Amended NI 43-101 Technical Report on Resources Cusi Mine Mexico

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Report Prepared for

Sierra Metals, Inc.

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Report Prepared by

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1 Summary

This report was prepared as a National Instrument 43-101 (NI 43-101) Technical Report (Technical Report) on Resources for Sierra Metals, Inc. (Sierra Metals) by SRK Consulting (U.S.), Inc. (SRK) on the Cusi Mine, Mexico (Cusi or The Mine). The purpose of this report is to present the methods and results of the current mineral resource estimate for the Cusi.

1.1 Property Description and Ownership

The Cusi property is held by Sierra Metals, formerly known as Dia Bras Exploration, Inc., through subsidiary companies Dia Bras Mexicana S.A. de C.V. and EXMIN S.A. de C.V. (collectively Dia Bras). It is located within the Abasolo Mineral District in the municipality of Cusihuiriachi, state of Chihuahua, Mexico. The property is 135 kilometers (km) from Chihuahua city by car and consists of 75 mineral concessions (11,815.3 hectares [ha]) wholly owned by Sierra Metals. Included in these concessions are six historic silver-lead (Ag-Pb) producers developed on several vein structures: The San Miguel Mine, La Bamba open pit, La India Mine, Santa Eduwiges Mine, San Marina Mine, and Promontorio Mine, as well as exploration concessions around the historic mine areas.

Sierra Metals holds surface rights to an area of 1,020 ha located generally within the area where Sierra Metals holds mineral concessions. Sierra Metals' area of surface rights includes the access points to the Promontorio and Santa Eduwiges underground mines that are in operation, as well as surface rights over all resource areas delineated in this report, with the exception of La India.

1.2 Geology and Mineralization

The property lies within a possible caldera that contains a prominent rhyolite body interpreted as a resurgent dome. The rhyolite dome trends northwest-southeast with an exposure of roughly 7 km by 3 km and hosts mineralization. It is bounded (cut) on the east side by strands of the NW-trending Cusi fault and on the west by the Border fault. The Cusi fault is a regional fault that may have controlled the location of the caldera and resurgent dome. Continued movement on the Cusi and related faults cut and brecciated the caldera and dome rocks and provided conduits for mineralizing fluids.

Numerous mineralized veins on the property, typically moderately to steeply dipping to the southeast, southwest, and north, range from less than 0.5 to 2 meters (m) thick, extend 100 to 200 m along strike and up to 400 m down-dip. There are at least seven major mineralized structures within the Cusi area, described below. Historically, small open pits were typically developed at vein intersections. Mineralization mainly occurs in faults, epithermal veins, breccias, and fractures ranging from 1 to 10 m thick.

Low-grade mineralized areas exist adjacent to major structures, showing intense fracturing and are commonly laced with quartz veinlets forming a stockwork mineralized halo around more discrete structures. The country rock in these zones is variably silicified. Pyrite and other sulfide minerals are disseminated in the silicified country rock and are also clustered in the quartz veinlets. A well-developed mineralized stockwork zone is in the Promontorio area, especially proximal to the Cusi fault.

1.3 Status of Exploration, Development and Operations

Cusi is an operating mine, with extensive supporting infrastructure and underground development. In addition to this, there are numerous satellite exploration targets which are the subject of drilling and exploration drifts.

1.4 Mineral Processing and Metallurgical Testing

Cusi's Malpaso mill is a conventional processing facility that has been long in operation. The performance statistics for the 2015 January to 2016 August period show that Cusi operates at a throughput ranging from 500 tonnes per day (t/d) to 600 t/d, or approximately 17,000 tonnes per month of fresh ore. In 2017, 87,690 tonnes (t) were processed with an average of 7,300 tonnes per month. Lead and zinc head grades are comparable and cover a wide range, with monthly average values for the 2017 period between 0.77% and 1.59% for Lead (Pb) and between 0.57% and 1.72% for Zinc (Zn). Silver (Ag) head grade range between 129 grams per tonne (g/t) to 223 g/t, and gold (Au) head grade range between 0.21 g/t to 0.28 g/t in the same period.

Historically, Cusi produced lead concentrate only, and since 2015 December it is also producing zinc concentrate. Lead concentrate production for the first eight months in 2016 ranged approximately between 300 tonnes per month to 800 tonnes per month with lead grade ranging between 30% and 40%.

Zinc concentrate production for the January to August 2016 period ranged approximately between 100 tonnes per month and 300 tonnes per month with zinc grade ranging from 50% to 55% approximately.

Silver metals is preferably deported to lead concentrate reaching recovery ranging from 70% to 80%. For the period in question, silver grade in lead concentrate is ranging from approximately 3,000 g/t to 7,000 g/t. Average silver recovery for 2016 was approximately 74%. Some improvements in the process plant implemented during the second semester of 2017 increased recoveries of silver of up to 87% and a yearly average of 70.34%.

Silver deportment to zinc concentrate is in the range of 1% to 3% and its grade reaches 300 g/t to 560 g/t, which is within a commercially payable range.

In 2017, the average grades of the Lead concentrate were 4.88 g/t Au, 3,949 g/t Ag, 29.41% Pb and 8.74% Zn.

1.5 Mineral Resource Estimate

Giovanny J. Ortiz, Associate Geologist, SRK Consulting (U.S.) Inc. conducted the update of resource estimation using a combination of software including Leapfrog Geo™, Maptek Vulcan™, and statistical analysis software including Snowden Supervisor™ and X10 Geo™.

The basis for the mineral resource estimate is a digital database featuring details about geology, structure, and mineralization. The updated drillhole and channel assay database was provided to SRK by Dia Bras on November 16, 2017. It features both drilling and channel samples, which are current to August of 2017. The final database contains over 65,000 assays from drilling and over 36,000 from channel sampling. The two data sets have been merged for the purposes of geological modeling, statistical analysis, and estimation.

Three-dimensional wireframe models for the Cusi veins were created by Dia Bras using Leapfrog Geo™ software. SRK reviewed the Leapfrog project files and the solids generated. The geology models are developed on a combination of geology codes and Ag grades, and effectively are built using hangingwall and footwall surfaces derived through selection of these points in the drilling and channel sample database, with subsequent interpolation of the points into 3 dimensional (3D) surfaces and volumes.

SRK considered each vein its own domain for the purposes of statistical analysis and estimation. SRK limited high grade outlier samples by capping the maximum grades for each area, and limiting samples above the cap to the grade of the cap. In order to minimize the variance in the estimation due to inherent variability in grade distributions within domains and provide a more homogenous data set for estimation, SRK used capping of high grades as well as compositing of sample lengths. Capping analysis was done on the raw sample data, evaluating each data set by relevant area. SRK evaluated the sample lengths within the mineralized domains defined by the geological model. The mean sample length within the mineralized domains is 0.68 m, with a maximum sample length of 8.2 m. SRK notes that there are very few samples that would be affected by a compositing length of 1.5 m that would in turn affect the estimation. SRK selected a nominal composite length of 1.5 m, retaining short samples for use in the estimation.

Bulk density of vein material is assigned on the basis of the results of specific gravity samples analyzed by the Servicio Geologico Mexicano (SGM) on behalf of Dia Bras. The average density of the samples is 2.73 grams per cubic centimeter (g/cm^3), and this density was flagged into the block model for use in the resource calculations.

Seven block models were built in Maptek Vulcan™ software and are designed to approximate the orientation of the strike for the major structures contained in each model. SRK interpolated grades for Ag, Au, Pb, and Zn using an inverse distance squared and cubed estimation methods. In general, a nested three-pass estimation was used with higher restrictions on sample selection criteria in the initial smaller passes, to less restrictive criteria in the subsequent, larger ellipsoids. The variations in the distribution of samples and the issue of clustering of high grade channel samples is dealt with using an octant restriction on the estimation.

SRK has validated the estimation for each model using a variety of methods considered to be industry standard. These include a visual comparison of the blocks versus the composites, an assessment of the quality of the estimate, and comparative statistics of block vs. composites.

SRK is satisfied that the geological modeling honors the current geological information and knowledge. The location of the samples and the assay data are sufficiently reliable to support resource estimation. The sampling information was acquired primarily by core drilling and channel sampling from mine development. SRK classified the mineral resources in a manner consistent with CIM Guidelines as Measured, Indicated and Inferred Mineral Resources.

Significant factors affecting the classification include:

- Lack of historic and consistent Quality Assurance/Quality Control (QA/QC) program;
- Lack of downhole surveys for most drillholes and measured deviations from planned and actual azimuths;
- Spacing of drilling compared to observed geologic continuity; and
- Cusi is a producing mine with a successful operating history dating more than 10 years.

SRK has based this classification both on the continuity observed in well-drilled areas of the Mine, as well as geologic continuity observed from underground exposures of the mineralization, and according to the CIM Definition Standards on Mineral Resources and Mineral Reserves, December 2005.

SRK updated the depleted the block models for previous mining prior to August 31, 2017.

The "reasonable prospects for economic extraction" requirement generally implies that the quantity and grade estimates meet certain economic thresholds and that the Mineral Resources are reported at an appropriate cut-off grade taking into account extraction scenarios and processing recoveries. Costs for mining and processing are taken from data provided by Dia Bras for their current underground mining operation. Costs were broken down as follows; Mining US$29.41/t, Processing US$18.3/t, and General and Administrative (G&A) US$3.74/t. These costs aggregate to US$51.45/t. Assuming a price for Ag of US$18.30/oz, Lead US$0.93/lb, Zinc US$1.15/lb and Gold US$1,283.00/oz, and recoveries of 84% Ag, 57% Au, 86% Pb, 51% Zn, this cost equates to a grade of about 105 g/t silver equivalent (AgEq). SRK has reported the mineral resource for Cusi at this cut-off.

The August 31, 2017, consolidated mineral resource statement for the Cusi area is presented in Table 1-1.

Table 1-1: Cusi Mine Mineral Resource Estimate as of August 31, 2017 – SRK Consulting (U.S.), Inc.

Source	Class	Ag_Eq (g/t)	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Tonnes (000's)
Santa Rosa de Lima (SRL)	**Measured**	268	225	0.13	0.55	0.68	362
Total Measured		**268**	**225**	**0.13**	**0.55**	**0.68**	**362**
Promontorio	**Indicated**	241	213	0.08	0.37	0.44	1097
Eduwiges		293	198	0.26	1.35	1.32	928
SRL		296	242	0.32	0.62	0.64	1435
San Nicolas		195	176	0.13	0.21	0.22	414
San Juan		208	189	0.13	0.2	0.21	121
Minerva		222	198	0.4	0.09	0.05	57
Candelaria		386	366	0.14	0.17	0.28	46
Durana		224	219	0.06	0.05	0.02	97
Total Indicated		**267**	**217**	**0.21**	**0.64**	**0.66**	**4,195**
Measured+Indicated		**267**	**217**	**0.21**	**0.63**	**0.66**	**4,557**
Promontorio	**Inferred**	218	185	0.1	0.35	0.62	308
Eduwiges		229	115	0.09	1.78	1.79	147
SRL		216	158	0.22	0.55	1.04	658
San Nicolas		181	161	0.14	0.21	0.23	340
San Juan		200	186	0.04	0.15	0.27	44
Minerva		149	143	0.05	0.08	0.06	5
Candelaria		185	125	0.16	0.62	1.17	128
Durana		124	115	0.01	0.17	0.09	3
Total Inferred		**207**	**158**	**0.16**	**0.54**	**0.84**	**1,633**

(1) Mineral resources are reported inclusive of ore reserves. Mineral resources are not ore reserves and do not have demonstrated economic viability. All figures rounded to reflect the relative accuracy of the estimates. Gold, silver, lead and zinc assays were capped where appropriate.
(2) Mineral resources are reported at a single cut-off grade of 105 g/t AgEq based on metal price assumptions*, metallurgical recovery assumptions, mining costs (US$29.41/t), processing costs (US$18.3/t), and general and administrative costs (US$3.74/t).
 * Metal price assumptions considered for the calculation of the cut-off grade and equivalency are: Silver (Ag): US$/oz 18.30, Lead (US$/lb 0.93), Zinc (US$/lb 1.15) and Gold (US$/oz 1,283.00).
 ** Based on the historical production information of Cusi, the metallurgical recovery assumptions are: 84% Ag, 57% Au, 86% Pb, 51% Zn.
(3) The resources were estimated by SRK. Giovanny Ortiz, B.Sc., PGeo, FAusIMM #304612 of SRK, a Qualified Person, performed the resource calculations for Cusi.

1.6 Mineral Reserve Estimate

SRK did not produce a reserve estimate or review reserves stated by Sierra Metals. Sierra Metals does not consider a release of reserves to be appropriate or of value at this time until sufficient work has been done to better delineate these resource areas and apply all relevant modifying factors.

1.7 Mining Methods

The primary underground mining method employed at Cusi in 2017 is overhand cut and fill with 93% of the production and the remaining 7% by shrinkage stoping.

Despite lacking a prefeasibility or feasibility study in the public market, which discloses mineral reserves, Cusi is, in fact, in operation and producing mineralized material from the underground mine. SRK notes that prefeasibility and feasibility studies are required for statement of reserves, but are not required for a company to initiate production for a property.

In December 2017, the mining operation produced approximately 270 tonnes of ore per day, and 214 tonnes of waste per day. The source of mined material is split evenly between the Promontorio (83%) and Santa Eduwiges (17%) mine areas at this time.

1.8 Recovery Methods

The Cusi concentrator is located in the outskirts of Cuauhtémoc City, approximately 50 km by road from Cusi operations. Dump trucks each hauling approximately 20 t of ore delivered 186,898 t and 87,690 t during the 2016 and 2017 periods respectively.

The Cusi processing facilities include two interconnected process plants, which are the Malpaso Mill purchased from Rio Tinto, and the El Triunfo Mill. Both Mills are conventional ball mill and flotation plants fed from a single crushing circuit. The flotation circuit has the ability to produce lead concentrate and zinc concentrate.

1.9 Infrastructure

The Project has fully developed infrastructure, including access roads, an exploration camp, administrative offices, a processing plant and associated facilities, tailings storage facility, a core logging shed, water storage reservoir and water tanks.

The site has electric power from the Mexican power grid, backup diesel generators and heating from site propane tanks. The overall Project infrastructure is built out and functioning and adequate for the purpose of the planned mine and mill.

1.10 Environmental and Permitting

Based on communications with representatives from Sierra Metals, it does not appear that there are currently any known environmental issues that could materially impact the extraction and beneficiation of mineral resources. However, given the pre-regulation vintage of the original tailings storage facilities (piles), the likelihood is high that these facilities are not underlain by low-permeability liners, increasing the risk of a long-term liability of metals leaching and groundwater contamination. Sierra Metals intends to cover these facilities during decommissioning in order to minimize this risk. Dia Bras personnel have commented that drill data near the newer tailings impoundment suggests that the underlying material will have no material permeability issues.

1.11 Capital and Operating Costs

SRK did not conduct a detailed review of costs as a part of this study. Only a high-level review was achieved during this scope of work. Capital is allocated based on a yearly budget, which is approved by the board. Additionally, operating costs are similar to other Mexican mines with the same mining method and mill feed.

1.12 Economic Analysis

SRK did not conduct a detailed review of costs or project economics as a part of this study.

1.13 Conclusions and Recommendations

1.13.1 Geology and Mineral Resources

SRK is of the opinion that the exploration efforts at Cusi are sufficient for the definition of mineral resources. The primary exploration method at Cusi has been diamond core drilling followed by limited underground development, which has been successful in delineating a system of discrete epithermal veins and related stockwork mineralization associated to areas of interception of veins. The drilling appears to be able to target and identify mineralized structures with reasonable efficacy, and the majority of drilling is oriented in a fashion designed to approximate true thicknesses of the veins. The exploration should be designed to maximize conversion of higher grade Inferred areas with less dense drilling to Measured and Indicated, or extending mineralization away from known areas accessed through channel sampling. Efforts during the last year have been focused on the area of SRL - San Nicolas with infill drilling.

Mine development is also used for exploration, as direct access of the veins along underground drifts is an excellent and efficient way for Cusi to understand the mineralization on a more local basis. More effort should be made to improve underground survey data, channel sampling consistency, and 3D as-built data.

SRK notes that Sierra Metals continues improving the quality of the drilling and information through more complete and thorough survey data (for drilling and underground development), as well as modern QA/QC programs which are delivering reasonable results. This lends additional confidence to recently-defined resources or newly drilled portions of historic areas.

SRK also notes that problems for the internal Malpaso Mill laboratory, identified in this document as well as previous technical reports, appear to continue although some improvements have been implemented in 2017. These are related to significant differences in precision recognized between the values reported for identical samples between Malpaso and third-party laboratories. These issues, combined with historic deficiencies in downhole surveying and QA/QC detract from the confidence in quality of the historic data.

The geologic model has been constructed by Dia Bras geologists, and reviewed by SRK using Leapfrog Geo™ software. Drilling and channel sample data, as well as sectional interpretation was used in development of the 3D geology shapes, defining veins and stockwork zones. These are used as resource domains to constrain and control the interpolation of grade during the estimation.

SRK built individual block models for the main resource areas, which have been rotated and sub-blocked to better fit the geologic contacts in each area. Grades were interpolated from capped and composited sample data using an inverse distance squared and cubed algorithm, with sample selection criteria designed to decluster the channel sample data compared to the drilling. A nested three-pass estimation was used, with decreasing data selection criteria.

SRK is of the opinion that the Mineral Resource Estimate has been conducted in a manner consistent with industry best practices and that the data and information supporting the stated mineral resources is sufficient for declaration of Measured, Indicated and Inferred classifications of resources. SRK has classified Measured resources category in the area of SRL, where the recent drilling campaign was carried out implementing an improved QA/QC program, downhole surveys, and channel sampling. In the rest of the areas, none of the resources were classified in the Measured category due to aforementioned uncertainties regarding the data supporting the Mineral Resource Estimate.

These deficiencies (for areas other than the SRL vein) include:

- The lack of a historic QA/QC program, which has only been supported by a recent resampling and modern QA/QC program for a limited number of holes. This type of program will be required in order to achieve Measured resources which generally are supported by high resolution drilling or mine sampling data that feature consistently implemented and monitored QA/QC.
- The lack of consistently-implemented down-hole surveys in the historic drilling. Observations from the survey data which has been done to date show significant down-hole deviations that influence the exact position of mineralized intervals. These discrepancies are confirmed by nearby workings that project the mineralized structures in a different position than that defined by the un-surveyed holes.
- The lack of industry-standard 3D survey as-built data delineating all the mined areas. This has currently been defined using a combination of the existing survey data, as well as simple polygons defining other areas thought to be mined. SRK believes these polygons to be conservative, as it is likely that pillar areas or other partially mined areas exist within the limits of the polygons, but are being excluded by this rudimentary methodology.

