11	0.22	72.1	1.17	---	368.7	20.0	20,759	104.6	---	89.21	14.60	77.51	80.01	---
		Sub-Total	12.23	4.11	0.23	72.9	1.20	---	502.5	28.0	28,666	146.6	---	89.21	14.60	77.51	80.01	---
Atacocha UG	75.96%	Proven	1.30	3.86	0.34	84.9	1.45	---	50.0	4.4	3,535	18.7	-	89.30	15.73	77.51	80.02	---
		Probable	3.01	4.54	0.43	77.7	1.29	---	136.6	12.8	7,509	38.8	-	89.30	15.73	77.51	80.02	---
		Sub-Total	4.30	4.33	0.40	79.8	1.34	---	186.5	17.2	11,044	57.5	-	89.30	15.73	77.51	80.02	---
Atacocha OP	75.96%	Proven	1.45	1.02	---	38.2	1.16	0.25	14.8	-	1,779	16.9	11.5	70.44	-	75.76	83.97	65.46
		Probable	1.88	0.97	---	32.4	1.14	0.29	18.2	-	1,958	21.4	17.4	70.44	-	75.76	83.97	65.46
		Sub-Total	3.33	0.99	---	34.9	1.15	0.27	33.1	-	3,737	38.2	28.9	70.44	-	75.76	83.97	65.46
Total Cerro Pasco		**Proven**	6.02	3.30	0.20	68.4	1.29	0.06	198.6	12.3	13,221	77.6	11.5	87.83	15.00	77.27	80.87	65.46
		Probable	13.84	3.78	0.24	67.9	1.19	0.04	523.5	32.9	30,226	164.7	17.4	88.58	15.04	77.40	80.53	65.46
		Total	19.86	3.64	0.23	68.0	1.22	0.05	722.1	45.2	43,447	242.4	28.9	88.37	15.03	77.36	80.64	65.46

Notes:

1. The definitions for Mineral Reserves in S-K 1300 were followed for Mineral Reserves which are consistent with CIM (2014) definitions.
1. Mineral Reserves are reported on an 83.48% and 75.96% Nexa attributable ownership basis for El Porvenir and Atacocha, respectively.
2. El Porvenir and Atacocha UG Mineral Reserves are estimated at break-even NSR cut-off values between US$63.77/t and US$69.00/t processed for SLS and between US$65.77/t and US$71.07/t processed for CAF depending on the mining zone. A number of marginal stopes with marginal NSR cut-off values between US$39.86/t and US$45.09/t processed for SLS and between US$41.86/t and US$47.16/t processed for CAF are included in the estimate.
3. Atacocha OP Mineral Reserves are estimated at an NSR cut-off value of US$16.21/t.
4. Mineral Reserves are estimated using average long term prices of Zn: US$2,799.04/t (US$1.27/lb); Cu: US$7,669.61/t (US$3.48/lb); Ag: US$21.17/oz; Pb: US$2,000.29 /t (US$0.91/lb); and Au: US$1,630.93/oz.
5. Metallurgical recoveries are accounted for in the NSR calculations based on historical processing data and are variable as a function of head grade.

- El Porvenir : Zn (89.2%), Pb (80.0%), Cu (14.6%), and Ag (77.5%)
- Atacocha UG: Zn (89.3%), Pb (80.0%), Cu (15.7%), Ag (77.5%),
- Atacocha OP: Zn (70.4%), Pb (84.0%), Ag (75.8%), and Au (65.5%)

6. A minimum mining width of 4.0 m was used for SLS stopes and 5.0 m for the CAF stopes.
7. A dilution equivalent linear overbreak/slough (ELOS) of 1.0 m is added to CAF stopes and a dilution factor of 10% is added to SLS stopes.
8. Mining recovery factors of 95% and 85% are applied to CAF and SLS stopes respectively.
9. No mining dilution was applied to Atacocha OP and a 100% mining recovery was assumed.
10. There are no Cu grades estimated for Atacocha OP and no Au grades estimated for Atacocha UG and El Porvenir UG. This has reduced the Cu and Au average grades for the total Cerro Pasco tonnes.
11. Numbers may not add due to rounding.

Table 12-2: Summary of Cerro Pasco Complex Mineral Reserve Estimate (100%) – December 31, 2023

Mine	Category	Tonnage (Mt)	Grade					Contained Metal					Recoveries				
			Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Au (g/t)	Zn (kt)	Cu (kt)	Ag (koz)	Pb (kt)	Au (koz)	Zn (%)	Cu (%)	Ag (%)	Pb (%)	Au (%)
El Porvenir UG	Proven	3.92	4.09	0.24	75.2	1.29	-	160.3	9.5	9,472	50.3	-	89.21	14.6	77.51	80.0	-
	Probable	10.73	4.11	0.22	72.1	1.17	-	441.6	24.0	24,867	125.3	-	89.21	14.6	77.51	80.0	-
	Sub-Total	14.65	4.11	0.23	72.9	1.20	-	601.9	33.5	34,338	175.7	-	89.21	14.6	77.51	80.0	-
Atacocha UG	Proven	1.71	3.86	0.34	84.9	1.45	-	65.8	5.7	4,654	24.6	-	89.3	15.73	77.51	80.0	-
	Probable	3.96	4.54	0.43	77.7	1.29	-	179.8	16.9	9,886	51.1	-	89.3	15.73	77.51	80.0	-
	Sub-Total	5.66	4.33	0.40	79.8	1.34	-	245.6	22.6	14,540	75.7	-	89.3	15.73	77.51	80.0	-
Atacocha OP	Proven	1.91	1.02	-	38.2	1.16	0.25	19.5	-	2,342	22.2	15.2	70.44	-	75.76	84.0	65.46
	Probable	2.47	0.97	-	32.4	1.14	0.29	24.0	-	2,577	28.1	22.9	70.44	-	75.76	84.0	65.46
	Sub-Total	4.38	0.99	-	34.9	1.15	0.27	43.5	-	4,919	50.3	38.1	70.44	-	75.76	84.0	65.46
Total Cerro Pasco	**Proven**	7.53	3.26	0.20	68.0	1.29	0.06	245.5	15.3	16,468	97.2	15.2	87.7	15.0	77.3	80.9	65.46
	Probable	17.16	3.76	0.24	67.6	1.19	0.04	645.5	40.9	37,330	204.5	22.9	88.5	15.1	77.4	80.6	65.46
	Total	24.70	3.61	0.23	67.8	1.22	0.05	891.0	56.1	53,797	301.7	38.1	88.3	15.1	77.4	80.7	65.46

Notes:

1. The definitions for Mineral Reserves in S-K 1300 were followed for Mineral Reserves which are consistent with CIM (2014) definitions.
2. Mineral Reserves are reported on a 100% Nexa attributable ownership basis. Nexa owns 83.48% of El Porvenir and 75.96% of Atacocha.
3. El Porvenir and Atacocha UG Mineral Reserves are estimated at break-even NSR cut-off values between US$63.77/t and US$69.00/t processed for SLS and between US$65.77/t and US$71.07/t processed for CAF depending on the mining zone. A number of marginal stopes with marginal NSR cut-off values between US$39.86/t and US$45.09/t processed for SLS and between US$41.86/t and US$47.16/t processed for CAF are included in the estimate.
4. Atacocha OP Mineral Reserves are estimated at an NSR cut-off value of US$16.21/t.
5. Mineral Reserves are estimated using average long term prices of Zn: US$2,799.04/t (US$1.27/lb); Cu: US$7,669.61/t (US$3.48/lb); Ag: US$21.17/oz; Pb: US$2,000.29 /t (US$0.91/lb); and Au: US$1,630.93/oz.
6. Metallurgical recoveries are accounted for in the NSR calculations based on historical processing data and are variable as a function of head grade.
   - El Porvenir : Zn (89.2%), Pb (80.0%), Cu (14.6%), and Ag (77.5%)
   - Atacocha UG: Zn (89.3%), Pb (80.0%), Cu (15.7%), Ag (77.5%),
   - Atacocha OP: Zn (70.4%), Pb (84.0%), Ag (75.8%), and Au (65.5%)
7. A minimum mining width of 4.0 m was used for SLS stopes and 5.0 m for CAF stopes.
8. A dilution equivalent linear overbreak/slough (ELOS) of 1.0 m is added to CAF stopes and a dilution factor of 10% is added to SLS stopes.
9. Mining recovery factors of 95% and 85% are applied to CAF and SLS stopes, respectively.
10. No mining dilution was applied to Atacocha OP and a 100% mining recovery was assumed.
11. There are no Cu grades estimated for Atacocha OP and no Au grades estimated for Atacocha UG and El Porvenir UG. This has reduced the Cu and Au average grades for the total Cerro Pasco tonnes.
12. Numbers may not add due to rounding.

12.2 Comparison with Previous Estimates

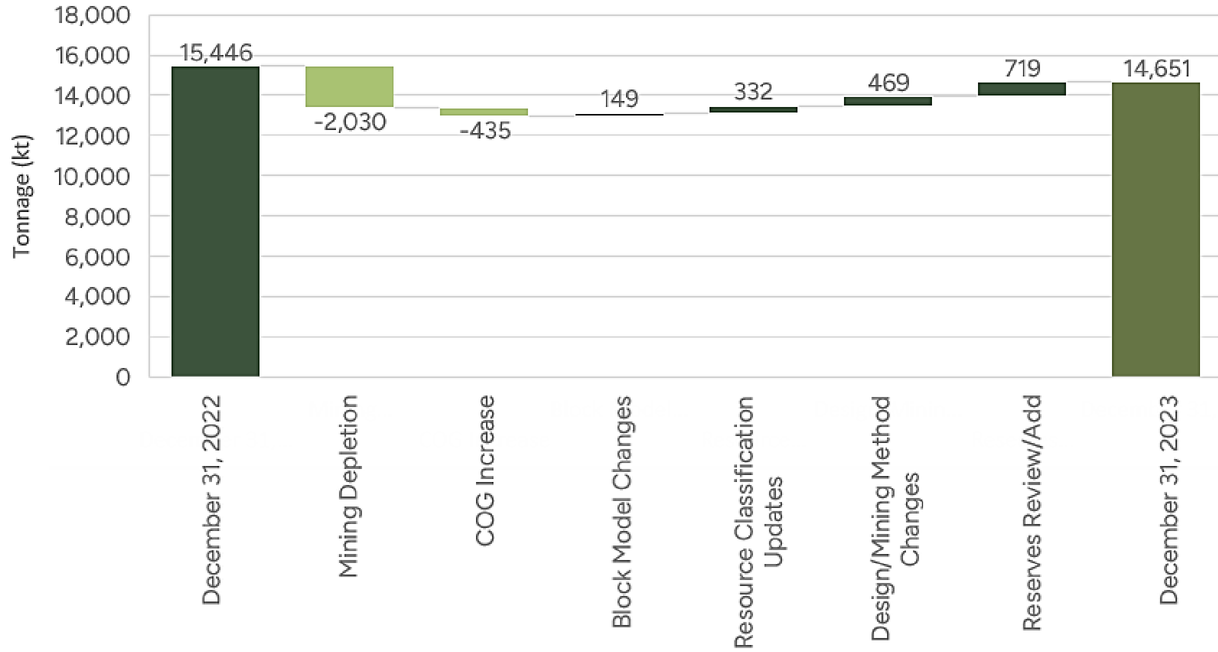
12.2.1 El Porvenir

A comparison of the El Porvenir underground Mineral Reserve estimates between December 31, 2023 and December 31, 2022 is presented in Table 12-3. Since the Atacocha underground mine was placed into care and maintenance in 2020, there were no Mineral Reserves declared in 2022. Mineral Reserves have decreased by approximately 5%. Figure 12-1 shows the additions and reductions contributing to the change in Mineral Reserves.

Table 12-3: El Porvenir (100%) Mineral Reserve Estimates Comparison

Category	Tonnage (Mt)	Grade				Contained Metal			
		Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Zn (kt)	Cu (kt)	Ag (Moz)	Pb (kt)
December 31, 2023									
Proven	3.92	4.09	0.24	75.2	1.29	160.3	9.5	9,472	50.3
Probable	10.73	4.11	0.22	72.1	1.17	441.6	24.0	24,867	125.3
Total	14.65	4.11	0.23	72.9	1.20	601.9	33.5	34,338	175.7
December 31, 2022									
Proven	2.54	3.70	0.21	67.7	1.12	94.0	5.4	5,532	28.3
Probable	12.96	3.58	0.19	65.7	1.06	464.6	25.0	27,362	137.3
Total	15.50	3.60	0.19	66.0	1.07	558.6	30.4	32,894	165.6
Difference 2023 vs 2022									
Proven	1.38	0.39	0.03	7.5	0.17	66.3	4.1	3,940	22.0
Probable	-2.23	0.53	0.03	6.4	0.11	-23.0	-1.0	-2,495	-12.0
Total	-0.85	0.51	0.04	6.9	0.13	43.3	3.1	1,444	10.1
Difference %									
Proven	54.2%	10.6%	15.7%	11.1%	14.8%	70.5%	76.2%	71.2%	77.9%
Probable	-17.2%	14.9%	17.7%	9.7%	10.1%	-4.9%	-4.0%	-9.1%	-8.7%
Total	**-5.5%**	**14.1%**	**20.4%**	**10.5%**	**12.0%**	**7.8%**	**10.3%**	**4.4%**	**6.1%**

Figure 12-1: Waterfall Chart of Change in El Porvenir Mineral Reserves



12.2.2 Atacocha

There was no previously reported Mineral Reserve. The current Mineral Reserve with the 2023 Mineral Reserve shows contained Proven and Probable Mineral Reserves of 43.5 kt of zinc, 50.3 kt of lead, 4.9 Moz of silver, and 38 koz of gold. Changes have occurred as a result of the Cerro Pasco Complex Integration, allowing San Gerardo open pit material to be processed at the Atacocha plant until the Atacocha underground mine is re-opened.

12.3 Atacocha and El Porvenir Underground

12.3.1 Summary

The Atacocha and El Porvenir mines are underground polymetallic mines operated by Nexa in the Pasco mining district in the Central Andes area of Peru. The mines have been in operation for several decades with mining operations starting in 1938 and 1949 for Atacocha and El Porvenir respectively.

The El Porvenir Mine is still in operation and feeds the El Porvenir processing plant which has a maximum milling capacity of 6,400 tpd. The Atacocha Mine was placed in care and maintenance in 2020 in order to focus mining operations at the San Gerardo open pit mine. While in operation, the combined Atacocha underground mine and San Gerardo open mine production fed the Atacocha processing plant with a nominal capacity of 4,500 tpd.

The Atacocha Mine is planned to re-start operations in 2027 at which point the San Gerardo open pit mine will have reached the end of its mine life. Production at Atacocha will then be integrated with El Porvenir operations to feed the El Porvenir processing plant. Both mines are envisaged to be mined using cut and fill (CAF) and sub-level stoping (SLS) mining methods. A summary of the Mineral Reserves for the two mines are presented in Table 12-4 and Table 12-5 on a Nexa attributable ownership basis and 100% ownership basis, respectively.

Table 12-4: Summary Atacocha (75.96%) and El Porvenir (83.48%) Underground Mines Mineral Reserves – December 31, 2023

Category	Tonnage (Mt)	Grade					Contained Metal				
		Zn (%)	Cu (%)	Ag (g/t)	Pb %)	Au (g/t)	Zn (kt)	Cu (kt)	Ag (Moz)	Pb (kt)	Au (koz)
Proven	4.57	4.02	0.27	78.0	1.33	-	183.7	12.3	11,442	60.7	-
Probable	11.97	4.22	0.27	73.5	1.20	-	505.3	32.9	28,268	143.4	-
Total	16.53	4.17	0.27	74.7	1.23	-	689.0	45.2	39,710	204.1	-

Notes:

1. The definitions for Mineral Reserves in S-K 1300 were followed for Mineral Reserves which are consistent with CIM (2014) definitions.
2. Mineral Reserves are reported on a 75.96% and 80.48% Nexa attributable ownership basis for Atacocha and El Porvenir respectively.
3. Mineral Reserves are estimated at break-even NSR cut-off values between US$63.77/t and US$69.00/t processed for SLS and between US$65.77/t and US$71.07/t processed for CAF depending on the mining zone. A number of marginal stopes with marginal NSR cut-off values between US$39.86/t and US$45.09/t processed for SLS and between US$41.86/t and US$47.16/t processed for CAF are included in the estimate.
4. Mineral Reserves are estimated using average long term prices of Zn: US$2,799.04/t (US$1.27/lb); Cu: US$7,669.61/t (US$3.48/lb); Ag: US$21.17/oz; and Pb: US$2,000.29 /t (US$0.91/lb).
5. Metallurgical recoveries are accounted for in the NSR calculations based on historical processing data and are variable as a function of head grade.
   - El Porvenir : Zn (89.2%), Pb (80.0%), Cu (14.6%), and Ag (77.5%)
   - Atacocha UG: Zn (89.3%), Pb (80.0%), Cu (15.7%), Ag (77.5%),
6. A minimum mining width of 4.0 m was used for SLS stopes and 5.0 m for CAF stopes.
7. A dilution ELOS of 1.0 m and a dilution factor of 10% is added to CAF stopes and SLS stopes respectively.
8. A mining recovery factor of 95% and 85% is applied to CAF and SLS stopes respectively.
9. Numbers may not add due to rounding.

Table 12-5: Summary Atacocha (100%) and El Porvenir (100%) Underground Mines Mineral Reserves – December 31, 2023

Category	Tonnage (Mt)	Grade					Contained Metal				
		Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Au (g/t)	Zn (kt)	Cu (kt)	Ag (Moz)	Pb (kt)	Au (koz)
Proven	5.62	4.02	0.27	78.1	1.33	-	226.0	15.3	14,125	75.0	-
Probable	14.69	4.23	0.28	73.6	1.20	-	621.5	40.9	34,753	176.4	-
Total	20.32	4.17	0.28	74.8	1.24	-	847.5	56.1	48,878	251.4	-

Notes:

1. The definitions for Mineral Reserves in S-K 1300 were followed for Mineral Reserves which are consistent with CIM (2014) definitions.
2. Mineral Reserves are reported on a 100% Nexa attributable ownership basis. Nexa owns 83.48% of El Porvenir and 75.96% of Atacocha.
3. Mineral Reserves are estimated at break-even NSR cut-off values between US$63.77/t and US$69.00/t processed for SLS and between US$65.77/t and US$71.07/t processed for CAF depending on the mining zone. A number of marginal stopes with marginal NSR cut-off values between US$39.86/t and US$45.09/t processed for SLS and between US$41.86/t and US$47.16/t processed for CAF are included in the estimate.
4. Mineral Reserves are estimated using average long term prices of Zn: US$2,799.04/t (US$1.27/lb); Cu: US$7,669.61/t (US$3.48/lb); Ag: US$21.17/oz; and Pb: US$2,000.29 /t (US$0.91/lb).

5. Metallurgical recoveries are accounted for in the NSR calculations based on historical processing data and are variable as a function of head grade.
   - El Porvenir : Zn (89.2%), Pb (80.0%), Cu (14.6%), and Ag (77.5%)
   - Atacocha UG: Zn (89.3%), Pb (80.0%), Cu (15.7%), Ag (77.5%),
6. A minimum mining width of 4.0 m was used for SLS stopes and 5.0% for CAF stopes.
7. A dilution ELOS of 1.0 m is added to CAF stopes and a dilution factor of 10% is added to SLS stopes.
8. Mining recovery factors of 95% and 85% are applied to CAF and SLS stopes, respectively.
9. Numbers may not add due to rounding.

12.3.2 Dilution

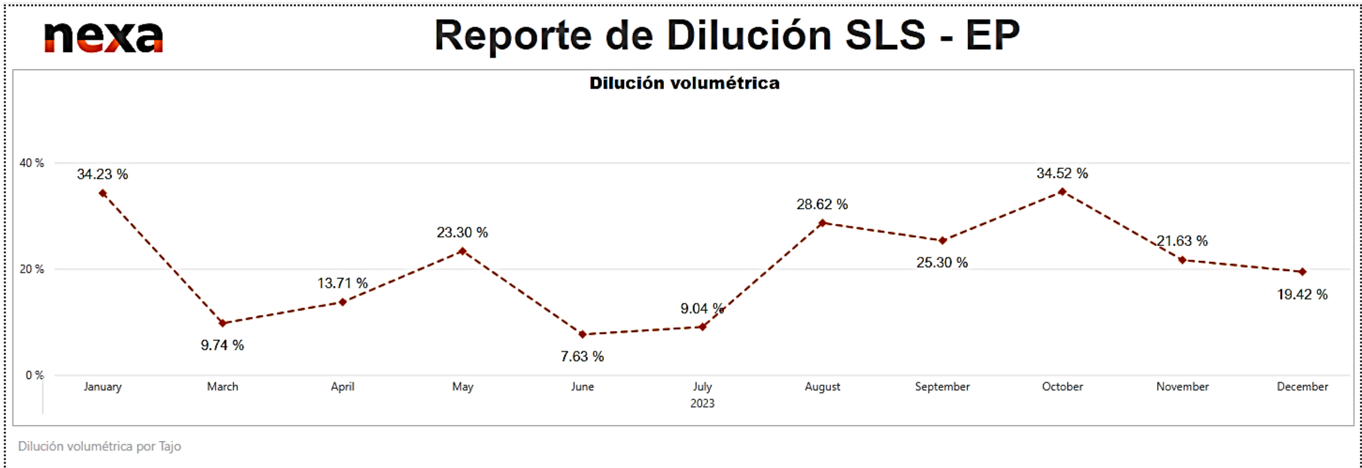
Dilution at Atacocha and El Porvenir has been applied based on mining methods. CAF and SLS are the two mining methods planned to be used at both mines. CAF has historically been the primary mining method used, however, over the past few years SLS has been used in areas where veins are steeply dipping. Over the LOM, approximately 40% of the total ore will be from SLS stopes and primarily from El Porvenir.

Planned or internal dilution is accounted for within the stope designs which considers minimum mining widths and appropriate stope angles. Unplanned or external dilution is applied by using either a dilution factor or adding a dilution "skin" in the form of an ELOS on the footwall or hanging wall of the stope designs.

Unplanned dilution for CAF stopes is applied as a total ELOS of 1.0 m (0.5 m along the hanging wall and 0.5 m along footwall), while a dilution factor of 10% at zero grade was applied to SLS stopes. CAF stopes have been extensively used at Atacocha and El Porvenir mines and is generally well understood. In SLR's opinion, the dilution factor applied is within industry standards for this type of mining method.

The SLS stope widths average 5.50 m indicating that a 10% dilution factor would result in an ELOS dilution skin of 0.55 m or approximately 0.28 m for the hanging wall and footwall. SLR has reviewed dilution analysis files provided by Nexa, summarized in Figure 12-2. The analysis compares the volumes between the mineralized structures and the surveyed mined-out stope. The data collected in 2023 shows an average dilution of approximately 20%.

Figure 12-2: Volumetric Comparison of El Porvenir Mineralization and Surveyed Stopes



In SLR's opinion, based on the volume comparison analysis and SLR's experience with operations with similar mining methods, and the potential impact from faults, the dilution being applied is low for narrow veins mining using the SLS mining method. Since reconciliation data between designed stopes and surveyed stopes is not available, SLR recommends using a more conservative dilution ELOS of 1.20 m which is equivalent to approximately 20% dilution. It is recommended to apply this dilution as ELOS during the optimization process instead of a factor so that any dilution grade will be captured. Furthermore, since unconsolidated backfill will be used for CAF and SLS stopes, SLR recommends applying an additional 3% factor to capture backfill dilution.

SLR has investigated the effect of applying the additional SLS and backfill dilution quantities and notes a reduction of approximately 2% in Mineral Reserves. While the effect on the overall Mineral Reserve estimate is not significant, the effect should be reviewed on a stope by stope basis. SLR recommends undertaking reconciliation analysis between planned designed stopes and surveyed stopes and estimating overbreak and underbreak quantities to support dilution and mining recovery factors for future Mineral Reserve estimation work.

12.3.3 Mining Extraction

Mining recovery factors were applied by mining method; 95% and 85% for CAF and SLS respectively. For development in ore, a factor of 100% was applied. In SLR's opinion, the mining recovery factors are appropriate for the selected mining methods.

12.3.4 Net Smelter Return

An NSR value was calculated for all blocks in the resource model taking into account metal grades, metallurgical recoveries, metal prices, and commercial terms and conditions.

The NSR value is expressed as US$/t and is calculated for Mineral Reserves to make an adequate comparison with production costs in order to determine whether mined material is ore (economically minable) or waste.

The sellable products from the mines are zinc concentrate, lead concentrate with silver content, and copper concentrate with silver content. The payable metals in concentrates include the applicable concentrate treatment, transportation, refining charges, deductions, and penalty elements. The zinc concentrate produced at the Atacocha and El Porvenir mines will be sent to Nexa's Cajamarquilla smelter. As such a premium, representing the smelter revenue, is added to zinc metal price. Lead and copper concentrates are sold to Traders and will be exported and have market based commercial terms applied.

Costs and other parameters used to calculate the NSR cut-off value are shown in Table 12-6. The metal prices are based on a 10 year average (2024 – 2033) of projected metal prices. Nexa has obtained metal prices from various sources and has internally reviewed them to produce a consensus pricing model to be used across all mining units. SLR verified that Nexa's selected metal prices for estimating Mineral Reserves are in line with independent forecasts from banks and other lenders.

Table 12-6: Summary of NSR Parameters

Item	Units	Value
Metal Prices		
Zn	US$/lb	1.27
Pb	US$/lb	0.91
Cu	US$/lb	3.48

Item	Units	Value
Ag	US$/oz	21.17
Zn premium	US$/lb	0.05
Net Metallurgical Recovery *		
Zn	%	89.2
Pb	%	80.0
Cu	%	15.7
Ag	%	77.5
Zn Concentrate Payable		
Zn - Integrated	%	95.3
Smelter Conversion Cost	US$/t Zn prod	656
Ag	Minimum of Payable (%) or Deduction (oz/t)	70 or 3.00
Pb Concentrate Payable		
Pb	Minimum of Payable (%) or Deduction (%)	95 or 3
Ag	Minimum of Payable (%) or Deduction (oz/t)	95 or 1.61
Cu Concentrate Payable		
Cu	Minimum of Payable (%) or Deduction (%)	97 or 1.00
Ag	Minimum of Payable (%) or Deduction (oz/t)	90 or 1.00
Logistics		
Zn Concentrate - Integrated	US$/t conc	46.7
Pb Concentrate	US$/t conc	44.1
Cu Concentrate **	US$/t conc	38.1
Refining Cost		
Ag in Pb conc	US$/oz	1.0
Ag in Cu conc	US$/oz	0.5
Treatment Cost		
Pb conc	US$/t conc	177
Cu conc	US$/t conc	241.0

Metallurgical recoveries used for Mineral Reserves vary by head grade and are based on historical data which has been consolidated by Nexa. Ore head grade versus recovery curves are presented in Figure 12-3, Figure 12-4, and Figure 12-5.

Figure 12-3: Zinc Recovery Curve

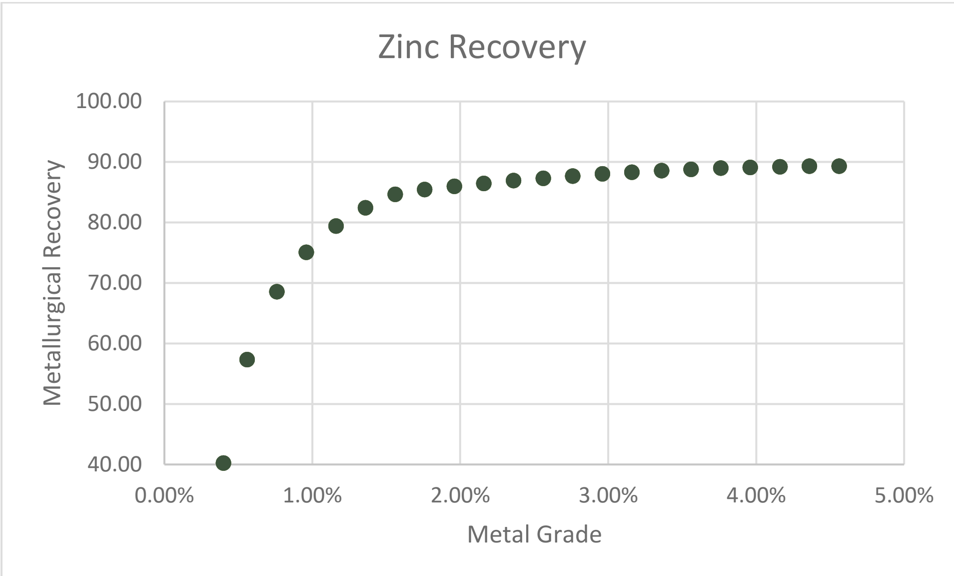


Figure 12-4: Lead Recovery Curve

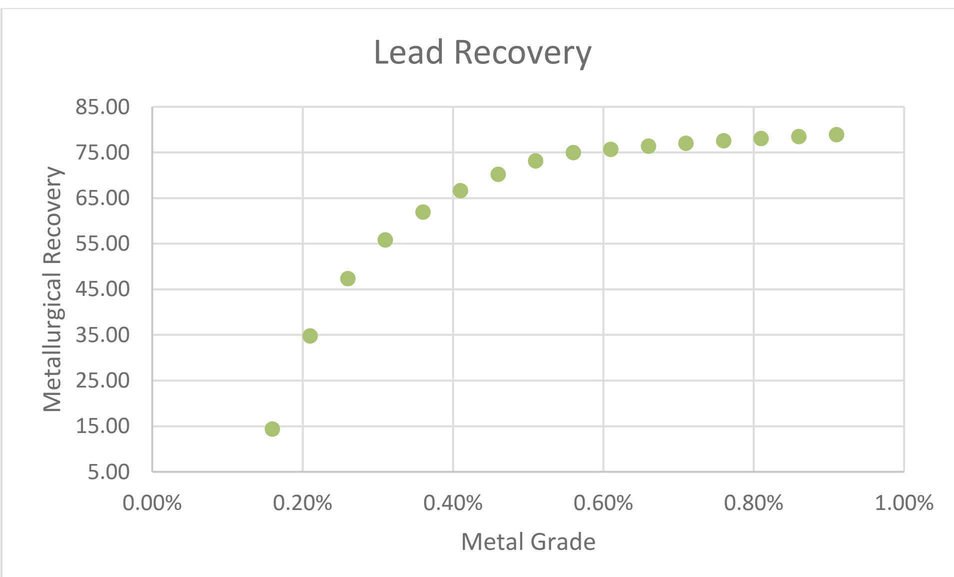
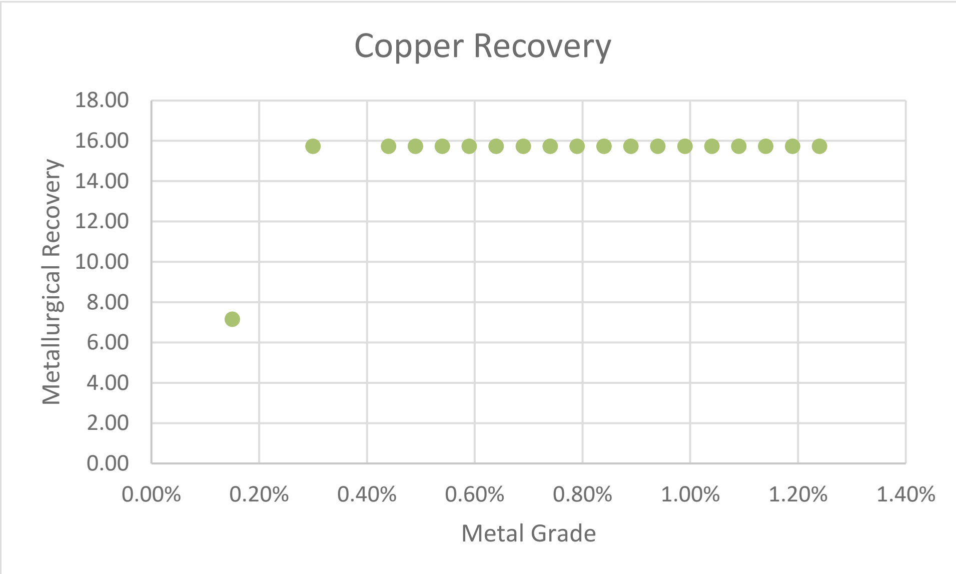


Figure 12-5: Copper Recovery Curve



12.3.5 Cut-off Values

Cut-off values were calculated for each mine based on mining method and zone. The mines were divided into four zones based on their elevations. The elevation intervals are presented in Table 12-7. The material movement at the mines involves a combination of trucking, transfer via orepasses and rail cars, and skipping via the Picasso shaft located at El Porvenir. The shaft loading pocket is located on the 2800 Level, therefore ore mined in zones located below that level will have to be trucked via haulage ramps, effectively resulting in higher mining costs. Mining costs have been adjusted for each mining zone to reflect the number of transfers or haulage required for each mining zone.

The Atacocha mining costs include the transfer of ore by trucks to the El Porvenir loading pockets whereas the mining costs at El Porvenir have been defined by zones. Nexa is currently evaluating a similar approach by zones for the Atacocha Mine. For the purposes of the current Mineral Reserve estimates at Atacocha, the average mining costs for El Porvenir were considered to be representative of the Atacocha underground mining costs with the addition of haulage costs. The operating costs were based on 2022 actual costs. The estimated cut-off values (COV) are presented in Table 12-8.

Table 12-7: El Porvenir and Atacocha Mining Zones

Original Name	El Porvenir	Atacocha
Zona Alta	Above 3,700 m	Above 3,700 m
Zona Intermedia	Between 3,400 m and 3,700 m	Between 3,100 m and 3,700 m
Zona Baja	Between 2,900 m and 3,400 m	Between 2,900 m and 3,700 m
Profundizacion	Below 2,900 m	Below 2,900 m

Table 12-8: Cut-off Value Estimates

Item	Units	SLS Costs	C&F Cost
Mining Costs - EP			
Zona Alta	US$/t	50.24	52.24
Zona Intermedia	US$/t	47.18	49.45
Zona Baja	US$/t	46.97	48.97
Profundizacion	US$/t	48.41	50.41
Mining Costs - AT	US$/t	52.20	54.27
Development Costs (incl in Mining costs)	US$/t	23.91	23.91
Processing Costs	US$/t	10.43	10.43
G&A	US$/t	6.37	6.37
Break-even COV - EP			
Zona Alta	US$/t	67.04	69.04
Zona Intermedia	US$/t	63.98	66.25
Zona Baja	US$/t	63.77	65.77
Profundizacion	US$/t	65.21	67.21
Break-even COV - AT	US$/t	69.00	71.07
Marginal COV - EP			
Zona Alta	US$/t	43.13	45.13
Zona Intermedia	US$/t	40.07	42.34
Zona Baja	US$/t	39.86	41.86
Profundizacion	US$/t	41.30	43.30
Marginal COV - AT	US$/t	45.09	47.16

12.3.6 Mineral Reserve Estimation

The Mineral Reserves were estimated by Nexa and reviewed and accepted by SLR. Reserve NSR factors were first added to the resource model. Deswik Stope Optimizer (DSO) was used to generate mining shapes using marginal cut-off values presented in Section 12.3.5. DSO was run separately depending on the orebody's strike direction and dip angles to optimize the results.

The resulting optimized shapes were then depleted against as-built wireframes. Surveyed mined-out stope and development wireframes to the end of September 2023 and forecasted stope and development wireframes to December 31, 2023 were used to deplete the optimized shapes. The depleted shapes were interrogated against the block model and average grades and NSR values were calculated. The shapes were then reviewed and excluded from Mineral Reserve estimates where appropriate.

The retained stopes were used to guide the development designs, and dilution and extraction factors were applied. The development and stope designs were then added to Deswik Scheduler to generate a production schedule. Mineral Reserves are reported as diluted and extracted stope and ore development tonnes and grades. These were fully scheduled in an appropriate LOM plan and applied to a discounted cash flow model. The Mineral Reserve estimate has demonstrated economically viable extraction.

In the SLR QP's opinion, the assumptions, parameters, and estimation methodology used for the Atacocha and El Porvenir underground Mineral Reserve estimates are appropriate for the style of mineralization and mining methods.

The SLR QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, political, or other relevant factors that could significantly affect the Atacocha and El Porvenir Mineral Reserves.

12.4 Atacocha (San Gerardo) Open Pit

12.4.1 Summary

The open pit Mineral Reserves were developed based on the October, November, and December forecast; end of year was projected using the September 30, 2023 surface. The total Mineral Reserve (100% basis) for San Gerardo open pit is estimated to be 4.4 Mt at an average grade of 0.99% Zn, 1.15%Pb, 1.12 oz/t Ag, and 0.27 g/t Au.

The open pit Mineral Reserve estimates were prepared by Nexa and have been classified in accordance with S-K 1300 and were confirmed by the SLR QP. A summary of the open pit Mineral Reserve estimate is shown in Table 12-9 and Table 12-10 on a Nexa attributable ownership basis and 100% ownership basis, respectively.

Table 12-9: Open Pit Mineral Reserves (75.96% Nexa Attributable Basis)– as of December 31, 2023

Category	Tonnage (000 t)	Grade					Contained Metal				
		Zn (%)	Cu (%)	Ag g/t)	Pb (%)	Au (g/t)	Zn (000 t)	Cu (000 t)	Ag (000 oz)	Pb (000 t)	Au (000 oz)
Proven	1,450	1.02	-	38.2	1.16	0.25	14.84	-	1,779	16.86	11.54
Probable	1,876	0.97	-	32.4	1.14	0.29	18.24	-	1,958	21.36	17.41
Total	3,327	0.99	-	34.9	1.15	0.27	33.08	-	3,737	38.22	28.95

Notes:

1. The definitions for Mineral Reserves in S-K 1300 were followed for Mineral Reserves which are consistent with CIM (2014) definitions.
2. Mineral Reserves are reported on a 75.96% Nexa attributable ownership basis.
3. Open pit Mineral Reserves are estimated at an NSR cut-off value of US$16.21/t.
4. Mineral Reserves are estimated using average long term prices of Zn: US$2,799.04/t (US$1.27/lb); Ag: US$21.17/oz; Pb: US$2,000.29/t (US$0.91/lb); and Au: US$1,631.93/oz with allowances for payable deductions and transport applied to the NSR calculation.
5. The NSR calculations do not include the impact of royalties, severance taxes, or any streaming agreements.
6. NSR calculations are based on historical performance of the concentrator. Metal recoveries are calculated based on grade-recovery relationships.
7. Metallurgical recoveries are accounted for in the NSR calculations based on historical processing data and are variable as a function of head grade. Atacocha OP: Zn (70.4%), Pb (84.0%), Ag (75.8%), and Au (65.5%)

8. The Mineral Reserves were scheduled based on the end of September 2023 surface. Small differences between the Mineral Reserve statement and the production schedule may occur because of the difference between the actual end of December 2023 topography surface and the projected end of year 2023 forecast.
9. Numbers may not add due to rounding.

Table 12-10: Open Pit Mineral Reserves (100% Basis) – as of December 31, 2023

Category	Tonnage (000 t)	Grade					Contained Metal				
		Zn (%)	Cu (%)	Ag (g/t)	Pb (%)	Au (g/t)	Zn (000 t)	Cu (000 t)	Ag (000 oz)	Pb (000 t)	Au (000 oz)
Proven	1,909	1.02	-	38.2	1.16	0.25	65.76	-	4,654	24.64	4.89
Probable	2,470	0.97	-	32.4	1.14	0.29	179.81	-	9,886	51.06	7.61
Total	4,380	0.99	-	34.9	1.15	0.27	245.57	-	14,540	75.70	12.49

Notes:

1. The definitions for Mineral Reserves in S-K 1300 were followed for Mineral Reserves which are consistent with CIM (2014) definitions.
2. Mineral Reserves are reported on a 100% ownership basis.
3. Open pit Mineral Reserves are estimated at an NSR cut-off of US$16.21/t.
4. Mineral Reserves are estimated using average long term prices of Zn: US$2,799.04/t (US$1.27/lb); Ag: US$21.17/oz; Pb: US$2,000.29/t (US$0.91/lb); and Au: US$1,631.93/oz with allowances for payable deductions and transport applied to the NSR calculation.
5. Metallurgical recoveries are accounted for in the NSR calculations based on historical processing data and are variable as a function of head grade. Atacocha OP: Zn (70.4%), Pb (84.0%), Ag (75.8%), and Au (65.5%)
6. NSR calculations are based on historical performance of the concentrator. Metal recoveries are calculated based on grade-recovery relationships.
7. The Mineral Reserves were scheduled based on the end of September 2023 surface. Small differences between the Mineral Reserve statement and the production schedule may occur because of the difference between the actual end of December 2023 topography surface and the projected end of year 2023 forecast.
8. Numbers may not add due to rounding.

12.4.2 Dilution

No open pit mining dilution was applied to the grade of the cells. Dilution intrinsic to the Mineral Resource model is considered sufficient to represent the stated mining selectivity.

12.4.3 Mining Extraction

Mining extraction was assumed to be 100% of the Measured and Indicated Mineral Resources. Inferred Mineral Resources were considered waste.

12.4.4 Net Smelter Return

NSR block value calculations are based on historical performance of the concentrator and current smelter contracts. NSR values represent the estimated dollar value per tonne of mineralized material after allowance for metallurgical recovery and consideration of smelter terms, including revenue from payable metals, treatment charges, refining charges transportation, and sales charges. The calculations do not include the impact of royalties, severance taxes, or any streaming agreements.

Metal prices used for reserves are based on a long term forecast. The NSR value for the Mineral Reserve estimates is based on a silver price of US$21.17/oz, gold price of US$1,630.93/oz, lead price of US$0.91/lb (US$2,000.29/t), and zinc price of US$1.2/lb

(US$2,799.04/t). There is no copper in the NSR cut-off grade calculations for the San Gerardo open pit.

Table 12-11: NSR Parameters

Parameter	Unit	Input	Note
Gold Price	$/oz	1,630.93	
Silver Price	$/oz	21.17	
Lead Price	$/lb	0.91	(2,000.29 $/t)
Zinc Price	$/lb	1.27	(2,799.04 $/t)
Metallurgical Recovery			
Pb (Pb Concentrate)	%	84.06%	Pb > 1.2912
	%	$-4.35xPb^2+11.24xPb+76.81$	0.68 < Pb ≤ 1.2912
	%	((Pb-0.12)/0.12) x 100 %	0.12 < Pb ≤ 0.68
		0%	Pb ≤ 0.12
Ag (Pb Concentrate)	%	75.76%	Ag > 0.2
Au (Pb Concentrate)	%	65.46%	Au > 0.12
Zn (Zn Concentrate)	%	70.44%	Zn > 0.62
		((Zn-0.17)/0.17) x 100 %	0.17 < Zn ≤ 0.62
		0%	Zn ≤ 0.17
Ag (Zn Concentrate)	%	3.55%	Ag > 0.2
Au (Zn Concentrate)	%	0%	-
Concentrate Grade			
Pb (Pb Concentrate)	%	53.71%	
Zn (Zn Concentrate)	%	48.98%	
Pb Concentrate Payable %			
Au - Max. Payable %	%	95%	Min Deduct 0.03 oz/t
Ag - Max. Payable %	%	95%	Min Deduct 1.6 oz/t
Pb - Max. Payable %	%	95%	Min Deduct 3.0%
Zn Concentrate Payable %			

Parameter	Unit	Input	Note
Ag – Max Payable	%	70%	Min Deduct 3.0 oz/t
Zn – Max Payable	%	85%	Min Deduct 8.0%
Logistics			
Zn Concentrate	US$/t conc		
Pb Concentrate	US$/t conc	$43	
Refining Cost			
Au in Pb conc	US$/oz	$10.00	
Ag in Pb conc	US$/oz	$1.00	
Treatment Cost			
Pb conc	US$/t conc	$177	
Zn conc	US$/t conc	$314	

12.4.5 NSR Cut-off Grade

Calculated block model NSR values were evaluated against the internal break-even value. Blocks classified as Measured or Indicated Mineral Resources with an NSR value above the internal break-even value, are included in the Mineral Reserve.

Block NSR values are expressed in US$/t and calculated from mineralization grades to make an adequate comparison with production cost in order to determine whether the mined material is categorized as potentially economic mineralization or waste. Blocks with an NSR value greater than or equal to the NSR cut-off value are categorized as mill feed and block value less than the NSR cut-off value is considered waste material. Table 12-12 summarizes the costs included in the NSR cut-off value.

Table 12-12: NSR Cut-off Value Parameters

Parameter	Unit	Input
Process Cost (1)	US$/t	10.65
General and Administrative Cost (2)	US$/t	5.56
NSR Cut-off Value (1)+(2)	US$/t	16.21

12.4.6 Open Pit Optimization

Different nested pits were evaluated by Nexa using the NPV Scheduler software package from Datamine, which employs the Lerchs-Grossmann pit optimization algorithm. A pit shell was selected for the reserve pit design based on a revenue factor of 0.90 of the prices from a set of shells generated using only Measured and Indicated Mineral Resources.

The pit optimization process considered an NSR cut-off values of US$22.44/t. The Mineral Reserve estimation included the incremental material with values between US$16.21/t and US$22.44/t.

Slope angles are based on the updated geotechnical assessment completed in February 2019 by SRK. Table 12-13 shows mine operating costs based on 2023 actual operating data from first six months and last six months of the forecasted budget. Open pit mining operating cost are defined as a constant value. However, there is a variable component associated with haulage distance of the open pit mining cost that requires a yearly truck haulage distance forecast in the LOM plan.

Table 12-13: Open Pit Reserve Pit Optimization Parameters

Parameter	Unit	Input
Open Pit Mining Cost (Mill Feed)	US$/t	6.23
Open Pit Mining Cost (Waste)	US$/t	2.27
Process Cost	US$/t	10.65
General and Administrative Cost	US$/t	5.56
Block Size	M	4x4x6
Overall Slope Angle	degrees	39/45

SLR received the San Gerardo depleted block model, historical underground mining as-built shapes, open pit design, and production schedule in Deswik format. SLR imported the block model and all wireframes into Vulcan. SLR also evaluated potential pits using the Whittle 4.7.3 software package, employing the Lerchs-Grossmann pit optimization algorithm, and produced optimization results consistent with those provided by Nexa. The open pit design applies design parameters consistent with the optimization parameters, and interrogation of the design yielded Mineral Reserve tonnes and grade consistent with those produced by Nexa using Deswik software.

13.0 Mining Methods

13.1 Atacocha and El Porvenir Underground

The Atacocha and El Porvenir mines are polymetallic underground mines in Peru.

The Atacocha underground mine has been in operation since 1938. Operations at the mine were suspended in 2020 in an effort to reduce costs and improve operational efficiency by shifting all production to the San Gerardo open pit mine. The underground mine is planned to restart production in 2027 at which point the open pit mine will be depleted. Over the planned LOM, Atacocha will be mined to a depth of approximately 1,500 m below surface. CAF will be the primary mining method used at the mine with a few areas mined using SLS. Mined-out stopes are backfilled using unconsolidated backfill and hydraulic fill using tailings.

The El Porvenir Mine is currently in production and is planned to extend 1,600 m below surface over its LOM. The mine currently feeds the El Porvenir processing plant at a nominal rate of 6,500 tpd. Similar to Atacocha, the two mining methods used at Porvenir are CAF and SLS. While CAF has historically been the primary mining method used at the mine, SLS will be increasingly used over the LOM particularly where the veins are steeply dipping. SLS will account for approximately 55% of ore production over the LOM.

13.1.1 Cerro Pasco Complex Integration

The current Atacocha processing plant is being fed by the San Gerardo open pit mine. Once the pit is depleted in 2027, operations at the underground Atacocha mine will be re-started. The underground mine will be integrated with the El Porvenir underground mine, with both mines feeding the El Porvenir processing plant. The Atacocha processing plant and mine site will be shut down and all operations will be transferred to the El Porvenir mine site. This scenario will be more efficient both operationally and economically. The tailings storage facility at Atacocha will still be operational and will accept tailings from the El Porvenir processing plant.

As part of the integration plan, a 1,750 m connection ramp between the two mines is being built on the 2,900 m level. The ramp will connect to a system of ore raises and haulage ramps at Atacocha and to the shaft loading pocket at El Porvenir. Since Atacocha has not been in operation since 2020, the mine will be rehabilitated where required prior to and during mining operations. The mine will contribute approximately 23% of the ore production during the first two years, then ramping up to 45%.

13.1.2 Mine Design

The mine designs for Atacocha and El Porvenir underground mines were prepared by Nexa using Deswik's mining software package. SLR has reviewed and validated the mine designs and Mineral Reserve estimates provided by Nexa.

Veins were initially reviewed to identify areas amenable to SLS mining methods, taking into account vein geometry and dip angles. Stope designs were prepared using a stope optimization tool. The optimization was run on Measured and Indicated Resources only. The NSR value of each block was calculated based on the parameters discussed in Section 12.3.4 and stope optimizations were completed using marginal cut-off values for each mining zone as presented in Table 12-7 and Table 12-8.