SRK has the following recommendations for additional work to be performed at Cusi:

- Identify areas that are dominantly supported by channel sample data and complete step out drilling. This should be done at a regular spacing of approximately 25 m as was implemented during infill drilling for the SRL structure in 2017.
    - Further to this, SRK notes opportunities where significant areas of veins have very few drillholes, but exhibit very high grades, resulting in local high grade Inferred blocks that could theoretically be converted to Indicated or measured with additional drilling. These should be prioritized.
    - Areas of cross cutting vein intersections could host high grade mineralization shoots that should be studied in detail.
- Continue the implementation and improvement of the current QA/QC program and include additional controls like coarse blanks, fine and coarse duplicates and second lab checks.
- Continue the use of commercial standards for QA/QC monitoring taking into the consideration the Ag, Au, Pb and Zn cutoff and average grades of the deposit.

- Increase the density of drilling in the areas of intercepting veins where mineralization in "stockwork" has been identified. This should be done at a regular spacing of approximately 15 m, due to the irregularity and discontinuity of the mineralization in those areas.
- The complete core sample preparation process for samples supporting the mineral resource estimation should be done in an ISO-certified laboratory such as ALS Minerals and avoid using Malpaso lab for the crushing process, based on the historic and current performance of certain QA/QC.
- All analyses supporting a mineral resource estimation should continue to be analyzed by an ISO-certified independent laboratory such as ALS Minerals. The intra-lab performance of check samples shows significant and unexpected deviations between ALS and the internal Dia Bras lab.
- Continue the downhole surveys via Reflex or other appropriate survey tool. This is currently being implemented at the mine, but has not historically consistently been the case.
- SRK strongly recommends continuing the practice of consistent use of a total station GPS for surveying of drillhole collars and channel sample locations, as well as mine workings. Discrepancies between the precise locations of these three types of data occur regularly where they are closely spaced and reduces confidence in the data.
    - A 3D mine survey could be accomplished relatively easily and for minimal cost, and could be conducted on a quarterly basis to develop a better measurement of mined material to be used in reconciliation processes.
- Develop a simple method of reconciling the resource models to production, using stope shapes and grades derived from channel sampling.

1.13.2 Mineral Reserves

Mineral reserves have not been stated in this report although the operation has been in production for many years. The company plans to perform further work to eventually produce an industry best practice reserve statement. The timeline for this work is yet to be defined, but the company has started on many aspects of this work.

SRK recommends the following work program to achieve mineral reserves:

- Field work to gather geotechnical information;
- Geotechnical analysis to confirm mining method parameters and safety analysis;
- Hydrogeological field work and generation of hydrogeological model;
- Additional drilling to increase resource confidence to Indicated category;
- Detailed mine design followed by mine schedule and ventilation analysis;
- Ensure that tailings and future metallurgical assumptions are appropriate for the next level of study; and
- Economic evaluation with detailed operating and capital costs.

2 Introduction

2.1 Terms of Reference and Purpose of the Report

This report was prepared as a National Instrument 43-101 (NI 43-101) Technical Report (Technical Report) on Resources for Sierra Metals, Inc. (Sierra Metals) by SRK Consulting (U.S.), Inc. (SRK) on the Cusi Mine, Mexico (Cusi or The Mine). The purpose of this report is to present the mineral resource estimate for the operating Cusi and surrounding exploration areas.

This Technical Report has been amended from a previously filed Technical Report on the Cusi Mine. This Amended report is unchanged from the Original NI 43-101 Technical Report dated April 14, 2017, except to include language with regards to the sustained production at the Cusi Mine. Changes were made to relevant portions of Sections 1, 25 and 26 summarized therefrom changes to Section 2 Introduction, Section 2.2, 2.3 and Appendix A for the addition of Qualified Person Giovanny J. Ortiz, Section 4.2, 4.4.2, 20.4.7 for additional mineral titles, permits and status. Sections 10, 11 for additional drilling and sampling, Section 13.2 for updated recovery estimate assumptions; Section 14 for updated mineral resource estimates, Section 16 for the additional of description of mining methods, and Section 21 for description of capital and operating costs.

SRK is not disclosing any material information in Section 15 or Section 22, as relevant study and/or analysis has not been conducted to support disclosure of mineral reserves or an economic analysis in the relative sections.

The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in SRK's services, based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report. This report is intended for use by Sierra Metals subject to the terms and conditions of its contract with SRK and relevant securities legislation. The contract permits Sierra Metals to file this report as a Technical Report with Canadian securities regulatory authorities pursuant to NI 43-101, Standards of Disclosure for Mineral Projects. Except for the purposes legislated under provincial securities law, any other uses of this report by any third party is at that party's sole risk. The responsibility for this disclosure remains with Sierra Metals. The user of this document should ensure that this is the most recent Technical Report for the property as it is not valid if a new Technical Report has been issued.

This report provides Mineral Resource, and a classification of resources prepared in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum Standards on Mineral Resources and Reserves: Definitions and Guidelines, May 10, 2014 (CIM, 2014).

2.2 Qualifications of Consultants (SRK)

The Consultants preparing this technical report are specialists in the fields of geology, exploration, Mineral Resource and Mineral Reserve estimation and classification, underground mining, geotechnical, environmental, permitting, metallurgical testing, mineral processing, processing design, capital and operating cost estimation, and mineral economics.

None of the Consultants or any associates employed in the preparation of this report has any beneficial interest in Sierra Metals. The Consultants are not insiders, associates, or affiliates of Sierra Metals. The results of this Technical Report are not dependent upon any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings between Sierra Metals and the Consultants. The Consultants are being paid a fee for their work in accordance with normal professional consulting practice.

The following individuals, by virtue of their education, experience and professional association, are considered Qualified Persons (QP) as defined in the NI 43-101 standard, for this report, and are members in good standing of appropriate professional institutions. QP certificates of authors are provided in Appendix A. The QP's are responsible for specific sections as follows:

- Giovanny Ortiz, Senior Consultant is the QP responsible for Geology and Mineral Resources, Adjacent Properties, and Other Relevant Data and Information; Sections 2-12 14, 23, 24 and portions of Sections 1, 25 and 26 summarized therefrom, of this Technical Report.
- Fernando Rodrigues, Principal Consultant is the QP responsible for Mining Methods, Market Studies and Contracts, Capital and Operating Costs, Economic Analysis – Sections 15, 16, 18, 19, 21, 22 and portions of Sections 1, 25 and 26 summarized therefrom, of this Technical Report.
- Mark Willow, Principal Consultant is the QP responsible for Environmental Studies, Permitting and Social or Community Impact Section 20, and portions of Sections 1, 25 and 26 summarized therefrom, of this Technical Report.
- Daniel Sepulveda, Associate Principal Consultant is the QP responsible for Mineral Processing and Metallurgical Testing, and Recovery Methods, Section 13, 17 and portions of Sections 1, 25 and 26 summarized therefrom, of this Technical Report.

2.3 Details of Inspection

Table 2-1 shows recent site visit participants.

Table 2-1: Site Visit Participants

Personnel	Company	Expertise	Date(s) of Visit	Details of Inspection
Giovanny Ortiz	SRK.	Geology and Mineral Resources	November 13 to 14, 2017	Reviewed geologic interpretation, drilling and sampling, QA/QC, and underground geology.
Matthew Hastings	SRK	Geology and Mineral Resources	March 11 to 16, 2015	Reviewed geologic interpretation, drilling and sampling, QA/QC, and underground geology.
Fernando Rodrigues	SRK.	Mining and Infrastructure	March 11 to 16, 2015	Reviewed mining methods, designs and planning, on site infrastructure, and limited costs and economics.
Daniel Sepulveda	SRK	Metallurgy and Process	October 19 to 20, 2016	Reviewed mill facility, process design and metallurgical balance.

Source: SRK, 2018

2.4 Sources of Information

The sources of information include data and reports supplied by Dia Bras or Sierra Metals personnel as well as documents cited throughout the report and referenced in Section 27.

2.5 Effective Date

The effective date of this report is August 31, 2017.

2.6 Units of Measure

The metric system has been used throughout this report. Tonnes are metric of 1,000 kg, or 2,204.6 lb. All currency is in U.S. dollars (US$) unless otherwise stated.

3 Reliance on Other Experts

The Consultant's opinion contained herein is based on information provided to the Consultants by Sierra Metals or their subsidiary Dia Bras throughout the course of the investigations. Where noted, SRK has relied upon the work of other consultants in the project areas in support of this Technical Report.

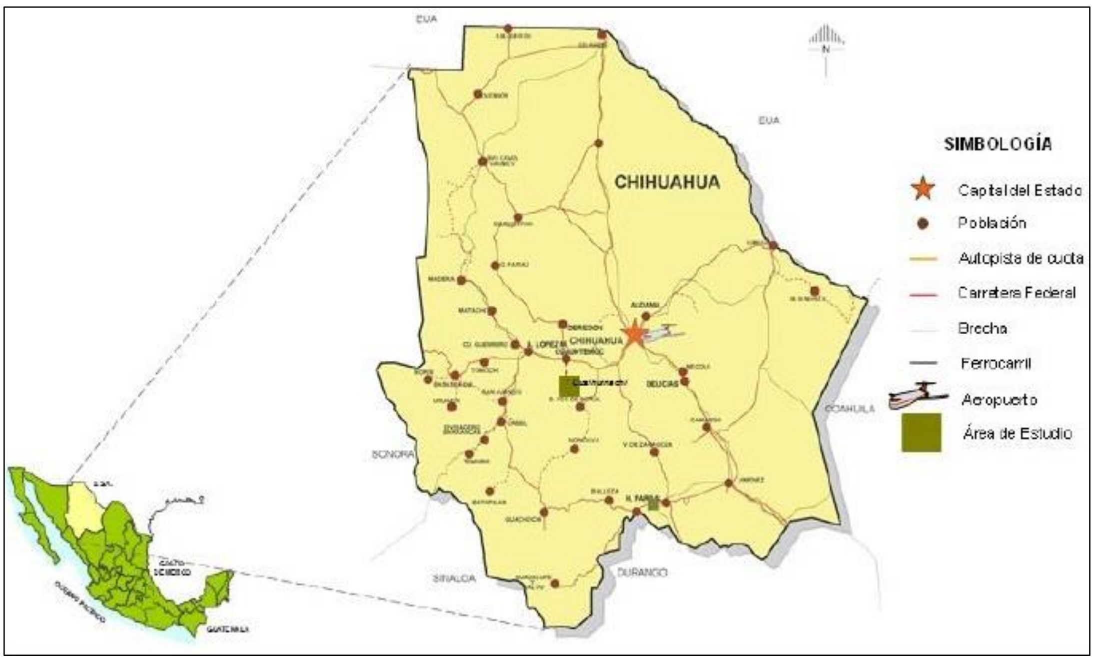
The Consultants used their experience to determine if the information from previous reports was suitable for inclusion in this technical report and adjusted information that required amending. This report includes technical information, which required subsequent calculations to derive subtotals, totals and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, the Consultants do not consider them to be material.

These items have not been independently reviewed by SRK and SRK did not seek an independent legal opinion of these items.

4 Property Description and Location

4.1 Property Location

The Cusi property is held by Sierra Metals, formerly known as Dia Bras Exploration, Inc., through subsidiary companies Dia Bras Mexicana S.A. de C.V. and EXMIN S.A. de C.V. (collectively Dia Bras). It is located within the Abasolo Mineral District in the municipality of Cusihuiriachi, state of Chihuahua, Mexico. The property is 135 kilometers from Chihuahua city by car and consists of 75 mineral concessions wholly owned by Sierra Metals. Included in these concessions are six historic Ag-Pb producers developed on several vein structures: San Miguel mine, La Bamba open pit, La India mine, Santa Eduwiges mine, San Marina mine, and Promontorio mine, as well as exploration concessions around the historic mine areas. The shaft of the Promontorio mine is located at Northing 3,125,854 m and Easting 319,019 m in the 13R UTM grid in WGS84 ellipsoid. Figure 4-1 shows the location and surrounding infrastructure of the Cusi property.



Source: Ciesieski, 2007

Figure 4-1: Location Map showing the Cusi Area (green box) and Nearby Infrastructure

4.2 Mineral Titles

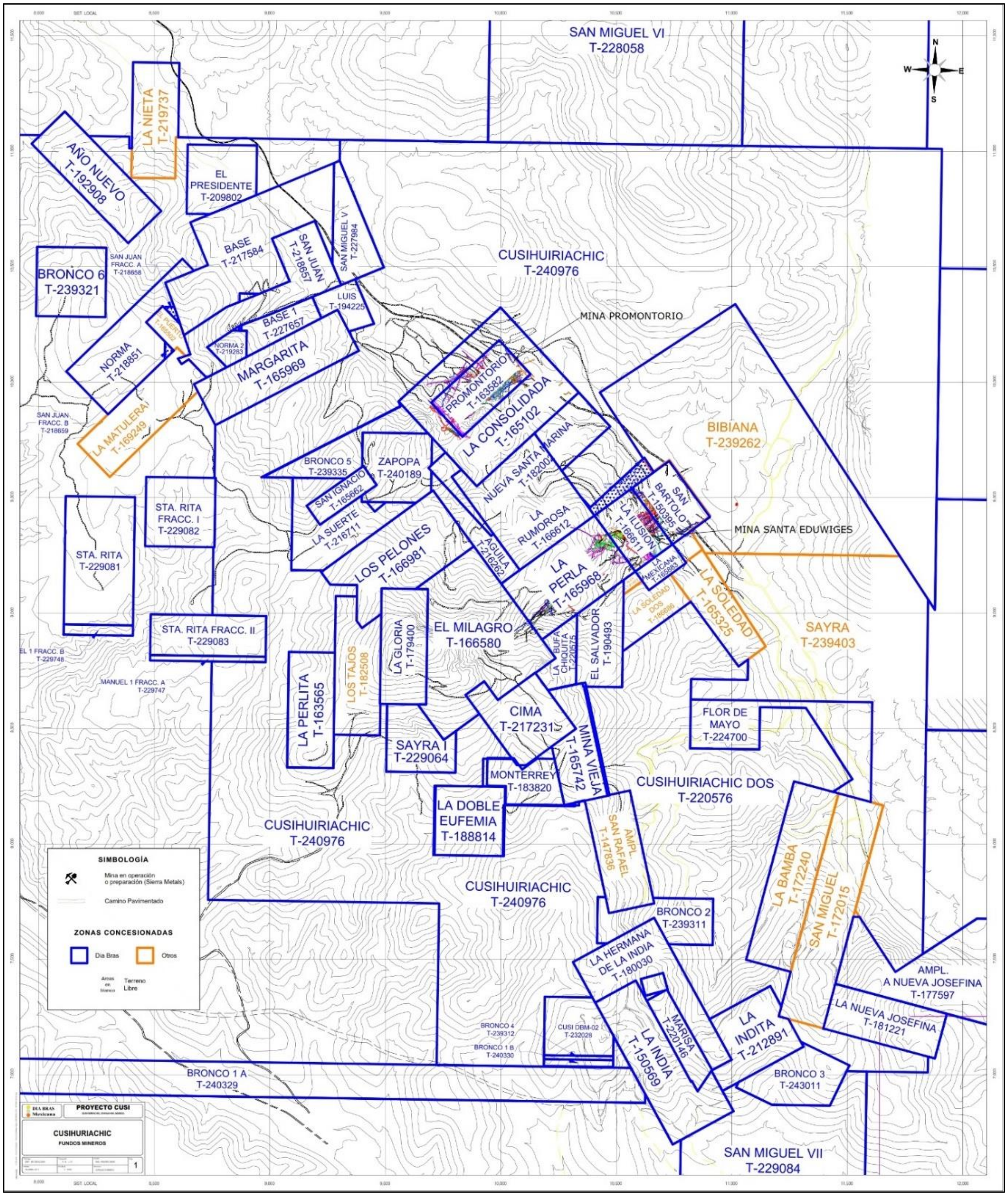
Sierra Metals wholly owns rights for exploration and mining for the Cusi Property for 75 mineral concessions covering an area of 11,815.3072 ha (Figure 4-2). Locations of the concessions for the Cusi project and their expiry dates are listed in Table 4-1.

Table 4-1: Mineral Concessions at Cusi

Held By	Name	Type	Area	File No.	Title No.	Registration Date Rpm	Expiration Date
Dia Bras Mexicana	Base*	Exploration	23.8090	016/30975	217584	06/08/2002	05/08/2052
Dia Bras Mexicana	Flor de Mayo*	Exploration	14.4104	016/32699	224700	31/05/2005	30/05/2055
Dia Bras Mexicana	Base 1	Exploration	3.9276	016/33729	227657	28/07/2006	27/07/2056
Dia Bras Mexicana	Santa Rita	Exploration	16.6574	016/34624	229081	06/03/2007	05/03/2057
Dia Bras Mexicana	Sayra I	Exploration	7.2195	016/34623	229064	02/03/2007	01/03/2057
Dia Bras Mexicana	San Miguel	Exploration	96.2748	016/33730	229166	21/03/2007	20/03/2057
Dia Bras Mexicana	San Miguel I	Exploration	98.6218	016/33731	228484	24/11/2006	23/11/2056
Dia Bras Mexicana	San Miguel II	Exploration	100.00	016/33732	227363	14/06/2006	13/06/2056
Dia Bras Mexicana	San Miguel III	Exploration	100.00	016/33733	227364	14/06/2006	13/06/2056
Dia Bras Mexicana	San Miguel IV	Exploration	96.9850	016/33734	227485	27/06/2006	26/06/2056
Dia Bras Mexicana	San Miguel VI	Exploration	98.9471	016/34642	228058	29/09/2006	28/09/2056
Dia Bras Mexicana	San Miguel VII	Exploration	52.6440	016/34640	229084	06/03/2007	05/03/2057
Dia Bras Mexicana	Saira	Exploration	16.00	016/33735	227365	14/06/2006	13/06/2056
Dia Bras Mexicana	Manuel	Exploration	100.00	016/33714	227360	14/06/2006	13/06/2056
Dia Bras Mexicana	Santa Rita Fracc. I	Exploration	9.00	016/34624	229082	06/03/2007	05/03/2057
Dia Bras Mexicana	Santa Rita Fracc. II	Exploration	8.8141	016/34624	229083	06/03/2007	05/03/2057
Dia Bras Mexicana	San Miguel V	Exploration	6.5328	016/34641	227984	26/09/2006	25/09/2056
Dia Bras Mexicana	San Juan	Exploration	12.3587	016/31500	218657	03/12/2002	02/12/2052
Dia Bras Mexicana	San Juan Fracc. A	Exploration	0.1727	016/31500	218658	03/12/2002	02/12/2052
Dia Bras Mexicana	San Juan Fracc. B	Exploration	0.1469	016/31500	218659	03/12/2002	02/12/2052
Dia Bras Mexicana	Norma	Exploration	12.2977	016/31700	218851	22/01/2003	21/01/2053
Dia Bras Mexicana	Norma 2	Exploration	1.7561	016/31715	219283	25/02/2003	24/02/2053
Dia Bras Mexicana	Cima	Exploration	9.9637	016/30957	217231	02/07/2002	01/07/2052
Dia Bras Mexicana	Manuel 1 Fracc A	Exploration	1.1858	016/34849	229747	13/06/2007	12/06/2057
Dia Bras Mexicana	Manuel 1 Fracc B	Exploration	1.3425	016/34849	229748	13/06/2007	12/06/2057
Dia Bras Mexicana	Alma	Exploration	80.4612	Valid	227982	25/09/2006	25/09/2056
Dia Bras Mexicana	San Bartolo	Exploitation	6.00	Valid	150395	30/09/1968	29/09/2018
Dia Bras Mexicana	Marisa	Exploration	5.08	Valid	220146	17/06/2003	16/06/2053
Dia Bras Mexicana	La India	Exploitation	15.76	Valid	150569	29/10/1968	27/10/2018
Dia Bras Mexicana	Alma	Exploration	87.2041	Valid	227650	27/07/2006	27/07/2056
Dia Bras Mexicana	Alma I	Exploration	106.00	Valid	226816	09/03/2006	09/03/2056
Dia Bras Mexicana	Alma II	Exploration	91.00	Valid	227651	27/07/2006	27/07/2056
Dia Bras Mexicana	Nueva Recompensa	Exploitation	21.00	Valid	195371	15/09/1992	13/09/2042
Dia Bras Mexicana	Monterrey	Exploitation	5.4307	Valid	183820	22/11/1988	21/11/2038
Dia Bras Mexicana	Nueva Santa Marina	Exploitation	16.00	Valid	182002	08/04/1988	07/04/2038
Dia Bras Mexicana	San Ignacio	Exploitation	3.00	Valid	165662	28/11/1979	27/11/2029
Dia Bras Mexicana	Promontorio	Exploitation	8.00	Valid	163582	30/10/1978	29/10/2028
Dia Bras Mexicana	La Perla	Exploitation	15.00	Valid	165968	13/12/1979	12/12/2029
Dia Bras Mexicana	La Perlita	Exploitation	10.00	Valid	163565	10/10/1978	09/10/2028
Dia Bras Mexicana	Luís	Exploitation	3.1946	Valid	194225	19/12/1991	18/12/2041
Dia Bras Mexicana	La Consolidada	Exploitation	22.00	Valid	165102	23/08/1979	22/08/2029
Dia Bras Mexicana	La Doble Eufemia	Exploitation	9.00	Valid	188814	29/11/1990	28/11/2040
Dia Bras Mexicana	La Gloria	Exploitation	10.00	Valid	179400	09/12/1986	08/12/2036
Dia Bras Mexicana	La Indita	Exploration	9.9034	Valid	212891	13/02/2001	12/02/2049
Dia Bras Mexicana	La Suerte	Exploration	10.5402	Valid	216711	28/05/2002	27/05/2052
Minera Cusi	El Hueco	Exploitation	1.8379	Valid	172321	23/11/2003	23/11/2033
Dia Bras Mexicana	El Presidente	Exploitation	8.1608	Valid	209802	09/08/1999	08/08/2049
Dia Bras Mexicana	El Salvador	Exploitation	7.7448	Valid	190493	29/04/1991	28/04/2041
Dia Bras Mexicana	Cusihuiriachic Dos	Exploitation	87.6748	Valid	220576	28/08/2003	27/08/2053
Dia Bras Mexicana	La Bufa Chiquita	Exploitation	3.6024	Valid	220575	28/08/2003	27/08/2053
Dia Bras Mexicana	Aguila	Exploration	4.2772	Valid	216262	23/04/2002	22/04/2052
Dia Bras Mexicana	Año Nuevo	Exploration	12.00	Valid	192908	19/12/1991	18/12/2041
Dia Bras Mexicana	Ampl. Nueva Josefina	Exploitation	18.2468	Valid	177597	02/04/1986	31/03/2036
Dia Bras Mexicana	El Milagro	Exploitation	26.8259	Valid	166580	27/06/1980	26/06/2030
Dia Bras Mexicana	Los Pelones	Exploitation	16.3018	Valid	166981	05/08/1980	04/08/2030
Dia Bras Mexicana	La Ilusión	Exploitation	6.00	Valid	166611	27/06/1980	26/06/2030
Dia Bras Mexicana	La Hermana de la India	Exploitation	13.1412	Valid	180030	23/03/1987	22/03/2037
Dia Bras Mexicana	La Rumorosa	Exploitation	20.00	Valid	166612	27/06/1980	26/06/2030
Dia Bras Mexicana	La Nueva Josefina	Exploitation	10.00	Valid	181221	11/09/1987	10/09/2037
Dia Bras Mexicana	Mina Vieja	Exploitation	8.25	Valid	165742	11/12/1979	10/12/2029
Dia Bras Mexicana	Margarita	Exploitation	14.00	Valid	165969	13/12/1979	12/12/2029
Minera Cusi	Cusihuiriachic	Exploitation	472.2626	Valid	240976	16/11/2012	15/11/2062
Dia Bras Mexicana	CUSI-DBM	TCM	4,716.6621	Valid	229299	03/04/2007	02/04/2057
Dia Bras Mexicana	CUSI-DBM 02	TCM	4,695.1748	Valid	232028	10/06/2008	09/06/2058
Dia Bras Mexicana	Bronco 1 A	Exploration	55.6309	Valid	240329	23/05/2012	22/05/2062
Dia Bras Mexicana	Bronco 1 B	Exploration	0.8801	Valid	240330	23/05/2012	22/05/2062
Dia Bras Mexicana	Bronco 2	Exploration	7.5296	Valid	239311	13/12/2011	13/12/2061

Held By	Name	Type	Area	File No.	Title No.	Registration Date Rpm	Expiration Date
Dia Bras Mexicana	Bronco 3	Exploration	8.1186	Valid	243011	30/05/2014	29/05/2064
Dia Bras Mexicana	Bronco 4	Exploration	0.5224	Valid	239312	13/12/2011	13/12/2061
Dia Bras Mexicana	Bronco 5	Exploration	6.7121	Valid	239335	13/12/2011	13/12/2061
Dia Bras Mexicana	Bronco 6	Exploration	9.00	Valid	239321	13/12/2011	13/12/2061
Dia Bras Mexicana	Zapopa	Exploration	8.3867	Valid	240189	13/04/2012	12/04/2062
Minera Cusi	La Mexicana	Exploration	2.00	To be Registered	165883	12/12/1979	13/12/2082
Fernando Holguin	Sayra	Exploration	78.84	Valid	239403	14/12/2011	14/12/2061
Fernando Holguin	Bibiana	Exploration	71.89	Valid	239262	07/12/2011	07/12/2061
			11,815.3072				

Source: Dia Bras, 2017



Note: The map in this figure has not been updated with some very minor claims acquisitions made in 2017. The updated maps were requested but were not provided. According to Dia Bras, these do not affect the mineral resource in any way.
Source: Dia Bras, 2017

Figure 4-2: Map Showing Locations of Cusi Mineral Concessions as of 2017

4.2.1 Nature and Extent of Issuer's Interest

Sierra Metals holds surface rights to an area of 1,020 ha located generally within the area where Sierra Metals holds mineral concessions. Sierra Metals' area of surface rights includes the access points to the Promontorio and Santa Eduwiges underground mines that are in operation, as well as surface rights over all resource areas delineated in this report, with the exception of La India. Sierra Metals has a working relationship with the local Santa Rita community, who views mining at the Promontorio mine and associated jobs favorably.

4.3 Royalties, Agreements and Encumbrances

Production from the Cusi Project area is subject to net smelter royalties ranging from 1.5% to 3%, depending on origin of the mined quantity with respect to the mineral concession area.

Mineral concessions that make up the Cusi property were acquired from private entities and the Mexican federal government (Dirección General de Minas). The terms associated for the claim blocks are described below.

4.3.1 Purchase Agreement with Minera Cusi

Mineral concessions were purchased from Minera Cusi S.A. de C.V. under a purchase agreement dated April 15, 2008. A total of 31 mineral concessions for 862 ha were acquired from Minera Cusi. Sierra Metals is subject to a net smelter royalty (NSR) on production from the Minera Cusi concessions of 2% if the price of silver is less than US$11 per ounce; and a NSR of 3% if the price of silver is greater than US$11 per ounce.

4.3.2 Purchase Agreement with Manuel Holguin

The mineral concessions from Manuel Holguin consisting of 27 concessions over an area of 976 ha were acquired under three purchase agreements dated May 30, 2006, December 7, 2006, and November 15, 2007. Royalties under the original purchase agreements were acquired under purchase agreements dated April 24, 2012 and November 23, 2012. These concessions are not currently subject to any royalties.

Sierra Metals holds 100% interest in these concessions.

4.3.3 Purchase Agreement with Martha Azucena Holguin

The mineral concessions from Martha Azucena Holguin consisting of 50% share of three concessions over an area of 293 ha were acquired under a purchase agreement dated May 12, 2010. The remaining 50% share was acquired under purchase agreement with Manuel Holguin May 30, 2006. These concessions are not subject to any royalties. Sierra Metals holds 100% interest in these concessions.

4.3.4 Purchase Agreement with Hector Sanchez

The mineral concessions consisting of two concessions over an area of 21 ha were purchased from Hector Sanchez Villalobos and Carmen Saenz Rodriguez under a purchase agreement dated May 2, 2006. These concessions are subject to a 1.5% NSR royalty from production on the two concessions, to a maximum of US$1.5 million. Sierra Metals holds 100% interest in these concessions.

4.3.5 Agreement with Mexican Government

The ten concessions over an area of 10,954 ha were acquired from the Mexican federal government. Exploration and mining at the Cusi property are subject to semiannual payments to the Mexican federal government. Fees are paid to the federal government twice each year, in January and July. Sierra Metals made a payment of 494,652.00 Mexican Pesos to the Mexican federal government in January 2014 covering the concessions for the Cusi Project for the period from January to June 2014.

4.4 Environmental Liabilities and Permitting

4.4.1 Environmental Liabilities

Previous technical reports noted that as part of current mining operations, waste rock from mining at Promontorio and Santa Eduwiges is stored near the entrances of the respective mines. Management of these waste rock piles does not require permits.

Tailings are stored in two tailings piles in the vicinity of the Malpaso Mill. Previous technical reports also noted that the tailings pile at the Malpaso Mill may not be lined, and may constitute a potential environmental liability.

4.4.2 Required Permits and Status

According to the information provided by Sierra Metals, the following concessions are exempt from having to apply for the Environmental Impact Statement (Manifestación de Impacto Ambiental - MIA) and the Land Use Change permit, this according to the document SG.IR.08-20141 / 93 from SEMARNAT dated May 2014 that recognizes the exception because Dia Bras proved that the mining concessions operate years before the 1988 law. Any other concession will need the MIA and the Land Use Change permit or to prove that operates before that year.:

- San Bartolo (Title 150395);
- La India (Title 150569);
- Promontorio (Title 163582);
- La Consolidada (Title 165102);
- La Perla (Title 165968);
- El Milagro (Title 163580);
- La Ilusión (Title 166611);
- La Rumorosa (Title 163512);
- Los Pelones (Title 166981);
- La Hermana de la India (Title 180030);
- Nueva Santa María (Title 182002);
- La Gloria (Title 179400); and
- La Perlita (Title 163565).

Requirements for environmental and land use change permits are managed by the Mexican federal government's Secretary of Environment and Natural Resources (Secretaria de Medio Ambiente y Recursos Naturales, or "SEMARNAT") and local government.

In the Cusi Mine there are no material emissions to the atmosphere other than nominal ventilation, and the Malpaso Mill has its Unique Environmental License (Licencia Unica ambiental) dated August 2013.

The Malpaso plant has the Water Discharge permit 02CHI141178/34EMDL15 dated August 2015. 2. Cusi has the documents No B00.E 22.4.-420 and No B00.E.22.4.-419 dated November 12, 2014 That excludes Dia Bras for the obligation to have discharge permits as the water does not contain contaminants or is used in industrial processes. All these documents were granted by CONAGUA (National Water Commission).

According to Sierra Metals and Dia Bras personnel, Cusi doesn’t require Authorization for Utilization of National Surface Water (Water from the Gulf of California) because the mine uses the water from the mine for all processing and mining operations.

Sierra Metals holds explosives use permit (Number 4599) from the Mexican federal government’s Secretary of National Defense (Secretaria de la Defensa Nacional, or “SEDENA”). This permit is in good standing and is renewed annually.

4.5 Other Significant Factors and Risks

As Sierra Metals does not hold surface rights for the La India area, it would be difficult to construct access or begin operations at La India at this time. Sierra Metals believes that it will be possible to secure these surface rights in a timely manner at a reasonable cost, but until such an agreement is secured, that portion of the resource remains at risk.

While no permit is required for the tailings piles at the Malpaso Mill, because the existing tailings deposit pre-dates permitting requirements, the tailings pile at the Malpaso Mill may not be lined, and may constitute a potential environmental liability.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Topography, Elevation and Vegetation

The topography of the Cusi Project ranges from approximately 2,000 to 2,500 meters above mean sea level (masl).

The Cusi Project is covered by vegetation consisting of deciduous forest in the valleys and coniferous forest at higher altitudes. Land use around the Cusi property is agricultural, including crops and cattle ranching. Overburden thickness ranges from one to three meters and consists of unconsolidated conglomerate with pebbles and boulders of volcanic rocks, sand, clay, and volcanic ash. Wildlife in and surrounding Cusi property includes insects, lizards, snakes, birds, and small mammals.

5.2 Accessibility and Transportation to the Property

The Cusi property is situated within the municipality of Cusihuiriachic located in the central portion of Chihuahua State, Mexico, approximately 135 km by car west of the City of Chihuahua. Access to the village of Cusihuiriachic from the City of Chihuahua is 105 km along Federal Highway No. 16 to Cuauhtémoc, then south for 22 km along a paved road to the village of Cusihuiriachic, where the Cusi Property is located.

5.3 Climate and Length of Operating Season

The climate at the Cusi Project is described as semi-arid with average daily mean temperatures per month ranging from 7.5° to 21.7° Celsius, with hotter months occurring mid-year. Annual precipitation is approximately 448 millimeters, with monthly precipitation ranging from 4.1 to 121 millimeters. The highest rainfalls during the year are recorded between July and September. Climate is conducive for year-round mining operations.

5.4 Sufficiency of Surface Rights

Sierra Metals holds surface rights over most of the main mining and resource areas discussed in this report. The main mine shaft of the Promontorio Mine is close to the surface rights boundary, and there is a second, currently unused shaft, (Tiro Consolidada) which is just outside the surface rights area. Cusi does not currently control surface rights for the La India mine. Otherwise, surface rights are expected to be sufficient for mining.

5.5 Infrastructure Availability and Sources

5.5.1 Power

Electrical power at the Cusi Project and Malpaso Mill is provided by the Mexican Electricity Federal Commission (Comisión Federal de Electricidad). At Cusi, electricity is conveyed in 33,000-volt power lines. At the Malpaso Mill, electricity is delivered on a 1,290-kilowatt power line. Existing electricity supply is expected to be adequate for foreseeable mining operations.

5.5.2 Water

At Cusi, Sierra Metals utilizes water recovered from the underground workings for process water and support of mining operations. Water was generated from dewatering operations in the Promontorio and Santa Eduwiges Mines. Potable water is trucked in.

5.5.3 Mining Personnel

At Cusi, approximately 100 persons are employed, and 67 persons are employed at the Malpaso Mill.

5.5.4 Potential Tailings Storage Areas

Two tailings dams are located in the vicinity of the Malpaso Mill. Land position within the Malpaso Mill complex is expected to be adequate to support anticipated future milling operations.

Tailings are stored in two tailings piles in the vicinity of the Malpaso Mill. Previous technical reports (Gustavson, 2014) noted that the existing tailings pile at the Malpaso Mill may not be have been constructed using a low permeability under-liner (soil and/or geomembrane), and that this lack of liner system could pose a risk to underlying groundwater resources and potential long-term environmental liability from the leaching of the tailings materials by meteoric precipitation. Given the extremely arid conditions at the site, however, this would likely be a low to moderate risk.

Dia Bras has permitted additional tailings storage on site to take on additional tailings in early 2018. Subsequent to this, additional areas on previously permitted and dried tailing facilities as well as upstream from the latest dam and tailings impoundment are in in authorized areas which have been previously permitted. All three of these areas combined should allow up to four years of capacity using filtered stack tails deposition.

5.5.5 Potential Waste Rock Disposal Areas

Waste rock is generally used as backfill for ongoing mining operations at Cusi. Regardless, there is sufficient surface area and access for temporary storage and/or disposal of waste rock near the mine.

5.5.6 Potential Processing Plant Sites

Ore from the Cusi Project is processed in the El Triunfo circuit of the Malpaso Mill, which has a capacity of 650 tonnes per day, and is expected to be sufficient for expected future operations.

6 History

6.1 Prior Ownership and Ownership Changes

Since discovery and initial production of precious metals in the Cusi district in the late 1800's, the ownership history is extensive and complex. This is summarized in Section 6.4.

6.2 Exploration and Development Results of Previous Owners

The extensive exploration history of the Cusi district is not well-documented. From surface sampling and exploration drifting in historic times to modern diamond drilling, the exploration has always been focused on development of more accurate understanding of the orientations and relationships of the many veins in the district.

6.3 Historic Mineral Resource and Reserve Estimates

As summarized in a previous technical Report (RPA 2006), exploration activities were conducted by Slocan Development Corp., Minera Cusi, and Pacific Islands Gold. Slocan Development Corp. conducted mineralogical studies which were reported in 1975; these reports were not available. Minera Cusi conducted surface and geochemical studies and reported results in 1988 and 1989; these reports were not available. Pacific Gold conducted geologic mapping, surface and underground chip sampling, and reverse circulation (RC) drilling along the San Miguel vein; these results were not available. There are no reports of historic Mineral Resource or Reserve Estimations.

6.4 Historic Production

Gold and silver were first discovered and exploited in the Cusi area within the San Miguel and La Candelaria zones by a Spaniard, Antonio Rodríguez, in 1687, and continued until the Mexican war of independence, which began in 1810. The amounts mined during the Spanish colonial time are not well documented.

The Mexican war of independence occurred from 1810 to 1821. The actual operators and production history in the vicinity of Cusi from 1821 to 1881 are not known. From 1881 to 1890, Don Enrique Mining Co. conducted mining operations. From 1896 to 1911, the Helena Mining Company purchased and conducted mining operations: during this period, the Santa Marina and San Bartolo shafts were sunk to the 1,000 foot level.