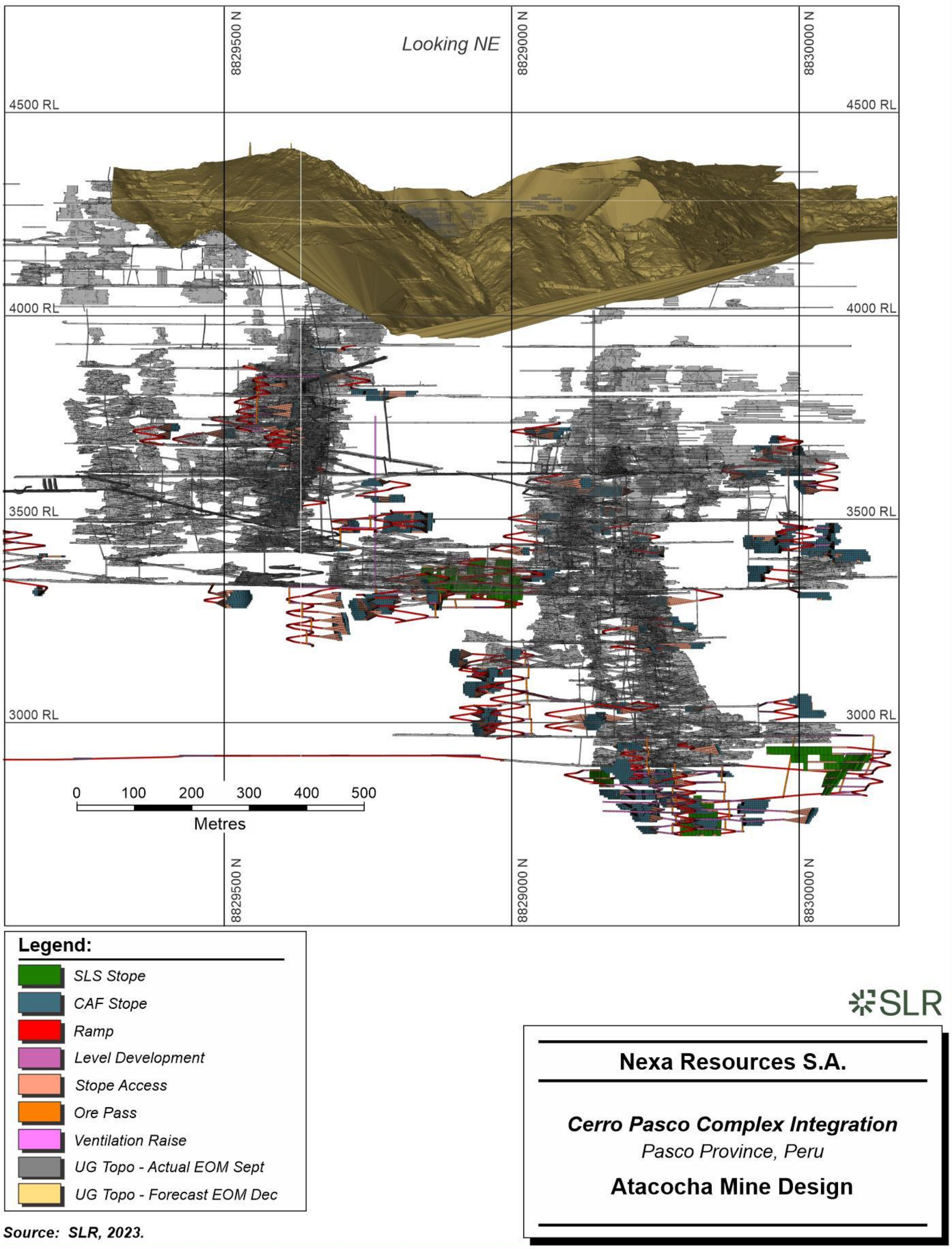
The mine design parameters applied to the DSO settings are presented in Table 13-1. The resulting shapes were depleted against mined-out wireframes and reviewed against development designs for inclusion of marginal stopes, which make up approximately 12% of Mineral Reserves. Stope shapes were further reviewed to remove stopes that were found to be isolated and far from existing development, low grade or uneconomic when reviewed against development requirements, within crown or sill pillars, or within ground with poor stability. Development designs were completed to connect to existing development and provide access to all stopes.

SLR has reviewed the mine designs, mining sequence, and production schedule and is of the opinion that they appropriately reflect current mining operations. The planned mining sequence assumes the use of unconsolidated backfill, therefore mining progresses in a bottom up method. SLR has identified some areas where a sill pillar is required as mining on an upper panel takes place before the lower panel is mined. The areas identified by SLR represent approximately 2% of the total reported Mineral Reserves. The SLR QP recommends reviewing the mining sequences against pillar locations and adjusting the sequence or pillar location accordingly. A longitudinal section of the Atacocha and El Porvenir mine designs are illustrated in Figure 13-1 and Figure 13-2, respectively.

Table 13-1: Mine Design Parameters

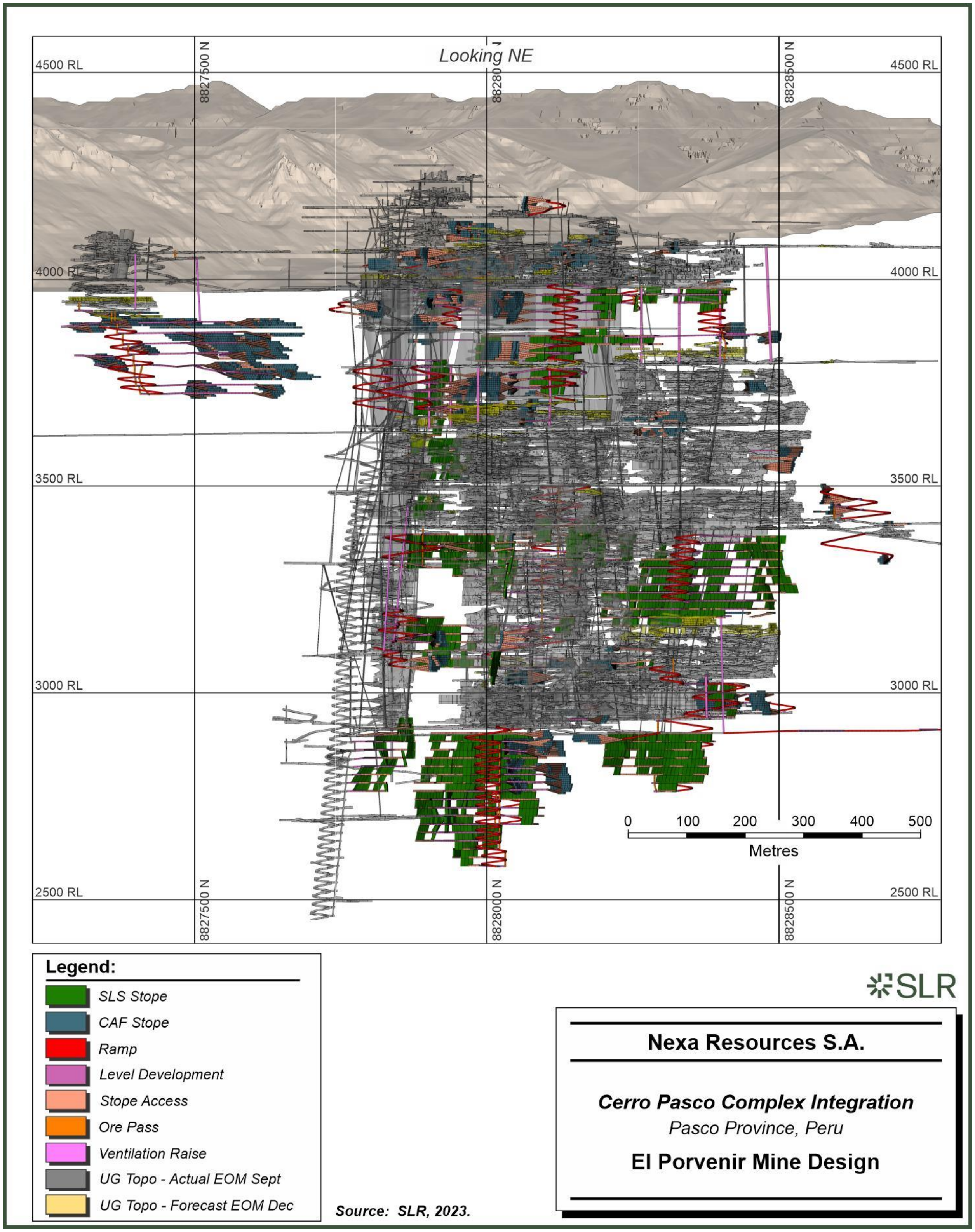
Item	Unit	CAF	SLS
Stope Design Parameters			
Min. Mining Width	m	5	4
Max. Mining Width	m	10	8
Length	m	4	10
Height	m	5	20
Development Design			
Main Ramps and Ore access	mH x mW	4.5 x 4.5	
Level development	mH x mW	4.0 x 4.0	
Ventilation Raise	m dia.	3.1	
Ore Pass	m dia.	2.1	

Figure 13-1: Atacocha Mine Design



Source: SLR, 2023.

Figure 13-2: El Porvenir Mine Design



Source: SLR, 2023.

13.1.3 Mining Method

Ore from El Porvenir is predominantly mined using overhand CAF mining methods, which accounts for approximately 80% of total production. SLS makes up the remainder of ore production. SLS was introduced to El Porvenir in 2018 and is planned to be used more extensively where the geometry of mineralization is amenable to this mining method. The same mining methods were used at Atacocha before the mine closure in 2020 and will continue to be used over the planned LOM.

The ore produced in the CAF and SLS stopes is transported to and dumped in orepasses by load-haul-dump units (LHDs). These orepasses extend to the 2,900 track haulage level where the ore is pulled from chutes and loaded onto mine cars. The mine cars dump at an orepass grizzly, and the ore is transferred to the shaft's loading pocket on the 2,500 Level. From there, the ore is loaded onto skips and hoisted via the shaft to the ore dump. After being discharged at the dump, the ore is transferred to the underground primary crusher. Crushed ore is transported to the surface and the processing plant via a conveyor in an inclined drift.

13.1.3.1 Overhand Cut and Fill

CAF mining is completed using horizontal cuts following the strike of the orebody. Each mining panel consists of four to five cuts. The first cut will be mined on the lowest level of each panel and subsequent cuts will be mined in an ascending manner. Once a cut is mined, it is backfilled with a combination of unconsolidated backfill from waste development and hydraulic fill using tailings. The cut is backfilled, leaving a one-metre gap between the next cut. The gap provides a free face to allow for efficient blasting for the next cut and also provides a platform on which the next cut can be mined.

The mining panels are accessed via 4.5 m x 4.0 m attack ramps that branch off the main ramp. The first ramp is driven at a gradient of -15% and each subsequent ramps are driven off the first attack ramp at a gradient of 15%. In order to mitigate dilution from backfill, red markers are placed along the walls of each cut, just above the planned backfill height, to provide a visual cue to operators when the cuts are being mined out.

In the SLR QP's opinion, the CAF mining method is well suited for the mines given the irregular and sinusoidal nature of the veins present at both Atacocha and El Porvenir. CAF allows for a greater level of selectivity and ability for operators to reduce dilution. CAF mining method setup is presented in Figure 13-3.

13.1.3.2 Sub-level Stoping

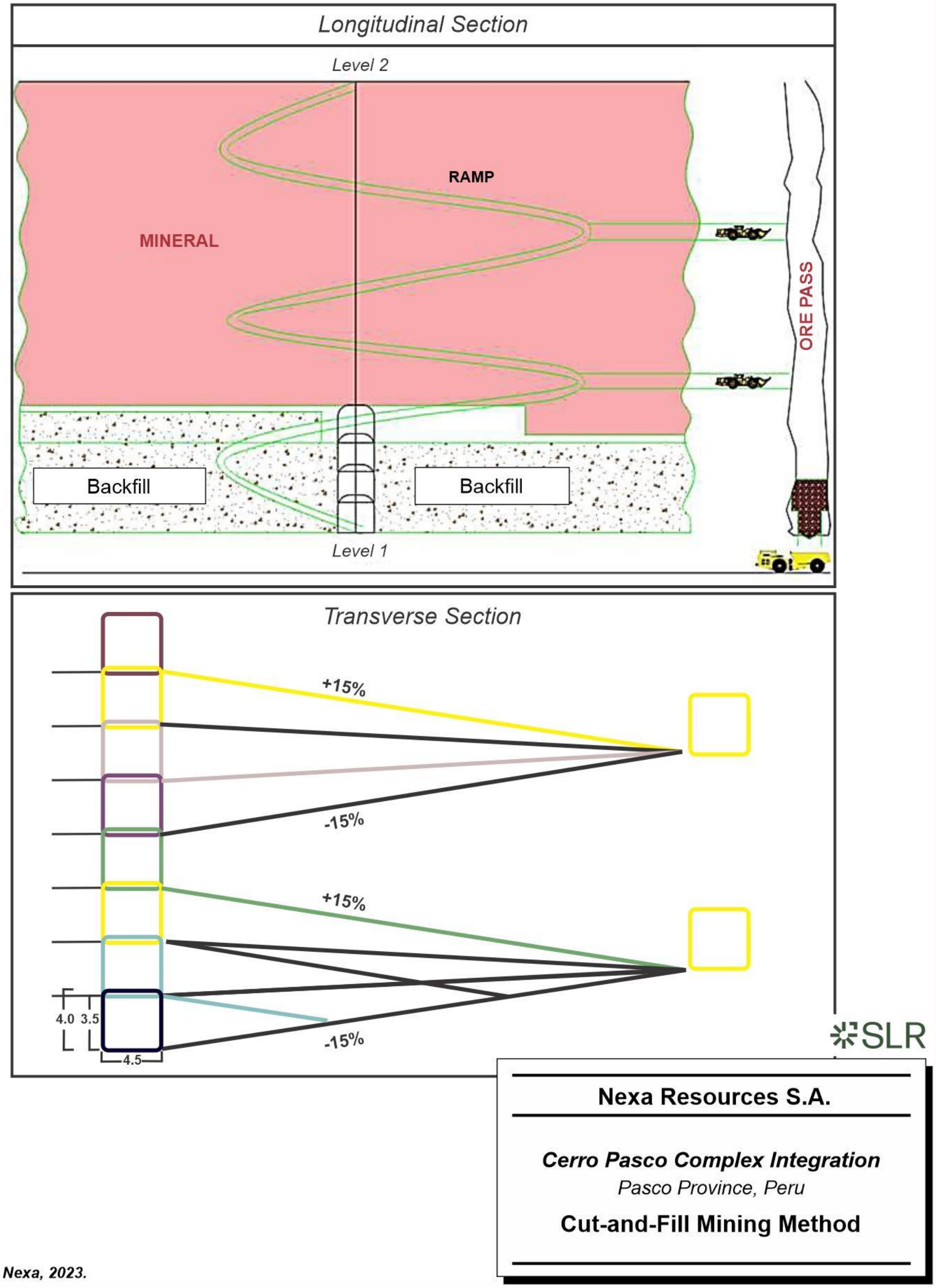
SLS is used only in areas where the veins are steeply dipping and have fairly constant strike directions. Two variations of SLS mining methods called Avoca and modified Avoca are used at the Atacocha and El Porvenir underground mines.

The Avoca method consists of developing ore drives at the bottom and top of the level in operation to provide mucking and drilling accesses. The level is typically accessed in the middle and the drives are developed along the length of the veins. A separate footwall drive is developed at the top of the level to access the end of the vein. This drive will be used for backfilling. Stopes are mined starting from the end of the vein and retreating towards the middle access. As mining progresses in retreat, the mined out stopes can simultaneously be backfilled via the top footwall access. This setup allows for high productivity rates as drilling, mining, and backfilling activities can happen at the same time. However, this method requires more development.

The modified Avoca approach eliminates the use of a top footwall access for backfilling and instead uses the middle access on top of the level. Using this approach, mining activities must stop while the stopes are being backfilled.

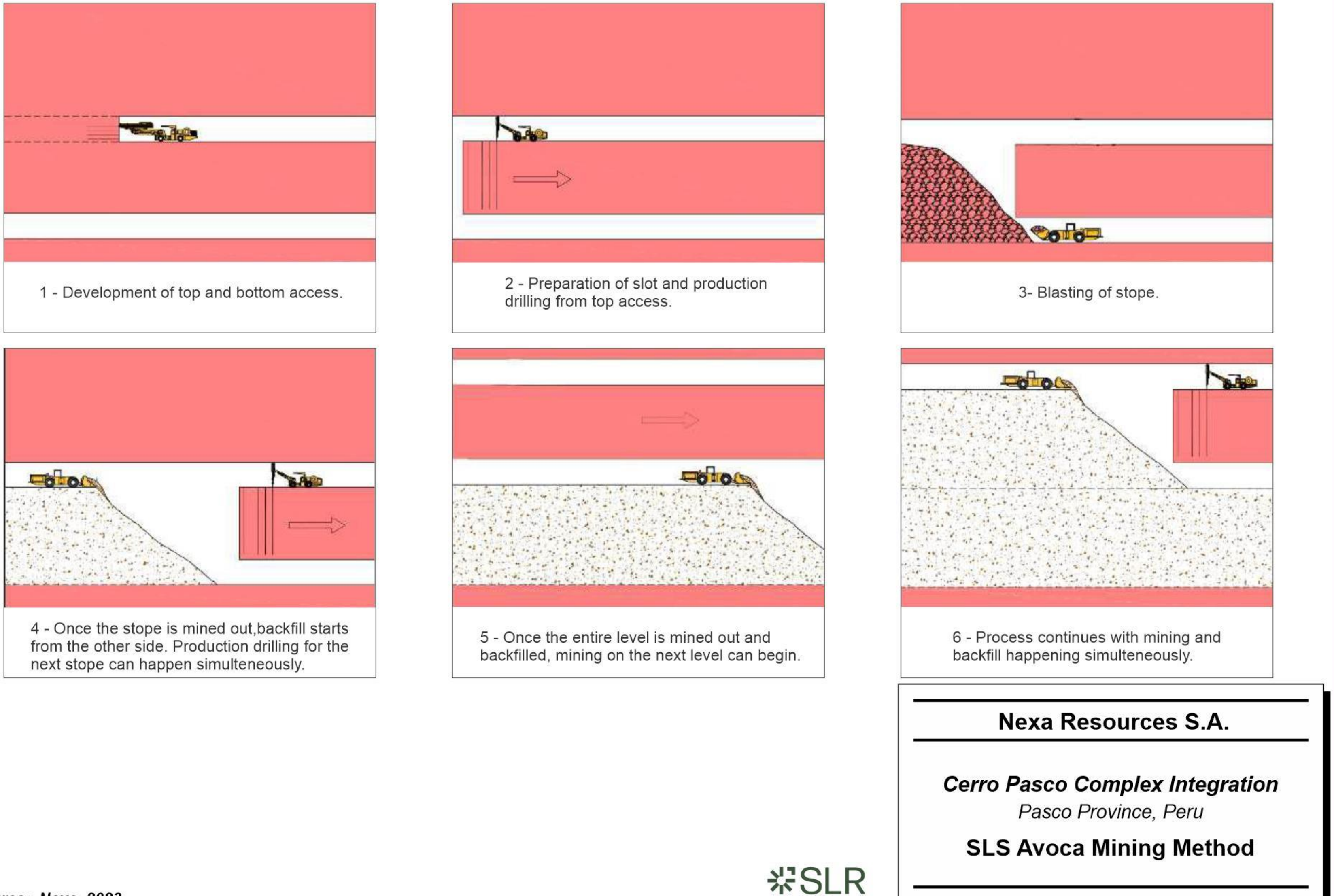
Nexa uses the Avoca method for veins with long strike lengths to provide working areas with high productivity rates and uses modified Avoca for veins with short strike lengths to reduce development requirements. The Avoca mining method sequence is presented in Figure 13-4.

Figure 13-3: Cut-and-Fill Mining Method



Source: Nexa, 2023.

Figure 13-4: SLS Avoca Mining Method



Source: Nexa, 2023.

13.1.4 Geotechnical Considerations

The underground mine design for El Porvenir is based upon the geotechnical study described in BISA, 2022, and summarized in this section.

Geotechnical data collection for El Porvenir includes window mapping at 51 locations, 11 line mapping surveys of underground exposures, and relogging of 18 historical drill holes including 1,372 m of core.

The rock mass at El Porvenir has been classified according to Bieniawski's Rock Mass Rating System (RMR) (Bieniawski, 1989) and converted to Barton's Q-System (Barton et al., 1974), and the Geological Strength Index (GSI) (Hoek et al., 1995) using established relationships.

Rock mass classification parameters derived from geotechnical mapping and logging for each of the geotechnical domains is presented in Table 13-2.

Table 13-2: El Porvenir Rock Mass Classification

Geotechnical Domain	RMR				Q-System			
	Ave.	Std. Dev.	Min.	Max.	Ave.	Std. Dev.	Min.	Max.
Mineralized Vein	53	3.8	49	57	0.875	0.301	0.574	1.335
Skarn	54	5.7	48	60	1.000	0.469	0.531	1.884
Limestone	54	5.3	48	59	0.946	0.421	0.525	1.705
Intrusive	50	6.2	43	56	0.611	0.304	0.307	1.216
Breccia	28	3.4	25	31	0.056	0.018	0.038	0.081

Geotechnical laboratory testing was completed on representative samples from each of the lithologies including physical density, Uniaxial Compressive Strength (UCS), direct shear testing of discontinuities, Triaxial Compressive Strength (TCS), and elastic properties Young's modulus and Poisson's Ratio. Samples for the limestone and ore rocks were collected from rock blocks, approximately 0.3 m x 0.3 m x 0.3 m in size, other samples were collected from diamond drill core.

The strength of the fill material was determined through Consolidated Undrained (CU) triaxial testing, classification according to the Unified Soil Classification System was completed through particle size distribution, and Atterberg limits testing.

The Hoek-Brown strength criterion was used to define the strength of the rock mass, presented in Table 13-3, for geotechnical analysis of the underground excavation. Properties were based upon analysis of the rock mass characterization and laboratory testing data. A disturbance factor, D, has been applied to account for disturbance of the rock mass due to blasting and excavation.

Table 13-3: El Porvenir Geotechnical Parameters

Geomechanical Domian	GSI	UCS (MPa)	Parameter mi	Unit Weight (kN/m^3)	Disturbance Factor D
Mineralized Vein	56	91	17	34.0	0.8
Skarn	57	82	29	34.2	0.8

Geomechanical Domian	GSI	UCS (MPa)	Parameter mi	Unit Weight (kN/m^3)	Disturbance Factor D
Limestone	57	112	22	26.5	0.8
Intrusive	53	60	28	28.7	0.8
Breccia	31	56	19	23.7	0.8

Induced stresses were assessed using the over-coring method during a study by INGEROC (2017 and 2018) allowing the magnitude and direction of the three principal stress components σ_1, σ_2 and σ_3 to be resolved through direct measurement with a triaxial strain gauge. A total of seven tests were completed. The results were verified through the use of the drill hole detonation method whereby the pattern of fracturing post detonation is used to estimate the minimum and maximum stress directions.

The stress magnitudes used for the evaluation of underground mine design are presented in Table 13-4.

Table 13-4: El Porvenir Stress Magnitudes Used for Geotechnical Evaluation

Sector	Zone	Level	Depth (m)	σ_3 vertical	σ_1 east-west	σ_2 north-south
Porvenir	Intermediate – High	3440	650	19.04	25.51	21.71
	Low	2995	1095	31.37	42.03	35.76
CN 3	Intermediate – High	3600	650	19.04	25.51	21.71
	Low	2995	1185	33.86	45.37	38.60
Éxito	Intermediate	3600	700	20.43	27.37	23.29
	Low	2995	1305	37.18	49.83	42.39
CN 1-2, Carmen, V5 Cola, V1204	Intermediate	3600	610	17.93	24.03	20.44

Numerical modelling of the behaviour of the rock mass at different stages of excavation was completed using Rocscience RS2 (2-dimensional) and RS3 (3-dimensional) finite element analysis software. This allows the stability of the excavation to be understood, and the Strength Reduction Factor (SRF) to be calculated, which can be considered to be equivalent to the Factor of Safety (FOS). The results of modelling indicate SRF values of less than 1 in the stope backs and advance ends due to high stresses and the stope walls due to tensile stress.

The stope dimensions were reviewed using the empirical charts developed by Potvin (1988), Potvin and Milne (1992), and Nickson (1992) following the work initiated by Mathews et al. (1981). Based on the analysis results BISA recommends the stope dimensions presented in Table 13-5.

Table 13-5: El Porvenir Recommended Stope Dimensions (from BISA, 2022)

Sector	Domain	Level	Maximum Longitudinal Span (m) for Height of:		Maximum Longitudinal Span (m) for Stope Width of:	
			20 m	23 m	5 m	6 m
CN 03	Limestone	3760	-	27	No Restriction	54
Éxito	Limestone	3650	-	27.4	No Restriction	54
Éxito	Limestone - Intrusive	3690	-	23.8	No Restriction	174
Porvenir 09	Limestone	2995	23	-	120	24
CN 03	Limestone	3120	20	-	120	24

Cablebolt spacing and lengths for stope support have been determined according to the method by Hutchinson and Diederichs (1996) using the charts developed by Nickson (1992). Recommendations for cablebolt support provided by BISA are presented in Table 13-6.

Table 13-6: El Porvenir Cablebolt Support Recommendations (From BISA, 2022)

Zone	Level	Domain	Description	N'	S (m)	N'/S	Cablebolt / m²	Mesh (m)	Length (m)
Porvenir 09	2995	Limestone	Roof	0.3	2.25	0.13	0.27 – 0.32	1.80 – 1.90	3.4
			Hangingwall	2.81	4.8	0.59	0.20 – 0.25	2.0 – 2.2	7.2
			Footwall	2.81	4.8	0.59	0.20 – 0.25	2.0 – 2.2	7.2
CN 03	3120	Limestone – Intrusive	Roof	0.3	2.1	0.14	0.27 – 0.32	1.80 -1.90	3.2
			Hangingwall	4.11	5.4	0.76	0.20 – 0.25	2.10 – 2.25	8.1
			Footwall	0.67	3.15	0.21	0.21 – 0.27	1.90 – 2.10	4.7
		Limestone	Roof	0.3	2.1	0.14	0.27 – 0.32	1.80 -1.90	3.2
			Hangingwall	4.11	5.6	0.73	0.18 – 0.25	2.0- 2.25	8.4
			Footwall	2.41	4.8	0.50	0.21 – 0.26	2.0 -2.2	7.2
	3760	Limestone	Roof	0.39	2.6	0.15	0.24 – 0.28	1.95 – 2.10	3.9
			Hangingwall	9.01	5.6	1.61	0.18 – 0.25	2.0 -2.2	8.4
			Footwall	4.47	5	0.89	0.20 – 0.25	2. -2.25	7.5
	3790	Intrusive	Roof	0.3	2.3	0.13	2.24 – 2.28	1.90 – 2.10	4.1
			Hangingwall	2.08	4.2	0.50	0.20 – 0.26	2.0 – 2.20	6.3
			Footwall	1.22	3.5	0.35	0.22- 0.28	2.0 – 2.2	5.3
Éxito	2995	Intrusive	Roof	0.7	2.7	0.26	0.24 – 0.28	1.90-2.10	4.1
			Hangingwall	2.55	5	0.51	0.18 0.25	2.0 – 2.25	7.5
			Footwall	1.68	4.15	0.40	0.20-0.26	2.05 – 2.20	6.2
	3650	Limestone – Intrusive	Roof	0.64	2.9	0.22	0.22 -0.258	1.95 – 2.15	4.4
			Hangingwall	5.89	5.6	1.05	0.18 – 0.25	2.0 – 2.2	8.4

Zone	Level	Domain	Description	N'	S (m)	N'/S	Cablebolt / m²	Mesh (m)	Length (m)
			Footwall	3.9	5.1	0.76	0.20 -0.25	2.0 -2.2	7.7
	3690	Limestone	Roof	0.64	2.9	0.22	0.22 -0.258	1.95 – 2.15	4.4
			Hangingwall	7.91	5.2	1.52	0.18 – 0.25	2.0 – 2.2	7.8
			Footwall	1.29	4	0.32	0.22 – 0.27	2.0- 2.15	6.0

Figure 13-5: El Porvenir Installation of Cablebolts for Veins Dipping Greater Than 80°

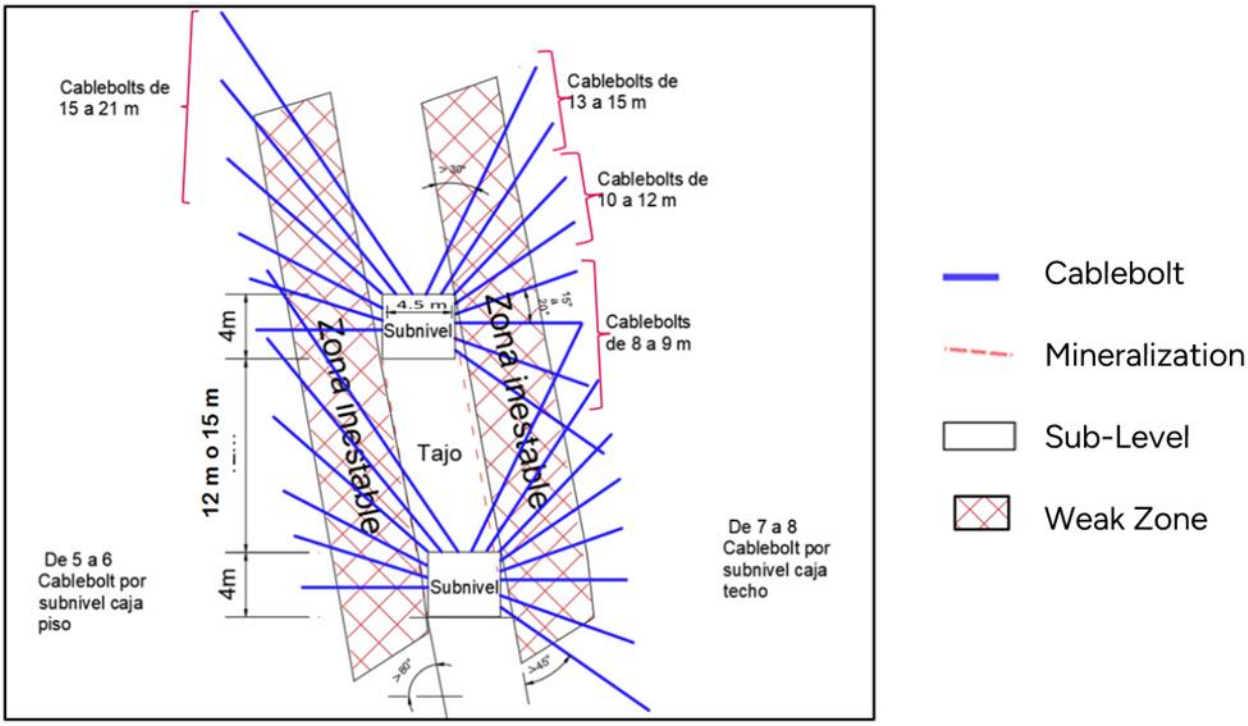
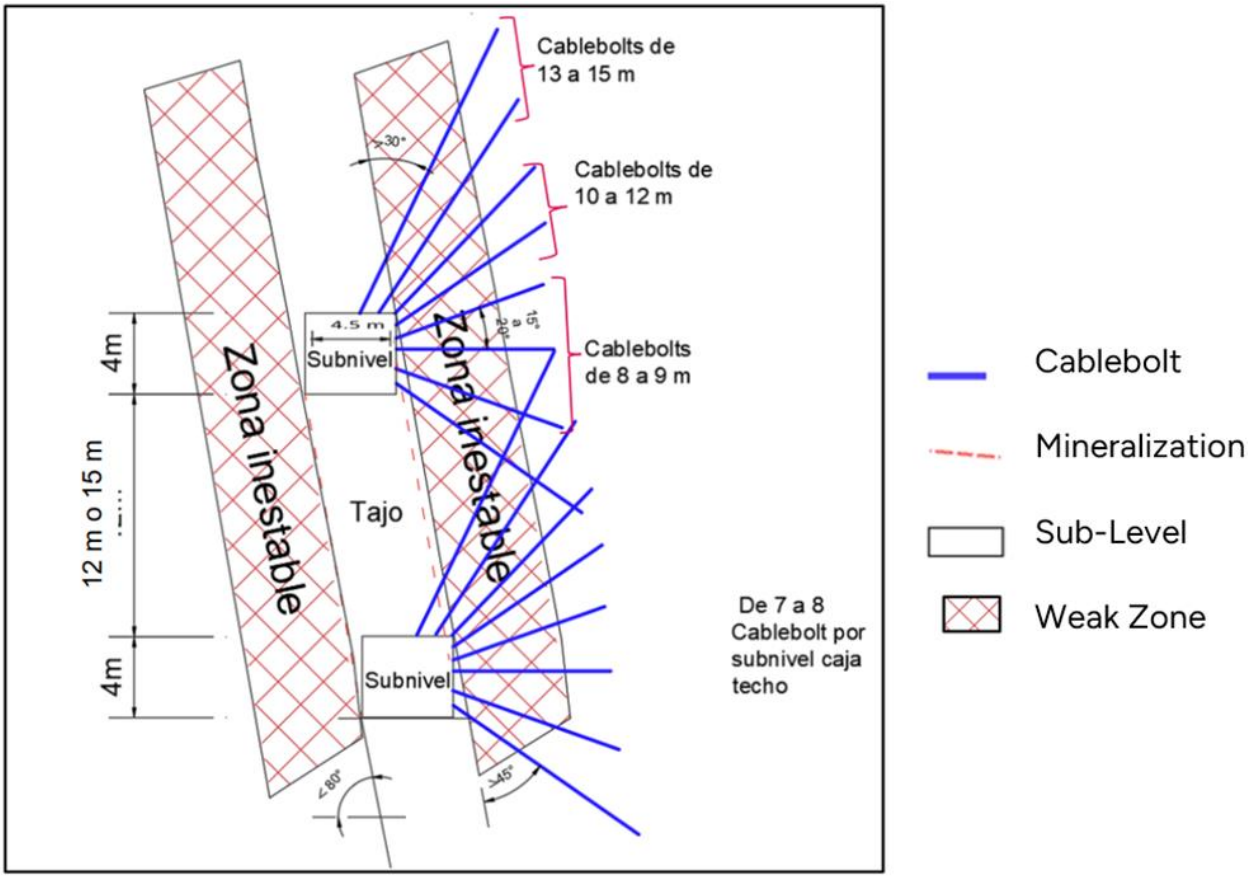


Figure 13-6: El Porvenir Installation of Cablebolts for Veins Dipping Less Than 80°



To determine the sill pillar thickness required for CAF mining, a sensitivity analysis was completed through numerical modelling using Rocscience RS2 finite element software for excavations backfilled with 25 m, 50 m, and 100 m of fill. The database of historic seismic events has also been interrogated to correlate the concentration of events with stopes that have already been mined and backfilled. As a result of this assessment, BISA recommends a filled column height of no greater than 100 m with a sill pillar thickness of 10 m between filled stopes.

In some areas, the mineralized structures bifurcate, which would require parallel mining with a waste rock pillar remaining between stopes. To account for this, the bench and fill variant of the bottom up cut and fill mining was assessed through numerical analysis based upon the following:

- Mining to comply with the excavation dimensions recommended using the Matthews stability chart
- Pillar width dimension to be a minimum of two times the stope width
- Mine the bottom panel first
- Mine the central panel after filling the lower panel
- Mine the top panel after the middle panel is filled

Development support requirements were determined from Q-System rock mass classification and the use of the Grimstad and Barton (1993) design charts. The developments must be assessed by a geotechnical engineer to define the rock class and degree of support required using Table 13-7 for permanent openings and Table 13-8 for temporary openings. Supports for intersections are presented in Table 13-9.

Table 13-7: El Porvenir Development Support for Permanent Openings

RMR Classification	Q-System Classification	GSI Index			Support
81 – 100	61 – 503	LF/B	-	-	Spot Anchor Bolts
61 – 80	6.61 – 54.6	LF/R	F/B	-	Systematic anchor bolts. 1.5m x 1.5m + electrowelded mesh
51 – 60	2.18 – 5.92	LF/P	F/R	MF/B	Systematic anchor bolts. 1.2m x 1.2m + electrowelded mesh
41 – 50	0.72 – 1.95	F/P	IF/B	MF/R	Shotcrete 2” + Systematic Anchor Bolts 1.5 m x 1.5 m
31 – 40	0.24 – 0.64	F/MP	IF/R	MF/P	Shotcrete 2” + Systematic Anchor Bolts 1.2 m x 1.2 m
21 – 30	0.08 – 0.21	IF/P	MF/MP	-	3” Shotcrete + Systematic Anchor Bolts 1.0 m x 1.0 m
0 – 20	0.01 – 0.07	IF/MP	-	-	2” shotcrete + falsework (spaced 1 to 1.2m apart)

Table 13-8: El Porvenir Development Support for Temporary Openings

RMR Classification	Q-System Classification	GSI Index			Support
81 – 100	61 – 503	LF/B	-	-	Spot Anchor Bolts
61 – 80	6.61 – 54.6	LF/R	F/B	-	Systematic anchor bolts. 1.5m x 1.5m + electrowelded mesh
51 – 60	2.18 – 5.92	LF/P	F/R	MF/B	Systematic anchor bolts. 1.2m x 1.2m + electrowelded mesh
41 – 50	0.72 – 1.95	F/P	IF/B	MF/R	Systematic anchor bolts. 1.1m x 1.1m + electrowelded mesh
31 – 40	0.24 – 0.64	F/MP	IF/R	MF/P	Shotcrete 2” + Systematic Anchor Bolts 1.2m x 1.2m
21 – 30	0.08 – 0.21	IF/P	MF/MP	-	3” Shotcrete + Systematic Anchor Bolts 1.0m x 1.0m
0 – 20	0.01 – 0.07	IF/MP	-	-	2” shotcrete + falsework (spaced 1 to 1.2m apart)

Table 13-9: El Porvenir Support for Intersections (Permanent Limestone and Temporary Ore Openings)

Geotechnical Domain	Q	Correction Factor	Q fixed for Intersections	Anchor Bolts (2.10m)	Shotcrete Thickness (in.)
Limestone	0.946	0.33	0.315	1 x 1 m	3
Mineralized	0.875	0.33	0.292	1 x 1 m	3

The following conclusions are drawn from the underground geotechnical analyses:

- Geomechanical domains have been delineated using lithological and structural wireframes.
- Rock mass characterization and structural data has been collected from mapping of underground openings and logging of historical drill core.
- Geomechanical testing has been completed to provide intact rock strength properties and joint strengths.
- Seismic hazard has been considered in underground mine for a 475-year return period earthquake.
- In situ stress has been estimated using the over-coring method and verified using the drill hole detonation method.
- Stope dimensions and cablebolt support have been defined using the Matthews stability chart method and verified using numerical modelling with Rocscience RS2 and RS3 software.
- Maximum filled stope height and sill pillar width requirements have been determined from numerical modelling using Rocscience RS2 and RS3 software.
- A mining methodology has been developed for mining of parallel stopes where the orebody bifurcates.
- Support requirements of permanent and temporary development has been provided using the Grimstad and Barton (1993) support chart.

13.1.5 Underground LOM Production

The underground LOM production plan for El Porvenir and Atacocha was prepared using Deswik software. The underground Mineral Reserve estimates support a LOM production plan of approximately 10 years. The LOM plan assumes that the Atacocha underground mine will be operational starting in 2027 and will ramp up from 0.5 Mtpa in 2027 to 1.0 Mtpa in 2029. The El Porvenir Mine will operate at current production rates until the Atacocha underground mine is operational. A lower production rate of 1.8 Mtpa is planned for 2026 due to a major upgrade scheduled for the El Porvenir processing plant.

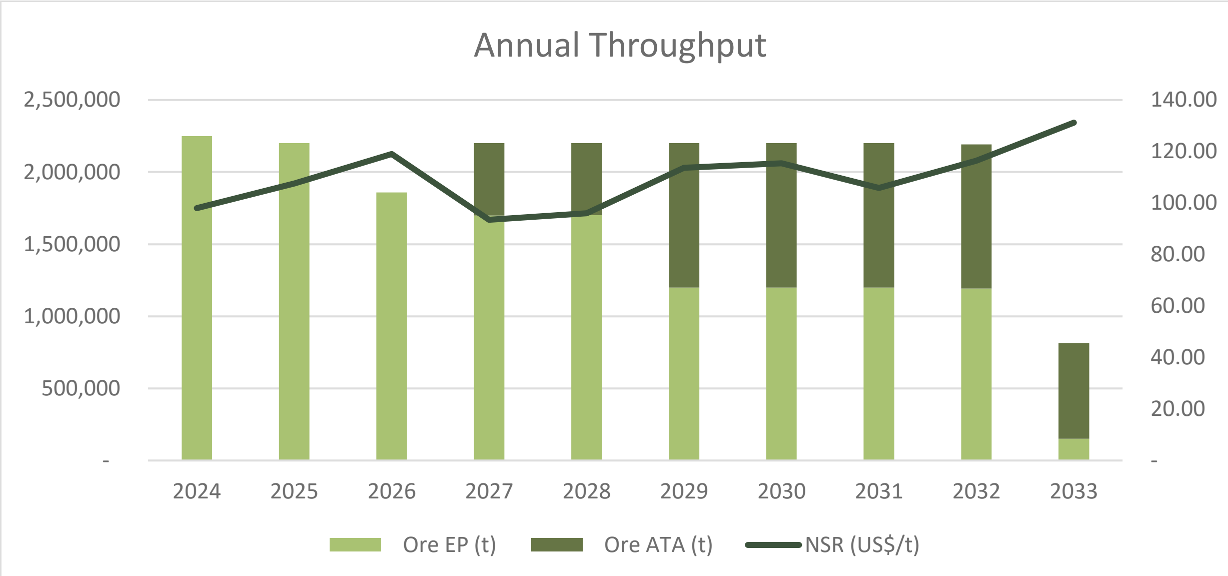
The LOM plan assumes stope mining rates of 1,500 tpd and 267 tpd and backfill rates of 860 tpd and 667 tpd for SLS and CAF stopes, respectively. Table 13-10 and Figure 13-7 show the LOM production plan for the Atacocha and El Porvenir underground mines.

Table 13-10: Atacocha and El Porvenir Underground Mines LOM Plan

	Units	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
El Porvenir												
Total Ore	kt	14,651	2,250	2,200	1,858	1,700	1,700	1,200	1,200	1,200	1,192	151
CAF	kt	5,550	1,043	932	1,265	630	458	387	300	351	142	42
SLS	kt	6,973	769	1,000	383	682	941	739	786	670	895	108
Ore Dev	kt	2,127	437	269	210	388	301	74	113	180	155	-
Avg Zn	%	4.11	3.71	3.84	3.37	3.92	4.22	4.28	4.43	4.18	6.03	4.24
Avg Pb	%	1.2	1.55	1.5	2	0.95	1.03	1.06	0.8	0.95	0.21	0.37
Avg Cu	%	0.23	0.21	0.22	0.12	0.22	0.22	0.2	0.26	0.25	0.45	0.31
Avg Ag	g/t	72.9	88.7	78.5	115.1	68.6	63.2	63.4	59.8	64.5	23.4	33.50
Atacocha												
Total Ore	kt	5,665	-	-	-	500	500	1,000	1,000	1,000	1,000	665
CAF	kt	4,386	-	-	-	453	244	808	942	707	846	387
SLS	kt	930	-	-	-	-	224	130	11	226	86	254
Ore Dev	kt	349	-	-	-	47	32	62	48	68	68	24
Avg Zn	%	4.33	-	-	-	3.26	3.28	4.06	4.05	4.27	4.82	6.16
Avg Pb	%	1.34	-	-	-	1.93	1.09	1.36	1.54	1.28	1.29	0.90
Avg Cu	%	0.4	-	-	-	0.17	0.32	0.43	0.39	0.39	0.52	0.42
Avg Ag	g/t	79.8	-	-	-	111.9	85.3	78.1	92.7	69.8	78.3	52.26
Total												
Total Ore	kt	20,316	2,250	2,200	1,858	2,200	2,200	2,200	2,200	2,200	2,192	816
CAF	kt	9,936	1,043	932	1,265	1,083	702	1,195	1,242	1,057	988	429
SLS	kt	7,903	769	1,000	383	682	1,165	869	797	895	981	362

	Units	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Ore Dev	kt	2,476	437	269	210	435	333	136	161	248	223	24
Avg Zn	%	4.17	3.71	3.84	3.37	3.77	4.01	4.18	4.26	4.22	5.48	5.80
Avg Pb	%	1.24	1.55	1.5	2	1.18	1.05	1.2	1.13	1.1	0.7	0.80
Avg Cu	%	0.28	0.21	0.22	0.12	0.21	0.24	0.3	0.32	0.32	0.48	0.40
Avg Ag	g/t	74.83	88.69	78.48	115.06	78.4	68.2	70.09	74.76	66.91	48.41	48.79
Development												
El Porvenir												
Capital Dev	m	59,611	4,950	9,438	11,622	7,429	7,119	7,647	8,308	2,886	213	-
Operating Dev	m	83,380	16,993	12,363	10,174	10,772	11,081	8,553	4,309	5,754	3,206	176
Total	m	142,992	21,943	21,801	21,795	18,201	18,200	16,200	12,616	8,640	3,418	176
Atacocha												
Capital Dev	m	48,086	-	-	2,660	6,513	6,704	8,017	11,986	9,880	1,797	530
Operating Dev	m	7,488	-	-	502	1,207	1,016	1,702	964	657	1,062	377
Total	m	55,574	-	-	3,162	7,720	7,720	9,720	12,950	10,537	2,859	907

Figure 13-7: Cerro Pasco Complex Integration LOM Production Plan



13.1.6 Infrastructure

13.1.6.1 Ventilation

Atacocha's and El Porvenir's ventilation systems together circulate approximately 50,000 m^3/min of airflow through the mines. The two mines are currently connected on two levels and part of the ventilation circuits are shared between them. Table 13-11 shows the fresh air intake and air exhaust locations and respective air flows at each of the monitoring points.

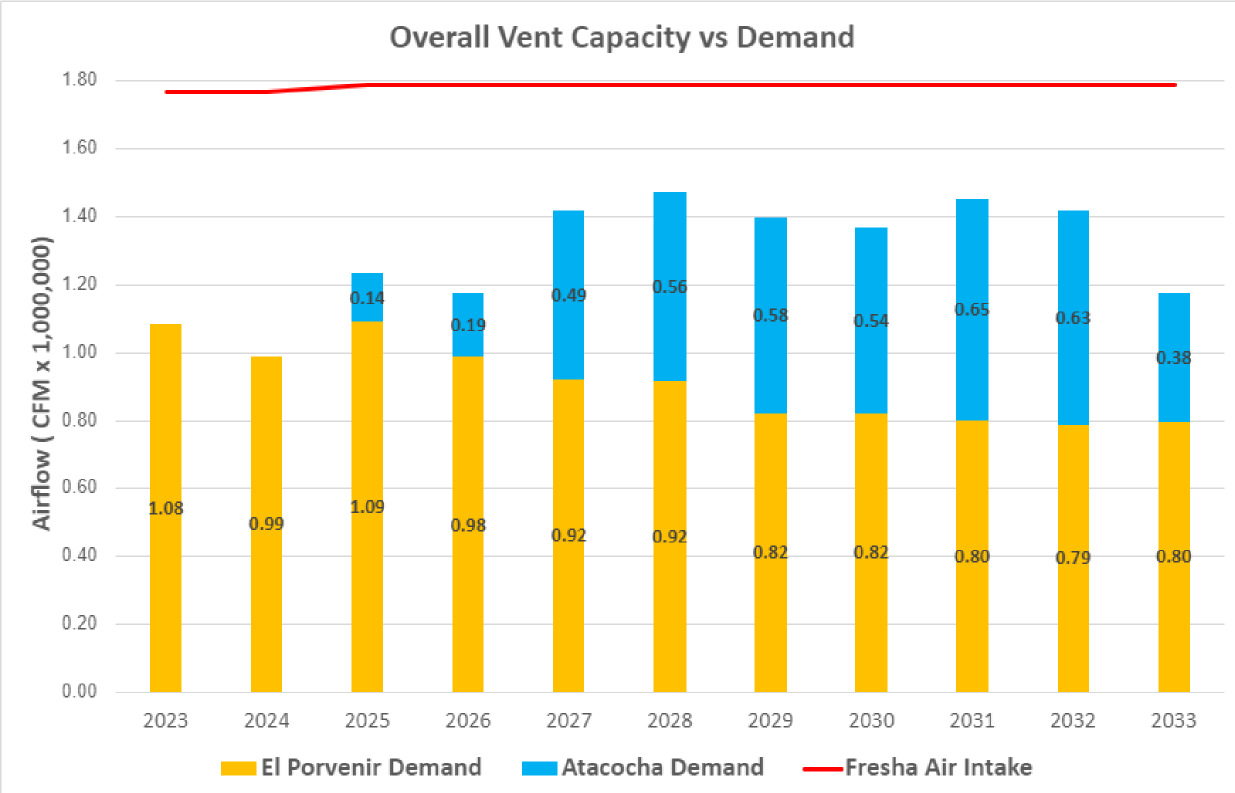
Table 13-11: Ventilation Balance

Air Intake Locations	Flow (m^3/min)	Air Exhaust Locations	Flow (m^3/min)
El Porvenir Mine			
Mine Entrance San Carlos 4070 level	2,225	Vent Raise 4120 level	592
Phase 1 Adit 4070 level	663	Vent Raise 4120 level	3,278
Main Drift 4170 level	3,465	Vent Raise 4240 level	2,900
Main drift 4120 level	1,754	Vent Raise 3970 level	5,412
Mine Entrance 4020 level	4,583	Vent Raise 4150 level	6,470
Porvenir II Ramp 3990 level	745	Tunnel n.° 1 sur - 1, 3100 level	665
Main Drift 4150 level	5,641	Tunnel n.° 1 sur - 2 2900 level	974
La Quiñua Tunnel 3620 level	4,751	Tunnel n.° 2 sur 3630 level	654
Connecting Drift to Atacocha 4070m level	1,628	Tunnel n.° 4 norte 3630 level	1,979
Connecting Drift to Atacocha 3370m level	4,290	Tunnel n.° 5 norte 3630 level	1,657
Don Ernesto Raise 4050 level	1,637	Alimak 2 4150 level	7,423

Air Intake Locations	Flow (m^3/min)	Air Exhaust Locations	Flow (m^3/min)
Mine Portal 4090 level	577	Alimak Don Ernesto 4250 level	2,228
El Porvenir Intake	31,959	El Porvenir Exhaust	34,232
Atacocha Mine			
Mine Portal 3900 level/Main Ramp	2,966	Mine Portal 4000 Level - San Ramon	1,101
Mine Portal 3600 Level - Portaro	1,240	Mine Portal 4020 level	3,926
Mine Portal 3600 Level - Don Paco	1,778	Alimak 392	1,599
Vent Raise 77	459	Mine Portal 4103 level	881
3620 Level	3,431	RB OP-1	3,396
Mine Portal 3950 Level	310	Tunnel 3300 level to El Porvenir	2,006
Mine Portal 3570 level	2,765	Tunnel 4050 level to El Porvenir	1,436
Mine Portal 4050 level	2,853	Mine Portal 4226 level OP-2	2,355
Mine Portal 4154 level	1,757	RB 140	1,547
Mine Portal 4218 level	1,099		
Atacocha Intake	18,658	Atacocha Exhaust	18,247
Total Intake	50,617	Total Exhaust	52,479

JCI Ingenieria & Servicios Ambientales (JCI) has completed a review of the ventilation in September 2023 and analyzed the planned demand based on future production. The analysis considered the number of people working in the mines, utilization ratios of diesel equipment, and requirements for maintaining an adequate temperature level in working areas. The results are presented in Figure 13-8. The air flow requirements are expected to reach a maximum of 1.50 million cubic feet per minute (Mcfm) which is equivalent to approximately 42,500 m^3/min. The current ventilation system is able to cover 117% of the maximum demand, however, JCI estimates that additional auxiliary fans will have to be added to the current ventilation network to supply all of the working areas.

Figure 13-8: Planned Ventilation Requirements



Source. Nexa, 2023

13.1.6.2 Mine Water Drainage

The pumping system at Atacocha is carried out in two areas: Atacocha and Santa Bárbara. Mine and surface water from San Gerardo drains into the Atacocha underground mine, where it is collected in settling sumps and subsequently reports by gravity to the Don Paco tunnel at the 3,600 m elevation. Water collected in the Atacocha area is pumped through five pumping stations from the 2940 Level to 3600 Level, while water from the Santa Bárbara area is pumped through one station from the 3420 Level to 3600 Level, wherefrom it is sent to the Atacocha processing plant for filtration. The mine dewatering system has a design capacity of 120 L/s.

El Porvenir's dewatering system discharges water via the La Quinua tunnel. Mine water occurring above the tunnel's elevation drains to it by gravity via drain holes. Water occurring in the levels below the tunnel is pumped to it by the mine's pumping system. The water occurring in the stopes, sub-levels, and work headings flows by gravity or is pumped to the auxiliary sumps present on each sub-level. The water is then conducted via drain holes and ditches to one of the main sumps and pumping stations.

Each pumping station has three stationary, multi stage pumps with a pumping capacity between 70 m^3/h and 90 m^3/h. Two pumps work alternatively, with one pump on standby. The pumping system uses 10” diameter Schedule 80 steel pipes.

13.1.7 Mine Equipment

The current mine equipment list is presented in Table 13-12. Since only the El Porvenir Mine is currently in operation, most of the active equipment is located at El Porvenir. Nexa has included in its capital expenditure budget the purchase of additional equipment to support the re-opening and operation of the Atacocha underground mine. Contractors are responsible for providing and maintaining their respective equipment.

Table 13-12: Mine Equipment List

Type	Make	Model	Nexa	Contractors						
				Ferreyros	Seprocal	Iesa	Miro Vidal	Unicon	Orica	Others
LHD	Caterpillar	R1300		1						
LHD	Caterpillar	R1600		9	4	6	1			
Jumbo	Sandvik	DD321	3							
Jumbo	Sandvik	DD421	2							
Jumbo	Sandvik	DD411	1							
Jumbo	EPIROC	Boomer S1D			4	5				
Scaler	BTI		5							
Scaler	Resemin					2				
Scaler	Paus				4	3				
Bolter	MacLean	MEM-946 & 975	3							
Bolter	Sandvik	DS 411, 421 & 312	3							
Bolter	Resemin	Bolter 99			3	5				
ANFO Loader	Normet	SF 505							5	
Forklift	Caterpillar						3			
Dump Trucks	VOLVO	FM500 6X4R				3	16			
Dump Trucks	EPIROC	MT2010				1	1			
Dump Trucks	EPIROC	MT2200				1				
Dump Trucks	Atlas Copco	MT-2010/2011			3					
Shotcrete Sprayer	Putzmeister	Wetcret SPM 4210						5		
Shotcrete Mixer	Putzmeister	Mixkret4						11		
Utility Trucks	Toyota	Hilux	4	2	12	16	8	6	6	36
Utility Trucks	Isuzu				3	4	1	1	2	3
Grader	Caterpillar						2			
Manitou					3	4	3			2

13.1.8 Personnel

The mine personnel will be a combination of Nexa workforce and contractors. A list of the mine personnel is shown in Table 13-13.

Table 13-13: Mine Personnel

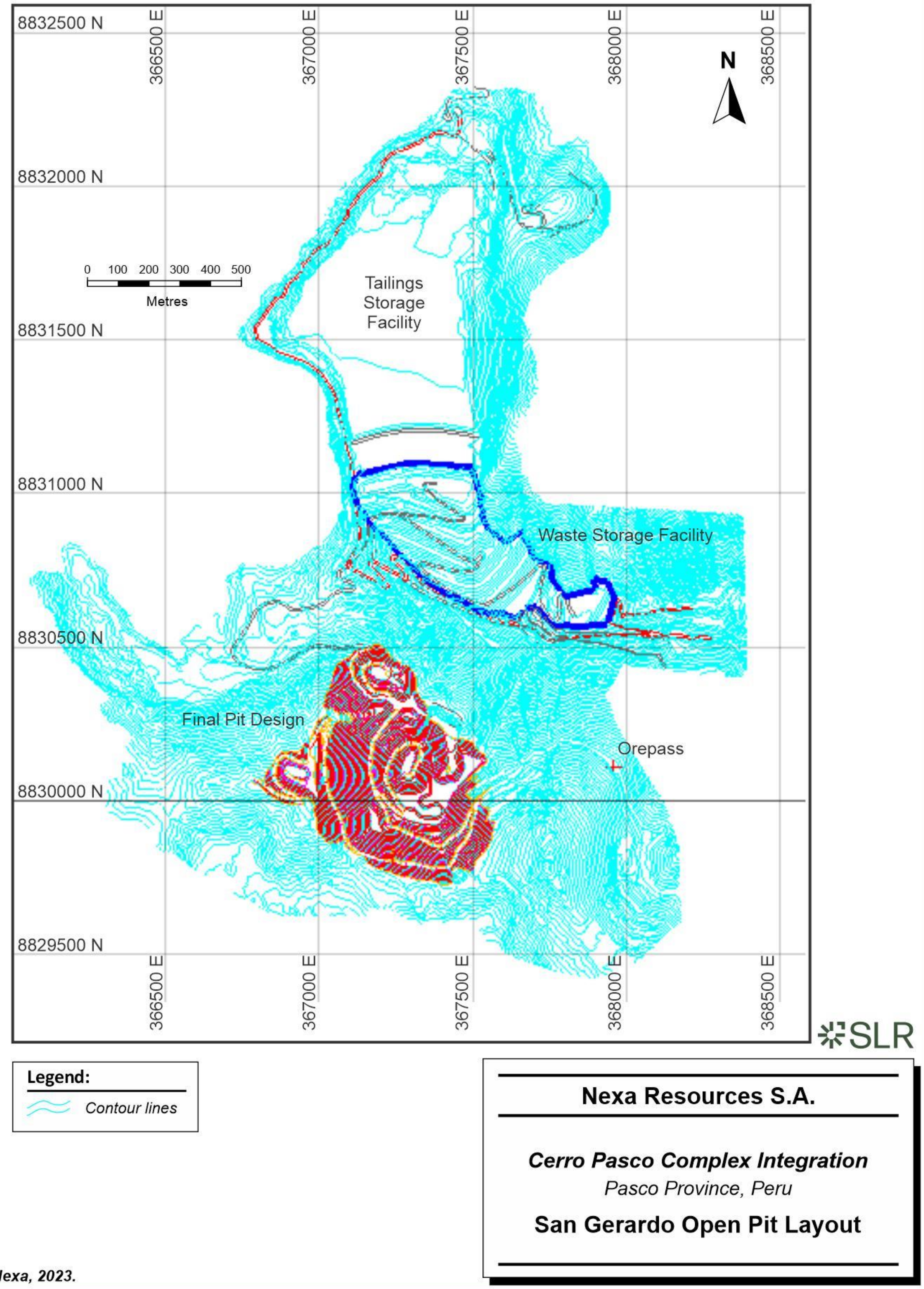
Company	Area	Number
Nexa	Mine Geology	23
	Underground Mine	219
	Technical Services	32
	Maintenance	128
	Supervision	23
Explomin	Infill Drilling	50
Exsa	Explosives nd Blasting	67
IESA	General Mine Services	363
Miro Vidal	Ramp Maintenance	38
	Auxiliary Services	193
	Ore and Waste Transport	82
Seprocal	Stope Mining	260
Tumi	Raise bore	15
Unicon	Shotcrete	128
Total		**1,621**

13.2 Atacocha Open Pit (San Gerardo)

San Gerardo is a conventional open pit drill and blast operation using excavators and trucks operating on bench heights of six metres. The open pit is operated by a contractor, that provides operators, equipment, and ancillary facilities required for the mining operation.

Mill feed material produced by San Gerardo is hauled to the orepass at the east of the pit that reports to the 3600 Level of Atacocha UG, where it is trammed by locomotive and rail car to the Atacocha plant. Waste is hauled to the San Gerardo waste dump, which is adjacent to the Atacocha TSF dam. Average single direction haul distances for ore and waste are approximately 1.0 km and 4.7 km, respectively. Figure 13-9 presents open pit location and waste dump location.

Figure 13-9: San Gerardo Open Pit Layout



Source: Nexa, 2023.

13.2.1 Open Pit Design

A pit design was created based on the NPV Scheduler output shell using Deswik mine planning software in four phases. The final pit outline with topography and phases is presented in Figure 13-10.

The San Gerardo pit is excavated with variable pit floor elevations and an ultimate pit bottom at 4,114 MASL. Ramps are 12 m wide at a 10% gradient that allow bi-directional haul truck travel. The mine is designed with a six-metre bench height, utilizing 127 mm vertical drill holes on 4.8 m x 5.8 m drill pattern with 0.5 m of sub-drilling.

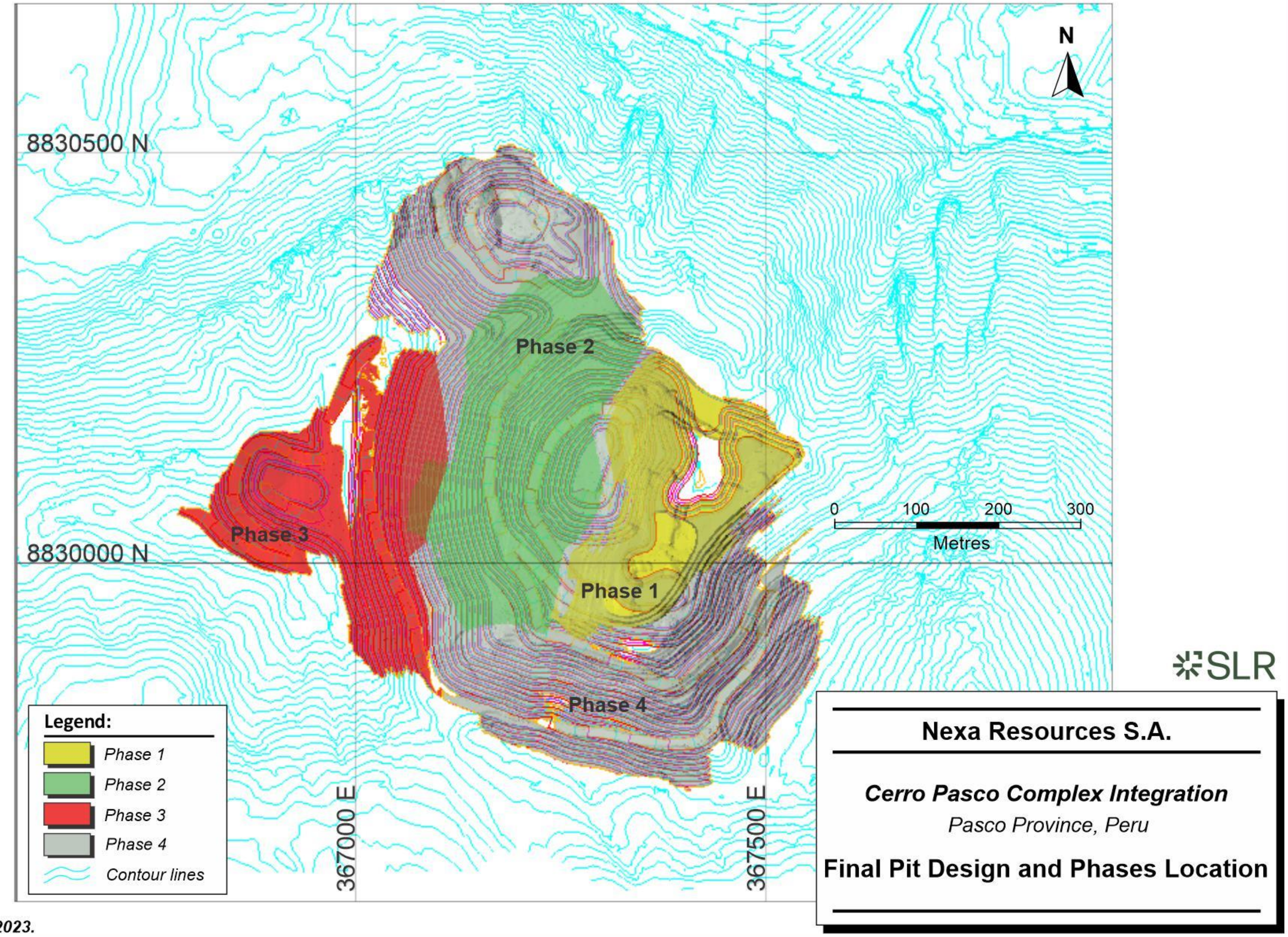
13.2.2 Geotechnical Considerations

A geotechnical study was completed by SRK in February 2019. The analyses utilized data including diamond drill core inspections, mapping of exposed pit walls and the surrounding area, and laboratory testing of rock properties. Slope and bench design parameters were updated by Nexa in 2023 for each geotechnical domain, which are summarized in Table 13-14 with geotechnical domain sectors illustrated in Figure 13-11. Pit slope design outside of the domain sectors was assumed to be 45 degrees for design and this assumption is considered low risk based on the wall height of the north and west satellite pits.

Table 13-14: Pit Slope Domain Sectors Parameters

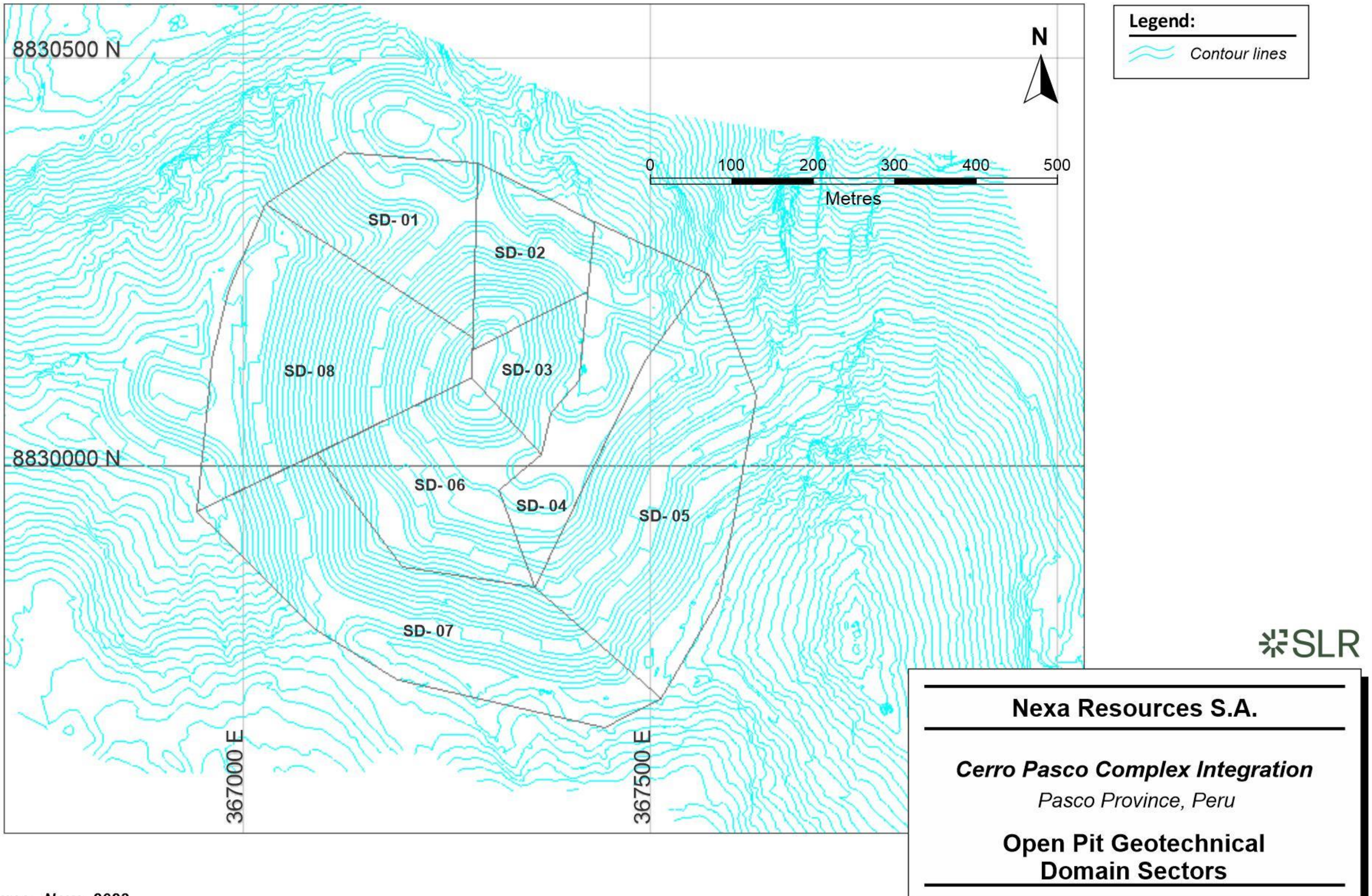
Pit Slope Domain Sectors	Overall Slope Design Parameters		Inter-ramp Design Parameters		Bench Design Parameters		
	Overall Slope (°)	Max Slope Height (m)	Slope (°)	Max Slope Height (m)	Bench Height (m)	Bech Face Angle (°)	Berm Width (m)
SD-01	40	250.0	45	60	6.0	65°	4.0
SD-02	43	165.0	47	60	6.0	65°	3.2
SD-03	42	110.0	46	60	6.0	65°	3.6
SD-04	45	80.0	46	60	6.0	65°	3.6
SD-05	39	170.0	45	60	6.0	65°	4.0
SD-06	39	150.0	45	60	6.0	65°	4.0
SD-07	45	70.0	45	60	6.0	65°	4.0
SD-08	40	270.0	45	60	6.0	65°	4.0

Figure 13-10: Final Pit Design and Phases Location



Source: Nexa, 2023.

Figure 13-11: Open Pit Geotechnical Domain Sectors



Source: Nexa, 2023.

13.2.3 Open Pit LOM Production Schedule

Nexa has prepared the open pit production schedules. Table 13-15 shows open pit mine production including tonnages and grades for each metal contained on a 100% basis. Copper grade was included as part of the open pit LOM production report, however, the NSR calculation does not include copper recovery.

The production schedules are based on Proven and Probable Mineral Reserves only. No Inferred Mineral Resources were used in the production schedules.

The open pit LOM production for San Gerardo was prepared using Deswik software. The open pit Mineral Reserve estimate supports an open pit LOM production plan of approximately four years before the underground mine starts production in 2027. Total material mined does not exceed 10 Mtpa (approximately 27 ktpd).

Open pit mining operating costs are defined as constant values for pit optimization. However, for the cash flow, there is a variable component associated with the haulage distance of the open pit mining costs that requires a truck haulage distance forecast in the LOM plan. The LOM plan should include a truck haulage distance forecast.

Table 13-15: Open Pit Life of Mine Production Schedule

Atacocha	Units	Total	2024	2025	2026	2027
San Gerardo						
Mill Feed	t	4,379,705	1,240,719	1,305,750	1,108,584	724,652
Zn	%	0.99	0.86	0.81	1.18	1.26
Pb	%	1.15	0.98	1.09	1.23	1.40
Cu	%	0.03	0.03	0.02	0.04	0.05
Ag	g/t	34.94	32.91	31.04	36.03	43.75
Au	g/t	0.27	0.36	0.36	0.19	0.09
Waste	t	21,323,607	8,771,261	6,802,299	4,500,000	1,250,048
Total		**25,703,312**	**10,011,980**	**8,108,048**	**5,608,584**	**1,974,700**
W/O Ratio		**4.9**	**7.1**	**5.2**	**4.1**	**1.7**

13.2.4 Infrastructure

Open pit truck shop and contractor facilities are located to the west of the current pit at approximately 4,300 MASL. Relocation of these facilities will be required to mine phase 4 to reach the final pit design.

Mine rock disposal is downstream of the existing Atacocha TSF dam. The access road from the open pit to the waste rock storage facility is operational. The Atacocha TSF dam study has been prepared by Ausenco (Ausenco, 2018a), including roads to raise the dam to the elevation of 4,180 MASL.

An orepass is connecting the open pit to the 3600 Level of Atacocha UG, wherefrom mill feed material is trammed by locomotive and rail car to the Atacocha plant.

13.2.5 Mine Equipment

San Gerardo surface mining is carried out by contractor (PEVOEX Contratistas Sac.), including drilling, blasting, loading, hauling, and support.

Loading is with excavators ranging from 3.4 m^3 to 6 m^3 and haulage of ore and waste is by 24 m^3 and 26 m^3 trucks respectively. Table 13-16 presents a summary of the contractor equipment list.

Table 13-16: Open Pit Mine Equipment List

Manufacturer	Model Type	Equipment Type	Quantity
Caterpillar	395JC	6 m^3 Excavator	1
Caterpillar	374FL	4.2 m^3 Excavator	1
Caterpillar	349D	3.4 m^3 Excavator	1
Sandvik	DP 1500i	Production Drill 4”-6”	2
Volvo	FMX8x4R	26 m^3 Haul Truck	8
Mercedez	AROCS 4151K	24 m^3 Haul Truck	7

13.2.6 Personnel

The Atacocha open pit personnel is made up of the mine owner employees and a significant number of contract employees as presented in Table 13-17.

Table 13-17: Open Pit Mine Personnel

Company	Area	Number
NEXA	Open Pit Mine Administration	2
NEXA	Mine Geology	14
Contractors		
PEVOEX CONTRATISTA S.A.	Open Pit Mining Contractor	194
FAMESA	Explosives Loading and Transport	7
SINCO	Waste Dump Construction Supervision	3
Total		**220**

13.3 Consolidated Life of Mine Plan

Nexa prepared production schedules for the two underground mines, El Porvenir and Atacocha UG, and a production schedule for the San Gerardo open pit mine. The Mineral Reserves will be processed in two different plants. San Gerardo open pit material is processed at the Atacocha processing plant ending in 2027. Ore from the current El Porvenir underground mine is processed at the El Porvenir plant and the Atacocha underground ore will be processed at the El Porvenir processing plant starting in 2027.

13.3.1 Scheduling Assumptions

The production schedules are based on Proven and Probable Mineral Reserves only. No Inferred Mineral Resources were used in the production schedules.

The input assumptions for the Mineral Reserves were adjusted based on current mine and production performances including throughput rates and recoveries.

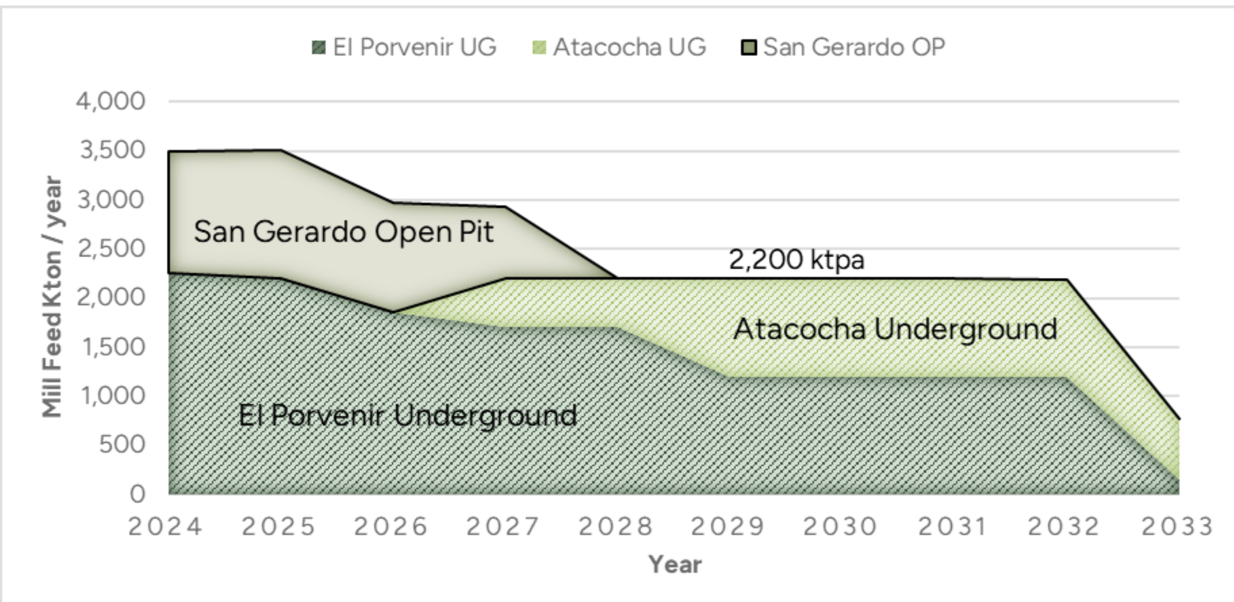
The LOM plan assumes that Atacocha UG will be operational starting in 2027 and will ramp up from 0.5 Mtpa in 2027 to 1.0 Mtpa in 2029. The El Porvenir Mine will operate at current production rates until Atacocha UG is operational. A lower production rate of 1.8 Mtpa is planned for 2026 due to a major maintenance scheduled for the El Porvenir shaft (Pique Picasso).

The LOM plan assumes stope mining rates of 1,500 tpd and 267 tpd and backfill rates of 860 tpd and 667 tpd for SLS and CAF stopes, respectively.

13.3.2 Mine Production and Processing Schedule

Figure 13-12 shows total mine production and the tonnages and grades for each mine on a 100% ownership basis.

Figure 13-12: Life of Mine Plan



The Atacocha processing plant will be running until the last year of operation of San Gerardo open pit in 2027. The El Porvenir plant will operate at a production rate of 1.8 Mtpa during 2026 due to a major upgrade scheduled for the processing plant. Based on the current Mineral Reserves, El Porvenir plant will finish processing underground ore in 2033.

A combined processing schedule will be limited to 2.2 Mtpa from 2028, after the San Gerardo open pit and Atacocha plant final year of the operation. Figure 13-13 shows the El Porvenir and Atacocha plant production schedules and mill feed annual rates.

Figure 13-13: Plant Production Schedule

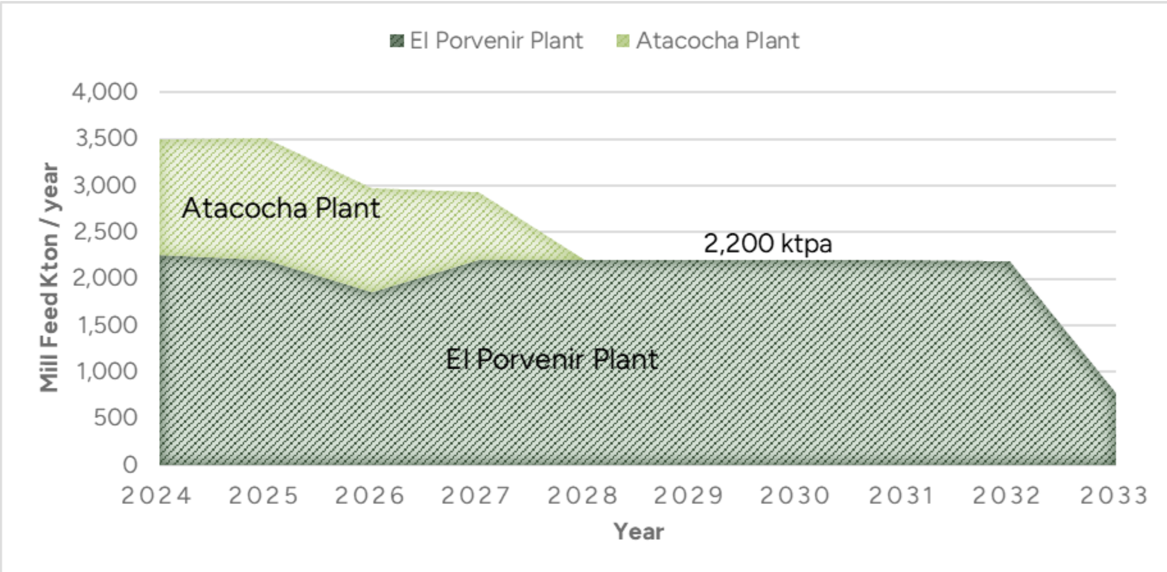


Table 13-18 presents a consolidated production schedule including Atacocha and El Porvenir underground mines, to be processed by El Porvenir plant, and Table 13-19 presents a production schedule for the open pit mine, to be processed by Atacocha plant.

Table 13-18: El Porvenir Plant Consolidated Underground Life of Mine Plan (100% Basis)

	Units	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Atacocha & El Porvenir UG Mill Feed - El Porvenir Plant												
Total Ore	kt	20,316	2,250	2,200	1,858	2,200	2,200	2,200	2,200	2,200	2,192	816
Avg Zn	%	4.17	3.71	3.84	3.37	3.77	4.01	4.18	4.26	4.22	5.48	5.80
Avg Pb	%	1.24	1.55	1.50	2.00	1.18	1.05	1.20	1.13	1.10	0.70	0.80
Avg Cu	%	0.28	0.21	0.22	0.12	0.21	0.24	0.30	0.32	0.32	0.48	0.40
Avg Ag	g/t	74.83	88.69	78.48	115.06	78.40	68.20	70.09	74.76	66.91	48.41	48.79

Table 13-19: Atacocha Plant Open Pit Life of Mine Plan (100% Basis)

	Units	Total	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
San Gerardo OP Mill Feed - Atacocha Plant												
Total Ore	kt	4,380	1,241	1,306	1,109	725	-	-	-	-	-	-
Avg Zn	%	0.99	0.86	0.81	1.18	1.26	-	-	-	-	-	-
Avg Pb	%	1.15	0.98	1.09	1.23	1.40	-	-	-	-	-	-
Avg Ag	g/t	34.94	32.91	31.04	36.03	43.75	-	-	-	-	-	-
Avg Au	g/t	0.27	0.36	0.36	0.19	0.09	-	-	-	-	-	-

14.0 Processing and Recovery Methods

14.1 El Porvenir

The concentrator at El Porvenir has an ore processing capacity of approximately 6,500 tpd, or 2.37 Mtpa, and consists of conventional crushing, grinding, and flotation to produce copper, lead, and zinc concentrates. The mineralogy is primarily sphalerite, galena and chalcopyrite, with associated pyrite, pyrrhotite, and limonite. Approximately 35% of the concentrator tailings are used for hydraulic backfill and the remainder is pumped to the TSF. El Porvenir copper and lead concentrates are sold to traders and delivered by road and rail to Callao, which is approximately 270 km by road, for shipping overseas. Zinc concentrate is transported by road and rail to Nexa's Cajamarquilla zinc refinery near Lima. El Porvenir is approximately 315 km from Lima by road.

14.1.1 Main Facilities

For a treatment of 6,500 tpd ore, the plant has the following unit operations (Table 14-1).

Table 14-1: Concentrator Plant Operation Stages

Stages	Metallurgical Operations	
Liberation of the sulphide minerals from the gangue material	Crushing	Primary Secondary Tertiary
	Milling	Primary Secondary Bulk & Zn Concentrate Regrinding
Concentration and Recovery of Valuable Sulphides	Flotation	Lead Unit Cells SK-240 Lead Flash Cells Bulk Circuit Pb-Cu Separation Circuit Zn Circuit
Concentrate Water Removal	Filtration	Lead Concentrate Copper Concentrate Zinc Concentrate
Product and/or Waste Management	Cyclone Classification	Underflow (35%) sent to Mine Overflow (65%) to TSF

14.1.2 Process Description

A simplified flowsheet for El Porvenir concentrator is provided in Figure 14-1. The concentrator processes on average approximately 6,500 t.

14.1.2.1 Primary, Secondary, and Tertiary Crushing

Primary crushing takes place underground at El Porvenir using a Hewitt Robins 30 in. x 42 in. jaw crusher. The product of the primary crusher with a top size of approximately 4.0 in. to 4.5 in. (100 mm to 125 mm) is transported by conveyor to the 30,000 t coarse ore stockpile at surface.

Ore is reclaimed from the coarse ore stockpile by two reciprocating feeders beneath the stockpile and transferred to a conveyor feeding a Metso primary double deck screen. Oversize from the two decks reports to the Sandvik 600 secondary cone crusher while the bottom deck screen undersize (P_{95} 9.5 mm) reports to the two 1,500 t grinding circuit feed bins. Secondary crusher product with a top size of 30 mm is conveyed to a three-way splitter that distributes the material to two Allis Chalmers 6 ft x 16 ft and one Metso 8 ft x 16 ft secondary double deck screens. Oversize material from the secondary screens is fed to two Sandvik CH 660 tertiary crushers, while bottom deck screen undersize (P_{95} 9.5mm) reports to the two grinding circuit feed bins. Tertiary crusher product is returned by conveyor to the distributor feeding the secondary screens, closing the tertiary crushing circuit.

14.1.2.2 Grinding

The grinding circuit consists of two Koppers 9.5 ft dia. x 12 ft primary ball mills and five secondary ball mills. Crushed ore with a P_{95} 9.5 mm is fed from the two grinding circuit feed bins to the two primary ball mills.

Primary Mill 1 works with three secondary mills, Secondary Mill 1 is an 8 ft x 4 ft Hardinge mill, Secondary Mill 2 is an 8 ft x 4 ft Comesa mill, and Secondary Mill 3 is a 6 ft x 7 ft Comesa mill. The discharge of Primary Mill 1 flows to two Sub A 1500 unit flotation cells. The lead concentrate produced flows to the final lead concentrate storage tank and the cell tailings flow into the secondary ball mill discharge pump box. Part of the slurry is pumped to a hydro cyclone classifier and the remainder to the high frequency Derrik vibrating screen feed distributor. The cyclone underflow discharges into the Derrick screen distributor along with the secondary ball mill discharge slurry and is fed to the high frequency Derrik screens.

Coarse material from the Derrik screens feeds the secondary ball mills while fine screen undersize material and overflow from the cyclone classifiers is combined in a mixing box, a portion of which is directed to the additional SK1 flash flotation cell. The lead concentrate produced is pumped to the final concentrate. The remainder of the cyclone overflow and the tailings from the SK1 flotation cell report to bulk flotation conditioning.

The secondary ball mill discharge slurry is pumped to the Derrick screens closing the circuit.

Primary Mill 2 works with two secondary mills, one is a Comesa 8 ft x 10 ft mill, which began operation in December 2011, and the other is an 8 ft x 5 ft Hardinge mill. The discharge of Primary Mill 2 goes to two Sub A 1500 unit cells. The lead concentrate reports to final concentrate and the flotation tailings are pumped to a second bank of high frequency Derrick screens for classification. The screen undersize is pumped to the flotation circuit and screen oversize flows to Secondary Mills 4 and 5. The discharge of Secondary Mill 4 goes to an SK-240 cell, the lead concentrate of which reports to final concentrate and the flotation cell tailings are combined in the secondary ball mill discharge sump and pumped to the Derrick screens for classification, closing the grinding circuit.

The addition of Secondary Mills 4 and 5 and optimizations of the milling circuit contributed to the increase in tonnage from 5,800 tpd to 6,500 tpd.

Instrumentation and control systems in the grinding circuit include nuclear density meters, automatic water controls in the mill feed, electronic scales, pulp level sensors, and a PSI-200 particle size analyzer.

Daily ball charge mixture to primary mills is in 2.5 in. (20%) and 3 in. (80%) sizes while secondary milling is with 1.5 in. and 2 in. ball sizes. The steel consumption in the ball mills is 0.380 kg/t. The required product granulometry is 12% +70 mesh (210 µm) and 52% -200 mesh (74 µm).

Among the most significant factors that contributed to the increase in tonnage are:

- The improvement of phase II granulometry.
- The improvement in the load distribution to the two secondary mills and the increase in the discharge density of the primary mills to ranges of 1,950 g/L to 2,050 g/L.
- The sorting density in the screens is in the range of 1,700 g/L on average, allowing for better classification with less return of fines to the secondary mills.
- The repowering of the motors and the increase in the revolutions of the primary pumps 1 A, B (100HP) and 2 A, B (70HP).

14.1.2.3 Bulk Flotation

The bulk flotation circuit consists of bulk rougher, scavenger, and cleaner cells and produces a copper and lead concentrate. Bulk scavenger concentrate is reground before being returned to the roughers. Bulk flotation is followed by copper-lead separation consisting of copper roughers, scavengers, and cleaners, during which copper minerals are floated while lead minerals are depressed to produce separate copper and lead concentrates. Tailings from the bulk flotation circuit feed the zinc flotation circuit.

The first rougher is an FM-100 cell, the second rougher is an OK-30, the third rougher is an OK-50 cell, the first scavenger is made up of two DR-300 cells, the second scavenger of six DR-100 cells, and the third Scavenger of six DR-100 cells.

Zinc sulphate and sodium cyanide are used as depressants of zinc and iron minerals in the bulk flotation circuit.

Xanthate Z-11, Aerphine-3418, and methyl isobutyl carbinol (MIBC) are used as collectors of lead minerals in the unit cells located in the discharges of the primary mills.

Xanthate Z-11 is the main collector and Aerophine-3418 is the secondary collector used in bulk Cu-Pb-Ag flotation. The pH ranges from 7.5 to 11.5.

14.1.2.4 Lead – Copper Separation

The concentrates from the third bulk cleaner circuit enter the lead copper separation circuit. The bulk concentrates pass through five OK-1.5 copper rougher cells. The tailings are the lead concentrate, and the concentrate is the copper concentrate. The copper concentrate passes through two stages of cleaning before the final copper concentrate is produced.

The reagents used for separation are:

- MIBC
- A mixture of carboxymethyl cellulose (CMC), Sodium Silicate and Sodium Bichromate

14.1.2.5 Zinc Flotation

Tailings from the bulk flotation circuit undergo three stages of conditioning prior to zinc flotation. The zinc flotation circuit consists of zinc roughers, scavengers, and three stages of cleaning to produce zinc concentrate and final tails.

Lime is used in zinc flotation as a pH modifier (9.5-11.5), copper sulphate as a reactivator of zinc minerals, xanthate as the main collector, and Flottec-4234 as secondary collectors. The only frother used in both circuits is MIBC.

The circuit consists of two OK-100 cells as the first and second roughers and one OK-50 as the third rougher, and for the first scavenger there is an OK–30. For the medium cleaner circuit, there is an OK-20, five DR-300 cells, eight DR-100 cells as cleaner scavengers, and eight DR-100 cells as second cleaner scavengers. The first cleaner is a column cell that works with the concentrate of the first and second rougher. The second cleaners consist of two OK-10 cells, and the third cleaners have an OK-5 cell and five DR-24 cells.

14.1.2.6 Concentrate Dewatering

Concentrates are dewatered in thickeners (lead and zinc) and a dewatering cone (copper) followed by a filter press for zinc concentrate and disc filters for lead and copper concentrates. The filtered concentrates are stored in covered stockpiles prior to being loaded into trucks using a front-end loader. Water from concentrate dewatering is recycled for use in the process. Lead and zinc concentrate moisture content is approximately 8% to 9%, and copper concentrate moisture content is approximately 11%.

The water obtained from machinery cooling is recovered in the order of 20.5 L/s in the dry season. In addition, a system has been implemented to recover water from the filtration operations as well as water from the wastewater treatment plant, which are used in the hydraulic backfill plant.

14.1.2.7 Concentrate Shipping

The concentrates produced by the processing plant are transported to Callao via the central highway in private trucks and via the central railroad and are sold to national or foreign smelters.

14.1.2.8 Tailings

Tailings at approximately 22% solids are classified in cyclones with coarse material in the underflow at approximately 62% solids sent to the hydraulic backfill plant for use in the mine as backfill. Mine backfill constitutes approximately 50% of tailings produced. Water from tailings dewatering is returned to the process. Overflow from the cyclones containing the fine tailings is deposited in the conventional TSF adjacent to the mine and processing plant. Tailings can be discharged at various points in the TSF by means of valved discharge points on the tailings line. Clarified water discharged from the TSF joins natural water flows used to generate electricity in Nexa's La Candelaria Hydroelectric Plant.

14.1.3 Energy, Water, and Process Materials Requirements

Power requirements for the processing facilities are not anticipated to change significantly in the foreseeable future from the current power requirements.

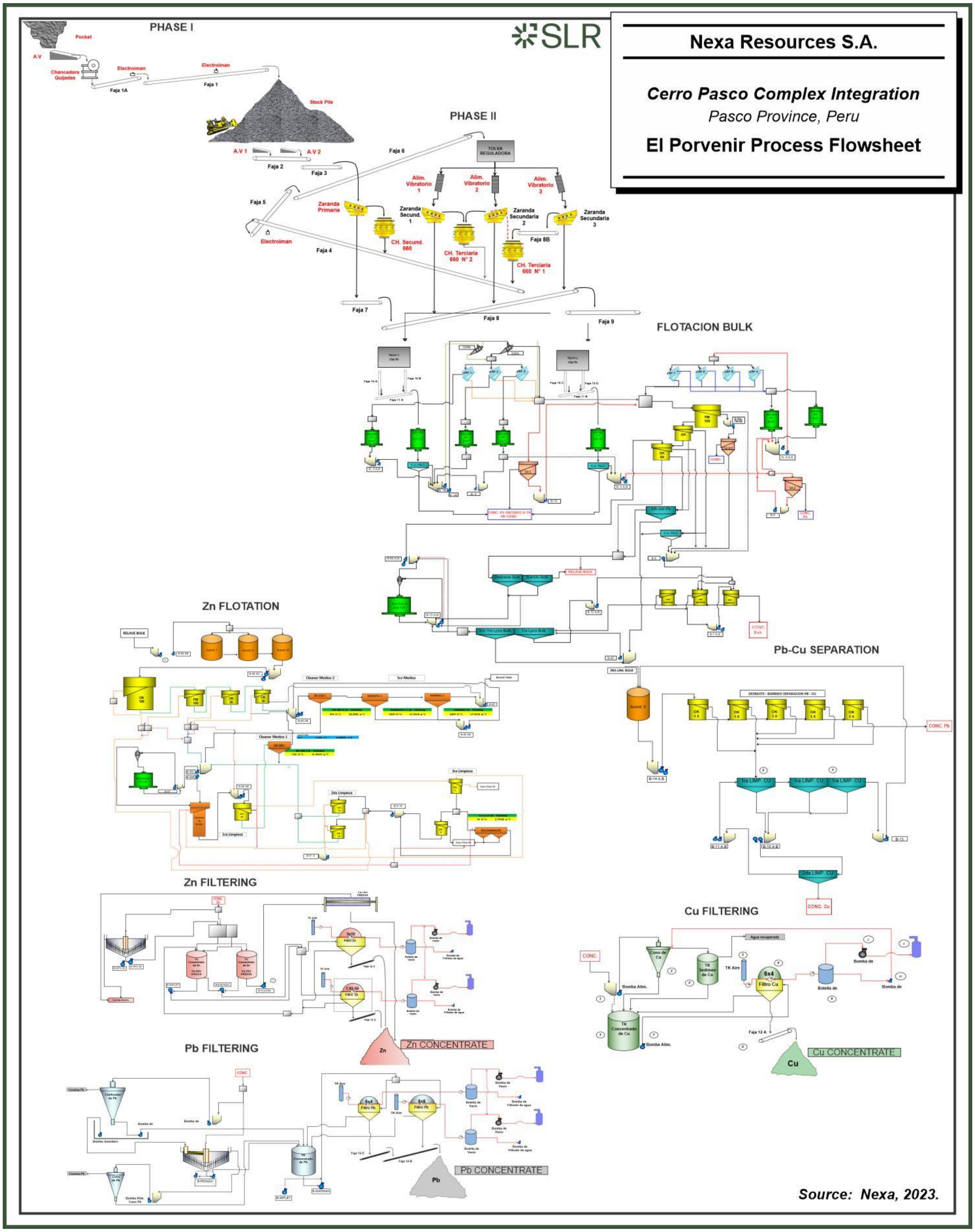
Make-up water is supplied from various creeks around the TSF, as well as the Carmen Chico River, approximately 3.2 km south of the processing facility. Water consumption is not expected to change significantly from the recent historical water usage and no supply concerns have been noted.

Key reagents used in the process include lime, sodium cyanide, sodium isopropyl xanthate (SIPX) Z-11, MIBC, copper sulphate, zinc sulphate, and collectors for copper, lead, and zinc.

14.1.4 Manpower

The processing plant personnel number 63. Maintenance (124), technical services (28), and projects personnel (9) service the mine and other departments in addition to the processing plant. These numbers are not anticipated to change significantly in the foreseeable future.

Figure 14-1: El Porvenir Process Flowsheet



Source: Nexa, 2023.

14.2 Atacocha

14.2.1 History

The Atacocha Mine is located in the Department of Pasco, province of Pasco, district of Yanacancha. The concentrator is located in the Chicrín ravine at kilometre 324 of the Lima-Huánuco central highway on the left bank of the Huallaga River.

Minera Atacocha was founded on February 8, 1936. The first concentrator called No. 1 began operations in 1937 with a treatment capacity of 100 tpd for the beneficiation of lead ores by flotation. Lead-zinc extraction by differential flotation has been done since 1941. Plant No. 1 operated for thirty years, ending operations in 1968 with a capacity of 200 tpd. Plant No. 1 is 90% dismantled and some of the equipment is for sale since it cannot be used in the currently operating Plant No 2. Plant No. 2 began operations in 1950 with an initial capacity of 375 tpd. In 1968, Plant No. 2 was expanded to 1,500 tpd, making it possible to shut down Plant No. 1.

Concentrator No. 2 began gradually increasing its treatment tonnage; in 2007 it processed 3,750 tpd due to process improvements. In November 2008, the SY-STD Short Head tertiary crusher was replaced by a Nordberg HP500, which improved the granulometry of the crushing product, and increased the production rate to 4,380 tpd. By November 2016, the P_{80} of the crushed product was reduced to 5,000 µm and by January 2017, the production rate increased to 4,600 tpd. An additional OK-100 flotation cell was installed in the zinc flotation circuit to maintain the flotation residence time, and an additional two holding tanks were installed for the lead concentrate to provide uniform pulp density and improve filtration efficiency.

Concentrator No. 2 currently treats an average of 4,400 tpd of ore producing two concentrates: lead concentrate (48% to 55% Pb) and zinc concentrate (48% to 55% Zn).

14.2.2 San Gerardo Open Pit Ore Processing

By 2019, Atacocha underground reserves were nearly depleted, and the plant began treating ore from the San Gerardo open pit mine. The amount of San Gerardo ore treated progressively increased through May 2020, after which all ore supplied to the Atacocha plant was from the open pit. The open pit ore characteristics were different than Atacocha underground ore, so the production rate was restricted to 4,100 tpd. In addition, the open pit copper head grades were too low to make saleable concentrate grade, so copper concentrate production was discontinued, leaving only the lead concentrate and zinc concentrate products. The operational process was then optimized to resume the treatment of 4,400 tpd at the end of 2023.

14.2.3 Mineralogy

Mineralization in the Atacocha area consists primarily of veins and bodies of massive galena, black sphalerite and cubic pyrite, emplaced in green garnet skarn zones, breccia marble, and in contact with siliceous breccias. In the Santa Bárbara area, the recurrent mineral is argentiferous galena, with a lower proportion of blond sphalerite and fine pyrite, mainly located in calcareous breccias. Mineralization at San Gerardo consists of narrow veins of massive galena, blond sphalerite, freibergite, and fine pyrite, emplaced in brecciated carbonate rocks and dacitic intrusive rocks.

It is worth mentioning that gold is found as structural impurities in all sulphides, economic and non-economic, including alabandite.

The mineral contribution for the processing is from the Atacocha and San Gerardo areas.

14.2.4 Process Description

The capacity of the Atacocha concentrator is approximately 4,400 tpd, or 1.68 Mtpa, and consists of conventional crushing, grinding, and flotation to produce lead and zinc concentrates.

Simplified process flow diagram for the concentrator is shown in Figure 14-2.

The Atacocha processing plant is divided into sections, which are described below.

14.2.4.1 Crushing

The mined ore is stored in four coarse underground hoppers located at the 3600 Level. Hopper No. 1 has a capacity of 1,600 t. Hopper No. 2 has a capacity of 1,900 t. Hopper No. 3 has a capacity of 800 t, and Hopper No. 5 has a capacity of 700 t.

The ore accumulated in the coarse hoppers is fed to the crushing section by conveyor. The new No. 1 and No. 2 coarse hoppers each work with a 42 in. x 12 ft Comesa apron feeder; the No. 3 and No. 5 coarse hopper each work with 60 in. x 16 ft Comesa apron feeders.

The ore is conveyed to a 1,100 mm x 850 mm, Nordberg C110 B primary jaw crusher. The crusher product is conveyed to the primary Simplicity double deck screen. The screen undersize is conveyed to the fine ore storage bins. The upper deck screen oversize feeds the secondary Sandvik CH660 cone crusher. The lower deck screen oversize discharges onto belt No. 4, which is joined with the product of the secondary CH660 crusher and both products are conveyed to the secondary 8 ft x 20 ft double deck banana type screen via belts 5, 6A, and 6B.

The secondary banana screen – 3/8 in. bottom deck screen undersize material reports to the fine ore storage bin and the top and bottom deck screen oversize material feeds the tertiary Nordberg HP-500 cone crusher. The tertiary crusher product is conveyed to the tertiary Simplicity screen via conveyors 8, 5, and 6. The tertiary Simplicity screen undersize reports to the fine ore bins and the screen oversize from both decks feeds the tertiary crusher, closing the tertiary crushing circuit.

Product conveyor No. 9 distributes the ore to each of the six 450 t fine ore bins using a tripper conveyor.

14.2.4.2 Grinding

The grinding circuit comprises six ball mills, two Hardinge 8 ft x 5 ft conical mills and four Comesa 8 ft x 10 ft mills as primary mills, and one Hardinge 8 ft x 5 ft conical ball mill used as a secondary mill.

Five of the primary mills operate in closed circuit. The discharge of each mill is fed to an SK-80 flash flotation cell that recovers coarse lead concentrate which is pumped directly to lead concentrate storage. The tailings from these cells are pumped to a 15 in. hydrocyclone classifier. The cyclone underflow feeds the primary ball mill and the hydrocyclone overflow feeds a 10 ft dia. by 12 ft high lead-copper flotation conditioner in the flotation circuit.

The sixth primary mill operates in series with a secondary mill. The primary mill discharge feeds an SK-80 flash flotation cell. The SK-80 tailings are pumped to a 15 in. hydrocyclone. The cyclone underflow feeds the single secondary ball mill, which is closed by a 20 in. hydrocyclone.

Each primary mill is fed by variable speed conveyor belts and tonnage is automatically controlled by Ramsey scales. The following flotation reagents are added to each primary mill: zinc sulphate (depressant), sodium cyanide (depressant), and in each flash flotation cell: xanthate (Z11 or Z14) and MIBC are added.

14.2.4.3 Flotation

The flotation plant consists of three circuits that are controlled by a Courier 6SL inline analyzer that was installed in September 2004 (currently only the multiplexer operates). The bulk rougher circuit produces a bulk copper-lead concentrate that is then separated in the lead circuit to produce the copper and lead concentrates. The zinc circuit processes the tailings from the copper and lead circuits, and including a regrinding stage, produces the zinc concentrate and the final tails.

Bulk Rougher Circuit

The bulk rougher flotation circuit treats the whole ore, obtaining lead concentrates, made up of the concentrates of the grinding circuit SK-80 flash flotation cells plus the OK-8 and OK-20 cleaner concentrates and the OK-30 I and 1st OK-8 scavenger concentrates. To this are added the concentrates of the RCS-30 and 2nd + 3rd OK-8 scavenger cells (may or may not include cleaners); the cleaner tailings are recycled to the bulk rougher feed. The feed to the cleaners is made up of rougher concentrates. The concentrates from the OK-30 I cells are fed to the OK-3 cells (lead cleaning), the concentrate from these cells also forms the lead concentrate and the tailings returns to the rougher feed.