In 1911, Cusi Mexicana Mining Co. purchased the property from Helena Mining Company. During the period of the Mexican Revolution from 1910 to 1920, mining at the Cusi Project area occurred intermittently. Total tonnage mined from 1821 to 1920 is unknown.

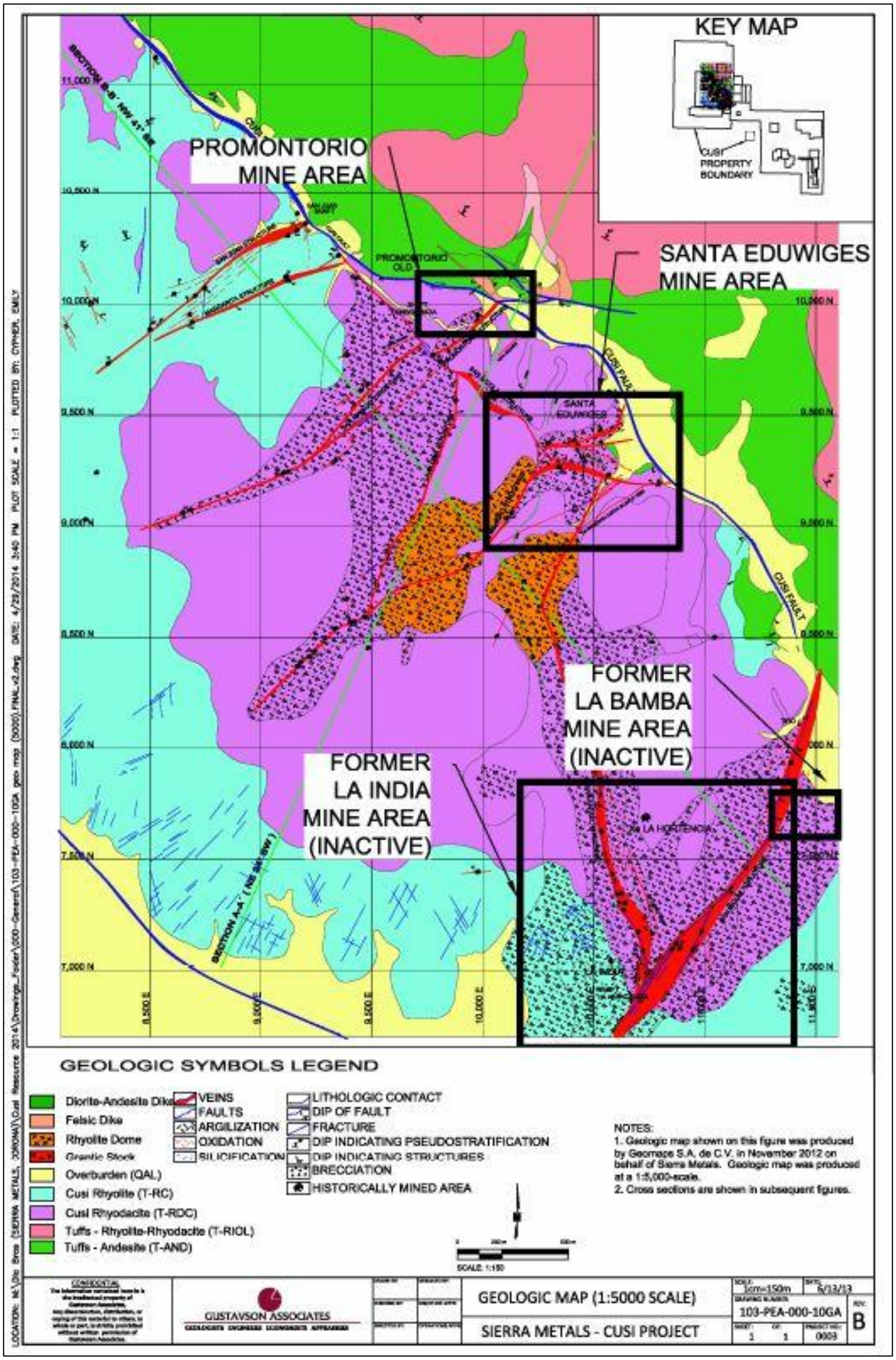
From the 1920s to 1937, concessions of the Cusi Project area were acquired by The Cusi Mining Company of American Capital. As reported by Sierra Metals, one million tonnes were mined. As reported in RPA (2006), from 1924 to 1942, 504,048 tonnes were mined, producing 265,460 kilograms of silver; however, the specific locations of mined areas were not reported. From 1937 to the 1970s, mining from the Cusi property was reportedly dormant. In the 1970s, mining occurred in several mines in the Cusi Project area: an estimated 3,000 tons of ore per month were being produced at an average silver grade of 12 to 18 ounces per ton silver. As reported in RPA (2006), during the 1980s, Minera Cusi conducted limited mining: no quantities were reported.

7 Geological Setting and Mineralization

7.1 Regional Geology

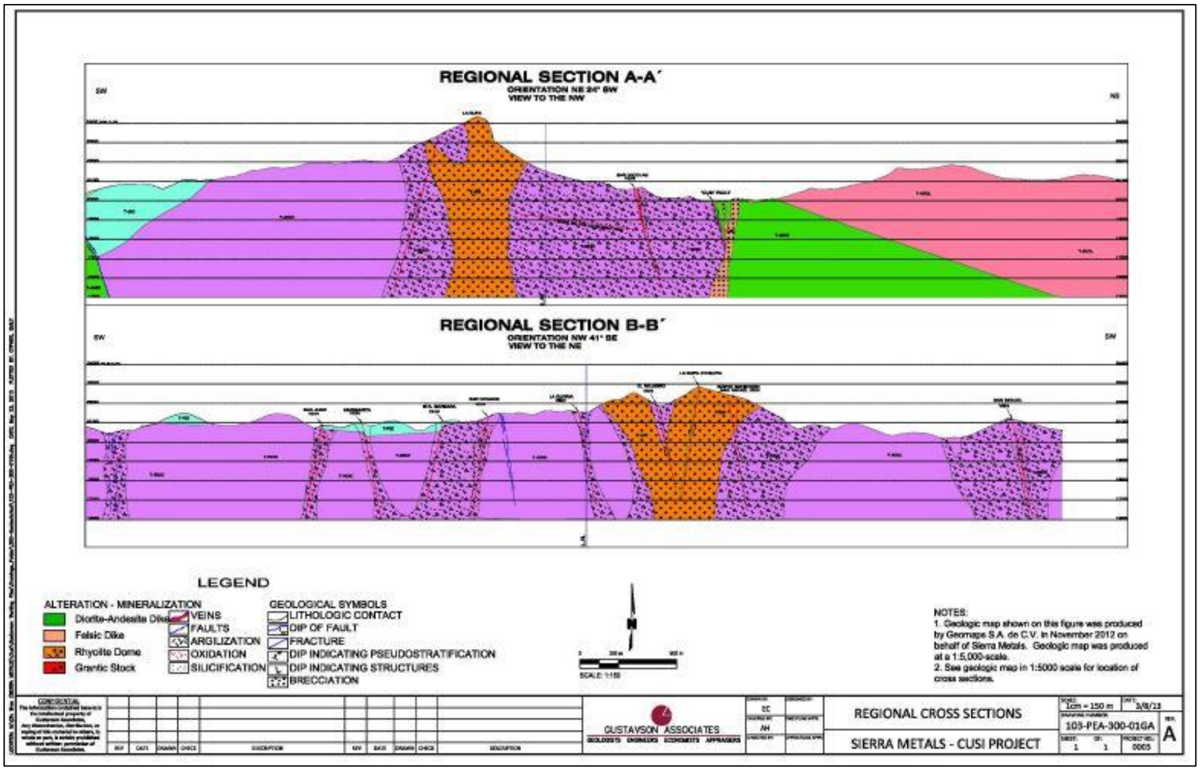
The Cusi Project is located within the Sierra Madre Occidental, a 1,200 by 300 km northwest-trending mountain system featuring a long volcanic plateau within a broad anticlinal uplift. The region is dominated by large-volume rhyolitic ash flow tuffs related to Oligocene (35 to 27 Ma) calderas considered to be the Upper Volcanic Series. These volcanic rocks comprise calc-alkalic rhyolitic ignimbrites with subordinate andesite, dacite, and basalt with a cumulative thickness of up to a kilometer. The Upper Volcanic series unconformably overlies rocks of the slightly older Eocene (46 to 35 Ma) Lower Volcanic Series which predominantly comprises andesite with interlayered felsic ash flow tuffs (Figure 7-1).

Deposition of the Lower Volcanic Series was accompanied by the intrusion of hornblende-bearing quartz diorite and granodiorite batholiths and stocks. The Lower Volcanic Series hosts the majority of the epithermal and porphyry-related precious metals deposits in the Sierra Madre Occidental. Thin flows of basaltic to rhyodacitic composition of late Miocene and younger age cap many of the plateaus in the region. The oldest structural episode is related to the Laramide orogeny which produced east-striking, steeply dipping strike-slip faults, generally with right-lateral sense of shear. Later transtensional tectonics resulted in the development of N-S normal faults and NNW-SSE trending subvertical faults with right-lateral strike-slip and normal sense of shear. Structures developed in the Cusi region are believed to have controlled emplacement of a series of north-northwest trending intrusions. Permeability associated with these and other faults and intrusive contacts formed conduits for hydrothermal fluids associated with mineralization (Figure 7-2).



Source: Gustavson, 2014

Figure 7-1: 1:5000 Scale Map Showing Generalized Lithologies and Locations of Historic and Active Mining Areas on the Property



Source: Gustavson, 2014

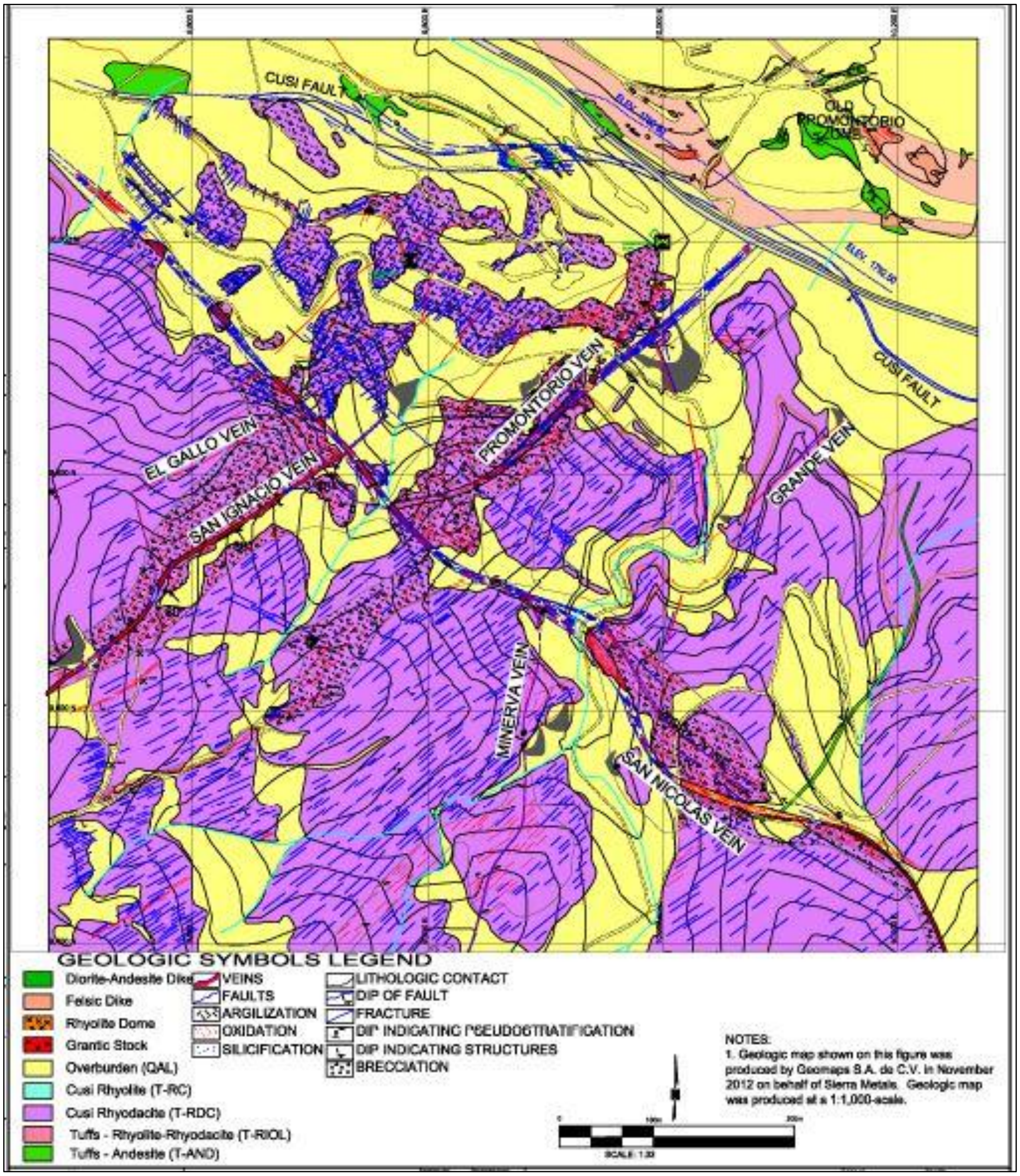
Figure 7-2: Northwest and Northeast-looking Cross Sections Through the Cusi Area, 1:5000 Scale

7.2 Local Geology

As reported in Geomaps (2012), the geology of the Cusi region ranges from andesitic volcanism of late Mesozoic to Eocene age to the issuance of rhyolitic tuffs and ignimbrites of Oligocene-Miocene age.

The Oligocene Bufa Formation ignimbrite forms the dominant topographic feature in the Cusi area. Older andesites in the area are members of the Loma del Toro Formation, located mostly to the north and northeast of the mineralized Bufa Formation.

Mapping by CRM suggests that the property is hosted within a collapsed caldera (Geostat, 2008). The Cusi fault is a regional NW-trending fault that may have localized and then faulted the caldera. Within the caldera, adjacent to the Cusi fault, a rhyolite dome has been identified which hosts much of the mineralization in the district. Hydrothermal mineralization at Cusi was episodic and accompanied by structural movement (Geostat, 2008). Galena, sphalerite, and chalcopyrite are the predominant sulfides commonly ranging from 5% to 10% with occasional massive sulfide zones. Historical mining activity in the District exploited a series of planar veins that cut a lower andesitic volcanic unit and an upper rhyolitic unit. The veins occur in northwest and northeast-striking faults that appear to define an overall transtensional regime. All veins contain quartz with a variety of crustiform and banded textures typical of the epithermal environment. Most historical mining was shallow (<100 m) and appears to have concentrated on supergene-enriched ores including Ag chlorides and native silver (Meinert, 2007) (Figure 7-3).



Source: Gustavson, 2014

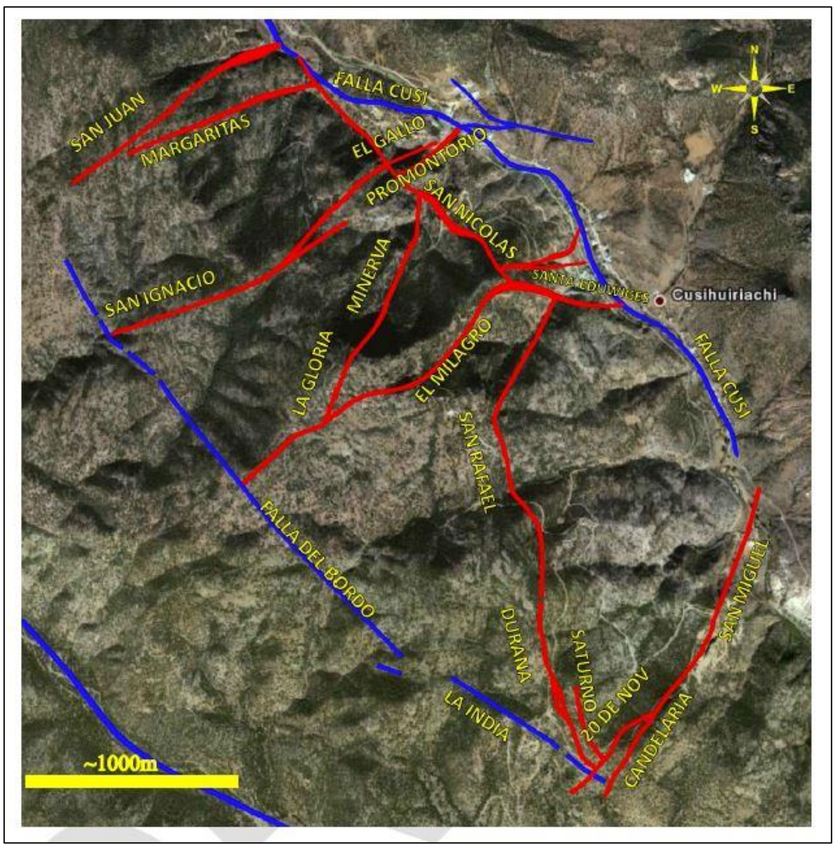
Figure 7-3: Local Geology Map showing the location of mineralized veins

7.3 Property Geology

The property lies within a possible caldera that contains a prominent rhyolite body interpreted as a resurgent dome. The rhyolite dome trends northwest-southeast with an exposure of roughly 7 km by 3 km and hosts mineralization. It is bounded (cut) on the east side by strands of the NW-trending Cusi fault and on the west by the Border fault. The Cusi fault has both normal and right-lateral strike-slip senses of shear. Strands of the Cusi fault are intersected by NE-trending faults, some of which indicate left-lateral strike-slip shear. NE-trending veins associated with these faults dip steeply either NW or SE. High-grade and wide alteration and mineralization zones exist in the areas of intersection of NW and NE structures (Figure 7-4).

The property tectonically formed during dextral transtension associated with oblique subduction of the Farallon plate beneath the North American plate. Strike-slip and normal faults related to this transtension controlled igneous and hydrothermal activity in the region. Regional NW-trending faults like Cusi are generally right-lateral strike-slip faults with a normal slip component. NE-trending faults are commonly left-lateral strike slip faults which were antithetic Riedel shears in the overall dextral transtensional tectonic regime.

The Cusi fault is a regional fault that may have controlled the location of the caldera and resurgent dome. Continued movement on the Cusi and related faults cut and brecciated the caldera and dome rocks and provided conduits for mineralizing fluids.



Source: Dia Bras, 2016

Figure 7-4: Aerial Photo of the Cusi property showing the locations and orientations of mineralized structures

7.4 Significant Mineralized Zones

Numerous epithermal mineralized veins exist on the property. These typically are moderately to steeply dipping to the southeast, southwest, and north, range from less than 0.5 to 2 m thick, and extend 100 to 200 m along strike and up to 400 m down-dip. There are at least seven major mineralized areas within the Cusi area, described in Section 8 of this report. Small open pits were typically developed at vein intersections. Mineralization mainly occurs in silicified faults, epithermal veins, breccias, and fractures ranging from 1 to 10 meters thick.

Low-grade mineralized areas exist adjacent to major structures, showing intense fracturing and are commonly laced with quartz veinlets forming a stockwork mineralized halo around more discrete structures. The country rock in these zones is variably silicified. Pyrite and other sulfide minerals are disseminated in the silicified country rock and are also clustered in the quartz veinlets. A well-developed mineralized stockwork zone is in the Promontorio area, especially proximal to the Cusi fault. These stockwork zones are the current targets for expansion and infill drilling, and their importance to the greater Cusi area is being studied in greater detail as a part of current exploration efforts.

8 Deposit Type

8.1 Mineral Deposit

Mineralization at Cusi has been variably described as a) low-sulfidation epithermal (Ciesielski, 2007), b) high-sulfidation epithermal (SGS, 2008) and linked epithermal-base metal system (Meinhert, 2006). Meinhert (2006) notes that although shallow (<100 m) historic mining is reported to have encountered grades exceeding 1000 oz/ton Ag, the veins currently exposed are more base-metal rich than would be expected in an epithermal system. However, Sierra Metals geologists consider the abundance of base metals on the property to be primarily a function of depth of exposure; SRK agrees with this interpretation. Mineralization occurs along narrow fractures containing quartz, sphalerite, and galena; wallrock alteration consists primarily of silicification and the development of clays and iron oxides. Veins themselves contain quartz with crustiform and banded textures typical of epithermal systems.

8.2 Geological Model

The current geologic model for the Cusi property is described as follows:

The country rock on the property consists primarily of felsic volcanics interpreted to represent a caldera with a resurgent dome. Magma is interpreted to have intruded along the Cusi fault, a regional NW-trending, right-lateral strike-slip fault; subsequent eruption produced the collapsed caldera and Upper Volcanic Series felsic tuffs. A resurgent dome then arose within the caldera on the western side of the Cusi fault. This dome was then dissected by numerous northeast-trending, left-lateral faults, which acted as conduits for hydrothermal fluids and now host mineralized veins.

Two of the vein sets at Cusi are relatively large and have been mapped along strike for nearly a kilometer each. Within these vein sets, dilatational areas and structural intersections are known to host the best mineralization. The veins are composed of both wide, continuous areas of mineralization as well as zones of numerous smaller swarms of veins or stockwork veinlets. The mineralization is predominately Ag and Pb-rich with lesser amounts of Au, Zn and Cu present in some areas.

SRK is of the opinion that the geologic model developed by Dia Bras, which focuses primarily on interpretation of the discrete veins and their related splays/stockwork zones is appropriate for the deposit type and mining method, and that this has been borne out by a history of production.

9 Exploration

In addition to drilling, Sierra Metals has commissioned several geologic studies, conducted several geologic mapping campaigns, and completed surface and underground sampling programs.

9.1 Relevant Exploration Work

Sierra Metals has commissioned several geologic studies culminating in reports summarizing their findings:

- *Cusi Epithermal Ag-Au District, Chihuahua, Mexico*. Prepared by Eric R. Braun for Dia Bras Exploration dated November 26, 2006.
- *Geology and Geochemistry of Mineralized Zones*. Prepared by Andre P. Ciesielski for Sierra Metals Exploration Inc. dated December 2007.
- *Observations on the Cusihuiriachic District*. Prepared by Lawrence D. Meinert of Smith College for Sierra Metals Exploration Inc. dated July 6, 2006.
- *Mineralogy, Assay, and Fluid Inclusion Characteristics of Quartz-Sulfide Veins of the Cusihuiriachic District, Chihuahua, Mexico*. Prepared by Lawrence D. Meinert for Dia Bras Exploration, Inc., dated January 17, 2007.
- *Mineralogy of High Grade Ag Zones in the Cusihuiriachic District*. Prepared by Lawrence D. Meinert for Dia Bras Exploration, Inc., dated April 13, 2007.

On behalf of Sierra Metals, Geomaps S.A. de C.V. has prepared geologic maps showing surface lithology at 1:5,000 scale and 1:1,000 scale, two regional cross sections through the Cusi Project area and a stratigraphic column. Geomaps' surface lithology maps also contained structural measurements of faults and veins.

9.2 Sampling Methods and Sample Quality

On behalf of Sierra Metals, Geomaps conducted surface rock sampling in the Promontorio area in an effort to identify the presence of disseminated mineralization. From November to December 2012, Sierra Metals collected 571 samples from rock outcrops in an area of approximately 0.1 square kilometer (650 m by 200 m). Samples were collected in lines perpendicular to main structure and faults where quartz vein and fractures with oxidation were identified. Samples were assayed for gold, silver, lead, manganese, and zinc at Sierra Metal's internal laboratory in the Malpaso Mill. Sierra Metals reviewed these data and found silver grades ranged from non-detect (less than 20 grams per tonne) to 351 grams per tonne. From these results, Sierra Metals concluded that disseminated mineralization near the surface within the Promontorio Viejo-San Ignacio- and San Nicolas zone are restricted to the intersections of main structures. Geomaps continued to conduct surface sample work in 2013. Sampling has now been performed over the entire project area, totaling over 2300 samples. Surface sample data for La Gloria / Minerva, and Monaco / Milagro areas only were used for this resource estimate. This set includes 116 surface channels at La Gloria/Minerva, and 67 surface channels at Milagro/Monaco.

Numerous mine workings are present at the Cusi Project area. Sierra Metals has conducted extensive sampling within these mine workings, the results of which were described in a 2014 technical report by Gustavson and are summarized in Table 9-1. All samples were analyzed at Sierra Metals' internal laboratory at Malpaso. The 2014 report by Gustavson does not mention sample spacing or other factors that may have resulted in biases, but SRK notes that it is likely that the channel samples, simply by the nature of their collection predominantly in higher grade production areas, are likely higher grade on average than the exploration drilling.

Table 9-1: Summary of Channel Sampling by Area

Mine	No. Samples	Avg. Ag Grade (g/t)	Avg. Pb Grade (%)	Avg. Zn Grade (%)
Santa Eduwiges	1,380	399	1.30	1.09
La India	1,187	53.8	0.06	0.15
La Gloria/Minerva	450	77.6	0.07	0.04
Milagro (incl. Monaco)	588	177	0.79	1.28

Source: SRK, 2016

9.3 Significant Results and Interpretation

Surface mapping of structures has been used where possible, but the majority of interpretation for the veins is taken from underground development and sampling, with diamond and reverse circulation drilling comprising the remainder.

10 Drilling

10.1 Type and Extent

The primary exploration method at Cusi has been diamond core drilling followed by limited underground development (Table 10-1 and Table 10-2). To date, 1,157 drillholes have been completed with an average length of 202 m. This represents over 233,784 m of drilling. The drillholes have historically been drilled primarily from surface in a wide variety of orientations, although recent drilling has been dominated by underground drilling. In the areas of focused exploration, the average drillhole spacing ranges between 25 to 50 m. In the less explored areas, the average drillhole spacing ranges between 75 and 150 m. Overall, the majority of the drilling completed by Sierra has been relatively closely spaced and not very deep. The closely spaced drilling has been designed to identify the base of historic mining and also directed at resource definition. The wider spaced drilling has been designed to test down dip from surface vein exposures to attain vein orientation and mineralization grades.

Table 10-1: Drilling Summary by Type

Hole Type	Count	Meters
NQ/BQ	3	244
NQ	166	37,918
HQ/BQ	1	406
HQ/NQ	354	75,082
HQ	236	77,517
BQ	346	40,539
TT-45	50	1,997
1-EXP-75E	1	83
Total	**1,157**	**233,784**

Note: Four holes are not accounted for in this table due to misnomenclature.
Source: SRK, 2017

Table 10-2: Drilling Summary by Period

Year	Count	Meters	% of Total
2006	53	10,177	4%
2007	99	22,358	10%
2008	86	13,245	6%
2009	84	8,206	4%
2010	71	10,055	4%
2011	84	19,623	8%
2012	199	37,827	16%
2013	102	24,130	10%
2014	73	10,543	5%
2015	147	27,158	12%
2016	38	8,706	4%
2017	121	41,758	18%

Source: SRK, 2017

10.2 Procedures

The drilling has been conducted with Sierra-owned drills and outside contractors.

All drill core is appropriate size (HQ/NQ/BQ) and has been logged by Sierra staff geologists. Samples intervals are determined by the geologist and the core is then split in half and bagged by Sierra technicians.

Collar locations are surveyed on surface using handheld GPS, and underground using total station. Collar surveys are accurate for both types of drilling and underground drill stations generally correspond to clusters of underground drill collars. Core is transported by Dia Bras personnel to the logging facility near the mine offices.

Core is logged by qualified Dia Bras geologists for lithology, alteration, structure, and mineralization, with sampling intervals identified during logging to delineate mineralized areas. Sample intervals are marked in the boxes along with a line down the core axis for splitting. Samples are split via core saw, and separated into labeled bags. As of yet, no barcode or automated tracking system has been implemented at Cusi or Malpaso for sampling.

10.2.1 Downhole Deviation

Only about 33% (381) of the drillholes have downhole deviation surveys. Since 2014, when a survey tool was acquired by the mine, the majority of drillholes have been surveyed. Surveys are done using a Reflex deviation tool, at intervals ranging between 25 and 50 meters or as available due to drilling conditions. Deviations in the bearing (for non-vertical holes) average only 0.33 degrees, but feature local significant deviations in excess of 15 degrees between intervals. Dip deviations range between -0 degrees and 13 degrees, with an average of 0.48 degrees between intervals.

A significant number of the historic drillholes are relatively long and their precise location is considered uncertain due to the lack of downhole deviation surveys. This contributes significantly to the uncertainty in the geological model as well as the resource estimation in certain mine areas. SRK has noted a select few cases where a drillhole which is not surveyed crosses very close to surveyed mine workings, and the vein intercept is offset 5 to 10 m from the projection of the structure using the channel samples and mine development. This offset, observed in areas where the mine workings are supposedly well surveyed, implies that the actual locations of the veins in non-surveyed drill-holes may be inaccurate to a similar degree.

Of the 776 drillholes which are not surveyed, the average length per hole is 179 m. This would indicate significant potential for deviation of these holes over these distances based on observed deviations in the surveyed holes. SRK noted that there are areas where the drill stations have probably been over-used, rather than simply moving the drill to a new station which would take advantage of closer proximity to the targets. There may be some advantages to efficiency, cost, and accuracy of drilling if the rig is moved more frequently to new drill stations.

10.2.2 Core Recovery

Core recovery is assessed prior to logging and sampling. This is based on the percentage of an interval that is recovered into the core box compared to the expected length of the interval. Recoveries are generally very good at Cusi, and with an average of 95% in mineralized intervals.

10.3 Interpretation and Relevant Results

SRK notes that Cusi is an advanced property with active mining ongoing.

Relationships between thicknesses of drilling intercepts and actual thicknesses in the mineralized veins underground have been confirmed through ongoing production. SRK does note that Dia Bras generally attempts to intersect veins in a perpendicular fashion through drilling, but does not always accomplish this due to difficulty of position rigs from surface or underground. Selected veins are sometimes drilled near the plane of the structure, which may exaggerate mineralized intercepts thicknesses. SRK is not reporting thicknesses or grades of any of these structures.

11 Sample Preparation, Analysis and Security

11.1 Security Measures

Samples are collected by the logging technicians or geologists after being marked and labeled in core boxes. These are grouped into larger batches of 10 samples per reinforced sack, with a weight of no more than 25 kilograms.

Each sack is noted with the intervals contained, the hole ID, and the order number for the laboratory. Samples are stored on site, behind access-controlled gates, until such a time as they are to be taken to the relevant laboratory. Historically, this has been the Malpaso Mill, a Dia Bras-owned mill facility, or ALS Chemex, an independent and ISO-certified laboratory with processing facilities in Hermosillo and analytical facilities in Vancouver, Canada. Since middle 2016 samples are sent to ALS and ALS only, but historically and now this decision was made after the sample was first sent to the Malpaso Mill for analysis, with any positive results of interest warranting confirmation by ALS, utilizing the coarse reject material from Malpaso, then ALS processes and analyzes the samples.

11.2 Sample Preparation for Analysis

The analytical history of the Cusi sampling is complex and includes various generations of analyses between the nearby Malpaso Mill and ALS. For samples assayed at ALS in Vancouver, drill core samples were prepared at the ALS prep lab in Chihuahua, Mexico. Upon receipt of samples, ALS dries the samples, records the received sample weight, and processes the samples as follows:

• Core is crushed to 70% passing rate of 2 millimeters;

• A 150-gram split is taken for pulp preparation; and

• The split sample is pulverized to a pulp at 85% passing rate at 75 micrometers.

Upon receipt of samples from the mine or exploration team, the Malpaso Laboratory also dries, weighs, and catalogs the samples. Drying times are 4 hours for channel samples and 8 hours for drill core. The current sample preparation procedures in practice at the Malpaso mill are as follows:

• Rock from core or channel is crushed to ¾ inch, then is placed in a cone crusher with the sample passing rate of 2 millimeters.

• A split is taken from this crushed material for pulp preparation (200 g=mine samples; 400 g=core). Samples are dried again for 30 minutes.

• Split samples are pulverized to a pulp at 90% passing rate 75 micrometers.

Previous technical reports have noted that the sample preparation procedures at Malpaso differ from those at ALS. For samples historically assayed at the Malpaso Mill, samples were crushed initially to 3.175-millimeter (1/8-inch) grain size, then further pulverized to 85% passing rate of 100 mesh (152-micrometer) or 150 mesh (104-micrometer).

SRK is aware that The Malpaso lab has been working to improve and adopt procedures such as those utilized by ALS, currently Malpaso Lab is crushing to 70% passing rate of 10 mesh, in order to fulfill same ALS process. Also, Malpaso Mill has recently (2017) improved quality of crushed samples by using coarse blank and fine blank material (silica) to clean the crushers and pulverizers and control possible contamination.

11.3 Sample Analysis

Sample analyses have been performed variably at ALS and Malpaso Mill. Historically, all samples have been analyzed at Malpaso, with periodic checks of analyses at ALS. This practice was deemed to be insufficient due to analytical and preparation inconsistencies in the Malpaso Mill. Thus, a series of campaigns were run with the analyses being entirely duplicated at ALS, with the findings showed significant differences between the two labs (SRK, 2017).

Currently, all drill core analysis supporting the mineral resource estimation is performed by ALS, although an initial analysis of the sample is done at Malpaso to determine whether it is warranted to send to ALS or if the material is barren. The coarse reject from the initial crushing of the sample at Malpaso is retained in case the sample needs to be analyzed by ALS. If the sample is analyzed at ALS, the coarse reject is submitted, and the remainder of sample preparation is completed at the ALS Chihuahua-Mexico facility. Final analysis is conducted at the primary laboratory in North Vancouver, BC, Canada.

SRK notes that the channel samples are still analyzed by the Malpaso internal laboratory as this laboratory has a considerably better turnaround time on analyses than ALS, which is critical for timely production decisions. The analytical techniques are appropriate for the mineralization. The analytical methods appear to be similar, but the Malpaso laboratory has an extremely high lower limit of detection (20 g/t Ag). Most modern laboratories (such as ALS) have significantly lower limits of detection in the 1 to 5 g/t Ag range for ore grades. While this likely does not affect the results of the resource estimation, it should be noted that the methods used by Malpaso may not be the same as ALS and may introduce a bias in comparisons made between labs (SRK, 2017).

At the ALS lab in Vancouver, several analytical techniques are employed for different generations of data. For primary analysis, pulverized samples are digested by aqua regia, followed by analysis for three metals (silver, lead, and zinc, collectively identified as “Limited Metals”) by inductively coupled plasma atomic emission spectroscopy (ICP-AES) under Method ICP41. A large portion of samples were analyzed for the entire suite of 35 metals by ICP-AES. A large portion of samples were also analyzed for gold by fire assay and atomic absorption (AA). For over-limit analysis, detections of silver, lead, and zinc that exceed the reporting limit of ICP41 are reanalyzed by an ore grade (OG) ICP-AES method, AA, or fire assay gravimetric methods (Table 11-1) (SRK, 2017).

Currently, pulverized samples are digested with concentrated nitric acid, after cooling, hydrochloric acid is added to produce aqua regia and the mixture is then digested again, then analyzed by Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP - AES) under Method ICP41a, High grade Aqua Regia ICP-AES.

For samples analyzed at the Malpaso Mill, pulverized material is assayed for gold and silver by fire assay and base metals by plasma atomic emission spectroscopy. Reporting limits for assays at Malpaso are summarized in Table 11-2. SRK notes that the reporting limits for the Malpaso lab are inconsistent with industry norms for analytical precision for all known metals, and that this should be rectified in order to have better confidence in these analyses. The uncertainty associated with stating material that may sit in the ranges of the lower limits of detection for Malpaso allows for the possibility of the expectation for completely unmineralized material to have grades of 0.5 g/t Au and 20 g/t Ag, which would seem to have significantly more value than the actuals (SRK, 2017).

Currently, ranges of the lower limits of detection for Malpaso have not changed, but the lab now is using a number standards for evaluation of different detection techniques.

Table 11-1: Analytical Methods and Reporting Limits for ALS

Metal	Initial Assay		Over-Limit	
	Analytical Method	**Reporting Limits (g/t)**	**Analytical Method**	**Reporting Limits (g/t)**
Gold	AA23	0.005 to 10	GRA-21	0.05 to 1,000
Silver	MEICP-41 (1)	0.2 to 100	OG-46	1 to 1,500
			GRA-21	5 to 10,000
	ME-ICP41a (2)	1 to 200	OG-46	1 to 1,500
Lead	MEICP-41	2 to 1,000	OG-46	10 to 200,000
	ME-ICP41a	10 to 50,000		
Zinc	MEICP-41	2 to 1,000	OG-46	10 to 600,000
	ME-ICP41a	10 to 50,000		

Source: ALS Minerals Fee Schedule, 2016-2017

(1) ME-ICP41 Multi-Element (Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Hg, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Sc, Sr, Th, Ti, Tl, U, V, W, Zn) Trace Level Method.