Bulk-Scavenger Flotation Circuit

The tailings from the bulk rougher OK-30 II cells feed the bulk scavenger flotation circuit consisting of an OK-20 cell followed by a bank of six OK-8 cells and one OK-16 cells. The OK-20 scavenger concentrate flows to a bank of five cleaner scavenger OK-8 cells. The bulk scavenger tailings feed the zinc circuit.

Pb/Cu Separation Circuit

Since July 2019, no Pb/Cu separation has been carried out due to a copper head grade of less than 0.10%, ranging from 0.06% to 0.08%. The Pb/Cu separation can be resumed when the copper head grade improves.

Zinc Circuit

The zinc rougher circuit processes the tailings from the bulk lead-copper scavenger circuit with conditioning in two 16 ft dia. x16 ft agitated tanks operated in series. The zinc rougher circuit consists of one OK-100 cell and one OK-50 cell operated in series. The scavenger circuit consists of a bank of three OK-16 cells, a bank of four OK-16 cells and one OK-50 cells, and the cleaning circuit consists of one stage using an OK-10 cell and a bank of five OK-3 cells. The zinc scavenger tailings are final tailings. The first rougher concentrate and the cleaner concentrate are the final zinc concentrates.

The scavenger concentrates return to the second scavenger feed (OK-16) and tailings from the first scavenger are recycled to the second rougher feed.

14.2.4.4 Flotation Reagents

The following reagents are used in the concentrator:

- Main collector: sodium isopropyl xanthate (Z11); 2.2% solution, for rougher - scavenger stages, bulk lead-zinc and zinc stages.
- Frother: MIBC is used for both lead and zinc circuits and is added neat.

- Depressants: sodium cyanide (1% solution), zinc sulphate (3.30% solution) is added in milling.
- Zinc activator: copper sulphate (4.50% solution) is used in the zinc circuit.
- Hydrated lime $Ca(OH)_2$ powder (65% CaO) is added for pH control in the zinc circuit.

The reagent consumptions are presented in Table 14-2.

Table 14-2: Flotation Reagent Consumptions

Reagent	Consumption, g/t
Nitric acid	17
Hydrated lime, mill	10
Sodium cyanide	22
Methyl isobutyl carbinol, MIBC	45
Copper sulphate pentahydrate	62
Zn sulphate	140
Sodium Isopropyl Xanthate, Z-11	30

14.2.4.5 Thickeners and Filters

Lead an zinc flotation concentrate are pumped to two parallel concentrate thickeners for each metal for dewatering. The thickener underflow slurry from the lead and zinc thickener underflows are pumped to the lead and zinc concentrate storage tanks respectively for density control. The slurry is then pumped to a CC-45 ceramic disc filter, which reduces the moisture in each of the concentrates to approximately 8.2% for transportation. Filter aid at 20 g/t is added to improve the filtration process. There are two drum filters that can be used for either lead or copper concentrate dewatering. The filtered concentrates are discharged to the concentrate storage areas for shipping. The concentrates are loaded into trucks by front end loader when being despatched to customers.

14.2.5 Tailings Pumping System

Atacocha's tailings transport system is a high pressure pumping system using Geho positive displacement pumps designed to pump thickened tailings at a density 55%-65% solids to the Atacocha tailings dam. A project is being developed for a treatment rate of 5,000 dry tpd, i.e. 4,500 tpd of tailings.

The concentrator's general tailings are fed to the 125 ft thickener at a density of 1,250 g/L to reduce the total volume of material that must be transported to the Atacocha TSF. The tailings pulp is temporarily stored in the thickener-clarifier. Flocculant is dosed at a rate of 30 L/min at a concentration of 0.025%. The underflow of the thickener is recirculated with HR-200 pumps until it reaches 55% to 65% solids. When the pulp reaches the appropriate density, it is fed into the linear sieve, to store clean pulp of adequate granulometry in the storage tanks, and when the density decreases, the pulp is recirculated to the thickener until it reaches the adequate density again. The overflow with < 50 ppm solids is stored in a tank and then recirculated to the concentrator, and excess water is sent to the settling ponds.

The pumped tailings are disposed of in the basin of the Atacocha TSF.

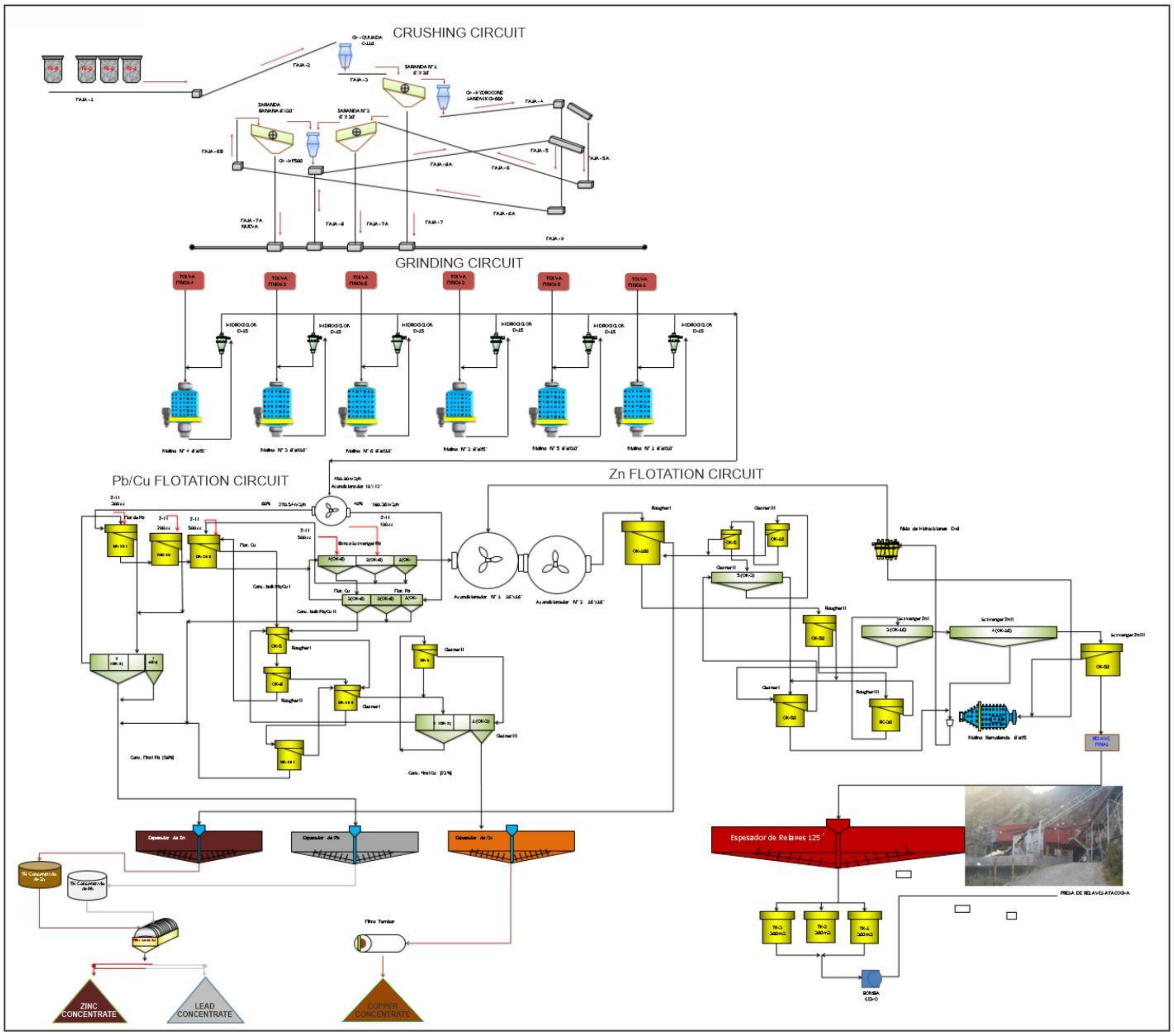
14.2.6 Water Consumption

The water consumption of the Atacocha processing plant is approximately 2 m^3/t of concentrate produced.

14.2.7 Power Consumption

The power consumption in the plant is 32.5 kWh/t to 33 kWh/t.

Figure 14-2: Atacocha Process Flowsheet



Nexa Resources S.A.

Cerro Pasco Complex Integration

Pasco Province, Peru

Atacocha Process Flowsheet

Source: Nexa, 2019.

15.0 Infrastructure

The Cerro Pasco Complex Integration project aims to maximize the synergy of the Atacocha and El Porvenir mines.

El Porvenir started in 1950 and is in operation. It is an underground mine, with multiple accesses including a shaft (Picasso shaft) for ore and people transportation.

Atacocha started in 1937. The Atacocha open pit mine (San Gerardo) is in operation, while Atacocha UG has been on care and maintenance since 2020.

Accesses to Atacocha UG are made by multiple tunnels, well preserved despite its production suspension.

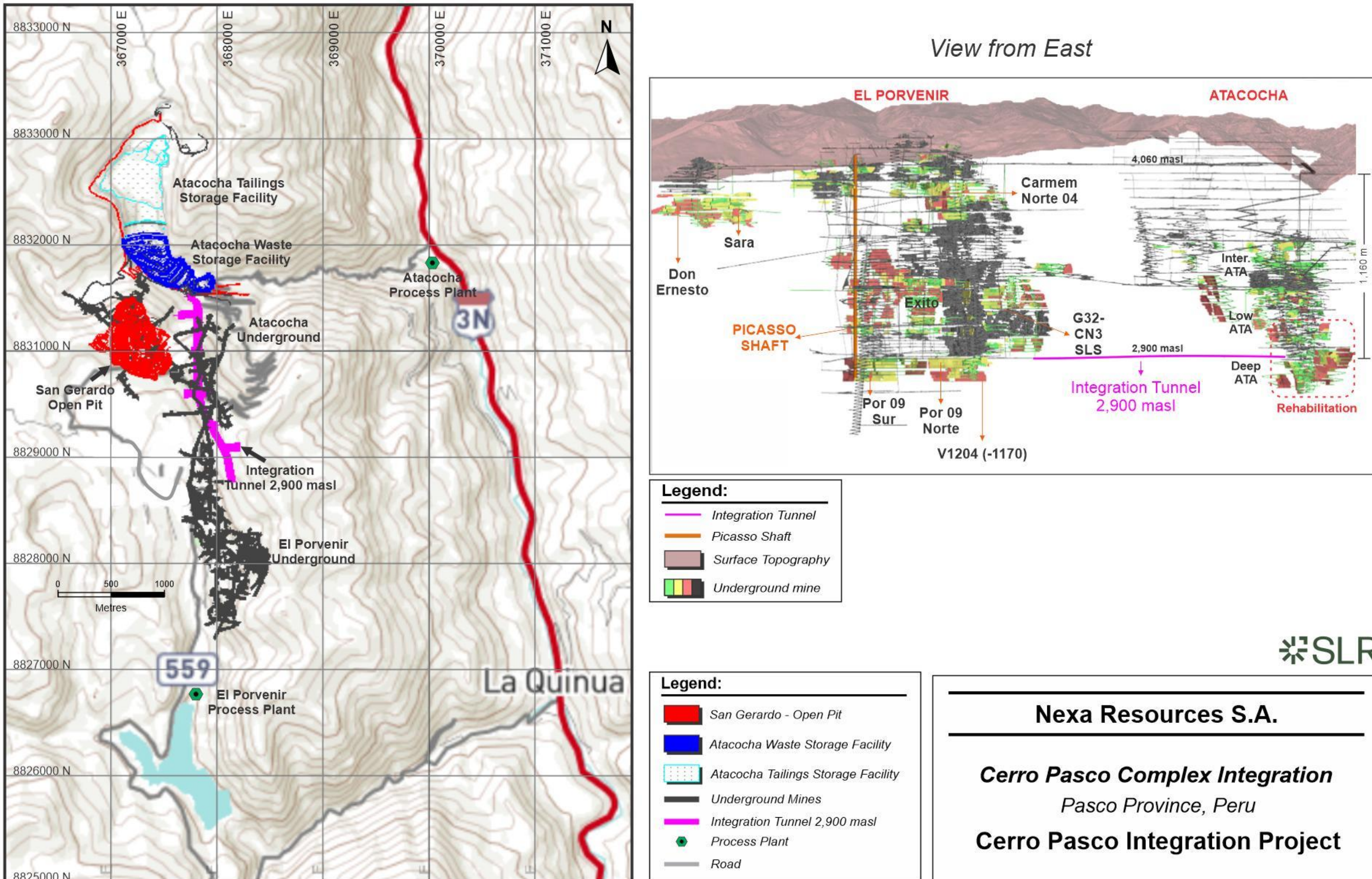
Atacocha is currently connected to El Porvenir through two active tunnels: at the 4070 and 3300 levels, with traffic of heavy mine equipment, conventional trucks, and transportation of mining crews (linking Atacocha surface to El Porvenir underground).

The integration plan currently includes:

- restarting and rehabilitation of the Atacocha underground mine,
- development of an approximately 2 km long connection tunnel (Tunnel 2900), linking Atacocha underground to the bottom of the Picasso shaft at El Porvenir, allowing the production from both underground mines to be hoisted and to feed El Porvenir processing plant,
- Picasso shaft capacity expansion to support production and extraction at both underground mines,
- closure of the Atacocha processing plant, with the exhaustion of Atacocha open pit reserves, in 2027,
- a new tailing pumping and pipeline system to be built, that will allow tailings from El Porvenir to be sent to the Atacocha dam, bringing a long term solution for tailings, supporting the extension of the combined life of the two mines.

The general location of the mines, processing plants, and tailings dams is provided in Figure 15-1.

Figure 15-1: Cerro Pasco Integration Project



Source: SLR, 2023.

15.1 El Porvenir

A combination of transportation methods, including road access, aircraft via Huánuco, and rail to Cerro de Pasco are used to supply the mine. Off-site infrastructure includes facilities for the transfer of concentrate from truck to rail at Cerro de Pasco to transport concentrate for export by train to the port of Callao. Mine access is via a 13 km dirt road northeast from Cerro de Pasco, and paved road from Lima to Cerro de Pasco (approximately 315 km).

The main road from Lima to Cerro de Pasco is used for personnel transportation, supply of food, reagents, spare parts, mining supplies, and diesel fuel. Huánuco airport can be used for personnel transportation and emergency situations.

The site comprises an underground mine, TSF, waste rock stockpiles, an ore processing facility with associated laboratory and maintenance facilities, and maintenance buildings for underground and surface equipment. Additional facilities and structures include an office building, change house facilities, main shaft, ventilation shaft, backfill plant, explosives storage area, hydroelectric power generating plant, power lines and substation, fuel storage tanks, a warehouse and laydown area, and an accommodation camp.

15.1.1 Power Plant and Distribution

The power supply for both El Porvenir and Atacocha mines mainly comes from the national power grid. The connection via PARAGSHA II substation (138 kV bar) feeds via 138 kV transmission line the main substation located near El Porvenir (MILPO substation).

From MILPO substation (138/50 kV), electricity is distributed to the El Porvenir and Atacocha substations, both with 50 kV/13.8 kV transformation.

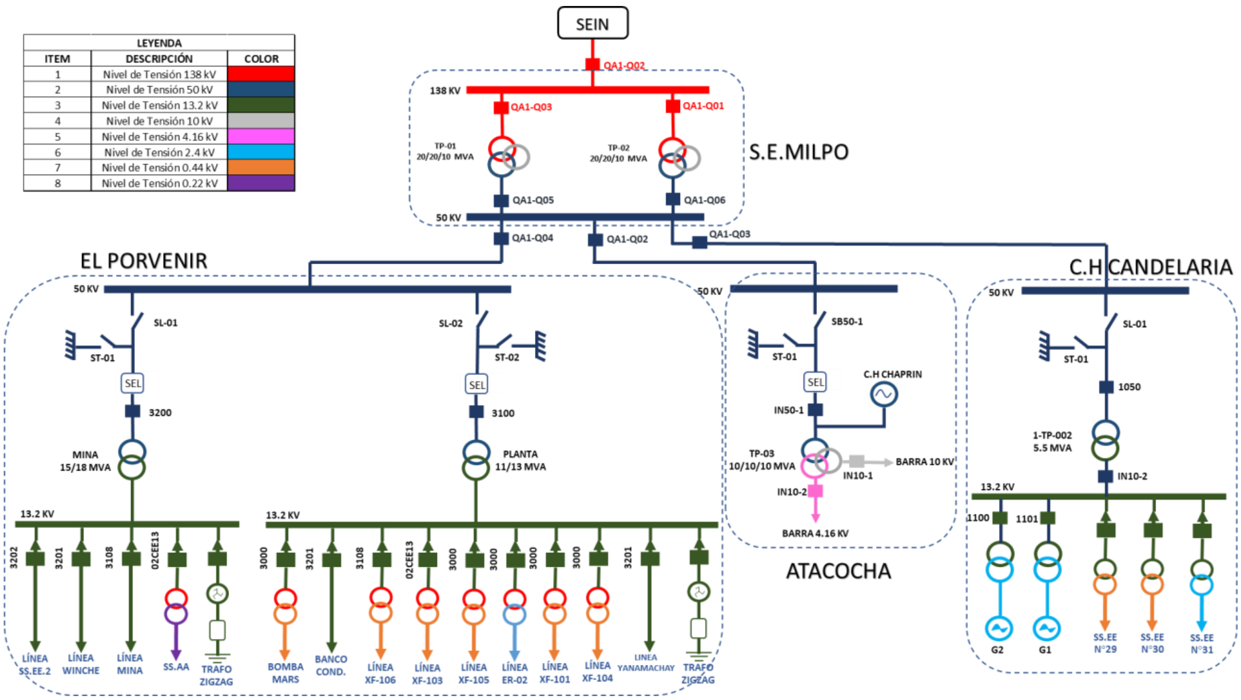
All other project loads are fed at 13.8 kV from the El Porvenir and Atacocha substation through overhead power lines. These power lines are used to deliver power to various locations to support activities during operation of the Mines.

Beyond national grid, the mine complex has three small power plants connected behind the meter.

A simplified electrical single line diagram showing power generation and distribution from the grid and the Candelaria Hydroelectric Plant to the El Porvenir and Atacocha mine sites is presented in Figure 15-2.

La Candelaria Hydroelectric Plant with 4.6 MW distributed in three turbines (0.5 MW, 0.96 MW, and 3.2 MW), is connected to the El Porvenir Mine through MILPO substation by a 2.58 km long 50 kV transmission line. However, this small power plant does not operate due to social issues since July 2020.

Figure 15-2: Power Distribution Single Line Diagram for El Porvenir and Atacocha Mine Sites



15.1.2 On-Site Roads

Mine site roads include main roads suitable for mining trucks that transport concentrates to Cerro de Pasco and Lima and service roads for smaller vehicles. The site roads are used by authorized mine personnel and equipment, with access controlled by Nexa.

A network of approximately 15 km to 20 km of service roads has been built providing access to the underground mine, processing plant, TSF, waste rock stockpiles, mine offices, workshops, mine camps, and other surface infrastructure. The roads are approximately six metres wide designed for two-way 15 m^3 truck traffic and road maintenance equipment.

15.1.3 Utilities and Services

Raw water is sourced from a small creek, Tingovado, as well as from other creeks around the TSF.

Fresh water supply is obtained from the Carmen Chico River, approximately 3.2 km south of the processing facility. This water is primarily for use in the mine camps and make-up requirements for the processing facility and industrial area.

15.1.4 Sewage Collection and Disposal

A sewage treatment facility has been constructed south of the industrial and mine camp sites at a lower elevation. Buried sewer pipes collect sewage from the site and transfer it to the treatment facility. The treatment facility consists of two independent containerized treatment lagoon systems providing redundancy if one unit must be shut down for maintenance. The system is capable of treating all of the wastewater generated in the camp, industrial, and office areas. Treated effluent is released to the TSF via a small stream.

15.1.4.1 Site Security

The principal site entry point on the access road from Cerro de Pasco consists of a lighted security gate and vehicle access barrier. A gatehouse provides sanitary facilities, communications equipment, and search facilities including metal detection. A weighbridge is located close to the gatehouse to enable load monitoring of incoming and outgoing vehicles.

15.1.5 Communication and IT Systems

Point-to-point satellite communication is the main communication system between the El Porvenir Mine and the outside world. The system includes voice/data/video/fax, internet, and VPN services, including bidirectional links between the Mine site and Lima.

Satellite television for entertainment, cellular communication, and FM radio is provided by local service providers.

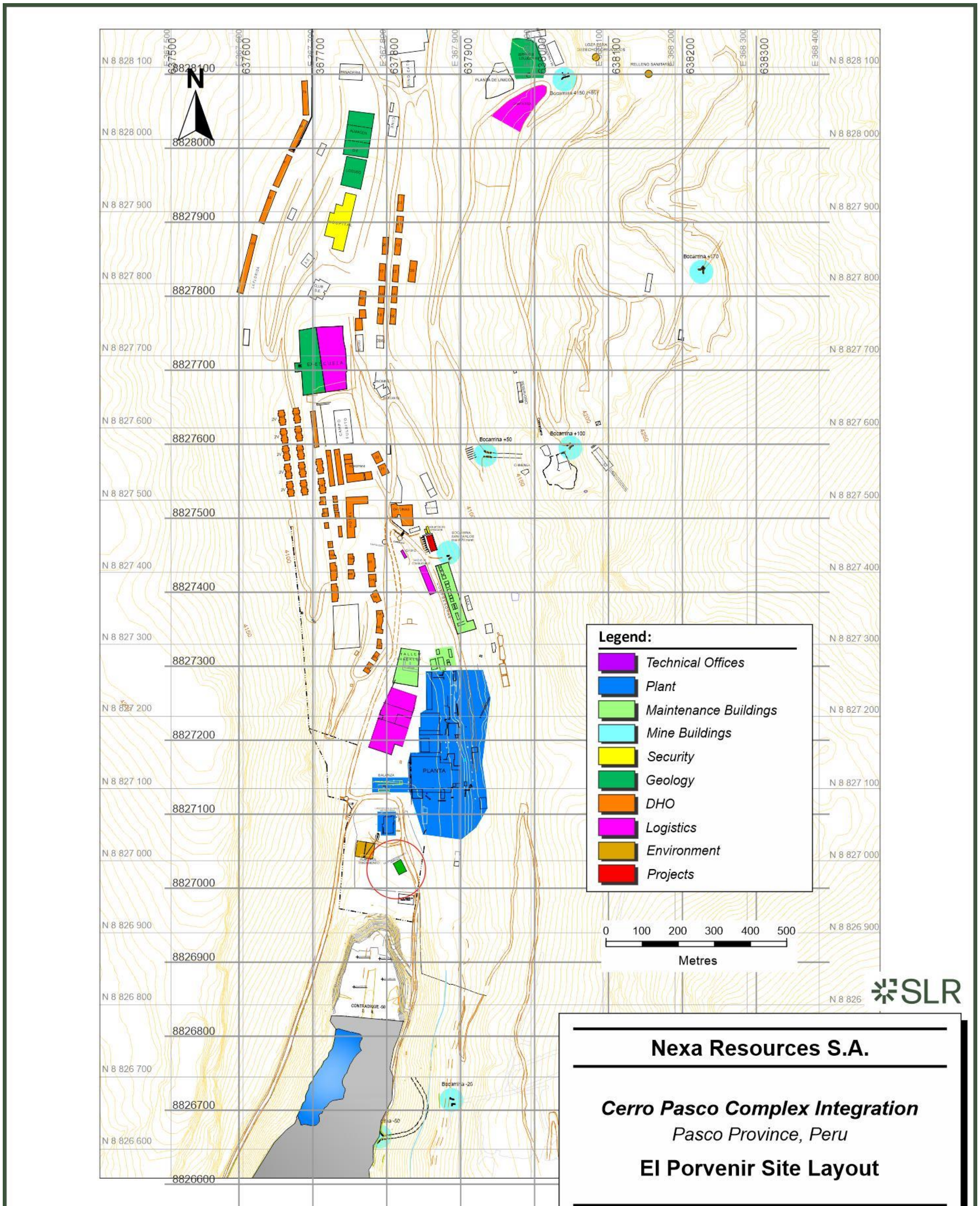
15.1.6 Vehicle Fuelling Facility and Mine Equipment Ready Line

The vehicle fuelling facility and ready line is located adjacent to the processing plant. The fuelling facility stores diesel and gasoline. Smaller tanks hold a variety of oils and lubricants.

15.1.7 Site Buildings and Facilities

A plan of the site buildings and facilities is provided in Figure 15-3.

Figure 15-3: El Porvenir Site Layout



Source: Nexa, 2020.

15.1.7.1 Operations and Maintenance Building

The Operations and Maintenance building is a masonry building that provides offices for mine management, administration, and technical staff, including environmental, administrative management, training, accounting, safety, and security. It includes staff support facilities such as a conference room, printing room, and lunchroom.

The underground mine operations building, electrical room, trackless equipment workshop, tire shop, air compressor shop, maintenance shop, lamp house, lockers, and washrooms are constructed adjacent to the main entrance to the underground mine at a 50 m distance, as approved by Peruvian safety regulations.

To the south of the main entrance to the mine are the main mine supplies storage, processing plant building, electrical workshop, backfill plant, and laboratory facilities.

15.1.7.2 Accommodation Facilities

The permanent accommodation complex has been constructed on an approximately 60 ha site north of the mine. The accommodation complex incorporates the following camp sites:

- Type A: staff houses, and staff hotel where dormitories are private, single occupancy rooms.
- Type B: three story building blocks are semi-private and have single occupancy rooms with two rooms sharing one shower and a washroom.
- Type C: three story blocks of dormitories are double occupancy rooms with a central shower and washroom facility shared by ten rooms.

The accommodation complex also includes the following facilities:

- Kitchen, bakery, dining hall.
- Recreation, exercise, and entertainment facility including a cinema that can also be used for meetings and training.
- Three soccer fields.
- Workers union building.
- Hospital equipped with trauma treatment facilities as well as life support equipment. The hospital is comprised of a waiting and reception area, doctor's office, operating theatre, two bed wards, washroom facilities, storage room, and ambulance parking.

15.1.7.3 Explosives Magazine

The explosives magazine has been constructed and operated in accordance with Peruvian law.

15.1.7.4 Solid Waste Disposal and Recycling Facility

Non-recyclable, non-toxic solid waste is disposed of in an on-site lined landfill. Used tires are shredded and placed in the landfill.

15.1.8 Tailings Storage

The El Porvenir TSF receives tailings generated by both El Porvenir and Atacocha concentrator plants. A portion of tailings is used for hydraulic backfill at El Porvenir. The El Porvenir TSF was originally constructed in the 1970s, and the current elevation of the dam crest is 4,064

MASL. The downstream toe is inferred to be less than 3,920 m from available plans, resulting in a dam height of 140 m.

Nexa is planning to improve the water management system through construction of a perimeter channel (i.e., upstream water diversion) to intercept clean (non-contact water) surface runoff water preventing its entrance to the TSF. Diverted water will be discharged downstream of the TSF in the Lloclla River gorge.

Contact water is recycled via a decant pumping system to the concentrator for use in the processing facility. The diversion on the western side of the TSF will be raised for the ultimate dam (Ausenco, 2016b). A lined seepage collection monitoring pond is located at the downstream toe of the main embankment to control water quality prior to water release to the environment. The monitoring pond is equipped with an overflow spillway and outlet channel for discharge into a local tributary creek of the Lloclla River.

A decant overflow system located on the left side of the main embankment conveys surplus flows from the tailings pond to the monitoring pond through the Lloclla Tunnel. Operation of a sluice gate at the pond location allows for the diversion of decanted water into the monitoring pond or bypass it, discharging directly into a local tributary creek of the Lloclla River. The water intake of the decant overflow system is a hydraulic structure consisting of two concrete towers with a series of inlets stacked vertically. Inlets must be progressively blocked and rendered inactive as the deposited tailings reach certain elevation.

A channeling structure, consisting of two breakwaters, direct flows towards the emergency spillway. The spillway is an overflow tunnel located in the right abutment. It is reportedly designed to convey flows from probable maximum precipitation (SRK, 2017). The tunnel discharges via a tunnel daylighting at elevation 4,035 MASL.

The layout of the TSF with its crest elevation of 4,064 MASL is presented on Figure 15-4. The intention is to raise the main embankment in 10 m increments with intermediate raises of four metres. It is noted that the expansion of the TSF to contain the LOM tailings requires a rockfill embankment dam and seepage collection pond at the northeast corner of the TSF to prevent tailings from impacting the concentrator plant area, as well as the northwest where the Tingovado Creek is diverted. The embankment located at the process pond is raised progressively in a downstream direction and its upstream slope is lined with a two millimetre thick high density polyethylene (HDPE) geomembrane. The detailed design of the El Porvenir TSF to its final elevation of 4,100 MASL has been completed (Ausenco, 2016b). The current plan is for Nexa to raise the dam up to dam crest elevation 4,070 MASL as part of the Cerro Pasco Complex Integration project. Determination to raise the dam beyond that elevation will be made in the future. Upgrades to the pumping and piping systems at El Porvenir will allow disposal of the El Porvenir tailings, not used for hydraulic backfill, at the Atacocha TSF.

Figure 15-5 shows the main TSF dam with a crest elevation of 4,064 MASL in plan view. The average crest width is approximately 15 m, with an overall downstream fill slope of 2.5H:1V and 1.5H:1V upstream; with an average interbank slope of 2H:1V.

Surface preparation for dam raises includes the removal of topsoil and unsuitable soils and compaction to provide a suitable foundation. For cases where there are cavities, a product of karst processes, the sealing of the openings with mortar or cyclopean concrete is required. To SLR's knowledge the measures to address seepage through karst rocks have been implemented through recent TSF construction including a sandy gravel platform around the perimeter of the TSF (SRK, 2017), and bedrock foundation grouting of the dam abutments in 2015. Ongoing operations will require continuous tailings deposition planning and pond management to maintain the design beach widths to limit seepage through the permeable dam.

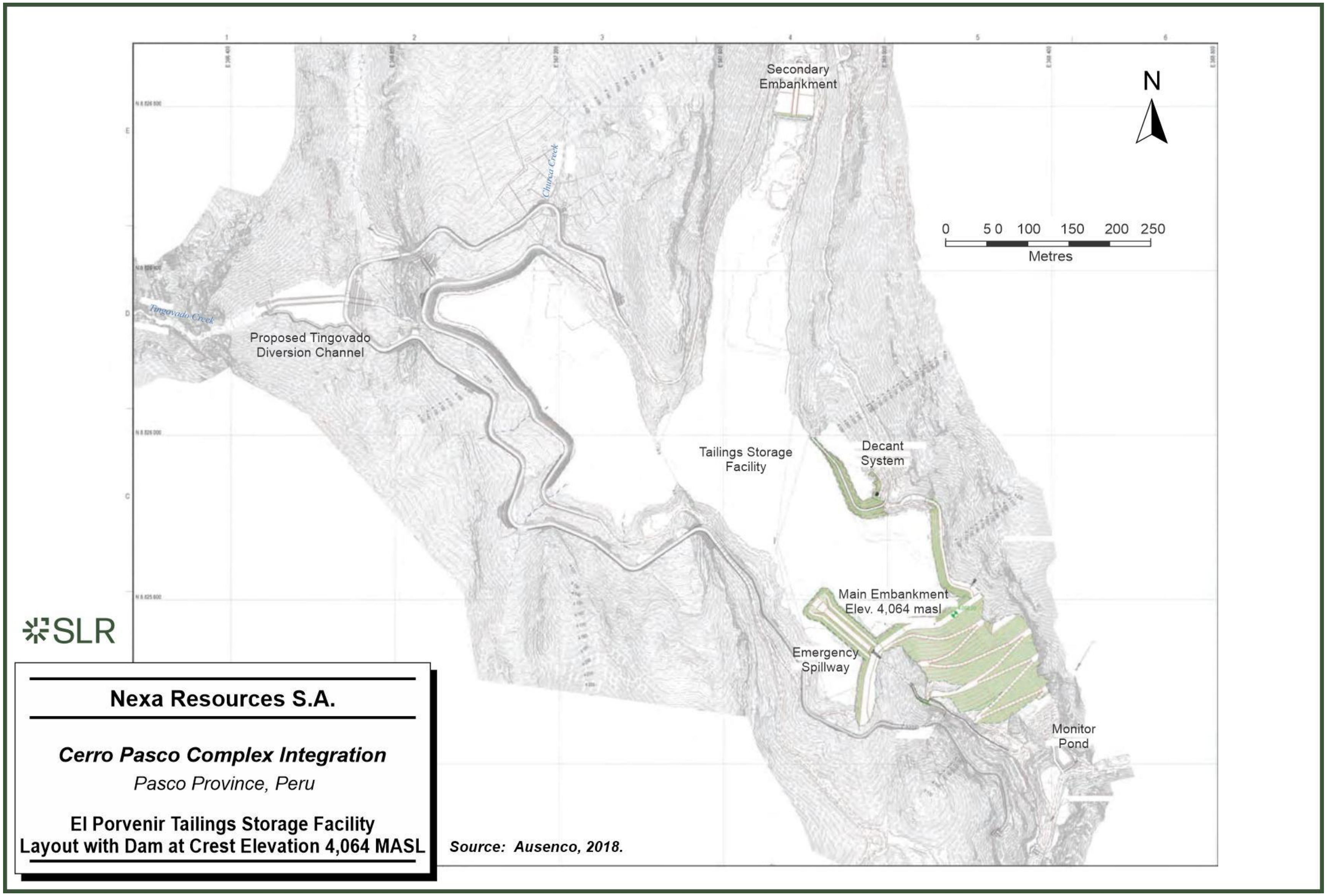
A cross section of the main dam at its ultimate crest elevation is shown on Figure 15-6. The initial TSF dam raises were performed using mainly compacted coarse tailings (cyclone underflow) with the centreline construction method. Due to a shortfall of the coarse fraction of the tailings to be used in the dam raises from 4,043 MASL, further raises used compacted rockfill and structural fill.

The crest of the dam is a horizontal platform of 15 m width and is composed of structural fill, which is mainly made up of sandy gravel. At the final elevation of the dam crest of 4,100 MASL, the height of the dam will be 187 m above the natural ground level of the gorge in which the dam is constructed.

In the design of the TSF, expansion plans considered that the processing rate would increase to 9,000 tpd in 2019 (3.24 Mtpa). Tailings produced would amount to 95.38% of ore processed. The design also considered the integration of El Porvenir with the Atacocha Mine and the disposal of Atacocha tailings in the El Porvenir TSF from 2016 onward. The Atacocha ore processing rate considered was 4,500 tpd (1.62 Mtpa) with plans for this to be increased to 5,000 tpd (1.8 Mtpa). Tailings produced would amount to 95% of ore processed.

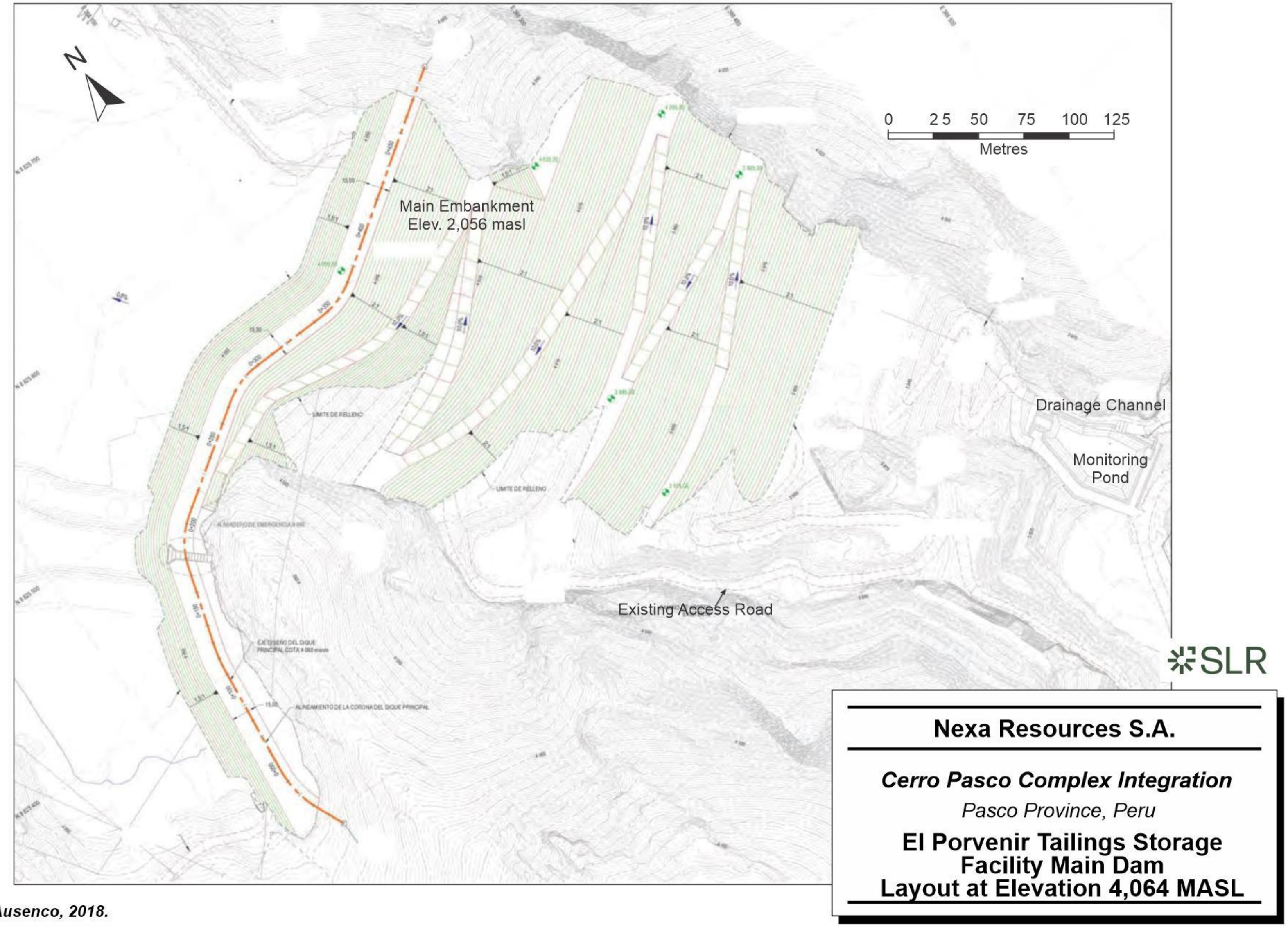
Monthly and annual dam safety inspections are currently being conducted by Geoconsultoria Ltda, an external consultant, for the El Porvenir TSF dam. The SLR QP has relied on the statements and conclusions of reports provided by Nexa and its consultants and provides no conclusions or opinions regarding the stability or performance of the dams and impoundments listed in this TRS.

Figure 15-4: El Porvenir Tailings Storage Facility Layout with Dam Crest at Elevation 4,064 MASL



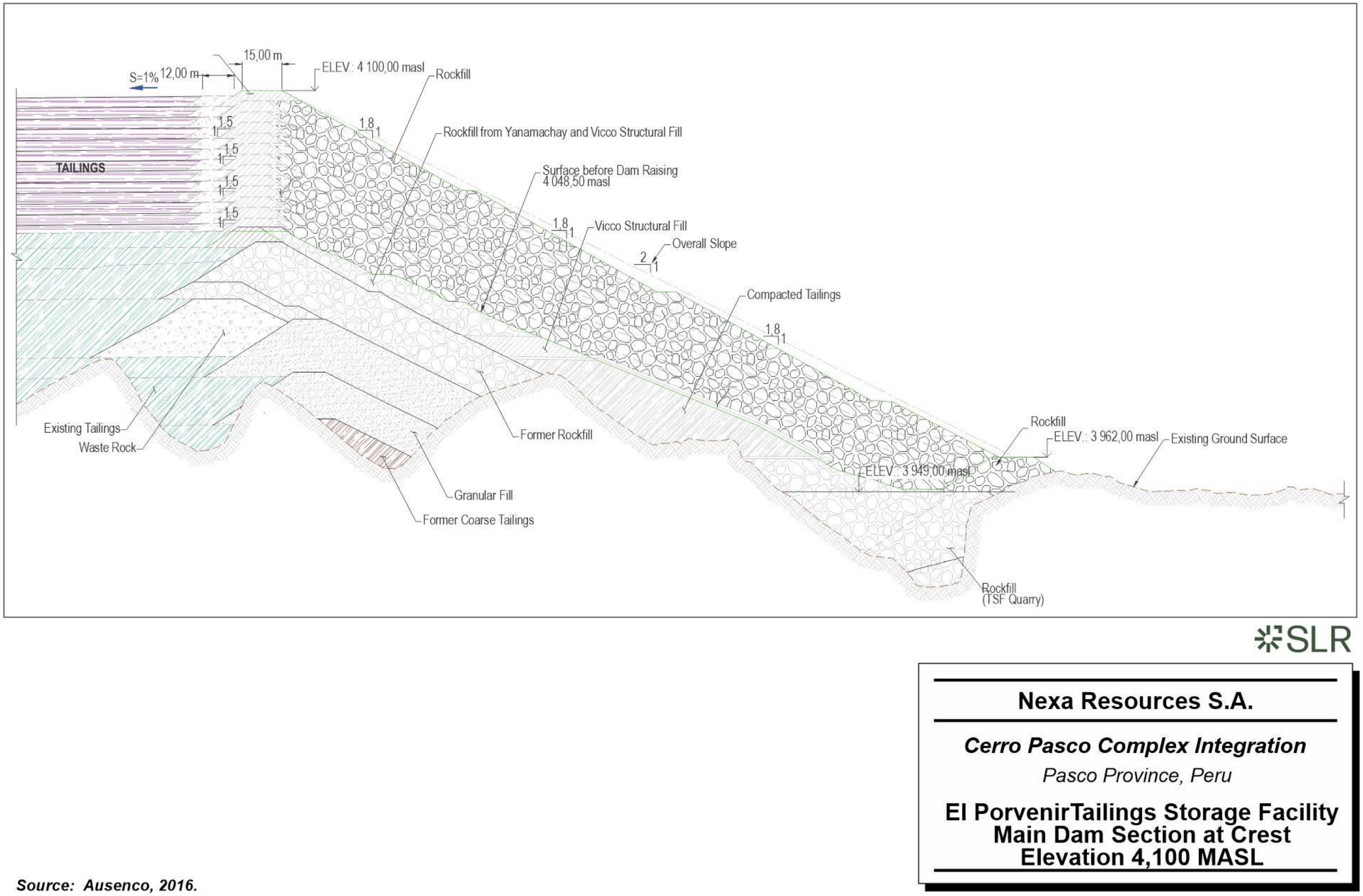
Source: Ausenco, 2018.

Figure 15-5: El Porvenir Tailings Storage Facility Layout Main Dam Layout at Crest Elevation 4,064 MASL



Source: Ausenco, 2018.

Figure 15-6: El Porvenir Tailings Storage Facility Main Dam Section to Crest Elevation 4,100 MASL



Source: Ausenco, 2016.

15.1.9 Waste Rock Storage Facilities

Historically, the volume of waste rock deposited on surface has been minor given that the El Porvenir operation is an underground mine. In the past, waste rock has been deposited in two areas within the TSF, and La Quinua waste rock dump (WRD) located outside the TSF. The La Quinua WRD is currently inactive.

Currently, waste rock is only brought to surface for storage if backfilling is not possible. If waste rock is brought to surface in the future, it will be deposited in a designated area near the secondary TSF embankment (southwest of the concentrator plant area), approved in Directorial Resolution R.D. 693-2012 MEM-AAM/LCD/RPP/MPC.

15.2 Atacocha

15.2.1 On-site Infrastructure

Site operations comprise an underground mine, open pit mine, and a process plant facility. Supporting on-site infrastructure include maintenance facilities; maintenance buildings for underground and surface equipment, laboratory, and tailings pumping station. Facilities and structures supporting operations include warehouses and laydown areas, offices, dry facilities, hydroelectric generating station, power lines and substation, fuel storage tanks, and accommodations camp. A network of site roads that are approximately 6 m wide and total 15 km in length are used by authorized mine personnel and equipment, including ore and waste haul trucks, concentrate haul trucks, support and light duty vehicles to provide access to on-site infrastructure.

Figure 15-7 shows the general layout of the Atacocha infrastructure.

Figure 15-7: Atacocha Site Layout

15.2.2 Power Plant and Distribution

Power supply for the Project comes from two sources, Electroandes, a power supplier located in Paragsha via a 30 km long 50 kV transmission line and two small hydro power plants connected to Atacocha Substation.

The first hydro power plant is the Chaprin hydro power plant that has 5.2 MW (3 x 1.8 MW). It produces almost 30 GWh per year. Is it connected to Atacocha substation via a 14 km long 50 kV transmission line.

The second one is Marcopampa hydroelectric generating station with a total capacity of 1.2 MW via a 2 km long 4.16 kV transmission line. However, this hydroelectric generating station is not in operation because of social problems.

Nexa has performed studies to retrofit these power plants and solve the social problems. However these improvements are not considered in the current plan.

A simplified electrical single line diagram showing power generation and distribution from the grid and the Candelaria Hydroelectric Plant to the El Porvenir and Atacocha mine sites is presented in Figure 15-2.

15.2.3 Tailings Storage Facility and Waste Rock Storage

The Atacocha TSF embankment crest was raised to an elevation of 4,128 MASL, the dam crest elevation currently permitted. Mine rock disposal takes place downstream of the existing Atacocha TSF dam, which also serves to buttress the dam to enhance stability. The Atacocha TSF dam has been raised in at least six stages by the downstream method, with a 2H:1V overall downstream slope and a 1.5H:1V upstream slope. The upstream slope is lined with a geomembrane. The Atacocha TSF is shown in Figure 15-8 and a dam cross section in Figure 15-9.

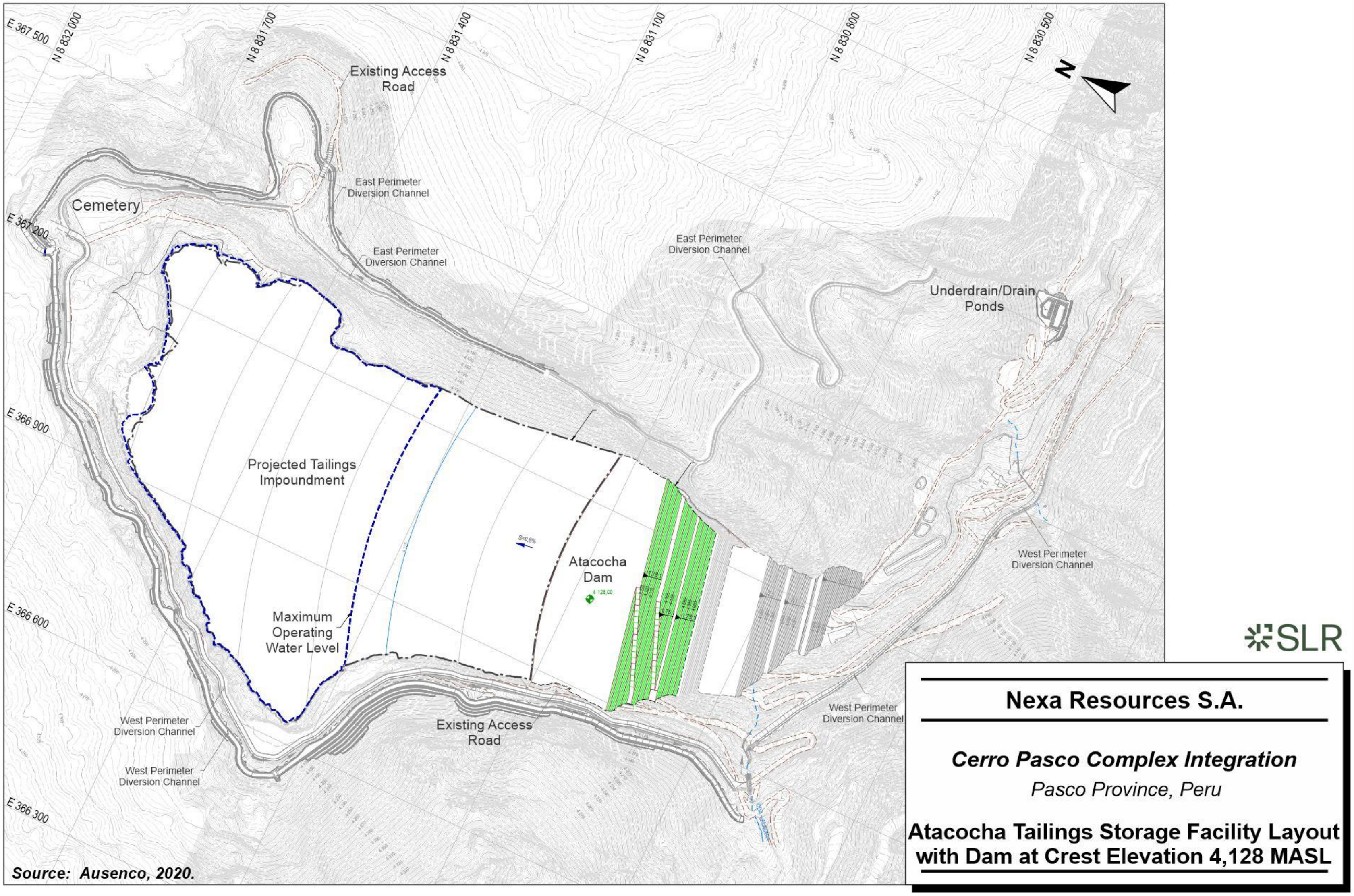
It is understood that the first of four stages of dam raising included geosynthetic clay liner (GCL) on both the upstream and downstream faces of the dam and around the perimeter of the TSF (SRK, 2017). The GCL was reportedly installed for the initial TSF development over concerns about potential acid generation in the tailings and in order to meet permitting conditions. The GCL lining on geogrid support layers around the TSF also serves to mitigate potential issues with karst terrain.

The Atacocha TSF is not equipped with an emergency spillway. It has a contingency pumping system that, when operating at the maximum combined pumping rate, reportedly provides capacity to handle the probable maximum flood. The Atacocha TSF has a perimeter diversion channel to intercept non-contact water and minimize the catchment area of the TSF.

Monthly and annual dam safety inspections are currently being conducted by Geoconsultoria Ltda, an external consultant, for the Atacocha TSF dam. The SLR QP has relied on the statements and conclusions of reports provided by Nexa and its consultants and provides no conclusions or opinions regarding the stability or performance of the dams and impoundments listed in this TRS.

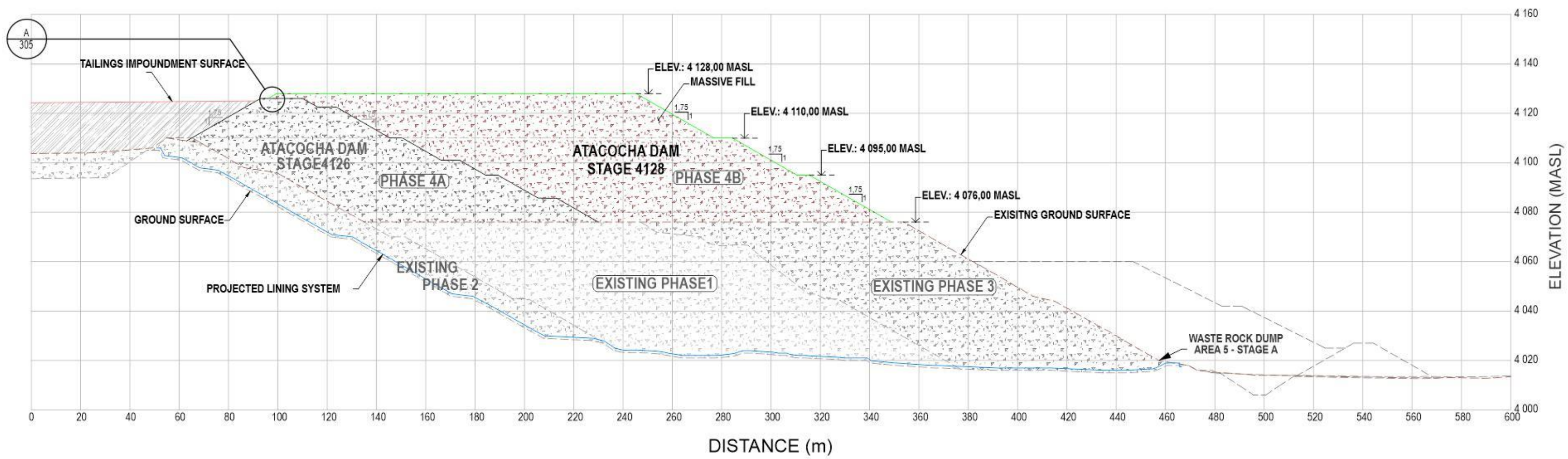
Mine waste rock management planning includes encapsulation of potentially acid generating waste rock within a non-potentially acid generating waste rock surround and the waste rock dump area is provided with a sub-drain seepage collection system (Ausenco, 2018b).

Figure 15-8: Atacocha Tailings Storage Facility Layout with Dam Crest at Elevation 4,128 MASL



Source: Ausenco, 2020.

Figure 15-9: Atacocha Tailings Storage Facility Main Dam Section to Crest Elevation 4,128 MASL



Nexa Resources S.A.

Cerro Pasco Complex Integration

Pasco Province, Peru

Atacocha Tailings Storage Facility Dam Section at Crest Elevation 4,128 MASL

Source: Ausenco, 2020.

16.0 Market Studies

16.1 Markets

The principal commodities produced at El Porvenir and Atacocha, Zn, Pb, Cu, Ag, and Au, are freely traded, at prices and terms that are widely known, so that prospects for sale of any Nexa production are virtually assured.

The final sale products for El Porvenir processing plant (for all underground material processed between years 2024 and 2033) are copper, lead, and zinc concentrates. El Porvenir copper and lead concentrates are sold to traders and delivered by road and rail to Callao, which is approximately 270 km by road, for shipping overseas. Zinc concentrate is transported by road and rail to Nexa's Cajamarquilla zinc refinery near Lima as per Nexa's internal planning. Over the LOM, zinc concentrate represents 60% of El Porvenir's gross revenue, while lead concentrate and copper concentrate represent 37% and 3%, respectively.

The final sales products for the Atacocha processing plant (for open pit material processed between years 2024 and 2027) are lead concentrate and zinc concentrate. Over the LOM of the Atacocha plant, the sale of lead concentrate represents 73% of Atacocha's gross revenue, while zinc concentrate represents 27% of Atacocha's gross revenue.

Over the LOM for the Cerro Pasco Complex, considering production from both El Porvenir and Atacocha plants, the gross revenue, broken down by metal sold is as follows: zinc 54%, lead 16%, copper 2%, silver 27%, gold 1%.

SLR has reviewed the concentrate terms provided by Nexa and found them to be consistent with current industry norms.

Market information in this section is based on the industry scenario analysis prepared by Nexa's Market Intelligence team for years 2022 and 2023 based on information sourced from different banks and independent financial institutions, economy and politics research groups, and metals consultants.

Nexa's Market Intelligence team notes that during the last two years the short-term market scenario is still challenging due to volatility in markets, uncertainty due to fear of a decrease in global demand, inflation affecting major economies and potential US recession in the short term, and geopolitical risks such as the war between Russia and Ukraine, and recent conflict in the Gaza Strip. All these factors are affecting the market fundamentals.

The SLR QP has reviewed the market studies and analyses and is of the opinion that the results support the assumptions in the TRS.

16.1.1 Zinc

16.1.1.1 Zinc Demand

The major market drivers for zinc demand are construction and infrastructure, transportation and vehicles production, industrial machinery production, batteries, and renewable energy. According to Nexa's Market Intelligence team, zinc demand growth will be moderate but will remain strong, supported in part, by government backed stimulus in infrastructure/urbanization and the energy transition, and also supported by China and emerging markets economy.

16.1.1.2 Zinc Supply

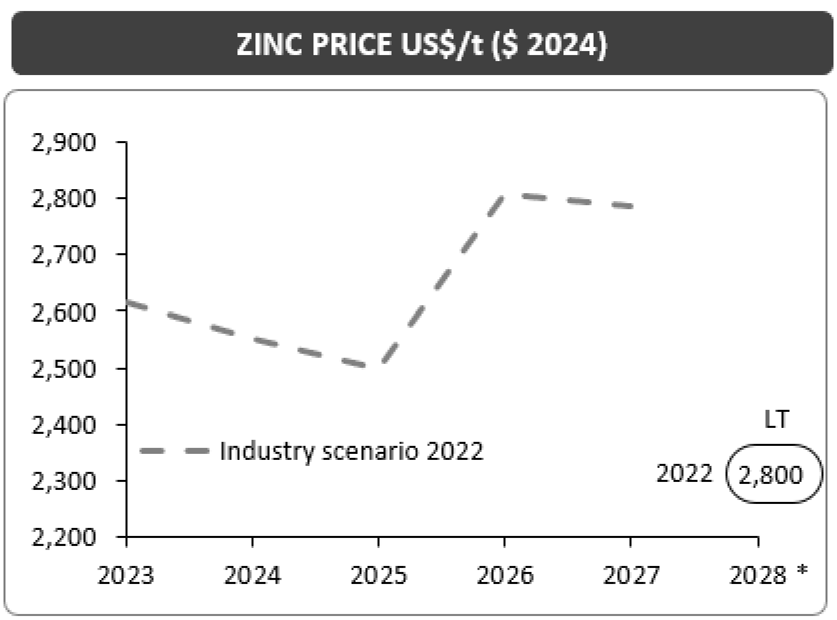
Nexa's Market Intelligence team's supply forecast analysis was based on the following industry information: zinc mine start-up and closure, mine production guidance, disruption allowance evaluation, project pipeline, and cost evaluation. Nexa's analysis results are summarized as follows:

- Mine supply increasing until 2026: operations achieving regular output, projects coming online and ramp-ups, compensating mine grades reduction. Additional volume after 2025 coming from projects at early stages of development .
- Metal production with an average growth of 1.9% from 2023 to 2027, as Europeans smelters overcome energy challenges and return to regular output. Market deficit expected until 2024 and a tight balance afterwards.
- Prices remaining at higher levels throughout the cycle, as refined zinc market remains tight, with inventories at a lower range.

16.1.1.3 Zinc Price Outlook

Zinc prices depend mainly on variations in supply, demand, and the perceived supply/demand balance. The most commonly referenced currency for zinc transactions is US dollars. Nexa forecasts a long-term price of US$2,800/t for its base case price scenario. Figure 16-1 shows the results of Nexa's analysis.

Figure 16-1: Zinc Price Outlook



According to Nexa's team, prices are expected to remain at good margin levels, but not elevated.

16.1.2 Copper

16.1.2.1 Copper Demand

The major market drivers for Cu demand are power generation and transmission, construction, factory equipment, and the electronics industry. Nexa foresees that after a sharp recovery in 2021, year over year demand may return to the pre-pandemic levels. Copper demand will be mostly driven by Electric Vehicles (EVs), renewables, and grid expansion. Major analysts foresee copper's role over the longer term will intensify as a result of decarbonization and the 'greening' of the economy.

16.1.2.2 Copper Supply

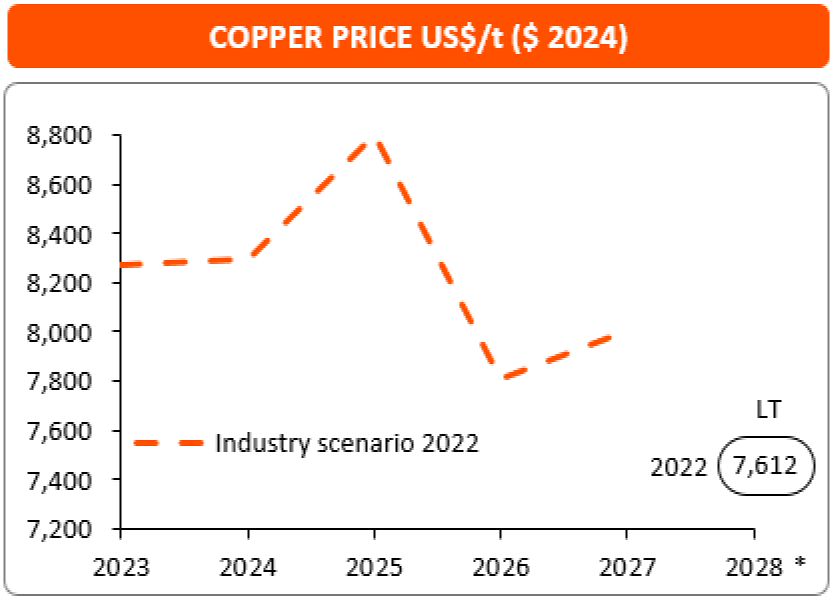
Nexa's Market Intelligence team's supply forecast analysis was based on the following industry information: copper mine start-up and closure, mine production guidance, project pipeline, and cost evaluation for the last two years. Nexa's forecast analysis results are summarized as follows:

- Big-scale brownfield and greenfield projects are expected until 2025, contributing to a concentrate surplus.
- Supply risks: environmental requirements and permitting processes become increasingly stringent and investors demand green credentials. Some projects will also be halted by environmental opposition.
- Among other sources of supply that could come online, scrap is expected to play an important part (32% of world's demand by 2027). China remains the main player for copper scrap: volumes consumed and regulations/standards established.

16.1.2.3 Copper Price Outlook

The main factors that drive copper prices are variations in supply, demand, and the perceived supply/demand balance. Nexa forecasts a long-term price of US$7,612/t for copper. Figure 16-2 shows the results of Nexa's analysis.

Figure 16-2: Copper Price Outlook



16.1.3 Lead, Silver, and Gold

Nexa has based its lead and silver price forecast solely on consensus prices and correlation analysis published by metal market analysts and financial institutions.

16.1.3.1 Lead Price Outlook

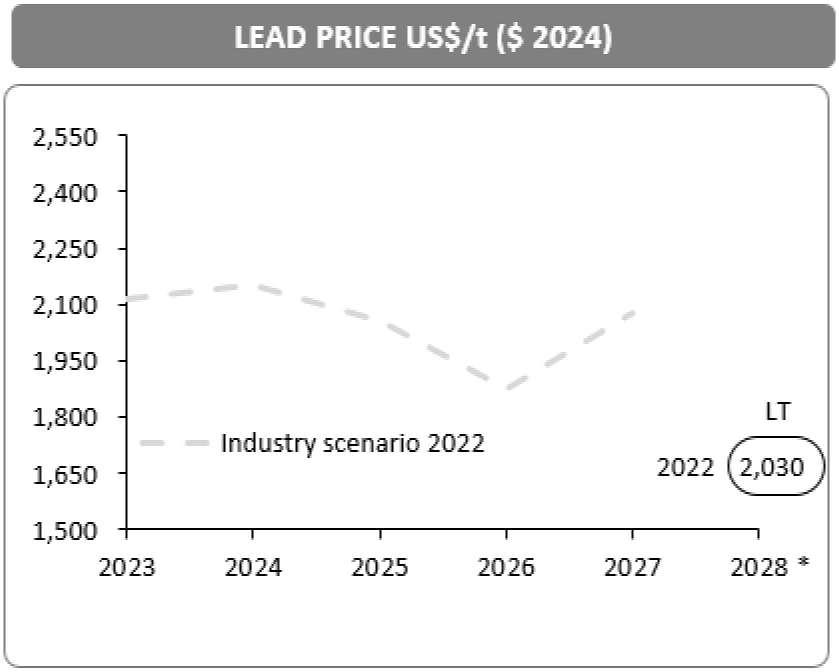
Recently, lead prices have been supported by a reduction in metal inventories due to the post-pandemic effects in the supply chains (higher freight and storage costs).

Recent price movements haven't climbed as sharply as other metals, which has increased lead–zinc spreads to unusual (high) levels. For that reason, lead may be less vulnerable to a further price correction in the mid term.

As fundamentals are concerned, the Chinese and Indian automotive sectors will be the main drivers of global demand growth.

Nexa forecasts a long-term price of US$2,030/t for lead. Figure 16-3 presents the results of Nexa's lead analysis.

Figure 16-3: Lead Price Outlook



16.1.3.2 Silver and Gold Price Outlook

Silver and gold represent 27% and 1% of Cerro Pasco's gross revenue, respectively. Nexa's silver and gold prices were chosen based on the median of consensus prices published by banks and institutions on a monthly basis.

Nexa forecasts a declining silver price from 2026 onwards (between US$20.50/oz Ag and US$21.11/oz Ag). For silver, current price movements are more based on investors optimism and less on increase in demand.

For gold, Nexa forecasts declining prices from 2026 onwards, from US$1,945/oz Au in the short term to US$1,619/oz Au in the long term. For gold, prices may lose strength throughout the cycle 2023 – 2027 as economies recover from current recession scenario and investors migrate to other types of assets.

The silver and gold forecast curves in Figure 16-4 and Figure 16-5, respectively, present the median silver and gold prices based on a consensus of institutional sources.

Figure 16-4: Silver Price Outlook

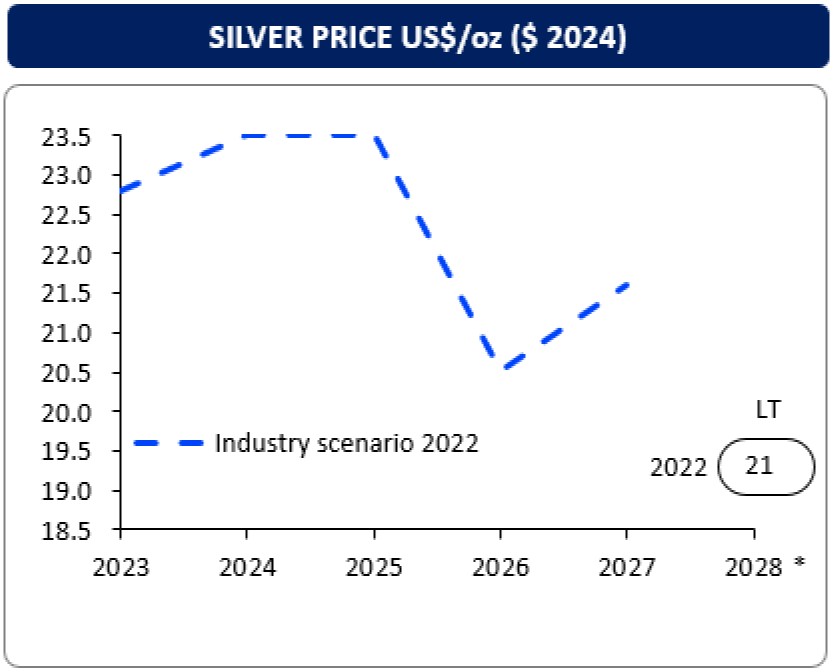
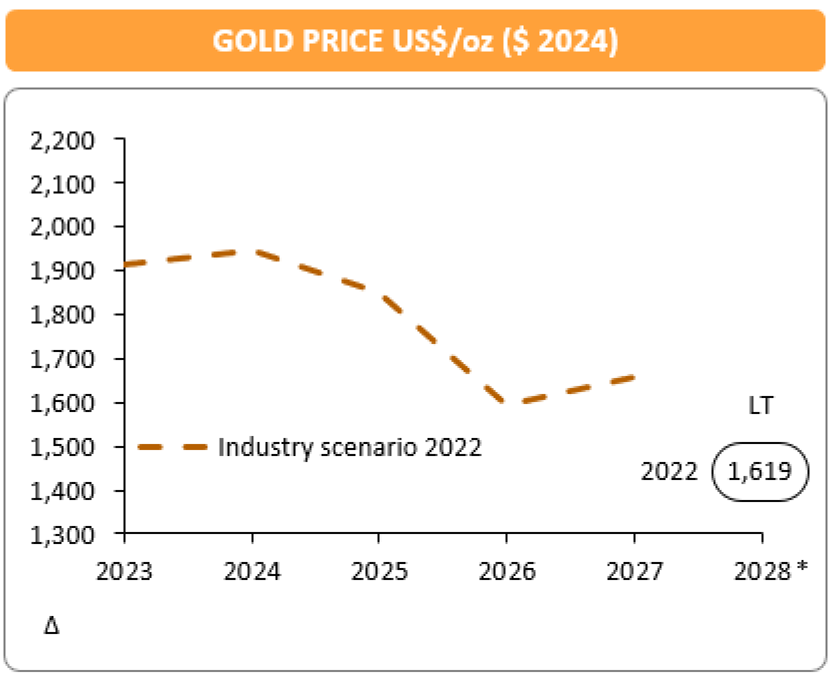


Figure 16-5: Gold Price Outlook



16.2 Contracts

Nexa has negotiated contracts for the sale of its copper and lead concentrates with several known traders (such as Glencore, Trafigura, Humon, and IXM). SLR has reviewed the agreement terms and found these to be in accordance with industry standards.

In addition to concentrate sales, Cerro Pasco has numerous contracts with suppliers for the majority of the operating activities at El Porvenir and Atacocha mine sites, such as:

- Mining operations: Drilling, explosives, loading, hauling, underground mine development, maintenance, etc.
- Processing: Plant maintenance, and laboratory services
- Suppliers for consumables, reagents, maintenance and general services
- General and administrative (G&A) requirements, and other services to support a remote mine operation.

SLR has not reviewed the various support service contract details at the Cerro Pasco Complex, however, Nexa has used these contractors in the past and continues to do so.

17.0 Environmental Studies, Permitting, and Plans, Negotiations, or Agreements with Local Individuals or Groups

Nexa has several corporate policies, including a Compliance Policy. SLR understands that Nexa does not have a specific environmental policy.

Nexa announced an Environmental, Social and Governance (ESG) strategy based on nine pillars, commitments and indicators in 2022 as per the 2022 Annual Report and on the company website. Environmental commitments include:

- Reducing green house gas emissions to reach net zero by 2050
- Optimising water management
- Ensuing full recovery of biodiversity in areas impacted by Nexa activities
- Be recognized as an engaged and transparent company in dam safety and management
- Be a global benchmark waste management and the circular economy
- Implement a decommissioning management system in a responsible manner.

Social commitments include:

- Ensure compliance with international and national Human Rights practices
- Maintain a social licence to operate
- Build social legacy with communities in affected areas
- Ensuring the health and well being of company workers
- Increase diversity and inclusion within the company
- Be recognised for attracting and retaining talent.

Governance commitments include:

- Raise awareness within the company sphere of influence about good business conduct and human rights practices
- Promote good business practices related to ethical, labour, environmental, community and human rights issues
- Transparent management of the ESG program.

Nexa is implementing initiatives and projects in several operations towards achieving these commitments.

17.1 El Porvenir

17.1.1 Environmental Aspects

17.1.1.1 Environmental Setting

Environmental baseline studies have been completed as part of the Environmental Impact Assessment (EIA). A summary of the existing conditions in the El Porvenir area based on information included in Ecotec (2018) and KCB (2020) is presented below, sourced from SLR (2021).

Climate

The climate is cold and dry throughout the year, which is typical of the Central Andes Mountain Region. Approximately 80% of the annual rainfall takes place between October and March. From June to August there are generally minimal rainfalls. Based on data from the Cerro de Pasco regional meteorological station operated by the government (data record from 1975 to 2017), the average temperature ranges from 4°C in July to 6°C in November. The average annual precipitation is 943 mm, with maximum monthly precipitation of 135 mm in March and minimum monthly precipitation of 15 mm in July.

Air Quality

Air quality has been characterized using records from eight monitoring stations for the period 2016 to 2018. The monitoring results are compared against national environmental quality standards for air quality (D.S. No. 003-2017-MINAM). Measured concentrations for particulate matter less than 10 µm (PM10), particulate matter less than 2.5 µm (PM2.5), gases (sulphur dioxide, nitrogen dioxide, carbon monoxide, ozone, hydrogen sulphide) and benzene were below the limit set in the standard.

Surface Water Quality

The existing conditions presented in Ecotec (2018) and KCB (2020) are based on surface water quality monitoring conducted at five sampling locations in three natural waterbodies (Lloclla River, Tingovado Creek, and Huallaga River). Four of these stations are located upstream of the mining activities and one is located downstream. Surface water quality is compared with the national environmental quality standards for water: D.S. No. 002-2008-MINAM for monitoring records from 2013 and 2014, D.S. No. 015-2015-MINAM for monitoring records from 2015 and 2016, and D.S. No. 004-2017-MINAM for monitoring records from 2017 and 2018. The reference values selected from the standards correspond to class 3-D1 for irrigation of high and low stem crops, and class 4-E2 for the Huallaga River.

Results from monitoring of water quality in the Lloclla and Huallaga rivers indicate a reduction of exceedances over time. Monitoring data from 2016 to 2018 (Ecotec, 2018) indicate some exceedances associated with zinc and lead in the Huallaga River, and some exceedances for pH, lead and manganese in the Lloclla River.

The water quality analysis included in Ecotec (2018) presents an individual discussion for each parameter explaining how the exceedances are associated with geological and morphological conditions inherent to the El Porvenir location. From the data presented in the Ecotec report exceedances are observed for short periods of time and are not simultaneously occurring for all the monitored parameters.

Effluent Water Quality

Effluent water quality is monitored at two discharge locations: water discharge from the underground mine to the Huallaga River, and water discharge from the TSF to the Lloclla River. The water quality at the effluent discharge locations complies with the maximum permissible limits established by the current Peruvian Legislation (D.S. No. 010-2010-MINAM and D.S. 003-2010-MINAM).

Groundwater Quality

No groundwater quality monitoring has been carried out prior to 2020 with the exception of monitoring at two locations where discharge of groundwater to surface from the aquifer takes place (i.e. springs). According to Ecotec (2018), one of the springs (station 13MM) has the potential to influence concentrations of arsenic, manganese, and lead in the waters of the Lloclla and Huallaga rivers. The second spring (station 14MM) has the potential to influence concentrations of arsenic in the water of the Lloclla and Huallaga rivers. Comparison against national standards is not applicable because no standards for groundwater quality have been developed for Peru.

Soils and Land Use

There are two types of soils in the El Porvenir area, mineral and organic, derived from residual and transported soils. Actual land use corresponds to five categories: urban development (populated centers) and private facilities (mining activity), cultivated land, natural pastures, arboreal vegetation, and unproductive land (rock outcrops).

Soils at El Porvenir have concentrations of arsenic, cadmium, and lead that exceed the national environmental quality standards (D.S. No. 011-2017-MINAM for industrial use), at some sampling points. According to the baseline characterization, high values of arsenic and lead could be attributed to the local lithology and mineralization. High values of cadmium could be of natural origin since cadmium is associated with zinc and lead impurities.

Noise and Vibrations

Ambient noise has been characterized using records from eight monitoring stations for the period 2016 to 2018. Exceedances were registered in three stations during the day and four stations at night when comparing the monitoring results against the national environmental noise quality standards (D.S. No. 085-2003-PCM) for an Industrial Zone. Exceedances were attributed to human activities and vehicular traffic (Ecotec, 2018). The ambient vibrations monitored at three locations meet international standards used as a reference (BS7385 Part 2-1993).

Aquatic Biology

Aquatic communities account for plankton, periphyton, macroinvertebrates (benthos), and fish. According to KCB (2020), during the wet season in 2015 the phytoplankton was represented by 56 species, the zooplankton by 16 species, the periphyton by 45 species, the benthos by 30 species, and the fish by one specie (*Oncorhynchus mykiss* [rainbow trout]). During the wet season in 2016 the phytoplankton was represented by 27 species, zooplankton by nine species, periphyton by 11 species, and benthos by 14 species. None of the species identified in the El Porvenir area of influence are included in the list of protected species within the Peruvian legislation.

Flora

There are five species included in the national protection list approved under Supreme Decree D.S. No. 043-2006-AG that are found in the El Porvenir area: *Ephedra rupestris* (CR), *Senecio nivalis* (VU), *Chuquiraga spinosa* (NT), *Baccharis genistelloides* (NT), and *Buddleja coriácea* (CR). One specie was identified as endemic: *Plantago serícea* (Plantaginaceae), and two species are used for medicinal purposes by local communities: *Minthostachys mollis* and *Ephedra rupestris*.

Fauna

Fauna in the El Porvenir area is represented by six species of mammals, 34 species of birds, one specie of amphibian, and one specie of reptiles. Four species of mammals, eight species of birds, one specie of amphibian, and one specie of reptiles are included in the national protection list approved under Supreme Decree D.S. No. 004-2014-MINAGRI. The endemic species include two species of mammals, two species of birds, one specie of amphibian, and one specie of reptiles.

Fragile Ecosystems

The high elevation wetlands (referred to as bofedales in Spanish) are present within the area of indirect influence of El Porvenir (i.e., they are located outside the direct area of influence). Ecosystems considered as fragile in Perú are recognized by Law No. 28611 – Environment General Law.

Social

The El Porvenir area of influence encompasses the following rural communities and populated centers:

- Comunidad de San Francisco de Asís de Yarusyacán,
- Comunidad de Cajamarquilla,
- Comunidad Santa Rosa de Pitic,
- Comunidad San Miguel,
- Comunidad La Candelaria,
- Centro Poblado La Quinua, and
- Cooperativa Pucayacu.

17.1.1.2 Environmental Studies and Management Plans

SLR has been provided with the following documents and reports to conduct its review:

- Modification of the Environmental Impact Assessment for Capacity Expansion of the Concentrator Plant to 5,500 tpd (Compañía Minera Milpo, 2011)
- Modification of the Environmental Impact Assessment for Capacity Expansion to 7,500 tpd (Cesel Ingenieros, 2011)
- Fifth Supporting Technical Report (Quinto Informe Técnico Sustentatorio in Spanish) for Modification of Auxiliary Components of El Porvenir Mine (Ecotec, 2018)
- Sixth Supporting Technical Report (Sexto Informe Técnico Sustentatorio in Spanish) for Introduction of Technical Improvements to the Concentrator Plant (Escegis S.R.L, 2020)
- Regulatory report regarding the evaluation of the Sevent Supporting Technical Report (Septimo Informe Técnico Sustentatorio in Spanish) for Introduction of Technical Improvements to the Concentrator Plant (SENACE, 2021)
- Regulatory report regarding the evaluation of the Eighth Supporting Technical Report (Octavo Informe Técnico Sustentatorio in Spanish) for Introduction of Technical Improvements to the Concentrator Plant (SENACE, 2024)
- Annual Report on Compliance with the Environmental Management Strategy in 2018 (Nexa El Porvenir, 2019)
- Annual Report on Compliance with the Environmental Management Strategy in 2019 (Nexa El Porvenir, 2020)
- Environmental Management Plan included in the Eight Supporting Technical Report
- Quarterly environmental monitoring reports for 2023

- Sustainability reports for El Porvenir for 2021 and 2022
- Emergency response plan for El Porvenir

El Porvenir is managed according to the environmental and closure considerations presented in four type of documents, which must be approved by directorial resolutions (RD for its acronym in Spanish) from the Peruvian government (see Section 17.1.3):

- Environmental Adjustment and Management Plan
- EIA and subsequent modifications
- Supporting Technical Reports (ITS for its acronym in Spanish)
- Mine Closure Plan

Various EIA modifications and ITSs have been submitted and approved between 2001 and 2024. The most recent EIA approved in 2012 corresponds to the expansion of the concentrator plant production rate to 7,500 tpd.

The key project effects and associated management strategies are presented in Table 17-1, as described in the EIA and ITS documents reviewed by SLR. Prevention and mitigation measures identified for soils, air quality, water quality, biology, socio-economic aspects, landscape, and archeological remains are presented in the Environmental Management Plans included in the EIA and ITS documents. Mitigation measures against vibrations are not considered in the environmental studies provided to SLR. The monitoring program includes meteorology, air quality and gas emissions, non-ionizing radiation, ambient noise, surface water quality, spring water quality, effluent discharges, flora and fauna.

The monitoring program includes the following:

- Air quality at nine locations
- Non-ionizing radiation at two locations
- Gas emissions at six locations
- Ambient noise at 11 locations
- Surface water quality in receiving water bodies at five locations
- Groundwater quality daylighting at surface from springs at three locations
- Industrial effluent water quality at two locations
- Treated wastewater effluent water quality at two locations
- Monitoring of flora at four locations
- Monitoring of fauna at four locations
- Hydrobiology monitoring at four locations

The environmental monitoring is conducted by an external consultant (SGS del Perú) responsible for preparing quarterly reports for Nexa. The results of the monitoring program are reported quarterly to the Agency for Environmental Assessment and Enforcement (OEFA for its acronym in Spanish) and the National Water Authority (ANA for its acronym in Spanish).

The conclusions presented by SGS del Perú in the quarterly reports prepared for Nexa in 2023 are summarized as follows:

- Water quality for industrial effluent discharge was in compliance with maximum permissible limits established in Peruvian norm D.S. No. 010-2010-MINAM.
- Water quality for treated wastewater discharge from domestic use was in compliance with maximum permissible limits established in Peruvian norm D.S. No. 003-2010-MINAM.
- The water quality values measured in receiving water courses (Llocla River, Huallaga River, Tingovado Creek) are compared against the Peruvian Environmental Quality Standards for water quality established in norm D.S. No. 004-2017-MINAM. The measured values for total metals met the applicable standards for water quality. However, exceedances in pH values were identified at all water quality monitoring locations both upstream and downstream of the operations.
- Water quality monitored at two springs was in compliance Peruvian norm D.S. No. 004-2017-MINAM.
- The non-ionizing radiation values measured at two locations are compared against the Peruvian Environmental Quality Standards for non-ionizing radiation established in norm D.S. No. 010-2005-PCM. Non-ionizing radiation was in compliance with the applicable standards.
- Air quality was in compliance with Peruvian norms D.S. No. 074-2001-PCM, R.M. No. 315-96-EM/VMM and D.S. No. 003-2017-MINAM.
- Ambient noise was in compliance with Peruvian norm D.S. No. 085-2003-PCM.

Table 17-1: Summary of Key Environmental Effects and Management Strategies

Environmental Component	Potential Impact	Mitigation Measures / Management Strategies
Topography and landscape	Relief alteration changes in landscape's visual quality.	No specific measures or strategies are proposed.
Soils	Changes to soil uses. Changes to soil quality.	Mitigation measures imbedded in the infrastructure design to minimize spill accidents. Appropriate management of industrial and domestic waste. Appropriate management of oils and fuels. Appropriate management of hazardous waste. Development and implementation of spills management plan. Removal of soils exposed to spills and storage in sealed containers for appropriate disposal in agreement with applicable legislation. Activities for vehicle maintenance are restricted to designated areas.
Surface water	Changes to surface water flows. Changes to surface water quality.	Appropriate management of chemical substances. Development and implementation of spills management plan. Domestic wastewater treatment. Mine water sedimentation ponds. Diversion of non-contact water around the TSF. Inspection and maintenance of the TSF diversion channel. Collection of surface runoff in the concentrator plant area. Sediment and erosion control measures. Tailings sub-drainage is captured in a monitoring pond and recirculated or discharged according to its quality, considering sediment control. Monthly water quality monitoring for receiving water bodies and effluent discharges. Currently Nexa reports monitoring results from 11 stations (five of them are effluent discharges). Quarterly reporting of monitoring results.
Groundwater	Changes to phreatic level. Changes to groundwater quality.	No specific measures or strategies are proposed. Monthly water quality monitoring in two springs and one piezometer (see Table 17-2). Quarterly reporting of monitoring results.
Air quality	Changes from particulate and gas emissions.	Regular irrigation of access roads with tanker trucks during the dry season. Wet grinding. Traffic speed control.

Environmental Component	Potential Impact	Mitigation Measures / Management Strategies
		Regular preventive maintenance of vehicles and equipment. Use of personal protective equipment by mine staff and training. Monitoring of particulate matter (PM10 and PM2.5), metals (lead, arsenic and zinc) and gases during the construction and operation phases. Monthly air quality monitoring at six stations located leeward and windward of the Concentrator Plant and the TSF. Quarterly reporting of monitoring results.
Noise	Disturbances resulting from changes to ambient noise levels.	Use of hearing protection devices in the concentrator plant area. Controlled time of exposition of workers to noise sources. Appropriate planning and scheduling of operation of noise sources. Regular preventive maintenance of vehicles and equipment. Use of vehicle horns limited to emergency situations. Quarterly monitoring at six stations. Quarterly reporting of monitoring results.
Flora and fauna	Changes to vegetation cover. Alterations to habitat. Disturbance of wild fauna.	Prohibition to disturb fauna. Land clearing limited to authorized areas. Prohibition to collect flora. Prohibition to extract species of flora and fauna. Noise control measures. Sediment control measures to protect natural streams. Traffic speed limits. Prohibition to use vehicle horns except in case of emergency. Monitoring of phytoplankton, zooplankton, benthic organisms, perifiton and macrofitas at four stations. Monitoring of metals content in sediment samples. Monitoring of flora at four stations. Monitoring of fauna at four stations. Bi-annual monitoring (dry and wet season).

17.1.1.3 Key Environmental Issues

SLR is not aware of any recent or ongoing environmental issues taking place associated with the El Porvenir operations. In the SLR QP's opinion, there are no environmental issues that could materially impact the ability to extract the Mineral Resources and Mineral Reserves based on the review of the available documentation.

17.1.1.4 Environmental Management System

Nexa uses an ISO 14001 compliant environmental management system at all of its operations to support environmental management, monitoring and compliance with applicable regulatory requirements during operation. Each operation undergoes an annual independent assessment with environmental laws, regulations and commitments.

Nexa utilizes an Integrated Dam Management System (referred to as SIGBar) for the TSF, which provides guidelines for document management, monitoring, evaluation, risk analysis, compliance with standards and legislation, training of personnel, operation of structures and other provisions.

The environmental monitoring program established at El Porvenir and the environmental audits performed annually (aiming to identify critical environmental risks in the operations) are the main tools of the El Porvenir's Environmental Management System to track the implementation of high environmental standards and the continuous compliance with the environmental commitments. The environmental audit matrix includes the evaluation of:

- Audit results to comply with legal requirement for environmental audit.
- Environmental monitoring activities.
- Environmental incidents.

According to Nexa's website and the Nexa Annual Report, the company maintains an active risk assessment, monitoring, and updating process as part of the environmental management system, considering all operating units and corporate areas. This is how the company identifies and manages the main risks from both an operational and strategic point of view, reducing and mitigating impacts to maintain business sustainability. All risks are assigned a "risk owner" and risks rated as high or critical require action plans. Nexa has an integrated management system that establishes the guidelines that govern the conduct of the businesses, with a focus on quality management of environmental, health and workplace safety, and social responsibility issues. In addition, Nexa follows applicable environmental laws and regulations pertaining to its business in each country where it operates.

17.1.2 Tailings Disposal, Water Management and Monitoring

17.1.2.1 Environmental Geochemistry

Geochemical testing of the cyclone tailings underflow by Ausenco (2013) determined that the tailings have a high potential for generating acid drainage in the long term. While the leaching tests do not indicate potential for metal solubilization in the short term, kinetic tests, that demonstrate the evolution of the quality of the leachates over time, have not been completed. Geochemical testing by the Universidad Nacional de Ingenieria (Ausenco, 2018c) of the waste rock used for dam construction concluded that the rock was non acid generating.

According to information included in the initial Mine Closure Plan (KCB, 2006), the waste rock deposited on surface (mostly in the La Quinua WRD) is non acid generating. SLR is not aware of geochemistry analysis of the rock walls of the El Porvenir underground mine having been conducted. If the rock is similar to the material disposed in the La Quinua WRD, then it is either non acid generating or has an uncertain potential for acid generation. Due to high neutralization potential of the rock identified from early testing, no acid rock drainage (ARD) is anticipated to occur in the short or mid term. The Mine Closure Plan recommends carrying out additional geochemical studies to confirm the rock acid generation potential before closure in order to define and appropriate closure strategy and management measures to achieve geochemical stability.

17.1.2.2 Tailings Management

SRK (2017) reported that crest settlements at the left side of the dam were reportedly noted in a 2008 report by Golder Associates that was not available for review. No issues regarding crest settlements were noted in recent dam safety surveillance reports. SLR notes however that bedrock foundation grouting of the left and right abutments carried out in 2015 observed very significant grout takes in numerous grout hole stages indicating the filling of voids. A series of seepage collection sub-drainage pipes were also installed on the downstream shell of the dam prior to raising the rockfill to the crest elevation of 4,056 MASL (Ausenco, 2016a).

According to a teleconference held with Nexa staff on March 14, 2024, the rock used to raise the dam is non-potentially acid generating rock taken from a quarry.

Tailings disposal at El Porvenir is performed in subaerial conditions which allows a beach with a gentle slope towards supernatant pond (settling pond). The safety of operating a centerline raised tailings dam depends on the ability to maintain wide tailings beach and a low phreatic level in the dam for stability. Tailings deposition plan considers deposition from three main locations to create the settling pond to be centrally located within the TSF and a tailings beach to form in front of the main embankment. The minimum beach width targeted by Nexa for operations in the OMS manual is 320 m. A capacity assessment of the TSF by Nexa (2020) recommends topographic and bathymetric surveys every six months to assess the available capacity.

The Cerro Pasco Complex Integration project provides Nexa with flexibility for tailings management by making possible the discharge of tailings from El Porvenir to the Atacocha TSF. It relies mostly on the storage capacity of the Atacocha TSF for tailings disposal in the future. It is not dependent on a raise of the El Porvenir dam above crest elevation 4,070 MASL.

Dam surveillance at El Porvenir consists of instrumentation measurements and field inspections. Field inspections (regular routine inspections) are carried out by Nexa personnel responsible for its operation, and monthly by an external consultant (Geoconsultoria). Piezometers and water level indicators are measured every two weeks, surface landmarks monthly. Pluviometry (precipitation) and the level of the pond within the TSF are read daily. The data are reviewed by an external consultant (Geoconsultoría) on a monthly basis. It is noted that Geoconsultoría has been conducting the monthly reviews for Nexa for various years now, which provides consistency to the review.

Nexa utilizes an Integrated Dam Management System (referred to as SIGBar) which provides guidelines for document management, monitoring, evaluation, risk analysis, compliance with standards and legislation, training of personnel, operation of structures and other provisions. An Operation, Maintenance, and Surveillance (OMS) manual is available that describes roles and responsibilities of personnel assigned to the operation and maintenance for the TSF. It includes an emergency response plan. A dam breach analysis was completed in 2022 considering the crest elevation 4,062 MASL to inform the emergency preparedness and response plan. Nexa reportedly considered the results of the dam breach analysis to inform the hazard potential classification of the TSF dam. SLR is not aware of a Trigger Action Response Plan (TARP) being established for the instrumentation system.

A Failure Mode and Effects Analysis (FMEA) was conducted by Ausenco in 2022 for the El Porvenir TSF dam raise to elevation 4,064 MASL. The level of risk was assessed considering four categories: Low, Medium, High and Extreme. Based on consideration of design and operation changes, operational controls, monitoring of geotechnical instrumentation and detailed studies completed for the TSF, all the risks ratings were either Low or Medium. No High or Extreme risks were identified. Ausenco concluded that the actions implemented and planned by Nexa appear to be adequate to mitigate the risks considered in the evaluation.

The risk status of failure modes is dynamic. All analyzes carried out are based on the conditions of the tanks in their current condition, so it is required to periodically review the failure modes, with the aim of identifying any variation in operating conditions and re-evaluating if necessary.

According to the OMS manual, the El Porvenir tailings dam design takes into consideration international standards (such as Canadian Dam Association, ICOLD, ICMM) in terms of geotechnical stability and flood management. A hazard consequence classification of ‘Extreme’ has been adopted for seismicity (maximum credible earthquake) and hydrological (probable maximum flood) design criteria. Nexa’s governance practices for El Porvenir aim to follow international standards and common practices by having appointed an Engineer of Record, implementing quality assurance during construction, preparing a monthly dam safety evaluation report, and conducting regular geotechnical monitoring. The SLR QP has relied on the statements and conclusions of reports provided by Nexa and its consultants and provides no conclusions or opinions regarding the stability or performance of the dams and impoundments listed in this TRS.

SLR understands that annual dam safety inspections were temporarily interrupted due the COVID pandemic that started in 2020 but have now been resumed and an annual dam safety inspection report for 2023 is being prepared by Geoconsultoría. It is noted that no annual inspection reports were included within the documentation provided to SLR for review for this TRS. Two recent monthly inspection reports by Geoconsultoría for December 2023 and January 2024 were provided to SLR. Geoconsultoría stated in the January report that the safety condition of the dam is satisfactory, and no non-conformities were identified from the monitoring data and the inspections. Of note, the target freeboard and minimum tailings beach width (measured relative to the dam) for operations were not met in December 2023 but corrective actions were implemented by Nexa and both were met in January 2024.

The following recommendations are proposed for the El Porvenir TSF:

- Develop TARPs for the piezometers for inclusion in the OMS manual and monitoring plan.
- Capacity assessments of the TSF completed on a bi annual basis with topographic and bathymetric surveys.
- Complete long term geochemical kinetic testing of the tailings.
- Implement a groundwater monitoring program at the TSF to determine levels of metals and sulphates. Monitoring stations should be implemented both upstream and downstream of the TSF.
- Monitor the water quality from the TSF subsurface drains.

Hatch (2024) noted that for the emergency spillway channel, post-seismic and pseudo-static conditions were not analyzed for all types of sliding surfaces. Nexa indicated to Hatch that these analyses were not performed because they are not permanent structures and would be repaired if there were potential damages. Hatch recommended conducting studies on post-seismic and pseudo-static conditions for sliding surfaces of fault blocks, both globally and locally, regardless of the temporality of the structure.

17.1.2.3 Water Management

Freshwater is withdrawn at the Yanamachay pumping station from the Carmen Chico River and the Huarmipuquio Spring for distribution to the potable water tank and three water supply ponds that feed the concentrator plant for industrial processes. These water supply ponds also receive water from the Milpo Creek via the Socorro Pond. Water from the potable water tank is supplied to the mine camp and neighbouring communities (Vista Alegre, San Carlos, San Juan).

Water for underground mine operations activities is taken from the water supply ponds of the concentrator plant. Underground mine water is pumped to the La Quinua Sedimentation Pond to promote settling of solid particles before being discharged to the Huallaga River.

Tailings discharged to the TSF come from the El Porvenir and Atacocha concentrator plants. Tailings water and surface runoff resulting from direct rainfall over the TSF footprint are collected in the tailings pond. Water from the tailings pond is recirculated to the El Porvenir concentrator plant as make-up water for ore processing via the three water supply ponds of the concentrator plant area. Seepage water intercepted by the TSF underdrain system is captured in a lined monitoring pond and recirculated to the tailings pond or discharged into a local tributary of the Lloclla River if the water quality meets the applicable standards for direct discharge to the environment. Surplus water collected in the TSF pond is discharged through a decant overflow system that conveys flows to the monitoring pond. Operation of a sluice gate at that location allows for discharge control of decanted water into the monitoring pond or directly into a local tributary of the Lloclla River. As a contingency measure, the water management system allows conveyance of water collected in the monitoring pond to the sediment ponds located near the La Quinua WRD.

Nexa is planning to improve the TSF water management system through construction of a perimeter channel to intercept non-contact water (freshwater) from the sub-watershed that contributes natural surface runoff towards the TSF footprint. The Chinchao and Tingovado creeks will be intercepted by this diversion channel that will redirect water from the creeks towards the Lloclla River.

Sanitary wastewater generated at El Porvenir is collected and treated in a wastewater treatment plant. Treated water is conveyed to the tailings pond of the TSF for re-use in mine operation activities.

Furthermore, it is unclear if the water balance for El Porvenir is continuously tracked during operation to support decision making associated with water management and dam safety. A water balance for ongoing operations to be updated regularly by mine operations personnel (or a designated consultant) is an important tool to ensure that sufficient water is available for ore processing and that pond water levels are adequate for safe operation of the TSF. The water balance makes it possible to track trends and conduct short term predictions through the simulation of variable operating and/or climatic scenarios to support decision making associated with tailings pond operation (e.g., maintaining adequate dam freeboard at all times).

As indicated in Hatch (2023), there is no integrated water balance for the entire operation after the integration of both units. SLR recommends developing a comprehensive water balance assessment to confirm that sufficient water will be available to meet the ore processing water demand and the safe operation of both the El Porvenir TSF and the Atacocha TSF.

SLR recommends Nexa develop an integrated water balance that reflects the interaction between the El Porvenir and Atacocha operations in regard to water balance, to identify and predict possible scenarios of interruption of mine operations due to water management issues and/or dam safety concerns (e.g., not maintaining adequate dam freeboard).

According to the Nexa 2020 (Annual Report on Compliance with the Environmental Management Strategy in 2019), water quality monitoring currently takes place at the 14 locations listed in Table 17-2. Based on the documentation available for review, SLR is not aware of any non-compliance issues raised by the authorities associated with the El Porvenir water quality monitoring program.

Based on the Environmental Management Plans presented in the EIA and ITS documents, only one groundwater quality monitoring location is included in the environmental monitoring program. Monitoring results at this location are not included in the quarterly monitoring reports on water quality.

Typical practice for environmental monitoring of groundwater involves the installation of wells upstream and downstream of the mine site to compare water quality results and identify potential impacts of the mine operation to groundwater. It is unclear how El Porvenir currently verifies that no changes to groundwater due to mining activities are taking place within the area of influence of the operation. SLR recommends expanding the groundwater quality monitoring program to include additional stations for collection of groundwater quality samples (and subsequent analysis). As a minimum, consideration should be given to the installation of one station upstream of El Porvenir.

Table 17-2: Water Quality Monitoring Locations

Station ID	Type of Water	Location
5MM	Surface water effluent	Underground mine discharge at La Quinua tunnel outlet.
5AMM	Surface water effluent	Discharge from sedimentation pond to the Huallaga River.
6MM	Surface water effluent	Discharge from the TSF to the Lloclla River.
6CH-F4	Surface water effluent	La Candelaria Hydroelectric Plant - Station 4.
16MM	Surface water effluent	Inflow to the Sanitary Wastewater Treatment Plant from the mine camp.
7MM	Receiving water body	Lloclla River upstream of the TSF.
8MM	Receiving water body	Lloclla River downstream of the TSF.
9MM	Receiving water body	Huallaga River upstream of the La Quinua tunnel outlet.
10MM	Receiving water body	Huallaga River downstream of the La Quinua tunnel outlet.
11MM1	Diverted water	TSF diversion channel before the discharge to the Lloclla River.
12MM	Surface water body	Tingovado Creek upstream of the diversion channel.
13MM	Groundwater	Spring.
14MM	Groundwater	Spring.
15MM	Groundwater	Piezometer.

17.1.3 Environmental Permitting

17.1.3.1 Current Permits, Approvals and Authorizations

The El Porvenir operation is managed according to the environmental and closure considerations presented in three types of documents, which must be approved by directorial resolutions from the Peruvian government:

- EIA and subsequent amendments and modifications
- Supporting Technical Reports (ITS for its acronym in Spanish)
- Mine Closure Plan

SLR understands that El Porvenir has the permits required to continue the mining operations in compliance with applicable Peruvian permitting requirements. The permits are RDs issued by the Peruvian authorities upon approval of mining environmental management instruments filed by the mining companies such as EIAs, ITSs, and Mine Closure Plans. The approved permits address the authority's requirements for operation of the El Porvenir underground mine, TSF, concentrator plant, water usage, and effluents discharge.

Nexa maintains an up-to-date record of the legal permits obtained to date, documenting the approving authority, validity period and expiry dates, status (current, canceled or superseded), and indicating if renewal is required or not.

The El Porvenir directorial resolutions on environmental certifications, effluent discharge, water use, mine closure and tailings management are listed in Table 17-3. According to the record of the legal permits provided by Nexa in February 2024, the approved environmental certifications (i.e., EIA and ITS) do not have expiry dates and therefore renewal dates are not applicable.

With the approval of the eighth ITS, Nexa can operate El Porvenir TSF until 2037, whereas prior to its approval the operation was authorized until 2026.