(2) ME-ICP41a Multi-Element (Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Hg, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Sc, Sr, Th ,Ti, Tl, U, V, W, Zn) High Grade Method

Table 11-2: Analytical Methods and Reporting Limits for Malpaso

Metal	Analytical Method	Lower Limit of Detection (g/t)
Gold	Fire Assay	0.5
Silver	Fire Assay	20
Lead	AES	8
Zinc	AES	8

Source: Dia Bras, 2017

11.4 Quality Assurance/Quality Control Procedures

In general, Sierra Metals has been drilling for the past ten years and has only recently (2013) instituted an industry standard QA/QC program. The QA/QC was abandoned for an extended period of time in 2014, resulting in a gap in the QA/QC monitoring. This was done by Dia Bras management to save costs (SRK, 2017).

Sierra Metals has documented the processes of the exploratory activities carried out in their projects, including some features that are part of an evaluation of quality but there is not a single document that compiles the QA/QC protocol that gives a guide to follow and maintain in the time.

A typical QA/QC program includes blanks, standard reference material and duplicates. The purpose is to submit sample with known values or properties which identifies sample mix ups, sample preparation contaminations, laboratory precision and accuracy and laboratory bias. Although there is no reason to assume the analytical data for Cusi is problematic, the lack of a consistent QA/QC program does reduce the confidence in the precision and accuracy of the analytical data (SRK, 2017).

The absence of insertion controls such as coarse blanks, fine duplicates and check pulp duplicates does not allow evaluate some parts of the sample process, as preparation, pulverizing and analyzing.

In April 2017, SRK conducted a thorough review of the QA/QC procedures and performance at Cusi, using data to September 2016. The review process included auditing internal QA/QC charts prepared by Sierra Metals, as well as independent analyses using data provided by the company for all QA/QC work completed since 2013 (SRK, 2017).

Although Sierra Metals maintains a QA/QC database, tracks the performance of duplicate, blank, and standard samples, and is aware of poor performance in some cases, no formal failure criteria have been developed. SRK noted that these "standards" do not adhere to the international reporting criteria of what a standard or certified reference material should be (SRK, 2017).

The review results for data 2014-2016 QA/QC monitoring at Cusi show significant failure rates or inconsistencies across all types of QA/QC, with these failures made all the more egregious by the fact that Dia Bras uses its own QA/QC materials for these tests, which feature standard deviations far in excess of industry-standard QA/QC (SRK, 2017).

SRK's independent analyses therefore included developing of a set of failure criteria for each type of QA/QC data and determining failure rates.

However, during the latter part of 2017 and in support of this report, Sierra Metals has been implementing some improvements, such as the consistent use of reference materials, as well as blanks, that have been certified by round robin analysis. Dia Bras has established failure criteria for QA/QC samples, is continuously monitoring their performance, and are obtaining good results for this program.

The insertion rate into the sample stream is established at a frequency of 1:20 for standards, 1:30 for blanks, and 1:50 for duplicates. This insertion rate is not reflected in the raw data because the insertion is made only in mineralized zones and is adjusted locally to account for particular observations in the core (i.e. insertion of blank material immediately after a mineralized vein to check for contamination). For 2017, the insertion rate was 4.4%. Table 11-3 presents the controls used and the total meters drilled per year.

Table 11-3: Historical Rate of Insertion of Laboratory Controls

	Insertion Rate	Prior 2013	2014	2015	2016	2017
Standards	1:20	144	98	49	101	83
Fine blanks	1:30 or 1:50	173	72	194	82	52
Coarse blanks	1:30 or 1:50	-	-	-	-	-
Coarse duplicates	1:30 or 1:50	No data available			-	-
Core duplicates	1:30 or 1:50	208	-	377	1,073	25
External duplicates	1:30 or 1:50	No data available			-	-
Total		525	170	620	1256	160
Meters Drilled		145,621	10,543	27,158	8,706	41,758

Source: SRK, 2017

11.4.1 Standard Reference Materials (SRM)

Prior to 2013, a total of 144 standards were inserted into the sample stream at Cusi, in 2012. These standards were prepared internally by Sierra Metals. This data was not available to include in the charts evaluation (SRK, 2017).

Following the implementation of a more formal QA/QC program in 2013, Sierra Metals began inserting standards (either high grade, medium grade, or low grade) into the sample stream regularly at a rate of one standard per twenty samples. The standards are internal standards prepared at the Malpaso mill, from material chosen for its similarity (mineralogical and in terms of appearance) to the samples from the Cusi exploration program. These standards were used until September of 2016 and are shown in Table 11-4 below.

The definition of the grade of the standards does not fully consider the averages in the area.

Table 11-4: List of Internal Standards of the 2014-2016 Program

SRM	No. Samples	Ag (g/t) ± 2SD	Pb (%) ± 2SD	Zn (%) ± 2SD	Period
Standard 1	21	703.39 ± 67.44	0.623 ± 0.074	0.419 ± 0.054	April-Sep 2016
Standard 2	142	185.66 ± 23.446	0.364 ± 0.018	0.614 ± 0.076	2014 & April-Sep 2016
Standard 3	14	2,080.22 ± 107.354	2.303 ± 0.15	2.588 ± 0.304	April-Sep 2016
Standard 4	68	75.852 ± 6.784	0.242 ± 0.052	0.464 ± 0.122	2015 & May-Sep 2016
Total	**245**				

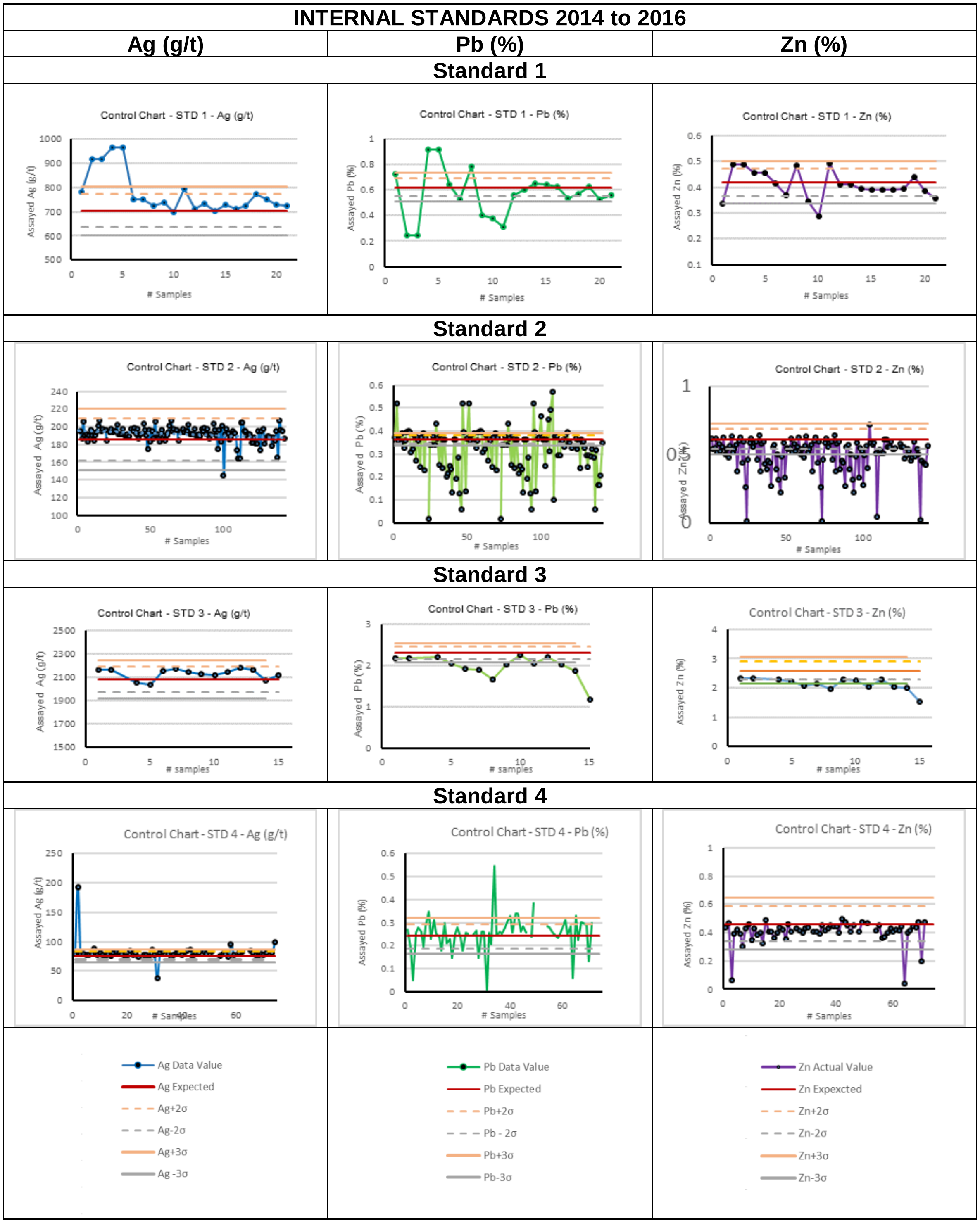
Source: SRK, 2017

SRK noted that the standard deviations used to define the failure criteria for standards were derived from the standards dataset and are higher than industry standard. Samples of each standard have been sent to three independent laboratories to define certified values for Ag, Pb, and Zn (ALS, SGM, and LIMSA); SRK noted that in most cases, the internally derived standard deviations are 2x to 3x higher than the standard deviations reported by external labs. This is not consistent with industry best practices for acceptable intra-lab performance. (SRK, 2017)

The results from internal standards used from 2014 to 2016 program are shown in charts for Ag, Pb and Zn on Figure 11.1.

Data has been examined for failures of each standard according to ± 3SD, defined by the Lab, Table 11-5. For all cases, the QA/QC is assessed on the basis of failures over time.

There is no documentation provided by Dia Bras regarding how failures of QA/QC are addressed, if the failures have been submitted for re-assay, or to find out the problem such as samples misnaming or mix-ups.



Source: SRK, 2017

Figure 11-1: Plots SRM Results for Ag, Pb, Zn for 2014 to 2016 Program

Table 11-5: Failure Statistics for Cusi Standards, 2014-2016 Program

Failure Statistics – Ag			
	Failure Criterion	Number of Failures	% Failure
Standard 1	± 3SD	4	19%
Standard 2	± 3SD	1	1%
Standard 3	± 3SD	3	21%
Standard 4	± 3SD	7	10%
Failure Statistics - Pb			
	Failure Criterion	Number of Failures	% Failure
Standard 1	± 3SD	8	38%
Standard 2	± 3SD	77	54%
Standard 3	± 3SD	9	65%
Standard 4	± 3SD	14	21%
Failure Statistics - Zn			
	Failure Criterion	Number of Failures	% Failure
Standard 1	± 3SD	1	5%
Standard 2	± 3SD	51	36%
Standard 3	± 3SD	6	43%
Standard 4	± 3SD	4	6%

Source: SRK, 2017

In 2017, five new CRM (certified reference materials) have been procured and certified via round robin analysis for the current exploration programs. These CRM have been homogenized and packaged by Target Rocks Peru (S.A.) and the round robin conducted by Smee & Associates Consulting Ltd., a consultancy specializing in provision of CRM to clients in the mining industry.

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

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

The CRMs used in 2017 included 2 low-grade CRM (MCL-01 and MCL-02), 1 CRM of medium grade (PSUL-03) which represents the material associated with the sulfide zone, a high-grade CRM (MAT-06) and a CRM (AUOX-10) to evaluate the Au values, associated with the Oxides zones.

Protocol include insertion of the high-grade MAT-06 CRM, and MCL-02 CRM with moderate grade, and AUOX-10 CRM which monitors grade of Au, but there is not enough information to evaluate their performance.

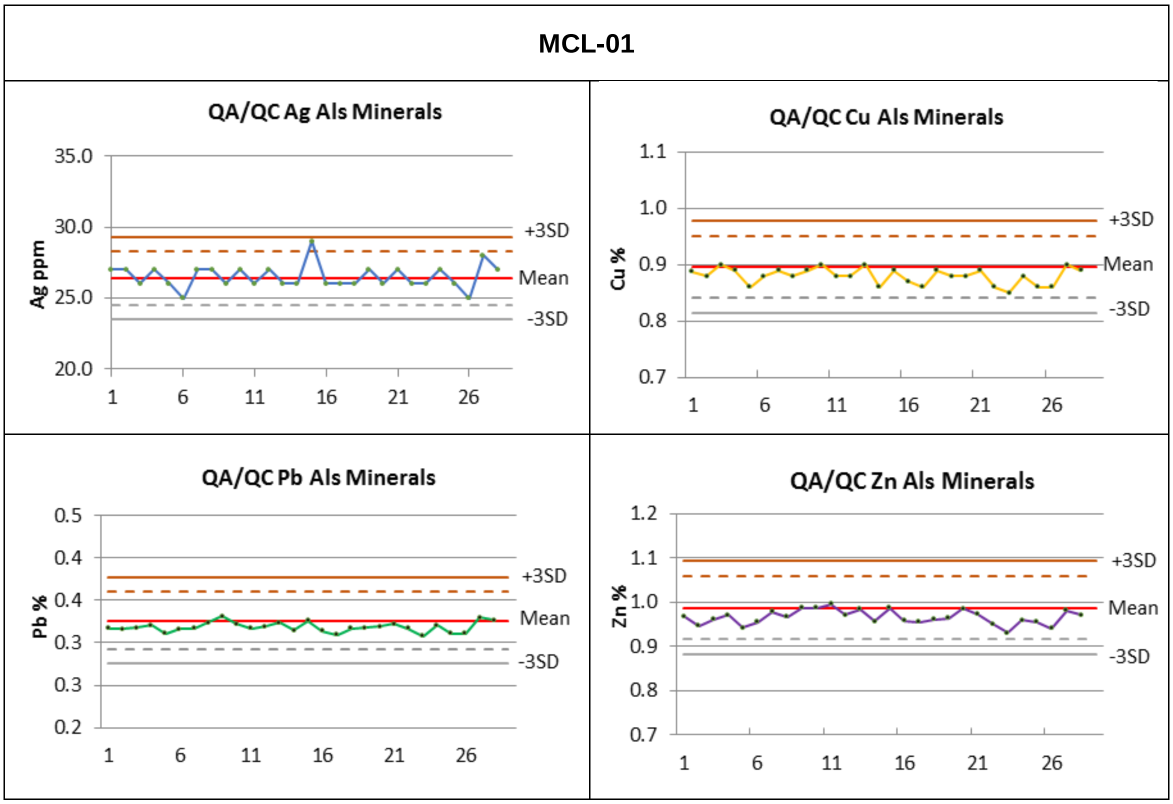
The means and between lab standard deviations (SD) are calculated from the received results of the round robin analysis, and the certified means and tolerances are provided in certificates from Smee and Associates. The certified means and expected tolerances are shown in Table 11-6.

Table 11-6: CRM Expected Means and Tolerances – 2017 Program

CRM	No. Samples	Au (g/t) ± 2SD	Ag (g/t) ± 2SD	Cu (%) ± 2SD	Pb (%) ± 2SD	Zn (%) ± 2SD
MCL-01	28	-	26.4 ± 1.9	0.896 ± 0.054	0.326 ± 0.034	0.988 ± 0.07
MCL-02	8	-	40.8 ± 3.40	1.581 ± 0.084	0.653 ± 0.05	2.490 ± 0.09
MAT-06	5	-	469.0 ± 13.0	2.530 ± 0.12	7.750 ± 0.40	7.980 ± 0.46
PSUL-03	39	-	192.0 ± 4.0	1.033 ± 0.036	3.094 ± 0.084	3.150 ± 0.13
AUOX-10	3	3.24 ± 0.16	850.0 ± 34.0	-	-	-
Total	**83**					

Source: SRK, 2017

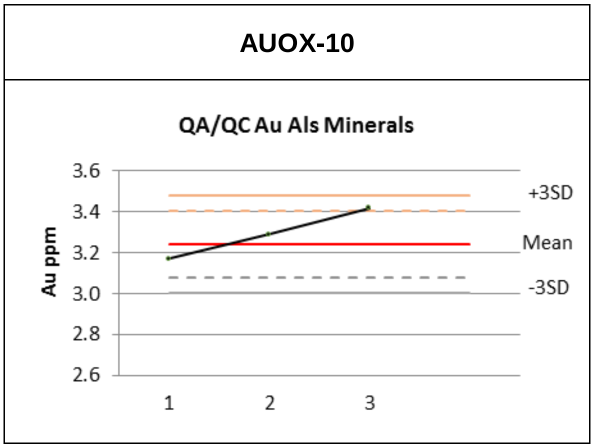
An evaluation for each CRM is conducted to evaluate performance and good practices of analysis for lab protocol. These are shown in Figure 11.2, Figure 11.3, Figure 11.4, and Figure 11.5. For MAT-06 (high grade CRM) and AUOX-10 final results for all samples has not been received the due to extended processing time for over-limit samples.



Source: SRK, 2017

Figure 11-2: Plots MCL-01 CRM Results for Ag, Pb, Cu, Zn for 2017 Program

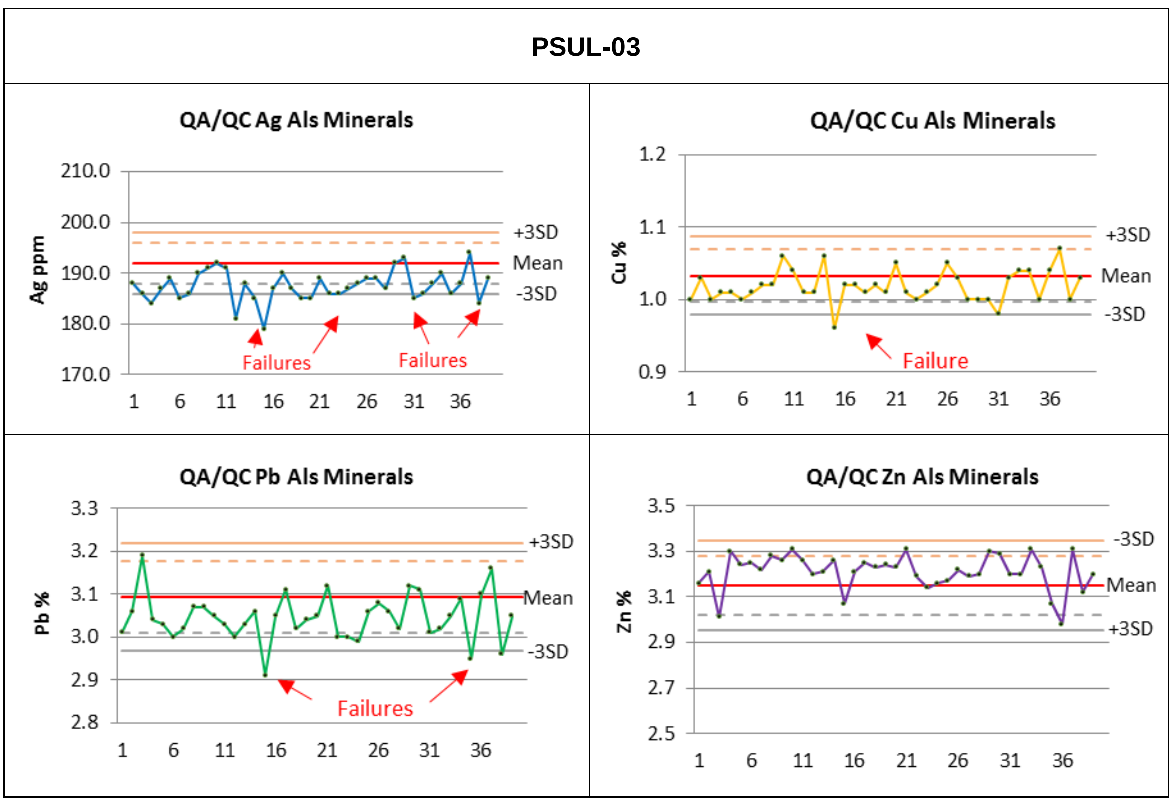
The CRM MCL-01 (low grade CRM) has good performance, with no noted failures, however it is important to note that the Cu, Pb, Zn have a strong generalized trend of values below the average. Figure 11.2.



Source: SRK, 2017

Figure 11-3: Plot AUOX-10 CRM Results for Au for 2017 Program

AUX-10 CRM (Au high grade) does not allow evaluation of the quality of analysis samples in the range of Au and Ag grades, because there are insufficient samples to perform an analysis. These are shown in Figure 11.3.



Source: SRK, 2017

Figure 11-4: Plots PSUL-03 CRM Results for Ag, Pb, Cu, Zn for 2017 Program

Results of the high grade PSUL-03 CRM show a strong downward trend for the Ag, Cu and Pb, while the Zn presents an upward trend of the mean. Failures occur mainly in Ag, and some in Cu and Pb.

There are no failures in Zn. In the failure summary table, the failure rate is observed for the recent QA/QC. There is no information of corrective actions documented for these failures, such as reviewing the causes of the failures or re-assays of the CRM that failed and the samples around it. Figure 11.4.

11.4.2 Results

The results for the 2014-2016 QA/QC monitoring at Cusi showed significant failure rates or inconsistencies across all types of QA/QC, with these failures made all the more egregious by the fact that Dia Bras used its own QA/QC materials for these tests, which feature standard deviations far in excess of industry-standard QA/QC standards. A summary of the failures for the internal Dia Bras standards is shown in Table 11-5. SRK notes that new commercial standards have been acquired recently by Dia Bras for the 2017 drilling.

Table 11-5: Failure Statistics for Cusi Standards and Blanks

Failure Statistics - Ag			
	Failure Criterion	**Number of Failures**	**% Failure**
Standard 1	± 3SD	1	6%
Standard 2	± 3SD	2	1%
Standard 3	± 3SD	0	0
Standard 4	± 3SD	4	6%
Blanks	>10x LLD	4	1%
Failure Statistics - Pb			
	Failure Criterion	**Number of Failures**	**% Failure**
Standard 1	± 3SD	0	0%
Standard 2	± 3SD	4	3%
Standard 3	± 3SD	1	7%
Standard 4	± 3SD	4	6%
Blanks	>10x LLD	235	68%
Failure Statistics - Zn			
	Failure Criterion	**Number of Failures**	**% Failure**
Standard 1	± 3SD	0	0%
Standard 2	± 3SD	2	1%
Standard 3	± 3SD	1	7%
Standard 4	± 3SD	0	0%
Blanks	>10x LLD	139	40%

Source: SRK, 2017

The 2017 performance of the QA/QC was considerably improved from previous efforts It can be said that the reference materials with sufficient samples to evaluate exhibit satisfactory performance as shown in Table 11-6.

Table 11-6: Failure Statistics for Cusi CRM´s – 2017 Program

Failure Statistics – Au			
	Failure Criterion	Number of Failures	% Failure
Failure Statistics – Ag			
MCL-01	± 3SD	0	0%
PSUL-03	± 3SD	9	23%
Failure Statistics - Pb			
MCL-01	± 3SD	0	0%
PSUL-03	± 3SD	3	8%
Failure Statistics - Zn			
MCL-01	± 3SD	0	0%
PSUL-03	± 3SD	0	0%
Failure Statistics - Cu			
MCL-01	± 3SD	0	0%
PSUL-03	± 3SD	1	3%

11.4.3 Blanks

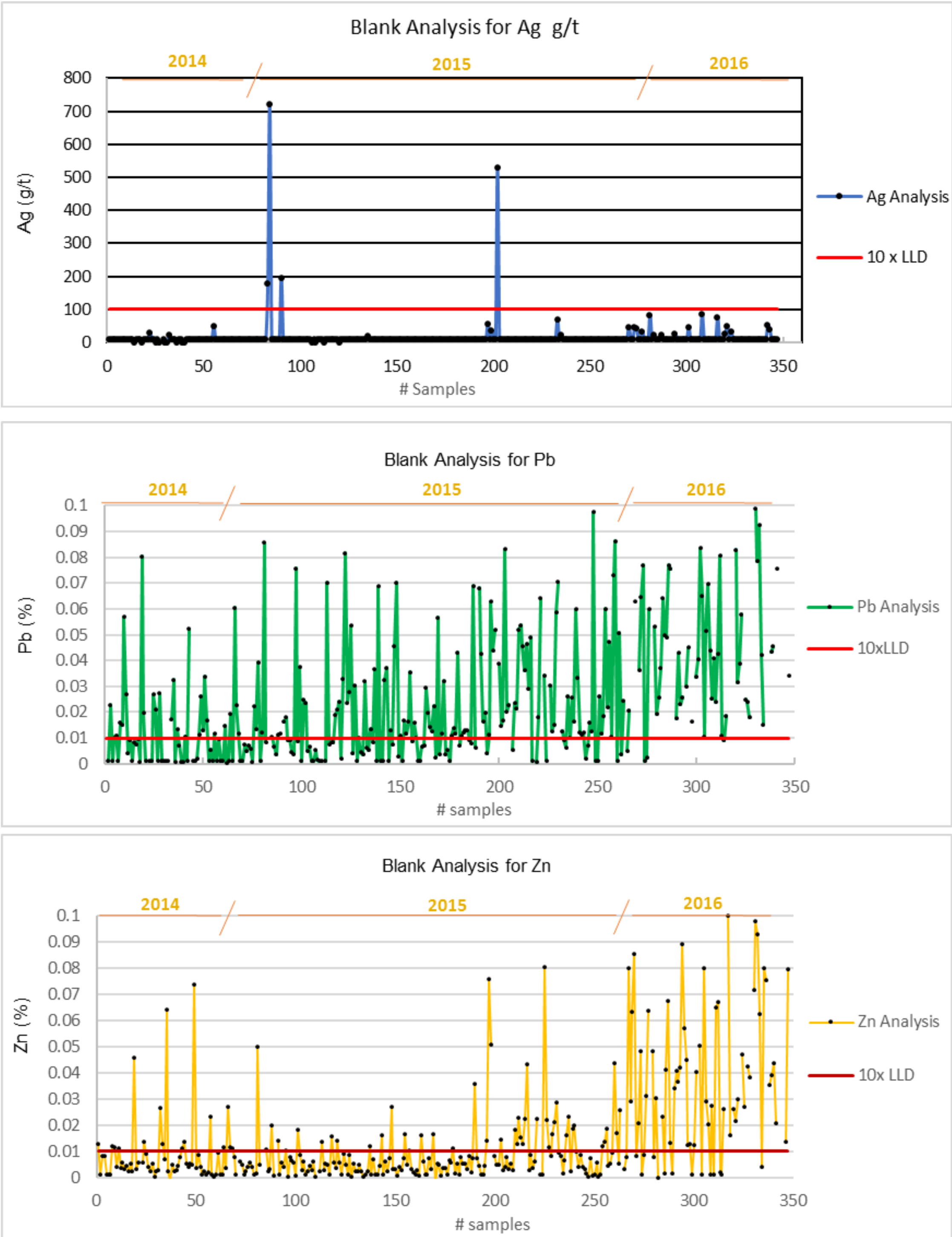
Prior to 2013, 173 blank samples were inserted into the sample stream at Cusi, also in 2012. These data results are not available. (SRK, 2017)

The blank samples were prepared internally by Sierra Metals from pulverized andesite presumed to be unmineralized.

Previous technical reports note that for gold, 97% of blank assays complied with acceptance criteria (values less than or equal to 5-times the ALS reporting limit); however, silver and lead performed less well (67% and 68% compliance, respectively), and for zinc, all blank assays exceeded the acceptance criteria. Gustavson (2014) concluded that unexpectedly high values for blank samples did not appear to be caused by carryover of the preceding sample and suggested that the andesite was in fact mineralized. Based on this result, it was recommended that Sierra purchase commercially prepared blank samples. (SRK, 2017)

Since 2013, Sierra Metals has inserted blanks into the sample stream regularly, at a rate of one blank per every 30 to 50 samples. Blanks continue to be prepared internally from pulverized andesite. Data prior 2014 is not available. (SRK, 2017).

The results of SRK's QA/QC review (2014-2016 program) show generally poor performance for blank samples, particularly for Pb and Zn. Many blank samples for these elements report values above 10x the lower limit of detection. Although the failure rate for Ag is 1%, the lower limit of detection for Ag at the Malpaso mill is 20 g/ton, significantly higher than at most commercial laboratories. SRK noted that although Sierra Metals tracks the performance of blanks at the mill (Figure 11-5), their results are compared to the standard deviation of the entire dataset for each element as opposed to the lower limit of detection for each element. The blanks dataset generally exhibits high standard deviation and it is SRK's opinion the performance of blanks is exaggerated in Sierra Metals' internal QA/QC review as a result. SRK agrees with Gustavson's (2014) conclusion that internally prepared "blank" material at Cusi may not be unmineralized. (SRK, 2017)



Source: SRK, 2017

Figure 11-5: Blank Analysis for Ag, Pb and Zn. 2014-2016 Program

In 2017, a new blank was certified which limits of detection for the different elements are shown in Table 11.8. This blank consists of barren limestone selected by the project geologists. The failure criteria for blanks is roughly +2SD of the mean of the blanks and is shown in Table 11-9.

Table 11-7: Failure Statistics for Cusi Blanks

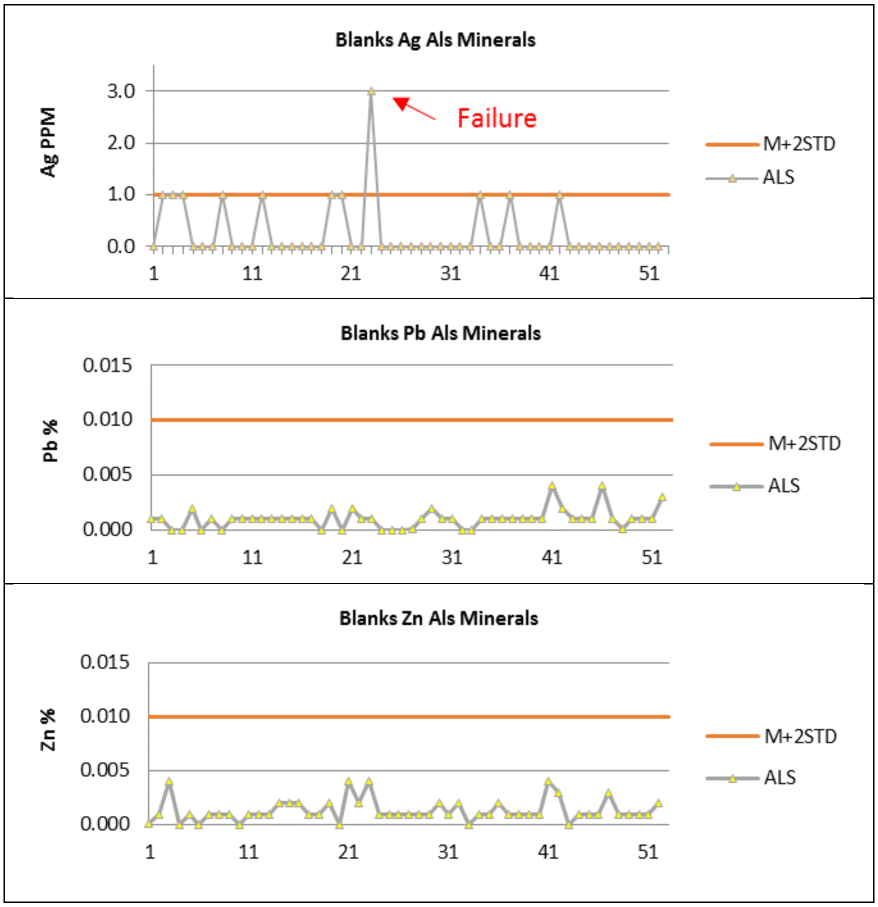
Failure Statistics – Ag			
	Failure Criterion	**Number of Failures**	**% Failure**
Blanks	>10x LLD	4	1%
Failure Statistics - Pb			
	Failure Criterion	**Number of Failures**	**% Failure**
Blanks	>10x LLD	235	68%
Failure Statistics - Zn			
	Failure Criterion	**Number of Failures**	**% Failure**
Blanks	>10x LLD	139	40%

Source: SRK, 2017

Table 11-8: Reporting Limits for Blank 2017

Metal	Lower Limit of Detection (g/t)	Acceptance limit (+2SD)
Ag	<1 ppm	1 ppm
Pb	<0.005 %	0.010 %
Zn	<0.001 %	0.010 %

The new Blank exhibits good performance. There is only one failure out of 52 blanks for Ag, with a high anomalous value of 3 ppm Ag. This could be a mix-up or should be addressed by re-assaying samples around the failure blank including the failure and report to the lab. These are shown in Figure 11.6.



Source: SRK, 2017

Figure 11-6: Blank Analysis for Ag, Pb and Zn - 2017 Program

11.4.4 Duplicates

Prior to 2013, 208 duplicates were inserted into the sample stream at Cusi, in 2008. Sierra Metals provided Gustavson with the results of the duplicate sample but was not able to provide information on the corresponding original, and so it was not possible to evaluate laboratory precision. (SRK, 2017)

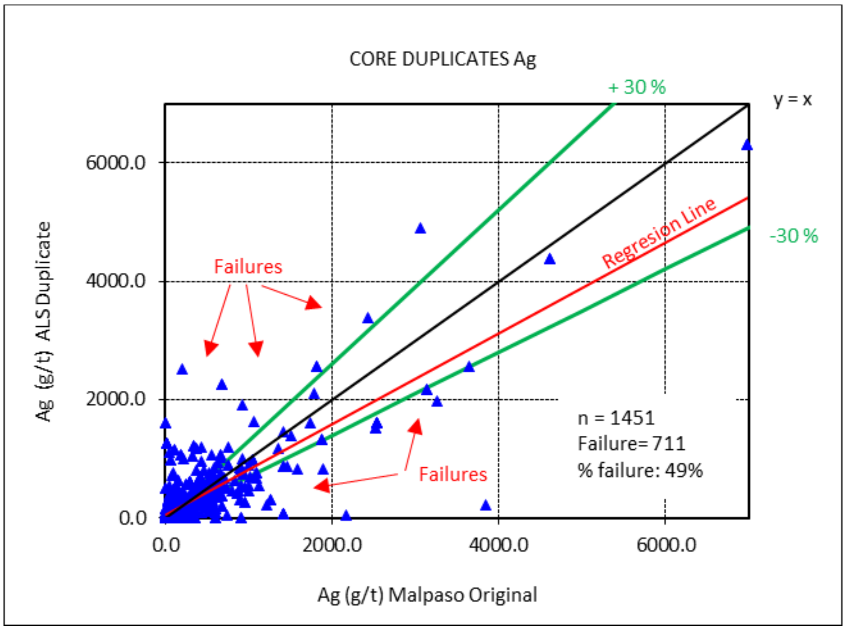
Following the implementation of a more formal QA/QC program in 2013, Sierra Metals devised a system whereby three types of duplicates (coarse duplicates, core duplicates, and external duplicates) are inserted into the sample stream every 30 to 50 samples. External duplicates are sent to ALS for comparison against the Malpaso Mill to ensure that the internal lab is performing in a manner consistent with industry standards. (SRK, 2017)

Although a failure rate was not determined for duplicate samples, SRK's review shows that internal duplicates generally exhibit poor performance. The review suggests that performance of the Malpaso mill is inconsistent, both internally and in comparison to commercial laboratories; however, they also suggest that the precision of the internal lab is higher for coarse duplicates than for core duplicates. Sierra Metals has not developed failure criteria for duplicates but acknowledges poor performance. (SRK, 2017).

SRK noted that the 2014-2016 intra-lab check analyses show a general agreement, which is encouraging. This agreement is only when evaluating the assays >20 g/t Ag, which is the Malpaso lower detection limit. In comparison of those assays above 20 g/t Ag, ALS reports average grades that are slightly higher than Malpaso for all metals, but which generally agree. This would indicate that the Malpaso Mill may be under-reporting grades in general, which may not be easy to perceive given the elevated lower limit of detection. (SRK, 2017)

Data from core duplicates insert during 2015-2016 program is evaluated using scatterplots using as a limit acceptance ±30%.

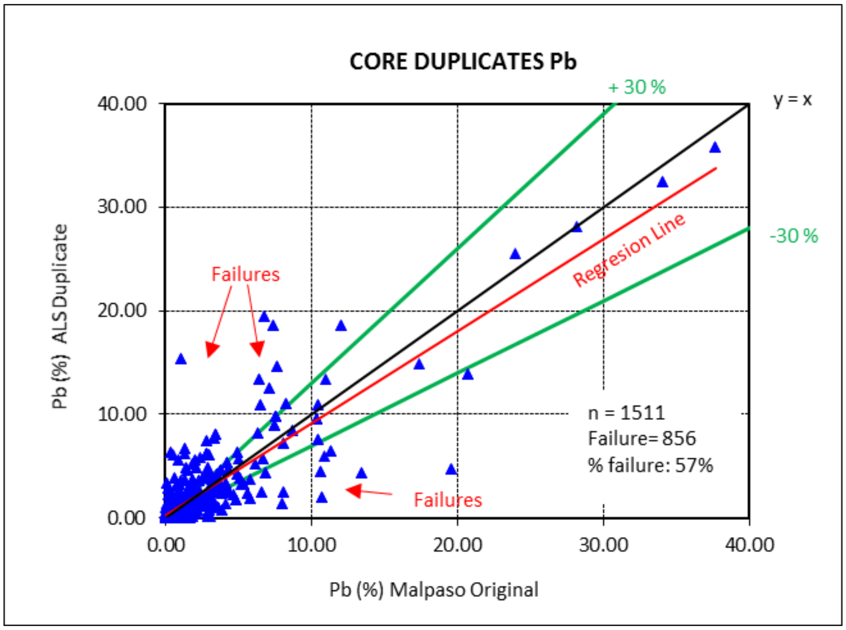
Poor performance is observed, and failures occur throughout all ranges of grades, Figure 11.7. The scatter plot shows a bias towards Malpaso when compared to ALS. The bias averages 25% lower than ALS.