Table 17-3: Environmental, Mine Closure, and Tailings Disposal Licences

Authority	Obligation/Licence	Date of Issue (DD/MM/YYYY)	Expiration Date (DD/MM/YYYY)	Status
Environmental Certifications				
MINEM-DGM	PAMA (Programa de Adecuación y Manejo Ambiental) Approval RD 023-1997-EM/DGM	17/1/1997	None	Active
MINEM-DGE	PAMA Approval - Electric System (CH Candelaria + CT Milpo) RD 028-1997-EM/DGE	23/1/1997	None	Active
MINEM-DGAAM	EIA for Production Expansion of the Plant to 3,100 tpd RD 379-2001-EM/DGAA	26/11/2001	None	Active
MINEM-DGM	PAMA Approval of Execution RD 288-2002-MEM/DGM	7/11/2002	None	Active
MINEM-DGAAM	Modification of the EIA for Production Expansion of the	2/9/2011	None	Active

Authority	Obligation/Licence	Date of Issue (DD/MM/YYYY)	Expiration Date (DD/MM/YYYY)	Status
	Concentrator Plant to 5,500 tpd RD 271-2011-MEM/AAM			
MINEM-DGAAM	EIA for Capacity Expansion of the Concentrator Plant to 7,500 tpd and Expansion of Cyclone Tailings RD 203-2012-MEM/AAM	25/6/2012	None	Active
MINEM-DGAAM	1st ITS El Porvenir – Transmission Line 220 kV Substation Paragsha II – Substation El Porvenir and Transmission Line 50 kV RD 159-2014-MEM/DGAAM	2/4/2014	None	Active
MINEM-DGAAM	2nd ITS El Porvenir – Integration Tailings Storage/Tailings Line Atacocha-El Porvenir (El Porvenir Zone) RD 526-2014-MEM/DGAAM	20/10/2014	None	Active
MINEM-DGAAM	IGA Ownership Change Record 647-2015-MEM/DGAAM	2/3/2015	None	Active
MINEM-DGAAM	3rd ITS El Porvenir – Approval “Variant to Ends of Transmission Line 220 kV-S.E. Paragsha II-SE El Porvenir and SE Milpo (El Porvenir), and tension reduction of Transmission Line from 220 kV to 138 kV" RD 271-2015-MEM-DGAAM	9/7/2015	None	Active
SENACE	4th ITS El Porvenir – Capacity Expansion of the Concentrator Plant to 9,000 tpd RD 319-2017-SENACE-DCA	24/10/2017	None	Active
SENACE	5th ITS El Porvenir – Auxiliary Components RD 058-2018-SENACE-PE/DEAR	13/12/2018	None	Active
SENACE	6th ITS El Porvenir – Introduction of Technical Improvements to the Concentrator Plant RD 51-2020-SENACE-PE/DEAR	10/3/2020	None	Active
SENACE	7th ITS El Porvenir – Drilling Pads and Modification to General Offices RD 36-2021-SENACE-PE/DEAR	04/03/2021	None	Active
SENACE	8th ITS El Porvenir – Auxiliary Components RD 23-2024-SENACE-PE/DEAR	07/02/2024	None	Active

Authority	Obligation/Licence	Date of Issue (DD/MM/YYYY)	Expiration Date (DD/MM/YYYY)	Status
Effluent Discharge and Reuse Authorizations				
ANA-DGCRH	Authorization for Discharge of Treated Industrial Residual Water from the Concentrator Plant RD 014-2010-ANA-DGCRH	10/8/2010	10/8/2012	Inactive Modified
ANA-DGCRH	Authorization for Domestic Residual Water Reuse for Irrigation RD 005-2013-ANA-DGCRH	7/1/2013	7/1/2015	Inactive Renewed
ANA	Renewal of Authorization for Discharge from LQ and Porvenir Underground Mine Portals RD 172-2015-ANA-DGCRH	15/6/2015	15/6/2019	Expired Not Renewed
AAA-HUALLAGA	Authorization for Water Reuse RD 165-2015-ANA/AAA-HUALLAGA	7/7/2015	7/5/2019	Expired Not Renewed
ANA	Renewal of Authorization for Discharge from LQ and Porvenir Underground Mine Portals RD 192-2019-ANA-DCERH	16/6/2019	16/6/2022	Active
ANA	Renewal of Authorization for Domestic Residual Water Reuse for Mining Purposes (Irrigation) RD 600-2019-ANA/AAA-HUALLAGA	6/7/2019	7/6/2025	Active
Water Use Licences				
ANA	Mine Water Licence RS 0392-1974-AG	08/4/1974	None	Inactive
ANA	Mine and Camp Water Licence RS 0057-76-AG/DGA	4/3/1976	None	Inactive
ANA	Mine and Population Water Licence RS 307-76-AG/DGA	14/12/1976	None	Inactive
ANA	Power Generation Water Licence RD 0020-92-AG-DGAS	30/6/1992	None	Active
ANA	Power Generation Water Licence RD 0029-92-AG-DGAS	17/7/1992	None	Active
ANA	Population Industrial Water Licence RA 0014-92-SRP-DGA/RN Y DR SAS	13/12/1992	None	Inactive
ANA	Power Generation Water Licence RA 001-93-DGA-SRPRN	15/2/1993	None	Active

Authority	Obligation/Licence	Date of Issue (DD/MM/YYYY)	Expiration Date (DD/MM/YYYY)	Status
ANA	Population Camp Water Licence RA 011-98-AG-DSRAP/INRENA-ATDRP	9/7/1998	None	Inactive
MINAGRI-ANA	Power Water Use Licence (Modification Ar1) RD 127-2006-AG-DRA-P-A-TPDR	22/12/2006	None	Inactive Modified
MINAGRI-ANA	Water for Population Use Licence (Modification Ar1) RD 125-2006-AG-DRA-P/ATPDR	22/12/2006	None	Inactive Modified
MINAGRI-ANA	Water for Mining Use Licence (Modification Ar1) RD 126-2006-AG-DRA-P/ATPDR	22/12/2006	None	Inactive Modified
ANA	Approval of Ownership Change to MAP - Water for Population Use Licence RD 264-2015-ANA-AAA-X-MANTARO	6/4/2015	None	Inactive
ANA/AAA-HUALLAGA	Approval of Ownership Change to MAP – Power Use RD 086-2016-ANA/AAA-HUALLAGA	11/2/2016	None	Not Applicable
ANA	Approval of Ownership Change to MAP - Water for Mining Use Licence RD N° 399-2016-ANA/AAA-HUALLAGA	13/6/2016	None	Inactive
ANA	Approval of Ownership Change to Nexa El Porvenir– Surface Water for Mining Use RA 322-2019-ANA-AAA-HUALLAGA-ALA ALTO HUALLAGA	3/10/2019	None	Active
Mine Closure Plans				
MINEM-DGAAM	El Porvenir Mine Closure Plan Approval RD 166-2009-MEM/AAM	17/6/2009	9/15/2019	Active Renewable
MINEM-DGAAM	El Porvenir Mine Closure Plan First Amendment RD 286-2011-MEM/AAM	15/9/2011	9/15/2019	Active Renewable
MINEM-DGAAM	El Porvenir Mine Closure Plan Update RD 034-2013-MEM/AAM	30/1/2013	9/15/2019	Active Renewable
MINEM-DGAAM	El Porvenir Mine Closure Plan Second Amendment RD 277-2016-MEM/DGAAM	15/9/2016	9/15/2019	Active Renewable

Authority	Obligation/Licence	Date of Issue (DD/MM/YYYY)	Expiration Date (DD/MM/YYYY)	Status
Tailings Management				
MINEM-DGM	Beneficiation Concession for the Tailings Storage Facility RD 280-97-EM/DGM	12/8/1997	None	Active
MINEM-DGM	Beneficiation Concession for the Tailings Storage Facility RD 281-97-EM/DGM	12/9/1997	None	Active
MINEM-DGM	Construction Authorization for Expansion of Tailings Storage Facility to Dam Elevation 4,043 RD 178-2010-MEM	7/4/2010	None	Active
MINEM-DGM	Authorization for Operation of Tailings Storage Facility to Dam Elevation 4,043 RD 356-2010-MEM-DGM/V	18/9/2010	None	Active
MINEM-DGM	Modification of Schedule for Expansion of the Tailings Storage Facility RD 252-2014-MEM-DGM/V	9/7/2014	None	Active
MINEM-DGM	Construction Authorization for New Components of Tailings Line from Profile Alignment Station 1+524m to El Porvenir Tailings Storage Facility RD 0584-2014-MEM-DGM/V	29/12/2014	None	Active
MINEM-DGM	Authorization for Operation of El Porvenir Tailings Storage Facility to Dam Elevation 4,047 and Expansion of the Beneficiation Concession "Aquiles 1 Accumulation" to 183.28 ha RD 612-2015-MEM/DGM	12/6/2015	None	Active
MINEM-DGM	Authorization for Operation of Tailings Pipeline El Porvenir RD 194-2015-MEM-DGM-DTM/PB	19/6/2015	None	Active
MINEM-DGM	Authorization for Operation of New Components of Tailings Line from Profile Alignment Station 1+524m to El Porvenir Tailings Storage Facility RD 0251-2015-MEM-DGM/V	19/6/2015	None	Active
MINEM-DGM	Authorization for Operation of Tailings Storage Facility Expansion to Dam Elevation 4,048.5 RD 0499-2016-MEM-DGM/V	18/8/2016	None	Active

Authority	Obligation/Licence	Date of Issue (DD/MM/YYYY)	Expiration Date (DD/MM/YYYY)	Status
MINEM-DGM	Construction of Tailings Storage Facility Expansion to Dam Elevation 4,100 and Secondary Embankment at the Process Plant Side RD 006-2017-MEM-DGM/V	9/1/2017	None	Active
MINEM-DGM	Authorization for Operation of Tailings Storage Facility Expansion to Dam Elevation 4,056 and Extension of Diversion Channel RD 828-2017-MEM-DGM/V	25/9/2017	None	Active
MINEM-DGM	Authorization for Operation of Tailings Storage Facility to Dam Elevation 4,060 RD 0498-2019-MEM-DGM/V	7/10/2019	None	Active

17.1.3.2 Future Permits and Authorizations

The main future permits to be obtained by Nexa for the implementation of the Cerro Pasco Complex integration include (Hatch, 2024):

- Modification of the EIA for El Porvenir (environmental certification)
- Amendment to the El Porvenir Mine Closure Plan to reflect the integration of both mining units and the modification of the EIA
- Water use authorization
- Renewal of industrial effluent discharge authorization

The effluent discharge authorization involves carrying out an assessment of the treatment system for discharge at monitoring stations 5MM and 6MM.

An independent technical evaluation of key components of the Cerro Pasco Complex Integration project was completed in early 2024 considering both El Porvenir and Atacocha. It included, among others, the TSFs, social risks and permitting (Hatch, 2024). No fatal flaws were found by Hatch. The evaluation resulted in a number of findings and recommendations to be considered by Nexa to derisk the Cerro Pasco Complex Integration project.

It is noted that the authorization for discharge of industrial effluent is expired. Nexa informed that the file for renewal of the authorization is under review by the environmental authority (Hatch, 2024).

Nexa should track closely the action items identified for obtention of new permits and renewal of expired permits required for the Cerro Pasco Complex Integration project and follow up on the status of progress regularly to prevent possible delays in the submission of permitting applications. Completion of permitting approvals within the project schedule developed by Nexa is critical to the success of the Cerro Pasco Complex Integration. There is a level of uncertainty regarding the amount of time required by the authorities for review and approval of permitting applications. In order to mitigate the risk of delayed approval, Nexa should initiate the first steps of the approval process for the main permits as early as possible (for example, the engineering design and the baseline field work) in order to build a buffer in the schedule.

17.1.3.3 Permitting Schedule

The main permits required for the implementation of the Cerro Pasco Complex Integration project are the modification of the EIA and the associated modification of the Mine Closure Plan for El Porvenir. The modification of the EIA from beginning to end, culminating with the approval, is anticipated to take approximately three years. This period includes the field work (collection of baseline data), development of supporting studies, the preparation of the EIA report, the submission of the report to SENACE, and the evaluation period involving the review from SENACE followed by Nexa addressing the comments resulting from the review. The review process is anticipated to take approximately one year but it could take less or longer.

Nexa initiated work on the EIA amendment during Q4 2023. Its approval by late Q1 or early Q2 2027 represents the critical path for the Cerro Pasco Complex Integration project from an environmental permitting perspective. Other environmental management instruments such as new ITS submissions and the Mine Closure Plan amendment have a shorter process of completion to receive approval from the regulators.

There is a high level of uncertainty associated with the actual duration of the review and approval period due to staffing issues SENACE and adjustments to its review and approval processes. As a mitigation measure, Nexa has included additional time in its permitting schedule for the Cerro Pasco Complex Integration project to carry a contingency for the permitting process. In addition, SLR understands that the storage capacity of the El Porvenir TSF will provide additional contingency by allowing to continue disposal of tailings at the El Porvenir TSF for approximately six months beyond the timeline set for approval of the EIA amendments for the two mining units.

17.1.4 Social or Community Requirements

17.1.4.1 Social Setting

The El Porvenir mine is located in the central Andes mountains region of Peru, specifically in the district of San Francisco de Asís de Yarusyacán, in the province of Pasco, Peru. The mine is situated 13 km from the town of Cerro de Pasco.

Its area of influence encompasses the rural communities and populated centers listed at the end of Section 17.1.1.1.

17.1.4.2 Key Social Issues

Regarding social issues for the Cerro Pasco Complex, Nexa's social team has noticed an increasing population around its operations (due to the influx of newcomers) and the overall perception of contamination from the mine operations, especially lead-related contamination to water bodies. The Cerro Pasco Complex project may increase expectations from the local communities in terms of contracting, employment, training and community investment opportunities (e.g., water, health, housing, and community infrastructure-projects). As of September 2023, El Porvenir had approximately 322 open commitments agreed with the communities from its area of influence (Nexa, 2023).

According to the annual report for 2023 issued by Nexa Resources Peru, one of the key risks for the Cerro Pasco operations (both El Porvenir and Atacocha mining units) is social conflict with communities within the area of influence, which can lead to blockades and in turn could result in operation interruptions and reputational damage. There is precedent for such conflict given that blockades organized by communities have taken place in the past and as recently as last year (2023) leading to short suspensions of operations.

The company has implemented the following mitigation measures to counterbalance this risk (Nexa Resources Peru, 2024):

- Mapping stakeholders to avoid, identify and alert potential conflicts proactively
- Having a commitment tracking tool to register and track the implementation of commitments
- Conducting ongoing and proactive dialogue with local stakeholders to ensure adequate and timely information.

17.1.4.3 Social Management System

At a corporate level, Nexa has adopted the International Integrated Reporting Council (IIRC) guidelines and the Global Reporting Initiative (GRI) standards. The IIRC guidelines promote a cohesive and integrated approach to reporting on organizational activities. The GRI standards provide best practices for public reporting on economic, environmental, and social impacts to aid Nexa and its shareholders in understanding their corporate contribution to sustainable development. Nexa reported on these standards in its most recent annual report for 2023 (Nexa Resources Peru, 2024).

According to the annual report for 2022 issued by Nexa, the company seeks to create a positive legacy in host communities and maintain a constant and close dialogue with them, working towards building a positive relationship with stakeholders. Nexa's ESG strategy is built around nine Environment, Social and Governance pillars. The Social Component includes the following four pillars (Nexa, 2023):

- People and Culture focuses on training and development and building a diverse, inclusive, and plural company.
- Health, Safety and Well-Being seeks to build a robust safety, health and well-being culture and environment.
- Social Legacy includes two sub-pillars: (i) Local Development, and (ii) Social License to Operate
- Human Rights to ensure compliance with international and local human rights practices.

The Social Legacy pillar is built around local development and the social license to operate sub-pillars. While local development aims to support income generation in host communities towards economic and social empowerment, the social license to operate is a desired outcome to be recognized as a trusted company by stakeholders.

Regarding Human Rights, Nexa became a signatory of the United Nations Global Compact and has developed training and procedures to avoid and prevent human rights violations. Nexa Resources is committed to respecting and complying with the requirements of ILO 169 (Indigenous and Tribal Peoples Convention, 1989) and the host country's regulations. It also strives to obtain the free, prior and informed consent of Indigenous Peoples in the locations it operates. In these territories, Nexa's approach is to have formal social investment agreements with local communities validated by the community's own governance as required by the laws of Peru for the collective lands of original communities (Nexa, 2023).

Nexa has a Corporate Compliance Program to guide Nexa's employee's behaviour and interactions with stakeholders. The Compliance Program includes the following policies and procedures:

- Code of Conduct
- Compliance Policy
- Anti-Corruption Policy
- Antitrust Policy
- Policy on Preventing Money Laundering and Terrorist Financing
- Disclosures Policy
- Insider Trading Policy
- Integrated Management Policy
- Information Security Policy

Specifically, for El Porvenir mine, a social baseline description, assessment of socio-economic impacts, and identification of mitigation/enhancement measures have been carried out to mitigate negative impacts and maximize positive benefits of the mine. These components are generally consistent with social impact assessment practices. A Community Relations Plan has been developed (included in the EIA amendment from 2011) outlining objectives, strategies and specific indicators for the following programs: information and communication; support to social projects and productive investment projects; health services; education; technical training; training for social and environmental participatory monitoring; promotion of environmental awareness; compensation for land use; and improvement of houses in surrounding communities.

Nexa has a permanent information office dedicated to receiving, managing, and addressing complaints, claims, questions and information requests from the communities. To be proactive, Nexa has also developed a communications program that involves the following activities (SLR, 2021):

- Distribution of informative material (Quarterly)
- Social concern monitoring (Quarterly)
- A complaint management process aimed at preventing and managing possible social conflicts in the area
- Meetings with local authorities (Quarterly)
- Guided tours (Quarterly)

Nexa Resources Peru has a Social Management Team of approximately 10 people led by a Social Manager and three Superintendents. They are accountable for building and maintaining positive relationships with local communities for Peru's operations (Nexa Resources Peru, 2023a).

17.1.4.4 Community Engagement and Agreements

Nexa works closely with the communities in the area of influence, respecting their internal governance through their elected representatives and authorities when engaging with them for an environmental license or social negotiation. In addition, Nexa encourages local communities to raise questions and concerns independently through its permanent offices or virtual communication.

SLR understands that Nexa has undertaken three community consultation activities for each of its mining units in Peru, including El Porvenir, and the recurring topics raised are local employment and contracting, monitoring of social commitments, local environmental monitoring, and social investment. In 2023, Nexa used a variety of stakeholder engagement mechanisms such as meetings with local leaders, public consultation activities, surveys and interviews, public participation committees, and environmental participatory monitoring to inform, receive feedback and involve local stakeholders in their activities (Nexa Resources Peru, 2024).

El Porvenir has signed agreements with Comunidad San Francisco de Asís de Yarusyacán y Comunidad Cajamarquilla associated with rights to land from the communities.

Regarding land use-related agreements/payments such as rights of way or usufruct with local communities, El Porvenir spent S/2,461,000 sol in 2023 to accommodate its operation expansions.

Nexa funds social investment initiatives in education, capacity building and training, water and sanitation, healthcare, transportation, and infrastructure. In 2023, El Porvenir spent approximately S/6,418,971 sol in social investment initiatives for communities within the area of influence.

Examples of social investment include the construction of a sports centre in the San Juan de Milpo community, the delivery of career counselling workshops for 69 senior high students, and the provision of music, computer, English and sports workshops for students of the San Juan de Milpo school (Nexa Resources Peru, 2024).

SLR understands that Nexa has a grievance mechanism for receiving local community questions, concerns, and complaints. In 2023, El Porvenir received 95 questions and 58 concerns and complaints. They were related to subcontractors, project updates, compensation, and environmental concerns (Nexa Resources Peru, 2024).

17.1.4.5 Indigenous Peoples

According to the annual report for 2022 issued by Nexa, El Porvenir and Atacocha's mines are close to Quechuas populations, which were recognized as indigenous by the Peruvian government after Nexa started operation of those mines in Peru.

The indigenous communities are identified in Nexa's social relationship strategies. In some cases, they own the surface rights for land where Nexa carries out mining activities and receive compensation under agreements and contracts (Nexa, 2023).

Nexa is planning to carry out an evaluation of which communities in the surroundings of the El Porvenir and Atacocha operations meet the regulatory criteria for indigenous communities.

17.1.4.6 Local Procurement and Hiring

SLR understands that local hiring is a key priority for Nexa as a mechanism to create value and deliver economic benefits to the local communities in the area of influence. The community relations team is accountable for proposing candidates from the direct and indirect areas of influence to Nexa and its subcontractors to meet their unskilled workforce demands.

In 2023, Nexa experienced an increase in local hiring for its three mine operations in Peru (El Porvenir, Atacocha, and Cerro Lindo). In 2023 El Porvenir employed 927 local workers from which 131 were employed by El Porvenir directly, and the remaining 796 workers were employed by its subcontractors (Nexa Resources Peru, 2024).

For the Cerro Pasco Complex, Nexa has declared local hiring commitments with eight local communities. Nexa has specific local hiring targets with Anexo San Juan de Milpo (30%) and Comunidad Matriz San Francisco de Asis de Yarusyacan (60%). To date, community members from Comunidad Matriz San Francisco de Asis de Yarusyacan represent 21% of the total local hires for the Cerro Pasco Complex.

As with local hiring, Nexa prioritizes local contracting to maximize benefits for local communities. Seven local businesses are serving the Cerro Pasco Complex. Approximately 50% of the workforce these local businesses hire are community members. Of note, 100% of the workforce hired by ECOSEM Yanapampa, owned by Anexo Yanapampa, is from the community (Nexa Resources Peru, 2023b)

In 2023 El Porvenir spent approximately S/347,527 sol on local purchases and support to community businesses (Nexa Resources Peru, 2024).

17.1.5 Mine Closure Requirements

17.1.5.1 Mine Closure Plan and Regulatory Requirements

The Mine Closure Plan is periodically updated over the LOM. A conceptual Mine Closure Plan was prepared in 2006 for the Mine components within the context of the Peruvian legislation (KCB, 2006) and has subsequently been amended or updated four times. The Mine Closure Plan addresses temporary, progressive, and final closure actions, and post-closure inspection and monitoring. Under Article 20 of the Peruvian mine closure regulations, the first update of the Mine Closure Plan must be submitted to the Peruvian Ministry of Energy and Mines three years after approval of the initial Mine Closure Plan, and every five years thereafter. Two years before final closure, a detailed version of the Mine Closure Plan will have to be prepared and submitted to the Peruvian Ministry of Energy and Mines for review and approval. The following is a summary of the El Porvenir Mine Closure Plan updates and modifications to date:

- Initial Closure Plan approved in 2007 by R.D. No. 318-2007-MEM/AAM and prepared according to the modification of Supreme Decree D.S. No. 033 2005 EM (Mine Closure Law).
- Feasibility level Mine Closure Plan approved in 2009 by R.D. No. 166-2009-MEM-AAM.
- First amendment to the Mine Closure Plan approved in 2011 by R.D. No. 286-2011-MEM-AAM.
- Update of the Mine Closure Plan approved in 2013 by R.D. No. 034-2013-MEM-AAM.
- Second amendment to the Mine Closure Plan approved in 2016 by R.D. No. 277-2016-MEM-AAM.
- Third amendment to the Mine Closure Plan prepared in January 2020 and submitted to the Peruvian Ministry of Energy and Mines for approval.

The Conceptual Mine Closure Plan approved in 2007 (KCB, 2006), the R.D. from 2009, the update to the Mine Closure Plan approved in 2013 (Schlumberger Water Services, 2012), and the third amendment to the Mine Closure Plan (KCB, 2020) were available for review.

The Third amendment to the Mine Closure Plan includes five years of progressive closure (2021 to 2025), two years of final closure (2026 and 2027), and five years of post-closure (2028 to

2032). Post-closure monitoring, assumed to extend for five years after closure, will include monitoring of physical, geochemical, hydrological, and biological stability.

The specific objectives of the El Porvenir Mine Closure Plan are as follows:

- Health and safety – Assure public health and safety during execution of closure and post-closure activities, recovering the original environmental quality of the surroundings and developing feasible rehabilitation works from a biological, technical and financial perspective. Protect the human health and the environment by maintaining physical and chemical stability of Mine components.
- Physical stability – Geotechnical stability of earth structures implementing designs that minimize short term and long term risks of failure following the applicable Peruvian legislation and best international practices.
- Geochemical stability – Feasibility design of encapsulating covers for hazardous materials and materials with potential to cause contamination of the environment. The covers should be designed to employ local materials with physical and geochemical characteristics resistant to degradation and erosion through time. The covers should be compatible with the landscape, favourable to the growth of local vegetation species.
- Hydrological stability – Adequate management of surface runoff. Design flows with adequate return period according to the applicable Peruvian legislation should be evaluated. The need for closure water management structures should be identified.
- Land use – Recovery of original levels for ground surface to the extent feasible in order to make it compatible with predevelopment land uses in the project area.
- Waterbodies use – Maintain equilibrium in the micro basins located in the mine area, preserving water quantity and quality, and implementing adequate water management.
- Social objectives – Minimize socio economic impacts creating conditions that promote sustainability for the social stakeholders through execution of social programs.

The Mine Closure Plan promotes to the extent feasible a passive condition that minimizes the efforts required for care and maintenance of the closed Mine components during post-closure.

The closure criteria for each component of El Porvenir are defined according to the following aspects:

- Dismantling
- Demolition, salvage and disposal
- Physical stabilization
- Geochemical stabilization
- Hydrological stability (water management)
- Re-establishing the landscape contour
- Re-vegetation
- Rehabilitation of aquatic habitats
- Social programs
- Post-closure maintenance and monitoring

The Mine Closure Plan concentrates on the decommissioning and closure of primary facilities and elements of infrastructure at El Porvenir, which include:

- Underground mine and associated portal, ventilation shafts, support facilities, and underground infrastructure
- Processing facilities (concentrator plant and associated infrastructure)
- WRDs
- TSF
- Water management facilities and infrastructure
- Borrow areas and quarries
- Mine camps (San Juan de Milpo and Carmen Chico) and administrative buildings
- Access roads
- Ancillary buildings

Ancillary infrastructure including among others:

- Electrical and ventilation systems
- Transportation systems
- Communication systems
- Domestic waste landfill
- Waste management facilities.
- Organic waste management facilities
- La Candelaria Hydroelectric Plant
- Power transmission lines and electrical sub-stations
- Topsoil deposits

A summary of the main proposed closure activities is presented in Table 17-4. Of note, the water supply to the San Juan de Milpo community from the Carmen Chico spring will be retained during post-closure.

Table 17-4: Summary of Main Closure Activities

Mine Component		Closure Activities
Mine	Underground mine	Redirection of underground mine water discharge towards the TSF. Flooding of underground works (recovery of phreatic level). Plugging or filling of mine openings. Disconnection, dismantling and removal of equipment and water management infrastructure. Soil sampling to evaluate contamination. Excavation/removal of contaminated material (including concrete) for appropriate disposal.

Mine Component		Closure Activities
Waste disposal facilities	La Quinua WRD	Slope contouring for physical stability. Cover installation and revegetation. Construction of an erosion prevention structure on the slope adjacent of the Huallaga River.
	TSF	Dam reconfiguration, if required for physical stability. Leveling and recontouring of the disposed tailings surface. Cover installation to prevent oxidation of the deposited tailings. Re-vegetation. Replacement of the overflow tunnel with a closure overflow spillway that discharges surface runoff to the Milpo Creek. Improvements to the drainage system near the confluence of the Milpo Creek and the Lloclla River to prevent flooding the area of the San Miguel community.
Other infrastructure	Concentrator plant Shops Water management infrastructure Power transmission lines Hazardous waste storage areas Access roads La Candelaria Hydroelectric Plant	Dismantling, demolition, salvaging and disposal of structures. (Donation of facilities to the local community will be considered on grounds of safety). Disposal of concrete in the underground mine. Removal of equipment for recycling, salvaging or disposal. Removal of contaminated soils. Transportation to authorized disposal areas. Cleaning and purification of tanks and deposits. Removal of Socorro pond. Recontouring of terrain and re-vegetation. Sale of the hydroelectric power plant to a third-party that could continue the power supply to local communities.
Staff facilities	Mine camp Administrative buildings Potable water and septic systems	Mobilization of equipment, machinery, and personnel. De-energization. Dismantling and removal of structures and equipment to authorized disposal areas. Dismantling and demolition of concrete structures for disposal in the underground mine. Recontouring of terrain and re-vegetation.

It is noted that the design criteria for the El Porvenir TSF closure planning have been defined according to Peruvian Standards, which are less stringent than Canadian dam safety guidelines. For example, the El Porvenir TSF dam has been designed to meet stability requirements for a 2,500-year return earthquake with estimated peak ground acceleration of 0.4 times the acceleration due to gravity, which is significant. Post-seismic stability analyses for El Porvenir dam were carried out by Ausenco (2016) to demonstrate dam stability but no information was provided related to the risk of failure of the emergency spillway inlet control structure and the potential for liquefied tailings release through the spillway tunnel. The ultimate tailings level is some 50 m above the spillway tunnel invert.

The El Porvenir TSF emergency spillway has been designed to pass the Probable Maximum Flood resulting from 146 mm of precipitation in 6 hours, which is appropriate given the size of the dam. It is not clear that the post closure flood routing assumed the perimeter watershed diversion channels would still be in service in the long term. The risk of diversion channel blockage and potentially higher inflows to the TSF should be evaluated with additional freeboard added to the dam crest, if required, to ensure the dam is not overtopped.

A comprehensive dam safety review is recommended in support of operation in future years and in order to finalize the detailed closure plan prior to moving into the closure stage.

Physical, chemical, hydrological, and biological stability conditions following closure will be verified through implementation of the post-closure maintenance and monitoring program. Monitoring will also support the evaluation and verification of compliance with closure activities, and the identification of deviations leading to the adoption of corrective measures. The monitoring activities will be carried out considering the Peruvian Environmental Quality Standards and Maximum Permissible Limits, as well as criteria set in the Mine Closure Plan for physical, chemical, hydrological, and biological stability.

No specific details of the post-closure monitoring programs for physical stability, water quality, biology and social were found in the Mine Closure Plan reports provided to SLR. Hence, SLR recommends to either confirm if these programs have been sufficiently advanced at a concept level or if details should be incorporated to the next update of the Mine Closure Plan for El Porvenir. As a minimum, it is recommended that post-closure monitoring programs include the following:

- Specific activities and frequency to monitor physical and hydrological stability (mainly focused on inspections).
- Locations and frequency for water quality sampling (surface water and groundwater).
- Biology campaigns and frequency.
- Indicators to track progress with social initiatives and programs implemented during the operations phase towards achieving social objectives at closure and post-closure.
- Proposed documentation and reporting.

17.1.5.2 Closure Cost Estimate and Financial Assurance for Closure

A closure cost estimate was developed and included in the Mine Closure Plans. The total value estimated in 2020 for the remaining LOM presented in the third amendment to the Mine Closure Plan is as follows (excluding local taxes):

- Progressive Closure (2021 to 2027) US$10,990,121
- Final Closure (2028 to 2029) US$12,583,266
- Post-Closure (2030 to 2034) US$ 1,622,646
- Total US$25,196,033

According to Supreme Decree D.S. N° 262-2012-MEM/DM, the financial assurance is calculated based on inflation and discount rates in order to estimate the net present value (NPV) for the mine closure cost. The total financial assurance (progressive closure, final closure, and post closure) calculated in 2020 considering an inflation rate of 2.37% and a discount rate of

2.14%, is US$20,635,472 (including local taxes). A detailed breakdown of the cost estimate is provided in the third amendment to the El Porvenir Mine Closure Plan (KCB, 2020). The closure cost estimate was not reviewed by SLR for this TRS.

17.1.6 Qualified Person's Opinion on the Adequacy of Current Plans to Address any Issues Related to Environmental Compliance, Permitting and Local Individuals or Groups

In the SLR QP's opinion, the Environmental Management Plan at El Porvenir is adequate to address potential issues related to environmental compliance according to the commitments captured in the regulatory permitting approvals.

No issues or concerns associated with environmental permitting planning were identified by the SLR QP based on the documentation provided by Nexa to SLR for review, and a meeting held with Nexa staff in support of this TRS. Nexa's Environmental Management Superintendent for El Porvenir and Atacocha understands well the environmental permitting requirements and has developed a tracking matrix that identifies the key components of each permit, corrective actions to be implemented to be in compliance, and the status of implementation of each action. All action items are qualified according to a ranking of criticality established (low, medium and high) for continuity of the operation.

In the SLR QP's opinion, the plans developed as part of the Social Management System are adequate to pursue positive relations with the communities located in the area of influence, promote social benefits, and contribute to reduce social risk for the El Porvenir operations.

17.2 Atacocha

17.2.1 Environmental Aspects

17.2.1.1 Environmental Setting

Environmental baseline studies have been completed as part of the EIA. The detailed baseline characterization is included in the EIA reports. A summary of the existing conditions in the Atacocha area is presented below, sourced from RPA (2019).

<u>Terrain</u>

Topographical relief comprises deep, long, narrow valleys with steep slopes. Some rivers cross through the area and have moderate slopes and some scattered peaks. The main valley has a general inclination from south to north. The Atacocha processing plant is located near the Huallaga River valley (3,600 MASL) surrounded by rugged hills/mountains.

<u>Climate</u>

The climate is cold and dry throughout the year, which is typical of the Central Andes Mountain Region. The rainy season occurs from December to April. From June to August there are generally minimal rainfalls. Based on data from the Cerro de Pasco regional meteorological station operated by the government, the average temperature ranges from 4°C in July to 6°C in November; the maximum monthly precipitation is 163 mm in February and the minimum monthly precipitation is 18 mm in July.

<u>Air Quality</u>

Air quality has been characterized using records from seven monitoring stations for the period 2012 to 2016. The monitoring results are compared against national environmental quality standards (R.M. No. 181 2016 MINAM). According to SRK (2017), particulate material less than 10 µm (PM10), less than 2.5 µm (PM2.5), and Ozone (O_3) rates as "Good" for the 2011-2016 in all cases, except for some measurements which qualify as "Moderate". The concentrations of the variables Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), Sulfur Dioxide (SO_2) and Hydrogen Sulfide (SH_2)2 are all classified as "Good" quality. No values have been registered that indicate "Poor" quality, nor "Threshold of care".

<u>Surface Water Quality</u>

Surface water quality monitoring is conducted at eight sampling locations in three natural waterbodies (i.e., Atacocha Creek, Lalaquia Creek and Huallaga River). Three of these stations are located upstream of the mining activities (one on each waterbody) and the rest are located downstream. Surface water quality is compared with the national environmental quality standards for water (D.S. No. 015 2015 MINAM, D.S. No. 004 2017 MINAM) for irrigation of high and low stem crops (class 3-D1), animal beverage (class 3-D2) and conservation of the aquatic environment (class 4-E2). The environmental standards correspond to "Uses of Water" and do not seek to establish Maximum Permissible Limits for watercourses given that natural watercourses, even those exempt from any anthropogenic influence, do not necessarily meet the values established by the environmental standards (SRK, 2017).

Results from monitoring conducted in 2015 and 2016 showed concentrations of manganese and lead that exceed the national environmental quality standards for class 3 and 4; and concentrations of Cadmium, Thallium, Zinc, and Nickel for class 4. There were also exceedances in parameters such as pH, conductivity and total suspended solids. Monitoring results from 2018 showed exceedances for Manganese, Lead, Cadmium, and Zinc. The water quality analysis included in the 2018 EIA presented an individual discussion for each parameter explaining how the exceedances are associated with geological and morphological conditions inherent of the mine location. It is noted that exceedances are observed for short periods of time and are not simultaneously happening for all the monitored parameters.

<u>Effluent Water Quality</u>

It is noted that effluent water quality is monitored at two locations: discharge from the sediment pond to the Huallaga River, and treated sewage discharge. The water quality at the effluent discharge locations complies with the maximum permissible limits established by the current Peruvian Legislation (D.S. No. 010-2010-MINAM and D.S. No. 003-2010-MINAM). Monitoring results from 2018 showed no exceedances.

<u>Groundwater Quality</u>

Groundwater quality standards from Brazil and Dominican Republic are used by the Peruvian Ministry of Energy and Mines for evaluation of compliance in absence of similar standards for Perú.

Groundwater quality monitoring conducted between 2014 and 2016 upstream of the Atacocha TSF showed concentrations of fluoride and of several total metals (Aluminum, Manganese, Nickel, Zinc, Arsenic and Iron) exceeding the environmental quality standards of Brazil and Dominican Republic. The monitoring conducted downstream of the Atacocha TSF showed short term exceedances of iron and lead (SRK, 2017).

Groundwater quality monitoring was conducted in 2018 at two locations equipped with piezometers, downstream of the Atacocha TSF. The monitoring results showed exceedances of Arsenic, Iron, Manganese, and Turbidity in one of the two piezometers. The water quality analysis completed by Nexa in December 2018 proposes the installation of monitoring locations upstream of the tailings storage facility to understand the comparative influence of seepage on the water quality results.

Soils

There are two types of soils in the mine site area, mineral and organic, derived from residual and transported soils. Actual land use corresponds to five categories: private facilities (mining activity), natural pastures, arboreal vegetation, terrain with hydromorphic vegetation (areas located in wet environments), and lithic outcrops (rock outcrops in top and hillside of mountains).

Soils at the site have concentrations of arsenic, cadmium and lead that exceed the national environmental quality standards (D.S. No. 002-2013-MINAM), at some sampling points; these high values could be attributed to the local lithology (SRK, 2017).

Noise and Vibrations

Ambient noise has been characterized using records from seven monitoring stations for the period 2012 to 2016. Exceedances were registered in three stations when comparing the monitoring results against the national environmental quality standards for Residential Zone. The exceedances were attributed in the 2018 EIA to human activities and vehicular traffic. The ambient vibrations monitored at 18 locations meet the national environmental quality standards.

Aquatic Biology

According to SRK (2017), the only reported fish species, Orestias agassizii, is not registered in any national conservation category. Likewise, two species of macrophytes have been reported and none have been registered with any category of national (D.S. No. 004-2014-MINAGRI) or international conservation (CITES 2017, IUCN 2016.3).

Terrestrial Biology

According to SRK (2017), the fauna is represented by 10 species of mammals; 24, of birds; one specie of amphibian; and 51 taxa of insects. It is worth mentioning that some species such as camelid and sheep cattle belonging to residents of areas bordering the project have been introduced. None of the species reported are categorized as threatened by the national standard (D.S. No. 004-2014-MINAGRI) nor international lists (CITES 2016 and IUCN 2016.I). Nevertheless, consider that two species of rodents are endemic for Peru: Akodon juninesis and Calomys sorellus.

A total of 112 species of vascular flora have been registered. It is worth mentioning that some species corresponding to vegetation of rural areas have been introduced.

According to international criteria for endangered species only one specie has been recorded: the Plantago, of Minor Concern, according to IUCN 2016.1. As to the national standard, D.S. No. 043-2006-AG, four species were registered as Endangered: Perezia pinnatifida, Ephedra rupestris, Buddleja coriaceae and Buddleja incana. The first two species are native and the Buddlejas have been introduced / naturalized and were reported only in ruderal areas as part of the grassland. Likewise, the national standard recognizes Chuquiraga spinosa as a species Near Threatened (NT), reported associated with rocky areas at high altitude that provide a favorable microclimate for its development.

There is no evidence of endemic species as to the Red Book of Endemic Species of Peru (Leon et al, 2006).

Metals in Plant and Animal Tissue

According to SRK (2017), concentration of metals in fish tissue (Orestias agassizii) exceed international standards for arsenic, lead, antimony and zinc, such as European legislation (European Commission, 2005), Brazilian legislation (Brazil, Laws, etc., 1965), and FAO (Nauen C. E., 1983) for the content of metals in fish for direct human consumption; these same elements are also highly concentrated in the macrophytes and in sediments (exceeding the Canadian standards); also, the concentration of arsenic, lead, and zinc in vegetal tissue in Mimulus glabratus and Cardamine bonariensis surpasses those referred by the Mercosur Technical Regulation, WHO and FAO (2008) as corresponds.

Sensitive Areas. The Atacocha mine does not overlap with any recognized protected or sensitive areas.

Social

The direct area of influence of the mine encompasses the following rural communities:

- Comunidad de San Francisco de Asís de Yarusyacán,
- Comunidad de Cajamarquilla,
- Comunidad de San Antonio de Malauchaca, and
- Comunidad de Ticlacayán.

17.2.1.2 Environmental Studies and Management Plans

SLR has been provided with the following documents and reports to conduct its review:

- Regulatory technical report regarding the evaluation of the second modification of the EIA for the expansion of the Atacocha mineral processing plant to 5.000 tonnes per day (SENACE, 2018)
- Environmental Management Strategy included in the second modification of the EIA for the expansion of the Atacocha mineral processing plant to 5.000 tonnes per day (SRK Consulting, 2018)
- Regulatory report regarding the evaluation of the Second Supporting Technical Report (Segundo Informe Técnico Sustentatorio in Spanish) for Introduction of Technical Improvements to the Concentrator Plant (SENACE, 2020)
- Regulatory report regarding the evaluation of the Third Supporting Technical Report (Tercer Informe Técnico Sustentatorio in Spanish) for Introduction of Technical Improvements to the Concentrator Plant (SENACE, 2021)
- Environmental Management Plan included in the Third Supporting Technical Report
- Quarterly environmental monitoring reports for 2022 and 2023
- Sustainability reports for Atacocha for 2021 and 2022
- Emergency response plan for Atacocha

Same as El Porvenir, Atacocha is managed according to the environmental and closure considerations presented in four type of documents, which must be approved by directorial resolutions (RD for its acronym in Spanish) from the Peruvian government (see Section 17.2.3):

- Environmental Adjustment and Management Plan
- EIA and subsequent modifications
- Supporting Technical Reports (ITS for its acronym in Spanish)

- Mine Closure Plan

Various Environmental Impact Assessments (EIA) and modifications have been submitted and approved between 2005 and 2018. The most recent modifications involve the implementation of a new power transmission line from El Porvenir mine site to the Atacocha mine site, and the expansion of the Atacocha processing plant capacity. Three Supporting Technical Reports have been prepared to date in addition to the EIAs.

The key project effects and associated management strategies, as described in the EIA modification from 2018, are presented in Table 17-5. An Environmental Management Plan including a monitoring program was prepared as part of the Environmental Impact Assessment. The most recent version is part of the Third Supporting Technical Report from 2021. The monitoring program includes air quality and gas emissions, non-ionizing radiation, noise, surface water quality, groundwater quality, springs water quality, effluent discharges water quality, vibrations, soil quality, terrestrial biology (vegetation and wildlife) and aquatic biology.

The environmental monitoring program established at Atacocha and the environmental audits performed annually (aiming to identify critical environmental risks in the operations) are the main tools of the Atacocha's Environmental Management System to track the implementation of high environmental standards and the continuous compliance with the environmental commitments. The environmental audit matrix includes the evaluation of legal requirement audit results, monitoring activities and environmental incidents.

The monitoring program includes the following:

- Air quality at four locations
- Non-ionizing radiation at one location
- Ambient noise at four locations
- Vibrations at three locations
- Surface water quality in receiving water bodies at eight locations
- Groundwater quality at five locations
- Industrial effluent discharge water quality at one location
- Treated wastewater effluent water quality at two locations
- Monitoring of flora at 10 locations
- Monitoring of fauna at 39 locations (11 for mammals, 10 for birds, nine for reptiles and amphibians, and nine for insects)
- Soil quality at eight locations

The environmental monitoring is conducted by an external consultant (SGS del Perú) responsible for preparing quarterly reports for Nexa. The results of the monitoring program are reported quarterly to OEFA and ANA.

The conclusions presented by SGS del Perú in the quarterly reports prepared for Nexa in 2023 are summarized as follows:

- Water quality for industrial effluent discharge was in compliance with maximum permissible limits established in Peruvian norm D.S. No. 010-2010-MINAM.

- Water quality for treated wastewater discharge from domestic use was in compliance with maximum permissible limits established in Peruvian norm D.S. No. 003-2010-MINAM.
- The water quality values measured in receiving water courses (Atacocha Creek, Huallaga River and Lalaquia Creek) are compared against the Peruvian Environmental Quality Standards for water quality established in norm D.S. No. 004-2017-MINAM. The measured values for total metals met the applicable standards for water quality except occasional exceedances for Manganese and Lead at three locations. Exceedances in pH values were identified at all water quality monitoring locations both upstream and downstream of the operations.
- Water quality monitored at two springs was in compliance Peruvian norm D.S. No. 004-2017-MINAM.
- Groundwater quality measured values are compared against the Brazilian Environmental Quality Standards for groundwater quality (norm CONAMA No. 396) because there are no such standards defined by the Peruvian legislation. Groundwater quality values were below the reference values from CONAMA No. 396.
- The non-ionizing radiation values measured at one location are compared against the Peruvian Environmental Quality Standards for non-ionizing radiation established in norm D.S. No. 010-2005-PCM. Non-ionizing radiation was in compliance with the applicable standards.
- Air quality was in compliance with Peruvian norms D.S. No. 074-2001-PCM, R.M. No. 315-96-EM/VMM, D.S. No. 003-2008-MINAM and D.S. No. 003-2017-MINAM.
- Ambient noise was in compliance with Peruvian norm D.S. No. 085-2003-PCM.
- Vibrations were below the reference values from the Peruvian Environmental Guideline for Drilling Blasting in Mining Operations.

Table 17-5: Summary of Key Environmental Effects and Management Strategies

Environmental Component	Potential Impact	Management Strategies
Topography and landscape	Relief alteration Changes in landscape's visual quality	Pre-planning to minimize impact Management of construction activities to minimize impacts (delimitations of work areas, minimization of stripping and earth works, regular inspection) Controlled perforation and blasting Design and monitoring of slope stability Re-conformation of the landscape Revegetation
Soils	Changes to soil uses Changes to soil quality	Rehabilitation of temporary areas used during construction Inherent design measures to minimize soil disturbance Development of topsoil deposits Revegetation Appropriate slope design to prevent landslides Appropriate management of industrial and domestic waste

Environmental Component	Potential Impact	Management Strategies
		Appropriate management of oils and fuels Appropriate management of hazardous waste Development of spills management plan Prohibition to circulate outside established roads
Surface water	Changes to surface water flows Changes to surface water quality	Environmental controls for construction activities Diversion of non-contact water Collection of contact water and maximization of water re-use in the mine operation Water quality treatment prior to discharging excess contact water to the Huallaga River Sewage treatment Implementation of oil and grease traps Sediment and erosion control measures Regular inspection and maintenance of water management facilities and associated infrastructure Monthly monitoring program for surface flows and water quality sampling (including effluent discharges) Additional geochemistry testing to verify acid generation and leaching potentials of waste rock
Groundwater	Changes to phreatic level Changes to groundwater quality	Reduction of deep infiltration through design features such as geomembrane liners and construction of underdrain systems Monthly monitoring program for water levels and water quality sampling
Air quality	Changes from particulate and gas emissions	Appropriate planning of work fronts to reduce truck circulation frequency and route distances Irrigation of access roads with tanker trucks Controlled perforation and blasting Traffic speed and load control Covered hoppers Regular preventive maintenance of vehicles and motorized equipment Prohibition to circulate outside established roads Revegetation Quaternary air quality monitoring
Noise and vibration	Disturbances resulting from changes to ambient noise levels and generation of vibrations	Use of hearing protection devices Appropriate planning of vehicle circulation Appropriate planning and scheduling of blasting activities Regular vehicle maintenance Control measures to attenuate noise at the sources Quaternary noise and vibrations monitoring
Fish	Changes in abundance and	Inherent design measures to minimize negative impacts to aquatic habitat

Environmental Component	Potential Impact	Management Strategies
	diversity of aquatic species	Meeting water quality standards at points of effluent discharge to the environment Prohibition to dispose of solid or liquid waste in natural waterbodies Prohibition to capture fish in the mine concession area Personnel training Bi-annual monitoring (dry and wet season)
Vegetation	Changes to vegetation cover and diversity of terrestrial flora Changes to sensitive species of wild flora	Fencing of work areas Inherent design measures to minimize disturbance area Revegetation Environmental controls for protection of local sensitive ecosystems (bofedales) Prohibition to collect flora and cut trees Personnel training Rescue of relocation of species as required Bi-annual monitoring (dry and wet season)
Wildlife	Changes in abundance and diversity of terrestrial fauna Alterations to habitat of terrestrial fauna	Inspection prior to construction activities Appropriate fencing and signalling Traffic speed limits Prohibition to capture and or extract fauna Prohibition to hunt Personnel training Rescue of relocation of species as required Bi-annual monitoring (dry and wet season)

17.2.1.3 Key Environmental Issues

SLR is not aware of any recent or ongoing environmental issues taking place associated with the Atacocha operations. In the SLR QP's opinion, there are no environmental issues that could materially impact the ability to extract the Mineral Resources and Mineral Reserves based on the review of the available documentation.

17.2.1.4 Environmental Management System

Refer to Section 17.1.1.4 of this TRS.

17.2.2 Tailings Disposal, Water Management and Monitoring

17.2.2.1 Environmental Geochemistry

Geochemistry information provided for review included two reports from 2015 on laboratory analysis conducted with rock samples taken from the San Gerardo open pit (formerly named Glory Hole), and one report from 2018 on hydrogeochemical modelling based on five samples to characterize the waste rock to be deposited in the Atacocha waste dump.

From the 2015 reports, two samples presented low acid generating potential and one sample presented high acid generating potential. From the 2018 report, the most representative lithologies are non acid generating and show low metal leaching potential. However, sandstones with high sulphide content have potential to be acid generating, and dacites showed inconclusive results.

The detailed design report for phase 5 of the Atacocha waste dump (Ausenco, 2018b), refers to results of static and kinetic testing from 2017 indicating that the waste rock is potentially acid generating.

According to the second modification of the Environmental Impact Assessment (EIA) of the expansion of the Atacocha processing plant (2018), geotechnical analysis from eight samples obtained from the San Gerardo open pit and in pit waste dumps showed uncertain acid generation potential due to the variability of the analysis results. The 2018 EIA also states that there was no acid generation from samples analyzed during a complementary evaluation.

17.2.2.2 Tailings Management

The Atacocha TSF dam has been raised in stages by the downstream method, with a 2H:1V overall downstream slope and a 1.5H:1V upstream slope, which is inherently safer than upstream raising with tailings. SLR is not aware of any issues regarding crest settlements (and none were noted in the monthly dam safety surveillance reports provided to SLR).

SRK (2017) describes the mine waste rock as uncertain with regard to acid generation potential, whereas Ausenco (2018) refers to geochemistry testing that shows the waste rock as acid generating. It is also understood that the first stage of dam raising included a geosynthetic clay liner (GCL) on both the upstream and downstream faces of the dam, and around the perimeter of the TSF (SRK, 2017). Lining both faces of the dam is not conventional and may be an indication of concerns that the mine rock is potentially acid generating (PAG). GCL lining on geogrid support layers around the TSF indicates that karst terrain likely controls TSF seepage and warranted serious concern.

Although the rock from the San Gerardo open pit was characterized as either non-potentially acid generating (non-PAG) or with uncertain acid generation potential, Nexa decided to assume that the latter is PAG rock. According to a teleconference held with Nexa staff on March 14, 2024, the rock used to raise the dam involves both PAG rock and non-PAG rock taken from the San Gerardo open pit. The PAG rock is encapsulated within non-PAG rock when the material is placed for dam raising. Based on the geochemistry evaluation conducted for the San Gerardo open pit, Nexa reportedly understands the location of PAG and non-PAG blocks within the pit, which allows Nexa to segregate the material to be used for dam construction according to the geochemical characterization.

It is noted that Hatch (2024) recommended to avoid PAG material for the construction of the tailings dam in Atacocha, as this may lead to water seepage with low pH and dissolved metal content issues, which would result in seepage flows that need to be collected, treated, and monitored. Additional laboratory testing in support of geochemical characterization of waste rock is recommended to achieve a better understanding of acid generation potential. Hatch also recommended conducting additional tests for tailings characterization because the humidity cell tests were only conducted for 20 weeks instead of a minimum of 40 weeks. This means that the data are less useful for assessing potential water quality issues, which may take longer to manifest in the test.

Given that the Atacocha dam has already been raised to the permitted crest elevation of 4,128 MASL, additional testing and characterization will be conducted by Nexa as part of the permitting process to obtain regulatory approval for a dam crest elevation of 4,155 MASL.

Tailings disposal at Atacocha is performed in subaerial conditions which allows a beach with a gentle slope towards the water or supernatant pond (settling pond). Tailings deposition planning considers deposition from spigots along the dam crest in such a way that a tailings beach forms in front of the embankment. The minimum beach width targeted by Nexa for operations in the OMS manual is 100 m.

Dam surveillance at Atacocha consists of instrumentation measurements and field inspections. Field inspections (regular routine inspections) are carried out by Nexa personnel responsible for its operation, and monthly by an external consultant (Geoconsultoria). Piezometric data are downloaded monthly. The data are reviewed by an external consultant (Geoconsultoría) on a monthly basis. It is noted that Geoconsultoría has been conducting the monthly reviews for Nexa for various years now, which provides consistency to the review.

Nexa utilizes an Integrated Dam Management System (referred to as SIGBar) which provides guidelines for document management, monitoring, evaluation, risk analysis, compliance with standards and legislation, training of personnel, operation of structures and other provisions. An OMS manual is available that describes roles and responsibilities of personnel assigned to the operation and maintenance for the TSF. It includes an emergency response procedure and strategy. A dam breach analysis was completed in 2022 considering crest elevation 4,128 MASL to inform the emergency preparedness and response plan. Nexa reportedly considered the results of the dam breach analysis to inform the hazard potential classification of the TSF dam. SLR is not aware of a TARP being established for the instrumentation system.

According to the OMS manual, the Atacocha tailings dam design takes into consideration international standards (such as Canadian Dam Association, ICOLD, ICMM) in terms of geotechnical stability and flood management. According to a teleconference with Nexa staff on March 14, 2024, a hazard consequence classification of ‘High’ has been adopted for the Atacocha TSF dam. However, Nexa decided to be more conservative and follow the design criteria of ‘Extreme’. As a result, maximum credible earthquake for seismicity and probable maximum flood for hydrology apply as design criteria. Nexa’s governance practices for Atacocha aim to follow international standards and common practices by having appointed an Engineer of Record, implementing quality assurance during construction, preparing a monthly dam safety evaluation report, and conducting regular geotechnical monitoring.

SLR understands that annual dam safety inspections were temporarily interrupted due the COVID pandemic that started in 2020 but have now been resumed and an annual dam safety inspection report for 2023 is being prepared by Geoconsultoría. It is noted that no annual inspection reports were included within the documentation provided to SLR for review for this TRS. Two recent monthly inspection reports by Geoconsultoría for December 2023 and January 2024 were provided to SLR. Geoconsultoría stated in both reports that the safety condition of the dam is satisfactory, based on monitoring data and absence of signs of instability. The SLR QP has relied on the statements and conclusions of reports provided by Nexa and its consultants and provides no conclusions or opinions regarding the stability or performance of the dams and impoundments listed in this TRS.

The following recommendations are proposed for the Atacocha TSF:

- Develop TARPs for the piezometers for inclusion in the OMS manual and monitoring plan.

- Capacity assessments of the TSF completed on a bi annual basis with topographic and bathymetric surveys.
- Complete long term geochemical kinetic testing of the tailings.
- Monitor the water quality from the TSF subsurface drains.

17.2.3 Environmental Permitting

17.2.3.1 Current Permits, Approvals and Authorizations

The Atacocha operation is managed according to the environmental and closure considerations presented in three types of documents, which must be approved by directorial resolutions from the Peruvian government:

- EIA and subsequent amendments and modifications
- Supporting Technical Reports (ITS for its acronym in Spanish)
- Mine Closure Plan

SLR understands that Atacocha has the permits required to continue the mining operations in compliance with applicable Peruvian permitting requirements. The permits are RDs issued by the Peruvian authorities upon approval of mining environmental management instruments filed by the mining companies such as EIAs, ITSs, and Mine Closure Plans. The approved permits address the authority's requirements for operation of the Atacocha open pit mine, TSF and effluents discharge.

Nexa maintains an up-to-date record of the legal permits obtained to date, documenting the approving authority, validity period and expiry dates, status (current, canceled or superseded), and indicating if renewal is required or not.

The Atacocha RDs on environmental certifications, water use and mine closure are listed in Table 17-6. According to the record of the legal permits provided by Nexa in February 2024, the approved environmental certifications (i.e., EIA and ITS) do not have expiry dates and therefore renewal dates are not applicable.

Table 17-6: Permits and Authorizations

	Governmental Consent	Resolution	Approval Date
Environmental certification			
1	Atacocha´s Adaptation and Environmental Management Program (PAMA)	DR 89-97-EM-DGM	06/03/1997
2	First Amendment to Atacocha´s PAMA	DR 313-2002-EM-DGAA	22/10/2002
3	Second Amendment to Atacocha´s PAMA	DR 154-2004-MEM-AAM	20/04/2004
4	EIA for the Tailing Deposit denominated "Depósito de Relaves Vaso Cajamarquilla"	DR 234-2005-MEM-AAM	08/06/2005
5	Amendment to the EIA for the Tailing Deposit denominated "Depósito de Relaves Vaso Cajamarquilla".	DR 242-2007-MEM-AAM	19/07/2007

	Governmental Consent	Resolution	Approval Date
6	EIA for the Tailing Deposit denominated "Depósito de Relaves Vaso Atacocha".	DR 361-2007-MEM-AAM	30/10/2007
7	Amendment to the EIA for the Tailing Deposit denominated "Depósito de Relaves Vaso Atacocha"	DR 380-2012-MEM-AAM	19/11/2012
8	Amendment to the EIA for the expansion of the capacity of the beneficiation plant of the beneficiation concession "Chicrin No. 2" up to 5,000 tpd.	DR 284-2012-MEM-AAM	05/09/2012
9	EIA for the 50 kV power transmission line SE El Porvenir - SE Chicrin	DR 347-2013-MEM-AAM	13/09/2013
10	Technical Report (ITS) for the exploitation of San Gerardo.	DR 170-2014-MEM-DGAAM	10/04/2014
11	Technical Report (ITS) for the tailings integration project.	DR 527-2014-MEMDGAAM-V	20/10/2014
12	Detailed Technical Report (MTD)	DR 243-2016-MEMDGAAM	11/08/2016
13	Second Amendment to the EIA for the expansion of the capacity of the beneficiation plant of the beneficiation concession "Chicrin No. 2" up to 5,000 tpd.	DR 119-2018-SENACE-JEF/DEAR	21/08/2018
14	Technical Report (ITS) for the Pumping System from El Porvenir TSF to Atacocha TSF, and Atacocha Diversion Channel	DR 28-2020-SENACE-PE/DEAR	10/02/202
15	Technical Report (ITS) for Auxiliary Components	DR 92-2021-SENACE-PE/DEAR	21/06/2021
16	Detailed Environmental Management Plan	DR 120-2023/MINEM/DGAAM	23/06/2023
Mine closure plan			
1	Mine Closure Plan	DR 198-2009-MEM-AAM	8/07/2009
2	First Amendment to the Mine Closure Plan	DR139-2012-MEM-AAM	03/05/2012
3	First Mine Closure Plan Update	DR 387-2012-MEM-AAM	22/11/2012
4	Second Amendment to the Mine Closure Plan	DR 98-MEM-DGAAM	04/04/2016
5	Third Amendment to the Mine Closure Plan	DR 136-2020/MINEM-DGAAM	09/10/2020
6	Fourth Amendment to the Mine Closure Plan	DR 278-2022/MIMEM-DGAAM	29/09/2022
Beneficiation plant and tailings disposal facilities			
1	Beneficiation Concession Title	R 192-74-DGM-DC	02/10/1974

	Governmental Consent	Resolution	Approval Date
2	Authorization to operate the facilities to expand the production capacity of the beneficiation plant up to 3,500 tpd.	Resolution s/n	28/11/2000
3	Authorization to operate the tailings deposit denominates “Vaso Atacocha” at 4,069 MASL	R 892-2008-MEM-DGM	21/02/2008
4	Authorization to construct the facilities to extend the Capacity of the tailings deposit denominated “Vaso Atacocha” at 4,081 MASL	R 689-2008-MEM-DGM-V	18/11/2008
5	Authorization to construct the facilities extend the capacity of the tailings deposit denominated “Vaso Atacocha” at 4,093 MASL	R 996-2009-MEM-DGM-V	23/12/2009
6	Authorization to construct the facilities to expand the production capacity of the beneficiation plant up to 4,380 tpd.	R 411-2010-MEM-DGM-V	8/11/2010
7	Authorization to operate the facilities to expand the production capacity of the beneficiation plant up to 4,380 tpd.	R 191-2011-MEM-DGM-V	14/06/2011
7	Authorization to construct the facilities to modify the beneficiation concession without changing the production capacity.	R 326-2011-MEM-DGM-V	25/08/2011
8	Authorization to construct the facilities to expand the tailings deposit denominated “Vaso Atacocha” at 4,105 MASL	R 92-2012-MEM-DGM-V	15/03/2012
9	Authorization to operate new infrastructure related to the beneficiation concession without expanding the authorized production capacity	R 137-2013-MEM-DGM-V	25/03/2013
10	Authorization to operate new infrastructure related to the beneficiation concession without expanding the authorized production capacity.	R 207-2013-MEM-DGM-V	10/05/2013
11	Authorization to operate the tailings deposit denominated “Vaso Atacocha” al 4,105 MASL	R 236-2013-MEM-DGM-V	31/05/2013
12	Authorization to construct the facilities to expand the tailings deposit denominated “Vaso Atacocha” at 4,128 MASL	R 375-2013-MEM-DGM-V	19/09/2013
13	Precisions to the R 375-2013-MEM-DGM-V	R 417-2013-MEM-DGM-V	4/11/2013
14	Authorization to construct the facilities to transport the tailing generated in the beneficiation concession denominated “Chicrín No. 2” to the beneficiation concession denominated owned by the mine “El Porvenir”.	R 594-2014-MEM-DGM-V	31/12/2014
15	Authorization to operate the facilities to transport the tailings generated in the beneficiation concession denominated	R 267-2015-MEM-DGM-V	3/07/2015

	Governmental Consent	Resolution	Approval Date
	"Chicrín No. 2" to the beneficiation concession denominated owned by the mine "El Porvenir".		
16	Authorization to construct the facilities to expand the production capacity of the beneficiation plant up to 5,000 tpd	R 120-2016-MEM-DGM-V	4/04/2016
17	Authorization to operate the beneficiation plant with a processing capacity of 4,600 tpd.	R 754-2016-MEM-DGM-V	22/11/2016
18	Authorization to construct the facilities to expand the tailing facilities denominated "Vaso Atacocha" at 4,110 MASL	R 210-2006-MEM-DGM-V	4/05/2016
19	Authorization to exploit Glory Hole as open pit	R 1158-2017-MEM-DGM/V	18/12/2017
20	Authorization to modify construction of Vaso Atacocha	R 64-2018-MEM-DGM	01/02/2018
Water Supply			
1	Water license for mining purposes	AR 20-99-CTARP-INRENAATDRP	12/03/1999
2	Water license for mining purposes	AR 134-2011-ANA-ALAPASCO	26/05/2011
3	Water license for human consumption purposes	AR 21-99-CTARP-DRAINRENA-ATDRP	12/03/1999
4	Water license for human consumption purposes	AR 12-2006-AG-DRAP/ATDRP	3/04/2006
5	Water license for energy purposes	AR 19-99-CTARP-INRENAATDRP	12/03/1999
Effluent Discharge to the Environment			
1	Authorization to discharge treated domestic waste waters from Campamentos Chicrií Bajo y Chicrín Artesanos	R 303-2016-ANA-DGCRH	30/12/2016
2	Authorization to discharge treated industrial waste waters from pond E09	R 69-2015-ANA-DGCRH	6/03/2015
3	Authorization to discharge treated industrial waste waters from Tailings Dam Atacocha	R 68-2015-ANA-DGCRH	6/03/2015

17.2.3.2 Future Permits and Authorizations

The main future permits to be obtained by Nexa for the implementation of the Cerro Pasco Complex integration include (Hatch, 2024):

- Modification of the EIA for Atacocha (environmental certification)
- Amendment to the Atacocha Mine Closure Plan to reflect the integration of both mining units and the modification of the EIA
- Water use authorization

- Renewal of industrial effluent discharge authorization

The effluent discharge authorization involves carrying out an assessment of the treatment system for discharge at monitoring station E09.

An independent technical evaluation of key components of the Cerro Pasco Complex Integration project was completed in early 2024 considering both El Porvenir and Atacocha. It included, among others, the TSFs, social risks and permitting (Hatch, 2024). No fatal flaws were found by Hatch. The evaluation resulted in a number of findings and recommendations to be considered by Nexa to derisk the Cerro Pasco Complex Integration project.

Nexa should track closely the action items identified for obtention of new permits and renewal of expired permits required for the Cerro Pasco Complex Integration project and follow up on the status of progress regularly to prevent possible delays in the submission of permitting applications. Completion of permitting approvals within the project schedule developed by Nexa is critical to the success of the Cerro Pasco Complex Integration. There is a level of uncertainty regarding the amount of time required by the authorities for review and approval of permitting applications. In order to mitigate the risk of delayed approval, Nexa should initiate the first steps of the approval process for the main permits as early as possible (for example, the engineering design and the baseline field work) in order to build a buffer in the schedule.

17.2.3.3 Permitting Schedule

The main permits required for the implementation of the Cerro Pasco Complex Integration project are the modification of the EIA and the associated modification of the Mine Closure Plan for Atacocha. The modification of the EIA from beginning to end, culminating with the approval, is anticipated to take approximately three years. This period includes the field work (collection of baseline data), development of supporting studies, the preparation of the EIA report, the submission of the report to SENACE, and the evaluation period involving the review from SENACE followed by Nexa addressing the comments resulting from the review. The review process is anticipated to take approximately one year but it could take less or longer.

Nexa initiated work on the EIA amendment during Q4 2023. Its approval by late Q1 or early Q2 2027 represents the critical path for the Cerro Pasco Complex Integration project from an environmental permitting perspective. Other environmental management instruments such as new ITS submissions and the Mine Closure Plan amendment have a shorter process of completion to receive approval from the regulators.

There is a high level of uncertainty associated with the actual duration of the review and approval period due to staffing issues SENACE and adjustments to its review and approval processes. As a mitigation measure, Nexa has included additional time in its permitting schedule for the Cerro Pasco Complex Integration project to carry a contingency for the permitting process. In addition, SLR understands that the storage capacity of the El Porvenir TSF will provide additional contingency by allowing to continue disposal of tailings at the El Porvenir TSF for approximately six months beyond the timeline set for approval of the EIA amendments for the two mining units. The storage capacity of the Atacocha TSF does not have influence in the critical path for permitting because the two facilities have not been integrated and discharge of tailings from the El Porvenir plant to the Atacocha TSF is not yet possible.

17.2.4 Social or Community Requirements

17.2.4.1 Social Setting

The Atacocha mine is located in the central Andes mountains region of Peru, specifically in the district of San Francisco de Asís de Yarusyacán, in the province of Pasco, Peru. The mine is situated 17 km from the town of Cerro de Pasco.

Its area of influence encompasses the rural communities and populated centers listed at the end of Section 17.2.1.1.

17.2.4.2 Key Social Issues

The social issues for the Cerro Pasco Complex are discussed in Section 17.1.4.2. SLR understands that the Atacocha mine has experienced blockades and social conflicts with communities from and beyond its area of influence, which has led to short suspensions of its operations. Recent events include blockades conducted by residents from Anexo Joraoniyoc (part of Comunidad Campesina de San Francisco de Asis de Yarusyacan) in March 2023 and February 2024 as reported online by Energiminas.

17.2.4.3 Social Management System

The social management system is discussed in Section 17.1.4.3. SLR understands that the Social Management Plan for Atacocha was developed with input (i.e., interviews and surveys) from local authorities and stakeholders. The objectives of the Social Management Plan for Atacocha are (RPA, 2019):

- Maximize positive social impacts and prevent or minimize negative social impacts resulting from the operational activities, thereby contributing to the welfare of society through dialogue and respect for people, society and the environment.
- Develop and maintain constructive relationships between the mining company, the population and interest groups in the area of influence.
- Channel and handle appropriately and timely questions, complaints, concerns and queries related to Atacocha's activities.
- Contribute to developing human and social capital in direct area of influence.

17.2.4.4 Community Engagement and Agreements

In 2004, Atacocha acquired rights to land from the community of Cajamarquilla via an agreement to construct tailings facilities and ancillary infrastructure. The agreement included various commitments and obligations, including financial compensation for rights to the land. Subsequently (2006, 2008, and 2012), the original agreement was amended and ratified by the community, and compliance with the commitments and obligations assumed by Atacocha in the original agreement and its amendments was confirmed. The agreements are in effect for the entire deposit's end of life.

Similarly, Atacocha acquired and subsequently renewed a right-of-way agreement with the community of Ticlacayán for its hydraulic infrastructure, routing water from the Huallaga River to two hydroelectric facilities at Marcopampa and Chaprín. The most recent renewal is for 20 years and will be in effect until 2033.

Atacocha's financial commitments under these agreements are summarized in Table 17-7.

Table 17-7: Summary of the Atacocha's Commitments Acquired by the Right of Land and Right of Way Agreements Celebrated with the Communities of Cajamarquilla and Ticlacayán

<table>
<tr><th>Agreements and amendments</th><th>Objectives</th><th>Community</th><th>Commitments acquired by Atacocha</th><th>Date/Term</th></tr>
<tr><td>Right of land celebrated with the community of Cajamarquilla (10/20/2004)</td><td>Right of land (13 hectares) for the construction of the Cajamarquilla's tailings deposit and auxiliary infrastructure</td><td>The community authorizes Right of land (13 hectares) for the construction and operation of the Cajamarquilla's tailings deposit and auxiliary infrastructure</td><td>Payment of 730,605.74 Soles, in works established in the Original Agreement and in its three (03) amendments.</td><td>Until the end of life of the deposit</td></tr>
<tr><td>First amendment (10/04/2006)</td><td colspan="4" rowspan="3">Each document records the progress in the fulfillment of the Commitments acquired by Atacocha. In the Third amendment, clause 5.1 the Community ratifies the fulfillment of all the commitments and obligations assumed by the Atacocha in the Original Agreement and its amendments.</td></tr>
<tr><td>Second amendment (06/03/2008)</td></tr>
<tr><td>Third amendment (10/23/2012)</td></tr>
<tr><td>Renewal of the right of way celebrated with the community of Ticlacayán and its amendments (04/15/2013)</td><td>Renewal of the right of way celebrated with the community of Ticlacayán for Atacocha's hydraulic infrastructure to conduct water from the Huallaga river to the hydroelectric schemes Marcopampa and Chaprín for the period of 4/15/2013 - 4/15/2033</td><td>The community recognizes the agreement for the right of way for Atacocha's hydraulic infrastructure to conduct water from the Huallaga River to the hydroelectric schemes Marcopampa and Chaprín for the period 1951 – 2008, its renewal for the period 2009 ongoing, and the renewal for the period of 4/15/2013 - 4/15/2033</td><td>Payment of 1 600,000.00 Soles, at the signing of the contract. In addition: 120,000 Soles performing works in the 7 neighbourhoods of the Community; 100,000 Soles for the electric power services; 680,000 Soles, for the development of projects in the Community (in two years); 1 000,000 Soles for work per concept of Taxes; Contracting of the communal enterprise in works realized by Atacocha; Hire people from the community in the different jobs that are generated</td><td>20 Years</td></tr>
</table>

Source: SRK (2017).

As indicated in Section 17.1.4.4, Nexa has a grievance mechanism for receiving local community questions, concerns, and complaints. In 2023, Atacocha received 74 questions and 35 concerns and complaints. They were related to subcontractors, project updates, compensation, and environmental concerns (Nexa Resources Peru, 2024).

17.2.4.5 Indigenous Peoples

Refer to Section 17.1.4.5 of this TRS.

17.2.4.6 Local Procurement and Hiring

Atacocha has experienced an increase in local hiring from communities within its area of influence. In 2023, Atacocha employed 496 local workers from which 76 were employed by the Atacocha mine directly, and the remaining 420 workers were employed by its subcontractors (Nexa Resources Peru, 2024).

In 2023 Atacocha spent approximately S/2,662,945 sol on local purchases and support to community businesses (Nexa Resources Peru, 2024).

Further details about local hiring and procurement are presented in Section 17.1.4.6.

17.2.5 Mine Closure Requirements

17.2.5.1 Mine Closure Plan and Regulatory Requirements

The Mine Closure Plan is periodically updated over the LOM. A conceptual Mine Closure Plan was prepared in 2006 for the Mine components within the context of the Peruvian legislation and has subsequently been amended or updated five times. The Mine Closure Plan addresses temporary, progressive, and final closure actions, and post-closure inspection and monitoring. Under Article 20 of the Peruvian mine closure regulations, the first update of the Mine Closure Plan must be submitted to the Peruvian Ministry of Energy and Mines three years after approval of the initial Mine Closure Plan, and every five years thereafter. Two years before final closure, a detailed version of the Mine Closure Plan will have to be prepared and submitted to the Peruvian Ministry of Energy and Mines for review and approval. The following is a summary of the Atacocha Mine Closure Plan updates and modifications to date:

- Initial Closure Plan approved in 2007 by R.D. No. 319-2007-MEM/AAM and prepared according to the modification of Supreme Decree D.S. No. 033-2005-EM (Mine Closure Law).
- Feasibility Level Mine Closure Plan approved in 2009 by R.D. No. 198-2009-MEM-AAM.
- First amendment to the Mine Closure Plan approved in 2012 by R.D. No. 139-2012-MEM/AAM.
- Update of the Mine Closure Plan approved in 2012 by R.D. No. 387-2012-MEM/AAM.
- Second amendment to the Mine Closure Plan approved in 2016 by R.D. No. 098-2016-MEM-DGAAM.
- Third amendment to the Mine Closure Plan approved in 2020 by R.D. No. 136-2020/MINEM-DGAAM.
- Fourth amendment to the Mine Closure Plan approved in 2022 by R.D. No. 278-2022/MINEM-DGAAM

The regulatory reports regarding the evaluation of the Second and Fourth amendments to the Mine Closure Plan (MINEM, 2016 and MINEM, 2022) were available for review.

The fourth amendment to the Mine Closure Plan indicated that progressive closure extends until 2017 and includes two years of final closure (2028 and 2029), and five years of post-closure (2030 to 2034). Post-closure monitoring, assumed to extend for five years after closure, will include monitoring of physical, geochemical, hydrological, and biological stability.

The specific objectives of the Atacocha mine Closure Plan are as follows:

- Health and safety – Securing public health and safety during execution of closure and post closure activities, recovering the original environmental quality of the surroundings and developing feasible rehabilitation works from a biological, technical and financial perspective.
- Physical stability – Long term closure design and measures adopting proper factors of safety for events with long recurrence periods.
- Geochemical stability – Long term closure design and measures to prevent acid rock drainage that could impact natural waterbodies.
- Land use – Proper uses following completion of rehabilitation activities in order to preserve the habitats for flora and fauna in the mine area of influence.
- Waterbodies use – Maintain equilibrium in the micro basins located in the mine area, preserving water quantity and quality, and implementing adequate water management.
- Social objectives – Minimize socio economic impacts as much as possible by executing social programs that preserve the way of life of local communities.

Maximizing the number of mine components that can be subject to a walk-away closure scenario is one of the main closure criteria for Atacocha.

The minimum closure activities to be considered are:

- Demobilization of machinery and equipment
- Dismantling
- Demolition and salvage
- Physical stabilization
- Geochemical stabilization
- Water management
- Re-establishing the landscape contour
- Social programs
- Post closure maintenance and monitoring

Where possible, the surface water drainage pattern would need to be re-established to a condition similar to the original hydrological system.

During site construction activities, topsoil is being stored separately to be used later for re vegetation purposes.

Waste materials will be decontaminated (if required), recycled when cost effective, and disposed at a licensed facility. Facilities containing petroleum products, chemicals, solid waste, hazardous waste, and/or contaminated soil or materials will be dismantled and managed according to regulatory requirements. All hazardous waste will need to be managed according to existing laws and regulations and will be transported off site.

The Mine Closure Plan concentrates on the decommissioning and closure of primary facilities and elements of infrastructure at Atacocha, which include:

- San Gerardo open pit;
- Underground mine and associated portal, ventilation shafts, support facilities and underground infrastructure;

- Waste rock dumps;
- Tailings storage facilities;
- Ore and topsoil stockpiles;
- The old (Chicrín No. 1, not active) and current (Atacocha, or Chicrín No. 2, active, including ore sorting, crushing, flotation circuit, thickener and filters, repulping pond) processing plants;
- Industrial water systems (intake, storage, distribution and waste water treatment);
- Quarries;
- Laydown areas and warehouses;
- Mechanical and maintenance shops;
- The fuel storage tank farm, secondary containments, and fueling station;
- Solid waste landfill;
- Hazardous waste storage facility area;
- The diesel power plant, power distribution substation, and power transmission lines;
- Mine access roads;
- Huallaga River derivation tunnel;
- Mine camp and administrative buildings; and
- Potable water and septic systems.

A summary of the main proposed closure activities is presented in Table 17-8.

Table 17-8: Summary of Main Closure Activities

Mine Component		Closure Activities
Mine	Open pits	Slope stability analysis and slope contouring if required (physical stability) Fencing Removal of equipment Dismantling and demolition of structures
	Underground mine	Plugging or filling of mine openings Dismantling and demolition of metallic and concrete structures Construction of drainage channels Placing of topsoil Re-vegetation
Waste disposal facilities	Waste dumps Landfills	Slope contouring (physical stability) Cover installation and revegetation Post-closure water monitoring Implementation of dykes for surface water runoff control
	Tailings storage facilities (Atacocha & El Porvenir)	Leveling and recontouring Cover installation and re-vegetation

Mine Component		Closure Activities
		Construction of perimeter channels
Other infrastructure	Ore stockpile Shotcrete plant Process plant Shops Power transmission lines Hazardous waste storage areas Laydown areas Access roads	Removal of low-grade ore Dismantling, demolition, salvaging and disposal of structures Removal of equipment Removal of contaminated soils Transportation to authorized disposal areas Cleaning and purification of tanks and deposits Recontouring of terrain, re-vegetation and habitat rehabilitation
Staff facilities	Mine camp Administrative buildings Potable water and septic systems	Mobilization of equipment, machinery and personnel De-energization Dismantling and removal of structures and equipment to authorized disposal areas Dismantling and demolition of concrete structures Recontouring of terrain and re-vegetation
Borrow Areas	Quarries	Cut and fill (physical stability) Fencing Construction of drainage channels Re-vegetation

It is noted that the design criteria for the Atacocha TSF closure planning have been defined according to Peruvian Standards, which are less stringent than Canadian dam safety guidelines.

A comprehensive dam safety review is recommended in support of operation in future years and in order to finalize the detailed closure plan prior to moving into the closure stage.

Physical, chemical, biological and social stability conditions following closure will be verified through implementation of the post closure maintenance and monitoring program. Monitoring will also support the evaluation and verification of compliance with closure activities, and the identification of deviations leading to the adoption of corrective measures. The monitoring activities will be carried out considering the Peruvian Environmental Quality Standards and Maximum Permissible Limits, as well as criteria set in the Mine Closure Plan for physical, chemical, biological and social stability.

Post closure monitoring activities involve the following:

- Physical – Displacements and settlements on slopes; the monitoring frequency will be quarterly during the first two years and biannually the following three years.
- Geochemical – Surface water quality monitoring in order to evaluate the effectiveness of the measures established; the monitoring frequency will be biannually for five years.
- Hydrological – Technical inspections programmed to identify possible erosions, settlements, collapses and obstructions; the monitoring frequency will be biannually for five years.

- Biological – Verify the effectiveness of the designed coverage and rehabilitation systems, evaluate the success of the systems of re vegetation and evaluate the need of complementary sowing, fertilization and weed control; the monitoring frequency will be biannually for five years (dry and wet season).
- Social – Development of a set of actions that will allow to verify the efficiency and effectiveness of the social programs at mine closure in accordance with established objectives, and adoption of corrective measures as required.

17.2.5.2 Closure Cost Estimate and Financial Assurance for Closure

A closure cost estimate was developed and included in the Mine Closure Plans. The total value estimated in 2022 for the remaining LOM presented in the fourth amendment to the Mine Closure Plan is as follows (excluding local taxes):

- Progressive Closure (until 2027) US$17,309,137
- Final Closure (2028 and 2029) US$42,538,865
- Post-Closure (2030 to 2034) US$ 2,850,228
- Total US$62,698,230

According to Supreme Decree D.S. N° 262-2012-MEM/DM, the financial assurance is calculated based on inflation and discount rates in order to estimate the net present value (NPV) for the mine closure cost. The total financial assurance (progressive closure, final closure, and post closure) calculated in 2022 considering inflation rate and discount rate is US$34,869,854 (including local taxes). A detailed breakdown of the cost estimate is provided in the fourth amendment to the Atacocha Mine Closure Plan. The closure cost estimate was not reviewed by SLR for this TRS.

17.2.6 Qualified Person's Opinion on the Adequacy of Current Plans to Address any Issues Related to Environmental Compliance, Permitting and Local Individuals or Groups

In the SLR QP's opinion, the Environmental Management Plan developed for Atacocha is adequate to address potential issues related to environmental compliance according to the commitments captured in the regulatory permitting approvals.

No issues or concerns associated with environmental permitting planning were identified by the SLR QP based on the documentation provided by Nexa to SLR for review, and a meeting held with Nexa staff in support of this TRS. Nexa's Environmental Management Superintendent for El Porvenir and Atacocha understands well the environmental permitting requirements and has developed a tracking matrix that identifies the key components of each permit, corrective actions to be implemented to be in compliance, and the status of implementation of each action. All action items are qualified according to a ranking of criticality established (low, medium and high) for continuity of the operation.

In the SLR QP's opinion, the plans developed as part of the Social Management System are adequate to pursue positive relations with the communities located in the area of influence, promote social benefits, and contribute to reduce social risk for the Atacocha operations.

18.0 Capital and Operating Costs

18.1 Capital Costs

The capital costs required to achieve the Cerro Pasco Complex Mineral Reserve LOM production were estimated by Nexa and reviewed by SLR. Since El Porvenir and Atacocha are operating mines, all capital costs are categorized as sustaining. Sustaining capital costs have been estimated by Nexa based on historical and actual costs, plus the estimated capital costs for the underground development, infrastructure and equipment required to complete the Cerro Pasco Complex integration. Based on the SLR QP's review, the sustaining capital costs are estimated to the equivalent of an Association for the Advancement of Cost Engineering (AACE) Class 2 estimate with an accuracy range of -10% to +15%. The sustaining capital costs include:

- Mine development
- Processing plants improvements.
- Mining equipment overhaul and replacement.
- Underground infrastructure and surface facilities.
- Tailings storage facilities.
- Other projects/assets sustaining costs.

All costs in this section are expressed in Q4 2023 US dollars. The summary breakdown of the estimated sustaining capital costs required to achieve the Mineral Reserve LOM production are presented in Table 18-1.

Table 18-1: Sustaining Capital Costs Summary – Cerro Pasco Complex

Cost Component	Value (US$ millions)
El Porvenir Mine Development	166
El Porvenir Processing Plant Improvements	19
El Porvenir Mining Equipment	17
El Porvenir Infrastructure	48
El Porvenir Tailings Storage Facilities	132
El Porvenir Other Projects / Assets Sustaining Capital	18
Atacocha Mine Development	137
Atacocha Processing Plant Improvements	3
Atacocha Mining Equipment	6
Atacocha Infrastructure	22
Atacocha Tailings Storage Facilities	35
Atacocha Other Projects / Assets Sustaining Capital	20
Total Sustaining Capital Costs	**622**

Notes: Sum of individual values may not match total due to rounding.

18.2 Operating Costs

The operating costs were estimated based on the actual operating expenditures and current operating budget for both El Porvenir and Atacocha mines, and the forecasted operating costs, considering the operating synergies once the integration process is completed. The costs were estimated by Nexa and reviewed by SLR. Both El Porvenir and Atacocha mines have been in operation for a number of years; therefore, the level of project definition for the operating cost estimates is high. The operating costs are estimated to the equivalent of an AACE Class 2 estimate with an accuracy range of -5% to +10%, although it is noted that AACE does not typically apply to operating costs.

The operating expenses estimated for mining, processing, and G&A activities to support the production of the Cerro Pasco Mineral Reserves over the LOM are summarized in Table 18-2. Operating costs total US$1,412 million over the LOM, averaging US$152million per year between years 2024 and 2033, which are years at full production.

The mining costs include all labour, supplies, consumables, and equipment maintenance to complete open pit mining related activities, such as drilling, blasting, loading, and hauling; and underground mining related activities, such as stopping, development, shaft and hoist, and shotcrete. The processing costs include all labour, supplies, consumables to complete processing related activities at the plants. The administrative expense includes all labour, supplies, consumables, and equipment maintenance to complete administrative, finance, human resources, environmental, safety, supply chain, security, site services, camp and kitchen, and travel related activities.

Table 18-2: Operating Costs Estimate – Cerro Pasco Complex

Cost Component	LOM Total (US$ millions)	Average Annual[1,2] (US$ millions)	LOM Average (US$/t milled)
Atacocha Plant (Open Pit material) [1]			
Open Pit Mining (Atacocha Open Pit)	85	21	19.52
Processing – Atacocha Plant	58	15	13.29
G&A – Open Pit	52	13	11.85
El Porvenir Plant (Underground material) [2]			
Underground Mining (El Porvenir & Atacocha)	797	86	39.25
Processing – El Porvenir Plant	266	28	13.07
G&A – Underground	154	16	7.56
Combined Site Operating Costs	**1,412**	**152**	**57.18**

Notes:

1. For Open Pit fully operational years (2024 – 2027)
2. For Underground fully operational years (2025 – 2032)
3. Sum of individual values may not match total due to rounding.

19.0 Economic Analysis

The economic analysis contained in this TRS is based on the Cerro Pasco Complex Mineral Reserves on a 100% basis, economic assumptions, and capital and operating costs provided by Nexa corporate finance and technical teams and reviewed by SLR. All costs are expressed in Q4 2023 US dollars. Unless otherwise indicated, all costs in this section are expressed without allowance for escalation, currency fluctuation, or interest.

A summary of the key criteria is provided below.

19.1 Economic Criteria

19.1.1 Physicals

- Mine life: 10 years (between 2024 and 2033).
  - Atacocha Open Pit: 4 years (between 2024 and 2027)
  - Atacocha and El Porvenir Underground: 10 years (between 2024 and 2033)
- LOM production plan (on a 100% ownership basis) as summarized in Table 19-2.
- LOM processing of 24.70 Mt, grading 3.61% Zn, 1.22% Pb, 0.23% Cu, 67.76 g/t Ag, and 0.06 g/t Au.
  - Atacocha Plant (open pit material): 4.38 Mt, grading 0.99% Zn, 1.15% Pb, 0.03% Cu, 34.94 g/t Ag, and 0.27 g/t Au
  - El Porvenir Plant (underground material): 20.32 Mt, grading 4.17% Zn, 1.24% Pb, 0.28% Cu, 74.83 g/t Ag, and 0.02 g/t Au
- LOM total contained metal of: 891 kt Zn, 302 kt Pb, 57.5 kt Cu, 53.8 Moz Ag, and 50.6 koz Au.
- Metallurgical recoveries at the LOM average of:
  - Atacocha Plant: 78.5% Zn, 83.0% Pb, 0% Cu, 3.3% Ag in Zn, 76.7% Ag in Pb, and 67.2% Au in Pb.
  - El Porvenir Plant: 89.0% Zn, 79.5% Pb, 14.3% Cu, 15.2% Ag in Zn, 66.4% Ag in Pb, 29.4% Au in Pb, 2.0% Ag in Cu, 8.6% Au in Cu.
- LOM realized metal payables (%) of: 84.0% Zn, 94.3% Pb, 95.0% Cu, 84.0% Ag, and 77.1% Au.
- LOM payable metal of: 663 kt Zn, 228 kt Pb, 7.6 kt Cu, 37.6 Moz Ag, and 23.4 koz Au.

19.1.2 Revenue

- All revenues are received in US$.
- Revenue is estimated based on the following LOM weighted average metal prices derived from Nexa’s Internal Projection forecasts: US$1.24/lb Zn (US$2,741/t Zn), US$0.92/lb Pb (US$2,032/t Pb), US$3.54/lb Cu (US$7,809/t Cu), US$21.72/oz Ag, and US$1,798/oz Au.
- Total gross revenue from concentrates of US$3,000 million.

- Net Revenue includes the benefit of Cerro Pasco's zinc concentrate processed at Nexa's Cajamarquilla (CJM) zinc refinery in Peru. This integration with Nexa's internal refinery provides the benefit of additional US$94.66/t Zn premium selling price, and zinc smelting at cost (rather than at commercial third-party terms).
- Transportation, Treatment, and Refining charges as defined in Table 19-1.

Table 19-1: Transportation, Treatment, and Refining charges assumptions

Transportation, Treatment and Refining charges	Units	LOM average
Transportation - Zn Concentrate Integrated - UG	US$/t conc	46.65
Transportation - Zn Concentrate Integrated - OP	US$/t conc	45.52
Transportation - Pb Concentrate - UG	US$/t conc	45.21
Transportation - Pb Concentrate - OP	US$/t conc	43.75
Transportation - Cu Concentrate - UG	US$/t conc	39.21
TC Zn Concentrate - EP Plant (UG)	US$/t conc	310.56
TC Zn Concentrate - ATA Plant (OP)	US$/t conc	315.36
TC Pb Concentrate - EP Plant (UG)	US$/t conc	182.96
TC Pb Concentrate - ATA Plant (OP)	US$/t conc	179.48
TC Cu at Cu Concentrate	US$/t conc	195.21
RC Cu at Cu Concentrate	US$/t conc	50.00
RC Ag at Cu Concentrate	US$/oz	0.50
RC Au at Cu Concentrate	US$/oz	8.00
RC Ag at Pb Concentrate	US$/oz	1.50
RC Au at Pb Concentrate	US$/oz	10.00
RC Ag at Zn Concentrate	US$/oz	-

- There are no third-party royalties applicable to the Cerro Pasco Complex operations.
- Net revenue after selling costs and royalties of US$2,758 million.
- Average net smelter return of US$112/t processed.
- Revenue is recognized at the time of production.

19.1.3 Costs

- Mine life: 10 years.
- El Porvenir sustaining and expansion capital (excluding closure costs) over the LOM totals US$400 million.
- Atacocha sustaining and expansion capital (excluding closure costs) over the LOM totals US$222 million.
- El Porvenir concurrent reclamation between 2024 and 2033 of US$7.9 million.
- El Porvenir mine closure costs between 2034 and 2037 of US$14.6 million.

- El Porvenir post-closure costs between 2038 and 2042 of US$2.3 million.
- Atacocha concurrent reclamation between 2025 and 2033 of US$16.2 million.
- Atacocha open pit mine closure costs between 2029 and 2032 of US$5.0 million.
- Atacocha underground mine closure costs between 2034 and 2037 of US$35.1 million.
- Atacocha post-closure costs between 2038 and 2042 of US$2.8 million.
- Total average unit operating costs US$57.18/t ore processed.
  - Open pit mining operating costs: US$3.33 /t mined (or US$19.52/t processed).
  - Underground mining operating costs: US$39.25/t mined (or US$39.25/t processed)
  - Processing operating costs – Atacocha: US$13.29/t ore processed
  - Processing operating costs – El Porvenir: US$13.07/t ore processed.
  - G&A – Atacocha open pit: US$11.85/t ore processed
  - G&A – El Porvenir underground: US$7.56/t ore processed.
- LOM site operating costs of US$1,412 million.
- Other Off-site operating costs: US$2.44/t ore processed.
- Costs were estimated considering an exchange rate of S/.3.67:US$1.00.

19.1.4 Taxation and Royalties

- Corporate income tax rate in Peru is 29.50%.
- Special Mining Tax Contribution (IEM) varies over the LOM between 2% and 3.6% based on the marginal rate.
- Government Mining Tax Royalty varies over the LOM between 1% and 4% based on the marginal rate.
- Employees' profit sharing participation: 8%.
- There are no third-party royalties applicable to the Cerro Pasco Complex.
- SLR has relied on Nexa's taxation model for calculation of taxes applicable to the cash flow.

19.2 Cash Flow Analysis

SLR prepared a LOM unlevered after-tax cash flow model to confirm the economics of the Cerro Pasco Complex over the LOM (between 2024 and 2033). Economics have been evaluated using the discounted cash flow method by considering LOM production at a 100% basis, annual processed tonnages, and gold and silver grades. The associated process recoveries, metal prices, operating costs, treatment, refining and selling charges, sustaining capital costs, and reclamation and closure costs, and taxes and government royalties were also considered.

The base discount rate assumed in this TRS is 7.22% as per Nexa's corporate guidance, based on Weighted Average Cost of Capital (WACC) analysis. Discounted present values of annual cash flows are summed to arrive at the Cerro Pasco Base Case NPV.

The economic analysis at the LOM weighted average prices of US$1.24/lb Zn, US$0.92/lb Pb, US$3.54/lb Cu, US$21.72/oz Ag, and US$1,798/oz Au, confirmed that the Cerro Pasco Mineral Reserves are economically viable.

The pre-tax NPV at a 7.22% base discount rate is US$364 million and the after-tax NPV at a 7.22% discount is US$162 million. The undiscounted pre-tax cash flow is US$568 million, and the undiscounted after-tax cash flow is US$290 million.

The annual after-tax cash flow summary is presented in Table 19-2.

Table 19-2: Annual After-Tax Cash Flow Summary

Calendar Year			2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038 to 2042
Project Timeline in Years			1	2	3	4	5	6	7	8	9	10	11	12	13	14	17 to 21
Time Until Closure In Years	US$ & Metric Units	LoM Avg / Total	10	9	8	7	6	5	4	3	2	1	-1	-2	-3	-4	-5 to -9
Market Prices																	
Zinc, Forecast	US$/lb	**$1.24**	$1.16	$1.13	$1.27	$1.26	$1.27	$1.27	$1.27	$1.27	$1.27	$1.27					
Lead, Forecast	US$/lb	**$0.92**	$0.98	$0.93	$0.85	$0.94	$0.92	$0.92	$0.92	$0.92	$0.92	$0.92					
Copper, Forecast	US$/lb	**$3.54**	$3.76	$3.99	$3.54	$3.63	$3.45	$3.45	$3.45	$3.45	$3.45	$3.45					
Gold, Forecast	US$/oz	**$1,798**	$1,945	$1,848	$1,594	$1,656	$1,619	$1,619	$1,619	$1,619	$1,619	$1,619					
Silver, Forecast	US$/oz	**$21.72**	$23.50	$23.50	$20.51	$21.60	$21.11	$21.11	$21.11	$21.11	$21.11	$21.11					
Physicals																	
1) Atacocha Open Pit																	
Total Open Pit Ore Mined	**kt**	**4,380**	**1,241**	**1,306**	**1,109**	**725**	-	-	-	-	-	-	-	-	-	-	-
Total Waste Mined	kt	21,324	8,771	6,802	4,500	1,250	-	-	-	-	-	-	-	-	-	-	-
Total Material Mined	kt	25,703	10,012	8,108	5,609	1,975	-	-	-	-	-	-	-	-	-	-	-
2) Atacocha Underground																	
Total Underground Ore Mined	**kt**	**5,665**	-	-	-	**500**	**500**	**1,000**	**1,000**	**1,000**	**1,000**	**665**	-	-	-	-	-
Total Waste Mined	kt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Material Mined	kt	5,665	-	-	-	500	500	1,000	1,000	1,000	1,000	665	-	-	-	-	-
3) El Porvenir Underground																	
Total Underground Ore Mined	**kt**	**14,651**	**2,250**	**2,200**	**1,858**	**1,700**	**1,700**	**1,200**	**1,200**	**1,200**	**1,192**	**151**	-	-	-	-	-
Total Waste Mined	kt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Material Mined	kt	14,651	2,250	2,200	1,858	1,700	1,700	1,200	1,200	1,200	1,192	151	-	-	-	-	-
Total Ore Processed	**kt**	**24,695**	**3,491**	**3,506**	**2,967**	**2,924**	**2,200**	**2,200**	**2,200**	**2,200**	**2,192**	**816**	-	-	-	-	-
Zinc Grade	**%**	**0.00%**	**2.70%**	**2.71%**	**2.55%**	**3.15%**	**4.01%**	**4.18%**	**4.26%**	**4.22%**	**5.48%**	**5.80%**	-	-	-	-	-
Lead Grade	**%**	**0.27%**	**1.35%**	**1.35%**	**1.72%**	**1.23%**	**1.05%**	**1.20%**	**1.13%**	**1.10%**	**0.70%**	**0.80%**	-	-	-	-	-
Copper Grade	**%**	**0.23%**	**0.14%**	**0.15%**	**0.09%**	**0.17%**	**0.24%**	**0.30%**	**0.32%**	**0.32%**	**0.48%**	**0.40%**	-	-	-	-	-
Gold Grade	**g/t**	**0.06**	**0.13**	**0.13**	**0.07**	**0.05**	**0.04**	**0.03**	**0.02**	**0.03**	**0.01**	**0.01**	-	-	-	-	-
Silver Grade	**g/t**	**67.76**	**68.86**	**60.81**	**85.53**	**69.82**	**68.20**	**70.09**	**74.76**	**66.91**	**48.41**	**48.79**	-	-	-	-	-
Contained Zinc	**kt**	**891**	**94**	**95**	**76**	**92**	**88**	**92**	**94**	**93**	**120**	**47**	-	-	-	-	-
Contained Lead	**kt**	**302**	**47**	**47**	**51**	**36**	**23**	**26**	**25**	**24**	**15**	**7**	-	-	-	-	-
Contained Copper	**kt**	**58**	**5**	**5**	**3**	**5**	**5**	**7**	**7**	**7**	**11**	**3**	-	-	-	-	-
Contained Gold	**koz**	**51**	**14**	**15**	**7**	**4**	**3**	**2**	**1**	**2**	**1**	**0**	-	-	-	-	-
Contained Silver	**koz**	**53,797**	**7,728**	**6,854**	**8,158**	**6,564**	**4,824**	**4,958**	**5,288**	**4,733**	**3,412**	**1,279**	-	-	-	-	-
Average Recovery, Zinc	%	88.6%	87.3%	87.8%	87.3%	88.2%	89.2%	89.2%	89.3%	89.3%	89.0%	88.6%	-	-	-	-	-
Average Recovery, Lead	%	80.2%	80.9%	81.0%	80.7%	80.7%	79.6%	80.0%	79.9%	79.8%	76.8%	77.9%	-	-	-	-	-
Average Recovery, Copper	%	13.9%	13.3%	13.4%	12.1%	13.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	-	-	-	-	-
Average Recovery, Gold	%	60.0%	67.4%	67.1%	67.1%	51.4%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	-	-	-	-	-
Average Recovery, Silver	%	83.2%	83.0%	82.9%	83.0%	83.0%	83.6%	83.6%	83.6%	83.6%	83.6%	83.6%	-	-	-	-	-
Recovered Zinc	kt	789	82	84	66	81	79	82	84	83	107	42	-	-	-	-	-
Recovered Lead	kt	242	38	38	41	29	18	21	20	19	12	5	-	-	-	-	-
Recovered Copper	kt	8	1	1	0	1	1	1	1	1	2	0	-	-	-	-	-
Recovered Gold	koz	30	10	10	4	2	1	1	1	1	0	0	-	-	-	-	-
Recovered Silver	koz	44,783	6,411	5,681	6,771	5,449	4,032	4,143	4,419	3,956	2,851	1,069	-	-	-	-	-
Atacocha Processing Plant																	
1) Zn Concentrate tonnes (dmt)	**kdmt**	**70**	**16**	**17**	**22**	**15**	-	-	-	-	-	-	-	-	-	-	-
Au grade in concentrate	g/t		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ag grade in concentrate	g/t		1,650	1,403	1,461	1,560	-	-	-	-	-	-	-	-	-	-	-
Zn grade in concentrate	**%**		**49.0%**	**49.0%**	**49.0%**	**49.0%**	**49.0%**	**49.0%**	**49.0%**	**49.0%**	**49.0%**	**49.0%**	-	-	-	-	-
Concentrate Moisture	%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-	-
Zn Concentrate (wmt)	kwmt	70	16	17	22	15	-	-	-	-	-	-	-	-	-	-	-
2) Pb Concentrate tonnes (dmt)	**kdmt**	**78**	**19**	**22**	**21**	**16**	-	-	-	-	-	-	-	-	-	-	-
Au grade in concentrate	g/t		15.95	14.08	6.65	2.78	-	-	-	-	-	-	-	-	-	-	-
Ag grade in concentrate	g/t		1,650	1,403	1,461	1,560	-	-	-	-	-	-	-	-	-	-	-
Pb grade in concentrate	**%**		**53.7%**	**53.7%**	**53.7%**	**53.7%**	**53.7%**	**53.7%**	**53.7%**	**53.7%**	**53.7%**	**53.7%**	-	-	-	-	-
Concentrate Moisture	%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-	-
Pb Concentrate (wmt)	kwmt	78	19	22	21	16	-	-	-	-	-	-	-	-	-	-	-
El Porvenir Processing Plant																	
1) Zn Concentrate tonnes (dmt)	**kdmt**	**1,504**	**148**	**150**	**110**	**147**	**157**	**163**	**167**	**165**	**213**	**84**	-	-	-	-	-
Au grade in concentrate	g/t		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ag grade in concentrate	g/t		205	175	294	178	146	143	150	136	76	72	-	-	-	-	-
Zn grade in concentrate	**%**		**50.2%**	**50.2%**	**50.2%**	**50.2%**	**50.2%**	**50.2%**	**50.2%**	**50.2%**	**50.2%**	**50.2%**	-	-	-	-	-
Concentrate Moisture	%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-	-
Zn Concentrate (wmt)	kwmt	1,504	148	150	110	147	157	163	167	165	213	84	-	-	-	-	-
2) Pb Concentrate tonnes (dmt)	**kdmt**	**385**	**54**	**51**	**57**	**40**	**35**	**40**	**38**	**37**	**23**	**10**	-	-	-	-	-
Au grade in concentrate	g/t		-	-	-	1	1	1	0	1	0	0	-	-	-	-	-
Ag grade in concentrate	g/t		2,467	2,259	2,481	2,882	2,828	2,533	2,853	2,639	3,106	2,707	-	-	-	-	-
Pb grade in concentrate	**%**		**52.1%**	**52.1%**	**52.1%**	**52.1%**	**52.1%**	**52.1%**	**52.1%**	**52.1%**	**52.1%**	**52.1%**	-	-	-	-	-
Concentrate Moisture	%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-	-
Pb Concentrate (wmt)	kwmt	385	54	51	57	40	35	40	38	37	23	10	-	-	-	-	-

Calendar Year				2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038 to 2042
Project Timeline in Years				1	2	3	4	5	6	7	8	9	10	11	12	13	14	17 to 21
Time Until Closure In Years		US$ & Metric Units	LoM Avg / Total	10	9	8	7	6	5	4	3	2	1	-1	-2	-3	-4	-5 to -9
3) Cu Concentrate tonnes (dmt)		**kdmt**	**40**	**3**	**3**	**2**	**3**	**4**	**5**	**5**	**5**	**8**	**2**	-	-	-	-	-
Au grade in concentrate		g/t	0.82	-	-	-	1.97	1.89	1.27	0.73	1.28	0.36	0.24	-	-	-	-	-
Ag grade in concentrate		g/t	740.33	1,179	985	2,652	1,039	763	634	632	579	273	332	-	-	-	-	-
Cu grade in concentrate		**%**	**19.8%**	**19.8%**	**19.8%**	**19.8%**	**19.8%**	**19.8%**	**19.8%**	**19.8%**	**19.8%**	**19.8%**	**19.8%**	-	-	-	-	-
Concentrate Moisture		%	0.0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-	-
Cu Concentrate (wmt)		kwmt	1,504	148	150	110	147	157	163	167	165	213	84	-	-	-	-	-
Payable Zinc, Total		kt	663	69	70	56	68	66	69	70	70	90	35	-	-	-	-	-
Payable Zinc, Total		**Mlbs**	**1,462**	**152**	**155**	**122**	**150**	**146**	**152**	**155**	**153**	**198**	**78**	-	-	-	-	-
Payable Lead, Total		kt	228	36	36	39	27	17	20	19	18	11	5	-	-	-	-	-
Payable Lead, Total		**Mlbs**	**503**	**79**	**80**	**85**	**60**	**38**	**44**	**41**	**40**	**25**	**11**	-	-	-	-	-
Payable Copper, Total		kt	8	1	1	0	1	1	1	1	1	1	0	-	-	-	-	-
Payable Copper, Total		**Mlbs**	**17**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**3**	**1**	-	-	-	-	-
Payable Gold, Total		**koz**	**23**	**9**	**9**	**4**	**1**	**0**	**0**	-	**0**	-	-	-	-	-	-	-
Payable Silver, Total		**koz**	**37,589**	**5,488**	**4,825**	**5,892**	**4,621**	**3,316**	**3,410**	**3,646**	**3,245**	**2,313**	**833**	-	-	-	-	-
Cash Flow																		
Zinc Gross Revenue	54%	$000s	1,616,903	153,764	152,204	139,541	169,858	165,532	172,655	175,953	174,258	224,894	88,242	-	-	-	-	-
Lead Gross Revenue	15%	$000s	463,691	77,320	74,284	72,528	56,899	35,085	40,257	38,125	36,884	22,590	9,719	-	-	-	-	-
Copper Gross Revenue	2%	$000s	59,489	5,210	5,722	2,335	4,929	5,549	6,868	7,350	7,183	10,960	3,382	-	-	-	-	-
Gold Gross Revenue	1%	$000s	42,965	17,728	17,208	6,066	1,642	180	68	-	73	-	-	-	-	-	-	-
Silver Gross Revenue	27%	$000s	816,869	128,974	113,382	120,860	99,796	69,995	71,994	76,960	68,506	48,821	17,580	-	-	-	-	-
Gross Revenue Before By-Product Credits	**100%**	**$000s**	**2,999,917**	**382,997**	**362,802**	**341,329**	**333,125**	**276,341**	**291,842**	**298,388**	**286,905**	**307,265**	**118,923**	-	-	-	-	-
Gross Revenue After By-Product Credits		**$000s**	**2,999,917**	**382,997**	**362,802**	**341,329**	**333,125**	**276,341**	**291,842**	**298,388**	**286,905**	**307,265**	**118,923**	-	-	-	-	-
Other Revenues & Compensations		**$000s**	**12,143**	-	-	-	**1,000**	**2,386**	**1,918**	**2,024**	**1,984**	**2,314**	**517**	-	-	-	-	-
OP Mining Cost		$000s	(85,481)	(25,705)	(23,577)	(20,440)	(15,759)	-	-	-	-	-	-	-	-	-	-	-
UG Mining Cost		$000s	(797,349)	(104,686)	(90,414)	(85,646)	(92,929)	(90,625)	(91,249)	(77,556)	(70,289)	(66,963)	(26,992)	-	-	-	-	-
Atacocha Process Cost (OP material)		$000s	(58,194)	(14,890)	(15,042)	(14,581)	(13,682)	-	-	-	-	-	-	-	-	-	-	-
El Porvenir Process Cost (UG material)		$000s	(265,546)	(26,195)	(26,108)	(25,254)	(27,824)	(30,130)	(29,392)	(29,594)	(29,952)	(30,368)	(10,729)	-	-	-	-	-
Site Support G&A Cost (OP)		$000s	(51,887)	(12,972)	(12,972)	(12,972)	(12,972)	-	-	-	-	-	-	-	-	-	-	-
Site Support G&A Cost (UG)		$000s	(153,629)	(16,197)	(16,223)	(16,226)	(16,282)	(16,313)	(16,365)	(16,401)	(16,722)	(16,686)	(6,215)	-	-	-	-	-
TC/RC charges		$000s	(241,889)	(30,955)	(32,008)	(32,519)	(27,724)	(21,213)	(23,136)	(23,185)	(22,281)	(20,803)	(8,067)	-	-	-	-	-
Third Party Royalty		$000s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Cash Costs Before By-Product Credits		$000s	(1,653,975)	(231,600)	(216,344)	(207,636)	(207,171)	(158,281)	(160,142)	(146,736)	(139,243)	(134,819)	(52,003)	-	-	-	-	-
Total Cash Costs After By-Product Credits		**$000s**	**(1,653,975)**	**(231,600)**	**(216,344)**	**(207,636)**	**(207,171)**	**(158,281)**	**(160,142)**	**(146,736)**	**(139,243)**	**(134,819)**	**(52,003)**	-	-	-	-	-
Operating Margin	**45%**	**$000s**	**1,358,085**	**151,398**	**146,458**	**133,693**	**126,954**	**120,446**	**133,618**	**153,676**	**149,645**	**174,761**	**67,437**	-	-	-	-	-
Off-site Other Operating Expenses		$000s	(60,210)	(16,653)	(13,878)	(9,751)	(3,734)	(3,018)	(3,018)	(3,018)	(3,018)	(3,018)	(1,107)	-	-	-	-	-
EBITDA		**$000s**	**1,297,875**	**134,745**	**132,580**	**123,942**	**123,221**	**117,428**	**130,600**	**150,658**	**146,628**	**171,743**	**66,330**	-	-	-	-	-
Depreciation Allowance		$000s	(518,456)	(40,746)	(35,068)	(46,957)	(47,716)	(56,022)	(81,319)	(68,200)	(69,114)	(44,394)	(28,919)	-	-	-	-	-
Earnings Before Taxes		**$000s**	**779,419**	**93,999**	**97,512**	**76,984**	**75,504**	**61,406**	**49,281**	**82,458**	**77,514**	**127,349**	**37,411**	-	-	-	-	-
Special Mining Tax and Mining Royalties		$000s	(47,220)	(6,530)	(5,943)	(5,264)	(4,806)	(3,827)	(3,670)	(4,811)	(4,371)	(6,054)	(1,943)	-	-	-	-	-
Workers' Participation Tax		$000s	(52,419)	(7,183)	(5,735)	(4,807)	(4,424)	(4,127)	(3,083)	(3,702)	(5,983)	(10,105)	(3,270)	-	-	-	-	-
Peru Corporate Income Tax		$000s	(177,831)	(24,367)	(19,457)	(16,309)	(15,009)	(14,002)	(10,460)	(12,558)	(20,297)	(34,280)	(11,093)	-	-	-	-	-
Net Income		**$000s**	**501,949**	**55,919**	**66,376**	**50,605**	**51,265**	**39,450**	**32,068**	**61,387**	**46,863**	**76,910**	**21,106**	-	-	-	-	-
Non-Cash Add Back - Depreciation		$000s	518,456	40,746	35,068	46,957	47,716	56,022	81,319	68,200	69,114	44,394	28,919	-	-	-	-	-
Working Capital		$000s	(23,648)	(61,112)	13,664	(3,793)	(7,797)	(516)	(2,479)	(1,465)	(1,878)	(9,521)	30,666	20,584	-	-	-	-
Operating Cash Flow		**$000s**	**996,756**	**35,553**	**115,108**	**93,769**	**91,185**	**94,956**	**110,908**	**128,122**	**114,099**	**111,782**	**80,691**	**20,584**	-	-	-	-
Sustaining Capital - Atacocha		$000s	(222,319)	(15,716)	(21,291)	(18,941)	(30,433)	(25,448)	(29,316)	(37,668)	(31,476)	(9,226)	(2,803)	-	-	-	-	-
Sustaining Capital - El Porvenir		$000s	(400,038)	(62,188)	(103,802)	(84,284)	(40,576)	(28,990)	(30,262)	(30,425)	(15,125)	(4,385)	-	-	-	-	-	-
Closure/Reclamation Costs - Atacocha		$000s	(59,033)	-	(405)	(1,035)	(5,519)	(5,347)	(787)	(4,652)	(1,417)	(1,156)	(882)	(796)	(2,633)	(25,045)	(6,588)	(2,770)
Closure/Reclamation Costs - El Porvenir		$000s	(24,899)	(795)	(795)	(795)	(795)	(795)	(795)	(795)	(795)	(795)	(795)	(332)	(1,099)	(10,448)	(2,748)	(2,319)
Total Capital		**$000s**	**(706,288)**	**(78,699)**	**(126,294)**	**(105,055)**	**(77,323)**	**(60,581)**	**(61,161)**	**(73,540)**	**(48,813)**	**(15,562)**	**(4,481)**	**(1,128)**	**(3,732)**	**(35,493)**	**(9,337)**	**(5,089)**
Cash Flow Adj./Reimbursements		**$000s**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LoM Metrics																		
Economic Metrics																		
a) Pre-Tax																		
Free Cash Flow		**$000s**	**567,938**	**(5,067)**	**19,950**	**15,093**	**38,100**	**56,331**	**66,961**	**75,653**	**95,937**	**146,660**	**92,515**	**19,456**	**(3,732)**	**(35,493)**	**(9,337)**	**(5,089)**
Cumulative Free Cash Flow		$000s		(5,067)	14,884	29,977	68,077	124,408	191,369	267,022	362,959	509,618	602,133	621,589	617,857	582,364	573,027	567,938
NPV @ 7.22%		**$000s**	**363,641**															
b) After-Tax																		
Free Cash Flow		**$000s**	**290,468**	**(43,146)**	**(11,186)**	**(11,287)**	**13,861**	**34,375**	**49,748**	**54,581**	**65,286**	**96,220**	**76,210**	**19,456**	**(3,732)**	**(35,493)**	**(9,337)**	**(5,089)**
Cumulative Free Cash Flow		$000s		(43,146)	(54,332)	(65,619)	(51,757)	(17,382)	32,366	86,947	152,233	248,453	324,663	344,119	340,387	304,894	295,557	290,468
NPV @ 7.22%		**$000s**	**162,059**															
Operating Metrics																		
Sales Metrics																		

19.3 Sensitivity Analysis

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities:

- • Metal prices
- • Head grades
- • Metallurgical recoveries
- • Operating costs
- • Capital costs (Sustaining and Closure)

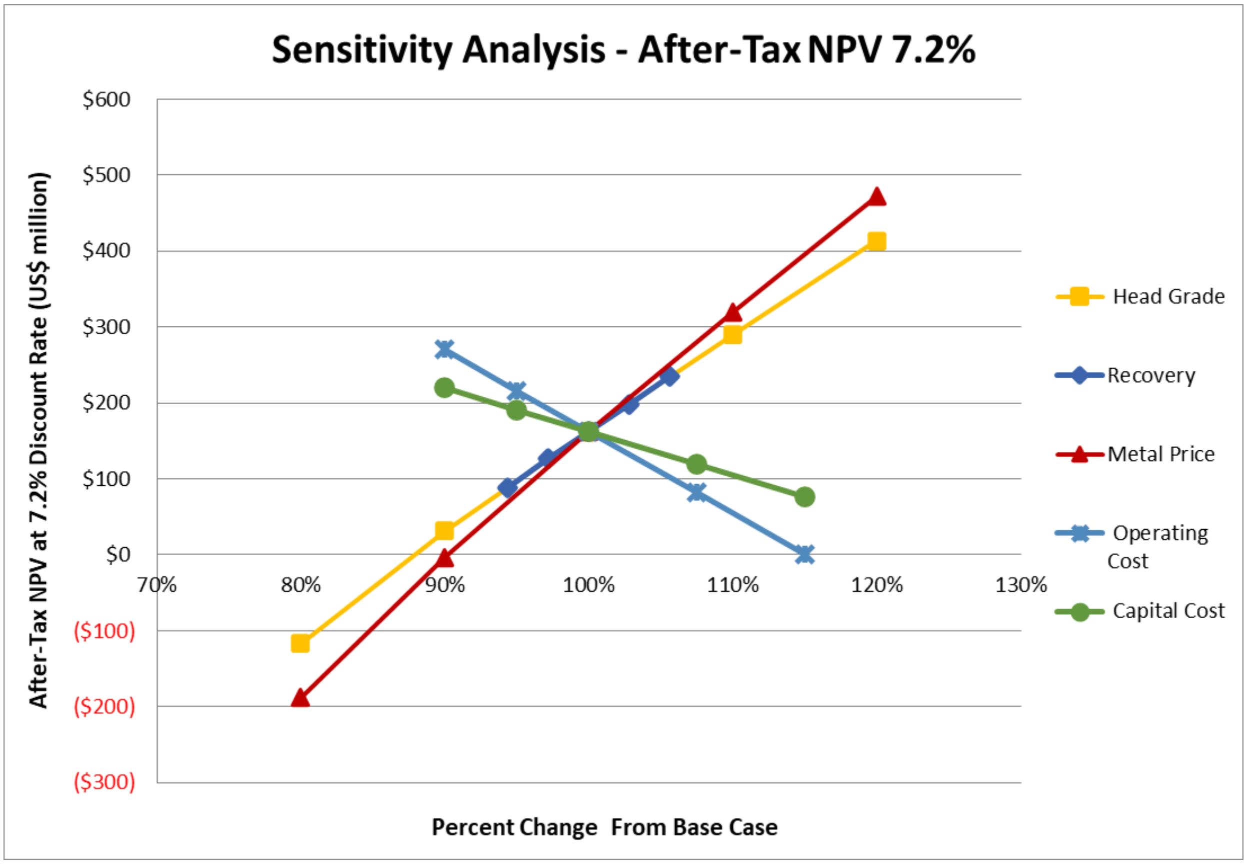
After-tax $NPV_{7.22\%}$ sensitivities over the base case have been calculated for -20% to +20% for head grade, -5% to +5% for overall recoveries, -20% to +20% for metal prices, and -10% to +15% for operating and capital costs variations to determine Cerro Pasco's most sensitive parameter. The sensitivities are shown in Figure 19-1 and Table 19-3

The sensitivity analysis at Cerro Pasco shows that the after-tax NPV at a 7.22% base discount rate is most sensitive to metal prices, head grade, and metallurgical recoveries, followed by operating costs and capital costs.

Table 19-3: After-Tax Sensitivity Analyses – Cerro Pasco Complex

Variance	Head Grade (% Zn)	NPV at 7.22% (US$ million)
80%	2.89%	(117)
90%	3.25%	31
100%	3.61%	162
110%	3.97%	289
120%	4.33%	414
Variance	**Recovery (% Zn)**	**NPV at 7.22% (US$ million)**
94%	83.6%	89
97%	86.1%	126
100%	88.6%	162
103%	91.0%	198
106%	93.5%	234
Variance	**Metal Prices (US$/lb Zn)**	**NPV at 7.22% (US$ million)**
80%	$0.99	(188)
90%	$1.12	(3)
100%	$1.24	162
110%	$1.37	319
120%	$1.49	472
Variance	**Operating Costs (US$/t)**	**NPV at 7.22% (US$ million)**
85%	$51.46	270
93%	$54.32	216
100%	$57.18	162
118%	$61.47	82
135%	$65.76	1
Variance	**Capital Costs (US$000)**	**NPV at 7.22% (US$ million)**
85%	$657	220
93%	$693	191
100%	$730	162
118%	$785	119
135%	$839	76

Figure 19-1: After-Tax Sensitivity Analysis



20.0 Adjacent Properties

As indicated in Figure 20-1, El Porvenir and Atacocha are surrounded by other mineral properties. The following companies that hold properties in the vicinity are subsidiaries of the Volcan Group:

- Compañía Minera Vichaycocha.
- Empresa Exploradora de Vinchos.
- Empresa Minera Paragsha.
- Minera San Sabastián AMC S.C.R.L.

The Volcan Group operates the Cerro de Pasco Mine in the nearby city of Cerro de Pasco. Nexa maintains a group of mining concessions located within the boundaries of some of the Volcan Group's properties.

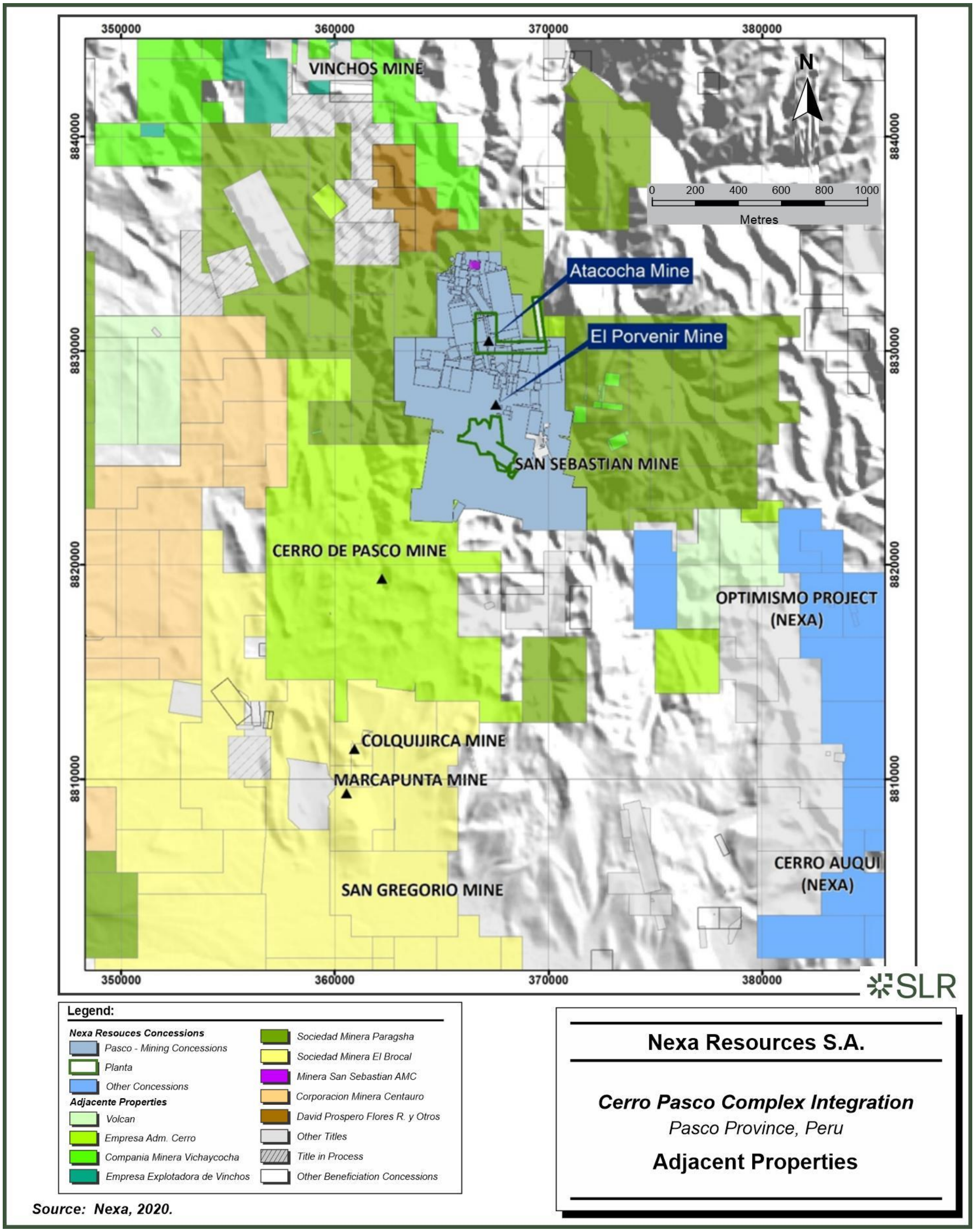
Other local property holders include:

- Sociedad Minera El Brocal
- David Prospero Rudas y otros.
- Corporación Minera Centauro S.A.C. (Centauro).

Centauro is a Peruvian capital corporation that focuses on exploration, mining, and processing of polymetallic minerals, such as Au, Ag, and Cu.

SLR has not independently verified this information and this information is not necessarily indicative of the mineralization at El Porvenir.

Figure 20-1: Adjacent Properties



Source: Nexa, 2020.

21.0 Other Relevant Data and Information

No additional information or explanation is necessary to make this TRS understandable and not misleading.

22.0 Interpretation and Conclusions

22.1 Geology and Mineral Resources

- The Mineral Resource estimate was prepared by Nexa. The resource estimate has been audited and accepted by the QP.
- Exclusive of Mineral Reserves, the estimated EOY2023 Measured and Indicated Mineral Resources attributable to Nexa comprise:
  - El Porvenir underground (83.48% attributable): 3.24 Mt at 3.29% Zn, 0.21% Cu, 62.2 g/t Ag, and 0.97% Pb containing 106.6 kt of Zn, 6.8 kt of Cu, 6,485 koz of Ag, and 31.1 kt of Pb.
  - Atacocha underground (75.96% attributable): 2.71 Mt at 3.35% Zn, 0.33% Cu, 55.0 g/t Ag, and 0.94% Pb containing 90.8 kt of Zn, 9.0 kt of Cu, 4,792 koz of Ag, and 25.4 kt of Pb.
  - San Gerardo open pit (75.96% attributable): 4.31 Mt at 1.12% Zn, 29.8 g/t Ag, 0.89% Pb, and 0.22 g/t Au containing 48.4 kt Zn, 4,128 koz Ag, 38.4 kt Pb, and 31.1 koz Au.
- In addition, the El Porvenir EOY2023 Inferred Mineral Resources attributable to Nexa total 9.23 Mt at 3.83% Zn, 0.24% Cu, 82.9 g/t Ag, and 1.32% Pb.
- Atacocha EOY2023 Inferred Mineral Resources attributable to Nexa total 6.12 Mt at 4.09% Zn, 0.56% Cu, 77.3 g/t Ag, and 1.21% Pb for Atacocha underground, and 1.29 Mt at 1.27% Zn, 32.7 g/t Ag, 1.15% Pb, and 0.22 g/t Au for San Gerardo open pit.
- El Porvenir and Atacocha feature skarn and hydrothermal vein/breccia-style mineralization. El Porvenir also has stratabound deposits, while Atacocha has porphyry mineralization. Controls on mineralization are lithological, mineralogical, and structural.
- The El Porvenir and Atacocha database closure date was January 31, 2023. Between then and the effective date of this report, 252 drill holes and 1,727 channels were completed at El Porvenir and 32 channels and 18 DDH were completed at Atacocha. SLR does not consider this to have a material impact on the estimated Mineral Resources.
- Protocols for drilling, sampling, analysis, verification, and security meet industry standard practices. The drill hole database was verified by SLR and is suitable for Mineral Resource estimation.
- The Mineral Resource estimates are completed to industry standards using reasonable and appropriate parameters and are acceptable for conversion to Mineral Reserves.
- Nexa has defined several polymetallic prospects located near the deposits, which warrant additional exploration, including the Integration Zone between the El Porvenir and Atacocha underground mines.

22.2 Mining and Mineral Reserves

- The Cerro Pasco Complex consists of the El Porvenir underground mine, the Atacocha underground mine, and the San Gerardo open pit mine.
  - Production is currently from the San Gerardo mine, which feeds the Atacocha processing plant that has a nominal throughput of 4,400 tpd, and the El Porvenir

underground mine, which feeds the El Porvenir processing plant that has a nominal throughput of 6,500 tpd.

- The Atacocha underground mine was placed in care and maintenance in 2020 to focus all production at the San Gerardo open pit mine. Atacocha is planned to resume production in 2027 when the San Gerardo pit has reached the end of its mine life.
- The Atacocha Mine will be integrated with the El Porvenir Mine and both will feed the El Porvenir processing plant.

- The Mineral Reserve estimates were prepared by Nexa and reviewed and accepted by SLR.
  - On an 83.48% Nexa attributable ownership basis, El Porvenir underground Mineral Reserves total 12.2 Mt averaging 4.11% Zn, 0.23% Cu, 72.9 g/t Ag, and 1.20% Pb.
  - On a 75.96% Nexa attributable ownership basis, Atacocha underground Mineral Reserves total 4.3 Mt averaging 4.33% Zn, 0.40% Cu, 79.8 g/t Ag, and 1.34% Pb.
  - On a 75.96% Nexa attributable ownership basis, San Gerardo open pit Mineral Reserves total 3.3 Mt at an average grade of 0.99% Zn, 34.9 g/t Ag, 0.27 g/t Au, and 1.15% Pb.
- The assumptions, parameters, and methodology used to estimate Mineral Reserves meet industry standard practices and are appropriate for the style of mineralization and proposed mining methods.
- The underground mines are planned to be mined using CAF and SLS mining methods. Backfill in the form of unconsolidated backfill from waste development and hydraulic fill from tailings will be used for both mining methods.
- Underground mine design and support recommendations have been developed using industry standard geotechnical data and analysis methods.
- The dilution factors assumed for SLS are low when compared to surveyed stopes and planned designs reconciliation data provided by Nexa.
  - SLR has investigated the effect of higher dilution and notes that approximately 2% of the total Mineral Reserves would be impacted. This is not considered to be a material difference.
- Mining of the San Gerardo open pit is planned using conventional open pit mining methods with drill and blast operations using excavators and trucks.
- Open pit NSR block value calculations are based on historical performance of the concentrator, historical operating costs and current smelter contracts.
- Open pit calculated block model NSR values are evaluated against the internal break-even value. Blocks classified as Measured or Indicated Mineral Resources with an NSR value above the internal break-even value are included in the Mineral Reserve.

22.3 Mineral Processing

22.3.1 El Porvenir

- The El Porvenir concentrator processed 2,220,011 tonnes of ore in 2023 with Cu, Pb, and Zn grades of 0.16%, 1.37% and 2.86% respectively. Recoveries to their respective concentrates were 10.1% Cu, 82.1% Pb, and 88.0% Zn.
- The head grades of Zn, Cu, Au, and Ag have been consistent for the period from 2018 through 2023, while Pb has increased from 0.98% to 1.37%. Pb, Ag, and Au recoveries have increased and the recovery of Ag and Au to the Pb concentrate has increased over the period. Cu grades and recoveries have decreased significantly over the period.
- The average head grades of Zn, Pb, and Cu during 2022 and 2023 were 2.83%, 1.36%, and 0.16%, respectively, and the recoveries of Zn, Pb, and Cu for the period were 87.49%, 81.65%, and 8.67%, respectively.
- Nexa began developing a geometallurgical model for El Porvenir in 2017. The objectives of the work were to develop a geometallurgical model able to predict the recovery of lead, zinc, copper, arsenic, and manganese, concentrate grades, as well as abrasiveness (abrasion index (Ai)) and hardness (Bond ball mill work index (BWi)), and therefore throughput, based on ore source within the deposit.
- Prior to the present Phase 6 study, five phases of geometallurgical studies were carried out. Identified risks include the presence of high-hardness material in intrusive materials and limestone, as well as high abrasiveness in sandstone and clastic materials.
- The potential penalty elements that should be monitored in the Cu Concentrate include As, Sb, Bi, Cd, and combined Pb+Zn. The potential penalty elements in the Pb concentrate are low lead concentrate grade, bismuth, and fluorine. The potential penalty elements in the Zn concentrate are copper and manganese.

22.3.2 Atacocha

- The Atacocha concentrator processed 1,397,192 tonnes of ore in 2023 with Pb and Zn grades of 0.93% and 0.77%, respectively. Recoveries to their respective concentrates were 85.7% Pb and 75.9% Zn.
- Head grades of ore being treated in the Atacocha concentrator have changed since the introduction of open pit ore in early 2016. Head grades of Zn have decreased from 1.8% to 0.77%, Cu has decreased from 0.11% to 0.04%, and Pb has decreased from 1.31% to 0.93% from 2016 to 2023. Since 2019, the copper grades have been too low to allow a separate copper concentrate to be produced.
- The average grades of Zn and Pb during 2022 and 2023 were 0.84% and 0.95%, respectively, and the recoveries of Zn and Pb for the period were 76.57% and 83.64%, respectively. The recoveries used for the cut-off grade and resource model at these grades were 70.44% for Zn and 84.06% for Pb, which compares well to the operating data for Pb, the Zn values being somewhat conservative.
- A metallurgical testing program was carried out to characterize the geometallurgical behaviour of the Atacocha San Gerardo ore according to the 2022-2023 mining plan.
- Prior to the present study, three phases of geometallurgical studies were carried out, increasing the available geometallurgical data progressively to reduce the risk in metallurgical predictions.

- Risks identified include the presence of high hardness and abrasive material in intrusive material and hydrothermal breccias, as well as areas of low Au recovery associated with Au disseminations in pyrite in mainly marble-type material.
- The potential penalty elements in the Pb concentrate are arsenic and fluorine. The potential penalty elements in the Zn concentrate are manganese, silica, and cadmium.

22.4 Infrastructure

22.4.1 Integration of Atacocha and El Porvenir

- The Cerro Pasco integration project aims to maximize the synergy of the Atacocha and El Porvenir mines.
- El Porvenir started in 1950 and is an operating underground mine with multiple accesses including a shaft (Picasso shaft) for ore and people transportation.
- Atacocha started in 1937 comprising an underground mine and an open pit mine. The open pit mine, San Gerardo is currently in operation, and the underground mine has been on care and maintenance since 2020.
- Access to Atacocha underground is by multiple surface tunnels, that are in good condition despite the production suspension.
- Atacocha is currently connected to El Porvenir through two active tunnels: at 4070 and 3300 levels, with traffic of heavy mine equipment, conventional trucks, and mining crews, linking Atacocha surface to El Porvenir underground.
- The integration plan comprises restarting of Atacocha underground, development of additional connections between El Porvenir and Atacocha, expand the Picasso shaft capacity, closure of the Atacocha processing plant in 2027, and construction of a new pipeline to pump El Porvenir mine tailings to the Atacocha tailing dam.
- A combination of transportation methods, including road access, aircraft via Huánuco, and rail to Cerro de Pasco are used to supply the Atacocha and Porvenir mines.
- Off-site infrastructure includes facilities for the transfer of concentrate from truck to rail at Cerro de Pasco to transport concentrate for export by train to the port of Callao. Mine access is via a 13 km dirt road northeast from Cerro de Pasco, and paved road from Lima to Cerro de Pasco (approximately 315 km).
- The main road from Lima to Cerro de Pasco is used for personnel transportation, supply of food, reagents, spare parts, mining supplies, and diesel fuel. Huánuco airport can be used for personnel transportation and emergency situations.
- The power supply for the Atacocha and El Porvenir mines comes from two sources: the national power grid via 50/13.8 kV main substations located near each of the mines and the La Candelaria Hydroelectric Plant, which consists of three turbines (0.5 MVA, 1.2 MVA, and 3.5 MVA), and is connected to the Atacocha and El Porvenir main substations by a 4.6 km long 50 kV transmission line.
- Power is generated at 4,660 kV at the La Candelaria Hydroelectric Plant. All other project loads are fed at 13.8 kV from the main substation through overhead power lines. These power lines are used to deliver power to various locations to support activities during operation of the Complex.

- The El Porvenir TSF receives tailings generated by both the El Porvenir and Atacocha concentrator plants. A portion of tailings is used for hydraulic backfill at El Porvenir. The El Porvenir TSF was originally constructed in the 1970s, and the current elevation of the dam crest is 4,066 MASL. The downstream toe is inferred from available plans to be at 3,920 MASL, resulting in a current dam height of 146 m.
- Nexa is planning to improve the water management system through construction of a perimeter channel (i.e., upstream water diversion) to intercept clean (non-contact water) surface runoff water before it flows into the TSF. Diverted water will be discharged downstream of the TSF in the Lloclla River gorge.

22.4.2 El Porvenir

- The El Porvenir site comprises an underground mine, TSF, waste rock stockpiles, an ore processing facility with associated laboratory and maintenance facilities, and maintenance buildings for underground and surface equipment.
- Additional facilities and structures include an office building, change house facilities, main shaft, ventilation shaft, backfill plant, explosives storage area, hydroelectric power generating plant, power lines and substation, fuel storage tanks, a warehouse and laydown area, and an accommodation camp.

22.4.3 Atacocha

- Atacocha site operations comprise an underground mine, open pit mine, and a process plant facility.
- Supporting on-site infrastructure include maintenance facilities; maintenance buildings for underground and surface equipment, laboratory, and tailings pumping station. Facilities and structures supporting operations include warehouses and laydown areas, offices, dry facilities, hydroelectric generating station, power lines and substation, fuel storage tanks, and accommodations camp.
- A network of site roads that are approximately 6 m wide and total 15 km in length are used by authorized mine personnel and equipment, including ore and waste haul trucks, concentrate haul trucks, support and light duty vehicles to provide access to on-site infrastructure.

22.5 Environment, Permitting, and Social Considerations

- No environmental issues were identified from the documentation available for review that could materially impact the ability to extract the Mineral Resources and Mineral Reserves. SLR understands that El Porvenir and Atacocha have the permits required to continue the mining operations in compliance with applicable Peruvian permitting requirements. Of note, expired authorizations under the renewal process do not interrupt the continuity of the operations (for example, the authorization for discharge of industrial effluent for El Porvenir has been filed by Nexa but it is pending approval by the environmental authority).
- Approval of environmental permits required for the Cerro Pasco Complex Integration is critical for its implementation. Nexa's Environmental Management Superintendent for El Porvenir and Atacocha understands well the environmental permitting requirements and has developed a tracking matrix that identifies the key components of each permit, corrective actions to be implemented to be in compliance, and the status of

implementation of each action. All action items are qualified according to a ranking of criticality established (low, medium and high) for continuity of the operation. The matrix includes the planning for the future environmental permits required for implementation of the Cerro Pasco Complex Integration.

- The monitoring program at El Porvenir includes meteorology, air quality, non ionized radiation, noise, surface water quality, groundwater quality (only one location), spring water quality, effluent discharges, fauna and flora, and TSF physical stability. El Porvenir reports the results of its monitoring program to the authorities according to the frequency stated in the approved resolutions. SLR is not aware of any non-compliance issues raised by the authorities.
- The monitoring program at Atacocha includes effluent discharges, gas emissions, air quality, non-ionizing radiation, noise, surface water quality, groundwater quality, springs water quality, vibrations, soil quality, terrestrial biology (vegetation and wildlife) and aquatic biology, and TSF physical stability. Atacocha reports the results of its monitoring program to the authorities according to the frequency stated in the approved resolutions. SLR is not aware of any non-compliance issues raised by the authorities.
- Nexa utilizes an Integrated Dam Management System (referred to as SIGBar) for the El Porvenir TSF and the Atacocha TSF, which provides guidelines for document management, monitoring, evaluation, risk analysis, compliance with standards and legislation, training of personnel, operation of structures and other provisions.
- SLR's social review indicates that, at present, Nexa's operations at El Porvenir make a positive contribution to sustainability and community well-being. From the review and SLR's site visit, Nexa appears to have the necessary governance documents and tools to manage social risks associated with the Cerro Pasco Complex operations. A grievance mechanism and Community Relations Plans are in place and implemented by the social teams for each of El Porvenir and Atacocha.
- An independent technical evaluation of key components of the Cerro Pasco Complex Integration project completed in early 2024 by a third party did not find any fatal flaws. The evaluation included the TSFs, social risks and permitting. It resulted in a number of findings and recommendations to be considered by Nexa to derisk the Cerro Pasco Complex Integration project.
- Community discontent represents a future risk for the Cerro Pasco Complex operations. The Cerro Pasco Complex Integration project may increase expectations from the local communities in terms of contracting of local services, employment, training and community investment opportunities. The modification of the Environmental Impact Assessment required for Atacocha and El Porvenir imply processes of consultation and Citizen Participation, which could delay the approval process in the event of social disagreement.
- Although there is no written commitment from Nexa to ensure local procurement, the company retains services from local businesses and from contractors that employ local workforce.
- In 2023, Nexa experienced an increase in local hiring for El Porvenir and Atacocha. Nexa has declared local hiring commitments with eight local communities and has specific local hiring targets with two of them.
- Atacocha acquired rights to land from the community of Cajamarquilla via an agreement to construct tailings facilities and ancillary infrastructure. The agreement included various

commitments and obligations, including financial compensation for rights to the land. Atacocha also acquired and subsequently renewed a right-of-way agreement with the community of Ticlacayán associated with hydraulic infrastructure. Community agreements related to rights to land from the community have also been signed for El Porvenir with Comunidad San Francisco de Asís de Yarusyacán y Comunidad Cajamarquilla.

- Independent conceptual Mine Closure Plans have been developed for El Porvenir and Atacocha within the context of Peruvian legislation and are periodically updated. The most recent modification to the Mine Closure Plan for El Porvenir and update to the closure cost estimate was completed in 2020. The most recent modification to the Mine Closure Plan for Atacocha and update to the closure cost estimate was completed in 2022.

22.6 Capital and Operating Costs and Economics

- Capital and operating cost estimates were prepared based on historical operating performance and the current operating budget for 2024, and the forecasted cost estimates for the integration project. SLR considers these capital and operating cost estimates to be reasonable, provided the operation and production targets are realized.
- The LOM production schedule in the cash flow model, covering a 10-year mine life, is based on the December 31, 2023 Mineral Reserves.
- All costs in this report are expressed in Q4 2023 US dollars.
- The economic analysis at average LOM prices of US$1.24/lb Zn (US$2,741/t Zn), US$0.92/lb Pb (US$2,032/t Pb), US$3.54/lb Cu (US$7,809/t Cu), US$21.72/oz Ag, and US$1,798/oz Au, demonstrated that the Cerro Pasco Mineral Reserves are economically viable.
- On a 100% ownership basis, the pre-tax NPV at a 7.22% base discount rate is US$364 million and the after-tax NPV at a 7.22% discount is US$162 million. The undiscounted pre-tax cash flow is US$568 million, and the undiscounted after-tax cash flow is US$290 million.
- There is good potential to extend the mine life through continued conversion of Inferred Resources, with improved economic results.

22.7 Risks

- Underground geotechnical risks:
    - The impact of faults on the stope stability and ELOS have not been accounted for in the geotechnical empirical analyses. SLR has evaluated the potential underestimate of ELOS (see Section 12.3.2), however, dilution in areas affected by faults may increase compared to that currently anticipated. Mitigation can be applied by installing ground support in the faulted walls and/or by reducing the stope size in those locations, which would impact productivity rates. It is considered that this a low-moderate risk and that these mitigations can be applied during production, so a change to the mine plan/schedule is not required at this stage.
    - The project is lacking a geotechnical block model. This is best practice and should be implemented. While its absence is considered a low risk, a geotechnical block model allows for a better understanding of the spatial distribution of the geotechnical

conditions and would assist in short-medium term mine planning (and also links back to the point on faults above).

- San Gerardo open pit risks:
  - Pit slope design outside of the domain sectors was assumed to be 45 degrees for design, this assumption is considered low risk based on the wall height of the north and west satellite pits.
  - Open pit mining operating costs are defined as constant values for mine planning. However, there is a variable component associated with the haulage distance of the open pit mining costs that requires a truck haulage distance forecast in the LOM plan. There is a low risk that the estimated mining cost will increase over the LOM due to increased truck haulage distances.
- Process risks:
  - There is a risk of lower metal grades and recoveries than planned and the recovery of deleterious elements in the concentrates that may draw penalties.
  - The potential penalty elements in the Pb concentrate are arsenic and fluorine. The potential penalty elements in the Zn concentrate are manganese, silica, and cadmium.
  - Geometallurgical testing has identified the presence of high-hardness material in intrusive materials and limestone, as well as high abrasiveness in sandstone and clastic materials may result in increased operating power and wear material consumption and costs.
  - Geometallurgical work has identified areas of low Au recovery associated with Au disseminations in pyrite in mainly marble-type material.
- Infrastructure risks:
  - The age of the current infrastructure and the cost of maintenance is a moderate risk.
  - Cost and schedule risk for the design and construction of integration infrastructure including the new tailing pumping station and pipeline from El Porvenir to the Atacocha TSF.
- Risks associated with environmental permitting and community relations:
  - The modifications to the EIA required for both El Porvenir and Atacocha as part of the Cerro Pasco Complex Integration project involve a period of review and approval by the environmental authority. There is a high level of uncertainty associated with the actual duration of the review and approval period due to staffing issues at the SENACE and adjustments to its review and approval processes. As a mitigation measure, Nexa has included additional time in its permitting schedule for the Cerro Pasco Complex Integration project to carry a contingency for the permitting process.
  - Community discontent represents a future risk for the Cerro Pasco Complex operations since it can lead to blockades and in turn could result in operation interruptions and reputational damage. There is precedent for such conflict given that blockades organized by communities have taken place in the past and, as recently as 2023, led to short suspensions of operations. As mitigation measures, Nexa is mainly working towards addressing and closing commitments with the communities in a more efficient manner, and is revisiting its social management

approach to be more proactive in preventing potential issues or addressing them early to avoid escalation.

23.0 Recommendations

23.1 Geology and Mineral Resources

1. Investigate if capping levels should be applied based on high-grade and low grade domains for Zn, Pb, Cu, and Ag for some domains of San Gerardo open pit.
2. Fine-tune the estimation workflow and dynamic anisotropy angles calculation to minimize visual grade artifacts observed in some domains (such as “de2” for El Porvenir and “sge” for Atacocha UG). Consider utilizing hangingwall, footwall, and reference surface data to refine local angle precision, alongside auxiliary dip and dip direction charts to identify and rectify any inconsistencies.
3. Consider incorporating the blast hole samples to define the LTM mineralization boundaries given that the GCM performs systematically better than the LTM for the San Gerardo open pit.
4. Increase the number of density samples to allow more accurate block density estimates.
5. Adjust the density estimation methodology to only interpolate where supported by sufficient samples.
6. Improve the Mineral Resource classification post-processing, aiming to clean up the remaining isolated blocks of Measured or Indicated classification, such as in the domain “vcn32” of El Porvenir.
7. Investigate relaxing the maximum of two composites per drill hole restriction in domain extremities and sparsely drilled areas.
8. For the Mineral Resource classification, consider excluding drilling intersections that are sub-parallel to tabular mineralized domains as they significantly reduce drill hole spacing calculations in an artificial manner.
9. Use the production data to monitor the selected drill spacing for the minor continuity zones to determine if sufficient confidence is provided to support detailed mine planning, as these domains show less grade and geological continuity.
10. In future models, incorporate a structural model to help properly define the estimation trends.
11. Improve the field duplicate rates of channels by revising the sampling protocol of duplicates in channels.
12. Increase the frequency of monitoring Inspectorate El Porvenir laboratory (Inspectorate EP) results on a batch basis to preliminarily identify and address instances of failure that may require re-analysis.
13. Keep monitoring CRMs and other controls to prevent and/or mitigate trends, biases, or other issues which may require sample re-analysis. Continue with periodic external checks across laboratories to ensure the primary laboratory's performance remains satisfactory.
14. Ensure all the samples analyzed by ALS are re-assayed using the relevant analytical method when exceeding the detection limit (i.e., samples >10,000 ppm Zn), to prevent few instances detected of incomplete results in the assay database.

15 Investigate and address sample discrepancies identified during the data verification process, particularly those related to Au values. These discrepancies, however, are minor and have negligible impact on the overall assessment.

16 Maintain standardization of the format and database structure.

17 Complete the 2024 exploration program, consisting of an 8,500 m drill program to explore new targets and continue with advanced exploration. The 2024 exploration program budget is approximately US$2.1 million.

18 Improve the reconciliation between the underground production volumes and the mineralization wireframes, to better understand the differences between the along-strike mineralization, and to better quantify the proportion of the discrepancy resulting from the opportunistic mining of ore from across-strike structures.

19 To better define mineralized extents, consider completing closer spaced exploration and infill drilling ahead of production, including at orientations better designed to intercept across-strike mineralized structures.

23.2 Mining and Mineral Reserves

1. Review the underground mine designs and mining sequence and incorporate sill pillars where required.
2. Continue underground geotechnical data capture, specifically seismic monitoring around pillars between stopes.
3. Develop an underground geotechnical block model to better spatially define the geotechnical variation.
4. Re-appraise stope stability and ELOS using an updated empirical method, such as the Villaescusa approach, which updates the Potvin approach, particularly the stress factor (A) for the underground.
5. Assess the impact of faults on the stope stability and ELOS, such as using the approach developed by Suorineni, which applies a fault factor to the analyses depending on the intersection geometry between the faults and the planned stope walls for the underground.
6. Implement reconciliation analysis between underground designed stopes and surveyed mined-out stopes to estimate overbreak and underbreak quantities to better define dilution and mining recovery factors.
7. Apply external underground dilution factors as ELOS during the optimization process to capture dilution grade.
8. Develop grade control practices particularly for planned underground SLS stopes to minimize dilution due to orebody irregularities.
9. Add a yearly truck haulage distance forecast to the open pit LOM plan.

23.3 Mineral Processing

1 Investigate the addition of instrumentation and process controls to both El Porvenir and Atacocha concentrators including a SCADA system to retrieve and store process data to support daily operations and planning.

2 Continue with the geometallurgical program at El Porvenir and Atacocha.

3 Perform a geological assessment of the Au association to galena and Au associated with pyrite based on deposit genesis and geometallurgical test results for San Gerardo.

4 Carry out a geological assessment for San Gerardo to identify areas associated with oxides in Phase 2 of mining, which represent a risk to the recovery of Pb, Zn, and Au.

5 Evaluate the behaviour of low recovery material near upcoming mining phases in the San Gerardo pit.

6 Perform recovery studies by size with plant feed material to quantify losses in recoveries of valuable metals by size fraction in both mines.

7 The steel consumption estimation model for El Porvenir was derived in 2018, based on circuit data and operating variables reported by Nexa to date. Update these models by incorporating the operational changes made to date in the grinding circuits of both El Porvenir and Atacocha concentrators.

23.4 Infrastructure

1 Place priority on the ongoing maintenance of older site infrastructure including piping, electrical, roads, and buildings.

2 Remove abandoned infrastructure such as old pipelines as it is replaced by new, to facilitate future maintenance.

23.5 Environment, Permitting, and Social Considerations

1 Track closely the action items identified for obtention of new permits and renewal of expired permits required for the Cerro Pasco Complex Integration project and follow up on the status of progress regularly to prevent possible delays in the submission of permitting applications. There is a level of uncertainty regarding the amount of time required by the authorities for review and approval of permitting applications. In order to mitigate the risk of delayed approval, initiate the first steps of the approval process for the main permits as early as possible (for example, the engineering design and the baseline field work).

2 Due to uncertainty regarding the potential for acid generation of the waste rock, geochemical evaluation (including static and kinetic geochemical testing on waste rock samples) should be carried out prior to the next Atacocha dam raise (not permitted yet), and prior to closure to inform closure planning and water quality predictions for post-closure. Carry out additional static and kinetic geochemical testing on waste rock and tailings samples to confirm or revise the geochemical characterization. Robust water quality monitoring should continue during operations to verify compliance with the national environmental standards and the appropriateness of the waste rock disposal and water management procedures that are in place.

3 Expand the groundwater quality monitoring program at El Porvenir to include additional stations for collection of groundwater quality samples (and subsequent analysis). At a minimum, consideration should be given to the installation of one station upstream of the El Porvenir TSF.

4 Consider conducting a Dam Safety Review (DSR) for El Porvenir TSF and the Atacocha TSF in support of mining operation and ore processing in future years, and in order to finalize the detailed mine closure plan prior to moving into the closure stage.

5 The following recommendations are proposed for the Atacocha TSF:

a) Develop TARPs for the piezometers for inclusion in the OMS manual and monitoring plan.

b) Capacity assessments of the TSF completed on a bi annual basis with topographic and bathymetric surveys.

c) Complete long term geochemical kinetic testing of the tailings.

d) Monitor the water quality from the TSF subsurface drains.

6 The same recommendations listed above are proposed for the El Porvenir TSF. In addition, implement a groundwater monitoring program at the El Porvenir TSF to determine levels of metals and sulphates. Monitoring stations should be implemented both upstream and downstream of the El Porvenir TSF.

7 Implement a water balance for ongoing operations to be updated by Mine personnel using meteorological and water monitored data on a regular basis (at least monthly). The water balance is an important tool to track trends and conduct short term predictions through simulation of variable operating and/or climatic scenarios to support decision making associated with tailings pond operation (e.g., maintaining adequate freeboard at all times).

8 Develop an integrated water balance that reflects the interaction between the El Porvenir and Atacocha operations from a water balance perspective to identify and predict possible scenarios of interruption of mine operations due to water management issues and/or dam safety concerns (e.g., not maintaining adequate dam freeboard).

9 El Porvenir and Atacocha have significant social commitments as the needs and expectations of local communities/stakeholders are high. Managing commitments requires an adequate tracking tool and implementation plan to honour commitments. SLR recommends that Nexa considers adopting a robust tracking tool to track commitments and allocate adequate resources to use it and keep it up to date, including an escalation process for overdue commitments. This action will avoid mismanagement of commitments, prevent potential conflicts, and demonstrate Nexa's efforts to maintain good relationships with host communities.

10 Review the current social area of influence for both El Porvenir and Atacocha to confirm or update its delineation in case new local communities or Indigenous communities should be added (e.g., Anexo Joraoniyoc, which belongs to Comunidad Campesina de San Francisco de Asis de Yarusyacan for the Atacocha mine site). This is a key action to identify potential impacts and develop social management plans for the newly added communities in the revised area of influence. The determination of the social area of influence is a dynamic matter that requires regular review. SLR understands that Nexa is already planning to review the current social area of influence and it held a meeting on this topic with the environmental authority as one of the initial steps.

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25.0 Reliance on Information Provided by the Registrant

This TRS has been prepared by SLR and by Nexa. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to SLR at the time of preparation of this TRS.
- Assumptions, conditions, and qualifications as set forth in this TRS.
- Data, reports, and other information supplied by Nexa and other third-party sources.

For the purpose of this TRS, the QP has relied on ownership information provided by Nexa in a legal opinion by the Legal Corporate Manager and Institutional Affairs of Nexa Peru dated March 6, 2024 entitled "PE_ATA_EP_REL_ANUAL_PM_2023 Legal Opinion" (Bardales Rojas, 2024). The QP has not researched property title or mineral rights for Cerro Pasco as we consider it reasonable to rely on Nexa's legal counsel who is responsible for maintaining this information.

SLR has relied on Nexa for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from the Cerro Pasco Complex in the Executive Summary and Section 19. As the Complex has been in operation for over ten years, Nexa has considerable experience in this area.

The Qualified Persons have taken all appropriate steps, in their professional opinion, to ensure that the above information from Nexa is sound.

Except as provided by applicable laws, any use of this TRS by any third party is at that party's sole risk.

26.0 Date and Signature Page

This report titled "Technical Report Summary on Cerro Pasco Complex Integration, Pasco Province, Peru" with an effective date of December 31, 2023 was prepared and signed by:

(Signed) *SLR Consulting (Canada) Ltd*

Dated at Toronto, ON
March 27, 2024

SLR Consulting (Canada) Ltd.

(Signed) *Jerry Huaman Abalos*

Dated at Lima, Peru
March 27, 2024

Jerry Huaman Abalos, B.Geo., AusIMM CP(Geo),
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Making Sustainability Happen