Source: SRK, 2017

Figure 11-7: Core Duplicates Analysis for Ag (g/t) - Malpaso vs ALS. 2015 to 2016 Program

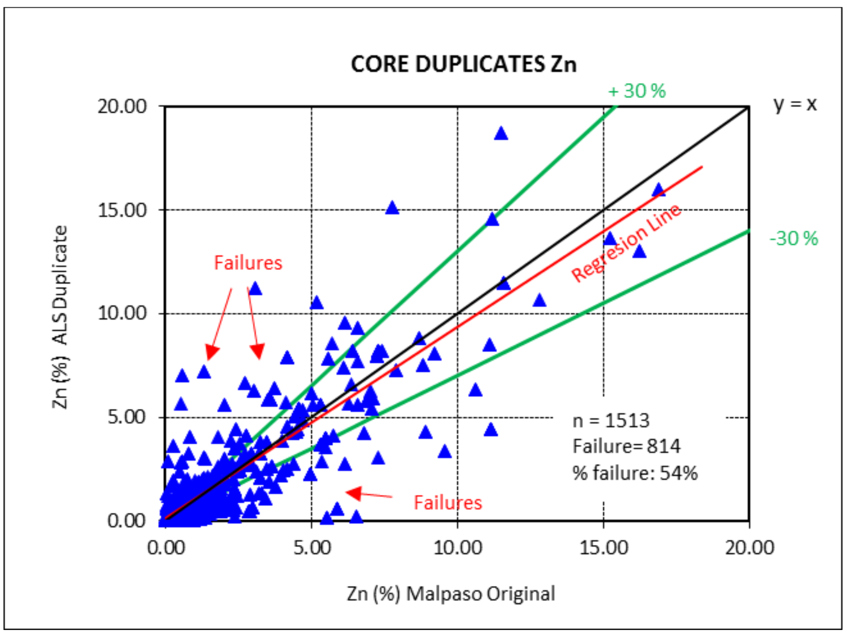
A high percentage of failures is observed for duplicates in Pb, following the acceptance limit of ±30%, with a bias slightly towards Malpaso. This bias is driven predominantly by grades greater than 20% Pb. This is shown in Figure 11.8.



Source: SRK, 2017

Figure 11-8: Core Duplicates Analysis for Pb - Malpaso vs ALS - 2015 to 2016 Program

There is no definite trend for Zn between the two laboratories for all grades, but there is a slight bias or bias towards Malpaso. This is shown in Figure 11-9.



Source: SRK, 2017

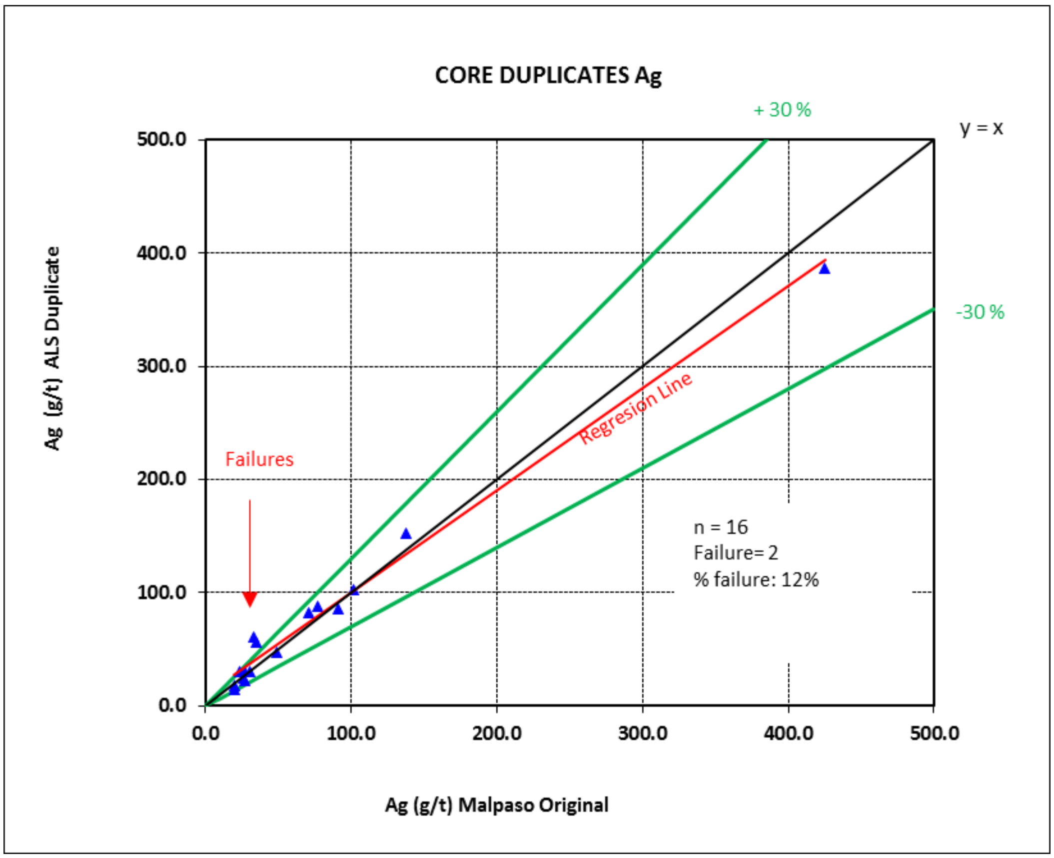
Figure 11-9: Core Duplicates Analysis for Zn - Malpaso vs ALS - 2015 to 2016 Program

In 2017, Sierra Metals continues with insertion of duplicates, but only core duplicates. A total of 25 core duplicates have been included, which does not allow for adequate monitoring of sampling precision.

This type of duplicate should be assayed at the same time as the normal samples. Sierra Metals is sending core duplicates to a secondary lab, which adds differences caused by laboratory drift, instrument set up etc., therefore these duplicates may be of limited use in determining sampling precision and sample representativity.

In the case of core duplicates, ideally these should be similar in mass to a normal sample, should be taken as ½ half core as a duplicate and the other half as an original simple. SRK notes that quarter core can be difficult to sample correctly, especially if mineralization is controlled by structure. In this case, this procedure is likely adding more variability to the results and the sampling precision would be compromised.

The 2017 data have been plotted, using a general rule of differential limits according to the type of duplicate, as follows: pulp duplicates is 10%, coarse reject duplicates is 20% and for the data available in this case of core duplicates is 30%. This is shown for Ag in Figure 11.10, Figure 11.11, Figure 11.12.



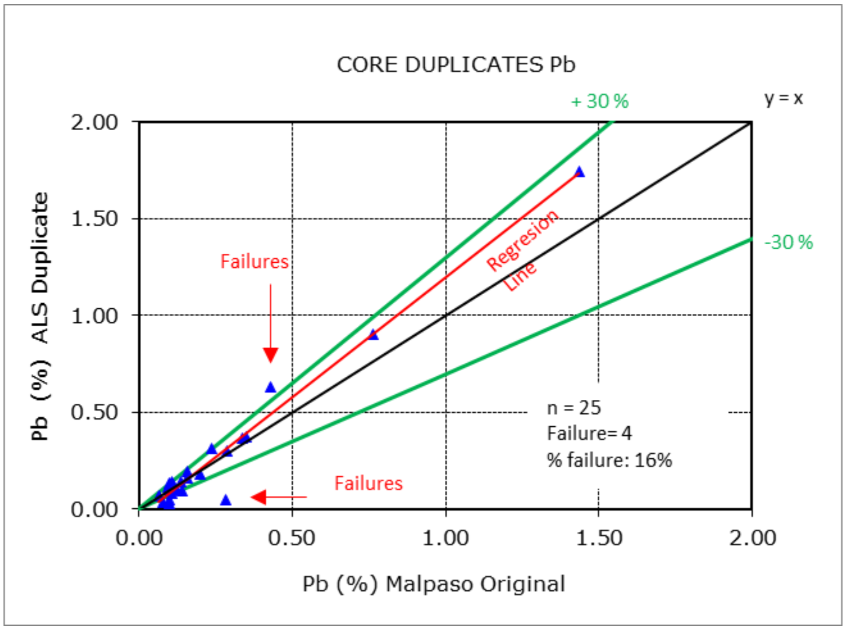
Source: SRK, 2017

Figure 11-10: Core Duplicates Analysis for Ag - 2017 Program

A total of 25 core duplicates have been inserted, with 9 samples with Ag grade below the detection limit of Malpaso, which does not allow comparison with ALS. Considering the remaining 16 samples, only 2 failures were observed using 30% acceptance limit.

There are very few samples to graph in order to evaluate precision, but in general good performance is observed. The proper insertion frequency is not being performed or the insertion rate of duplicates was recently resumed.

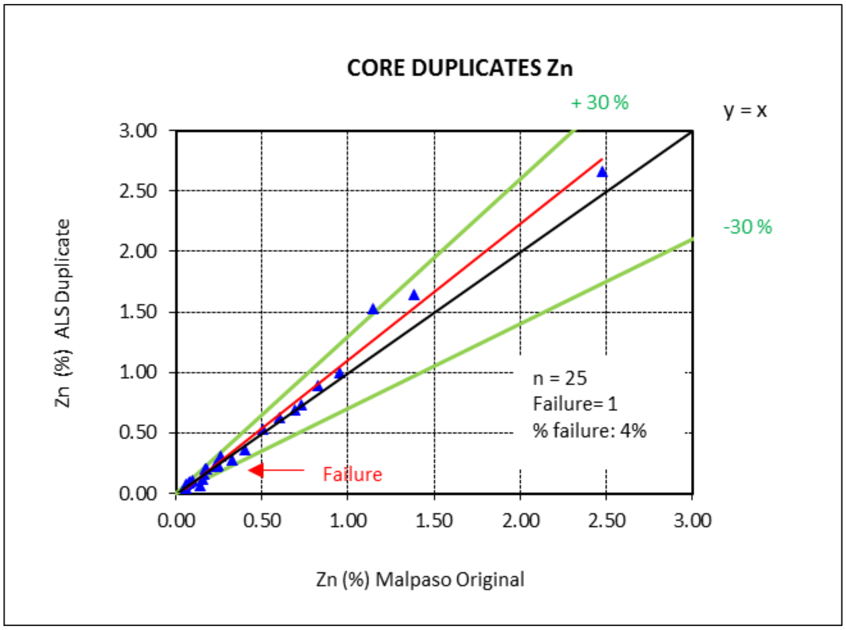
Considering a total of 25 core duplicates, 4 failures are observed for Pb, using 30% acceptance limit, with a 16% failure rate with a trend towards ALS Duplicate, shown in Figure 11-11.



Source: SRK, 2017

Figure 11-11: Core Duplicates Analysis for Pb - 2017 Program

Considering a total of 25 samples, good performance for Zn is observed, with only one failure based on a 30% acceptance limit, with a 4% failure rate, shown in Figure 11-12.



Source: SRK, 2017

Figure 11-12: Core Duplicates Analysis for Zn - 2017 Program

11.5 Opinion on Adequacy

In previous evaluations of the QA/QC program, it has been indicated that inconsistencies are observed in the performance of the blanks, standards and duplicates, mainly explained by failures in the Malpaso laboratory.

Some improvements have been made in the Malpaso lab where the crushing and analysis is performed to select the core samples to be send to ALS. The lab does not fulfill all the requirements of a ISO certified laboratory. The preparation and quality control of the samples have shown good performance on the new blanks, reference materials and duplicates.

All the core sample preparation process of samples supporting the mineral resource estimation should be done in an ISO-certified laboratory such as ALS Minerals and avoid using Malpaso lab for the crushing process.

Additionally, the use of new certified standards and blanks gives greater reliability to the processes monitoring preparation and analysis of samples in the laboratory, and this is reflected in the results of the CRM, which indicated good performance of the analysis procedures, where all samples returned grades within the accepted limits.

In spite of the progresses, it is recommended to improve the insertion rate of the controls, because the available controls are insufficient to make a real evaluation of the precision and accuracy in all the ranges of grades present in the area.

Different types of controls as part of a typical QA/QC protocol on the mining industry are not being used consistently, such as coarse duplicates, fine duplicates and external intra-lab duplicates, which are important in order to monitor the sampling processes.

SRK recommends that Dia Bras improve the insertion rates of QA/QC, implement all the corrective actions on the failures and include other control samples as noted above.

It is also suggested to carry out a QA/QC training of the exploration team of Cusi to clearly understand the objectives and the concepts behind the quality control and quality assurance procedures.

12 Data Verification

12.1 Procedures

The data supporting the mineral resource estimation for Cusi has been validated in a number of ways by previous workers as well as SRK. Detailed descriptions of these validations are found in Gustavson's 2014 report, and are material to the consideration of the deposit as a whole. Since these validations were performed, SRK notes that Cusi has implemented marked improvements in things like the location of drillholes and downhole surveys, which were issues in previous reports.

SRK visited the mine in 2016 and 2017 and was able to access the mine workings, reviewing estimated vein thicknesses and grades in the mine and finding them appropriately stated. In addition, SRK witnessed the collection of channel samples as well as underground drilling at Cusi and noted these to be consistent with industry standards.

12.1.1 Database Validation

As a part of this mineral resource estimation, SRK also reviewed the drilling database against ALS Minerals assay certificates. In 2016, a selection of ALS analytical certificates was selected at random from the files provided to SRK by Dia Bras, and these were compared back to the drilling database. This represented a total number of samples of 1,467, which only represents about 2.6% of the drilling database. SRK does note that all samples reviewed from the certificates matched the database exactly. In 2017, an additional random selection of 350 sample analyses were checked by SRK and 100% of the results matched the database used for the estimation.

In 2016, and due to the historic performance of the QA/QC and the intra-lab data between ALS and Malpaso, SRK recommended that a series of re-analyses were run in areas which were judged to be critical to the mineral resource work completed in that year. The purpose of this was to obtain a separate selection of samples, taken from core or coarse reject material that could be submitted to ALS (and hadn't been previously) along with appropriate QA/QC to support the mineral resource where previously the only support had been from Malpaso. In total, this small program featured 233 samples from various areas of Cusi, across grades ranging from 0.2 g/t Ag to over 3,700 g/t Ag. Duplicates, blanks and standards were submitted with these samples, and show reasonable performance across all grade ranges.

However, the intra-lab check samples did not show close agreement to expectations for the analysis quality and data between labs. For this small subset of samples, Malpaso reported an average Ag of 142 g/t Ag compared to 111 g/t Ag from ALS. Although some of this is related to the Malpaso lab's inability to report grades less than 20 g/t Ag, there are several intervals where Malpaso reported very high grades, in excess of 500 g/t Ag, where ALS reported less than 20 g/t Ag. Although it is also possible that this is related to the highly variable nature of the mineralization at Cusi and its representation in split core halves, SRK would expect an average that is more similar between the two labs. SRK does note that, in general, the higher-grade samples occurring in a sequence of similar samples are repeated between the labs.

12.2 Limitations

No external auditor or consultancy, including SRK, has validated 100% of the database to date with independent samples or third-party laboratory checks.

12.3 Opinion on Data Adequacy

SRK notes that the database validation against provided certificates shows excellent agreement, but that the results of the intra-lab comparison carried out in 2016 showed significant variation. This, combined with other factors such as the lack of consistent down hole deviation make the data sufficient for reporting of Indicated and Inferred resources only in most of the areas.

The drilling campaign performed in 2016 and 2017 was focused in SRL - San Nicolas and in select parts of Promontorio group of veins, and was developed using improved QA/QC procedures, and appropriate down hole deviation measurements. Some of the resources In SRL veins were classified as Measured in this study. The other areas of the project do not include Measured resources due to the data confidence issues mentioned previously.

13 Mineral Processing and Metallurgical Testing

13.1 Testing and Procedures

Cusi's Malpaso mill facilities include the upgraded metallurgical laboratory. Sampling and testing is executed on an as-needed basis to support the industrial scale operation. No detailed metallurgical testwork results are available for the areas being mined.

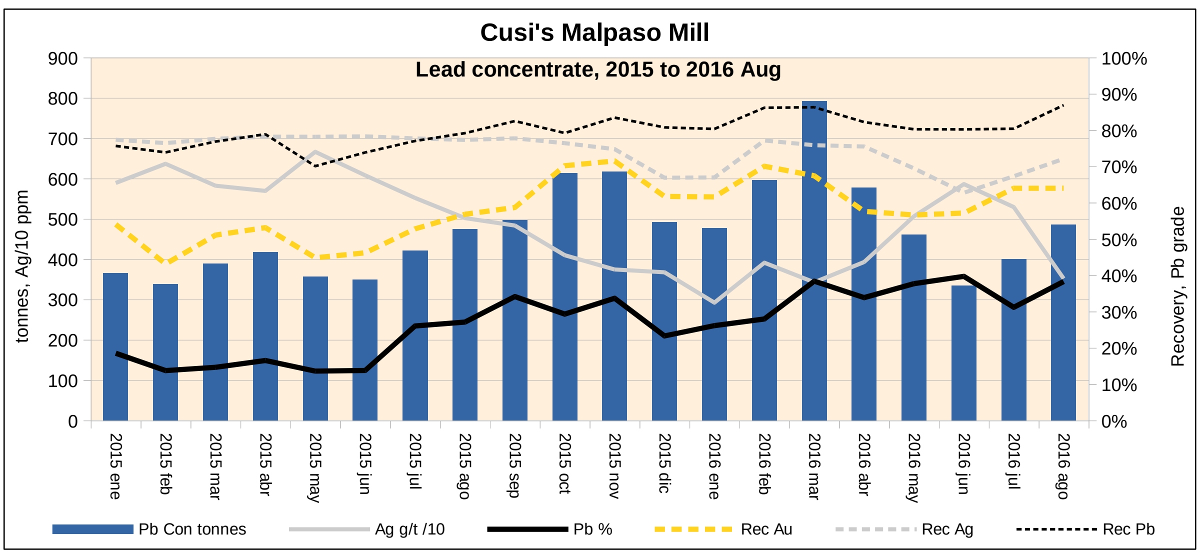
13.2 Recovery Estimate Assumptions

13.2.1 2015 January to 2016 August

Metallurgical performance at Malpaso shows a steady improvement in the 2015 January to 2016 August period. While initially producing lead concentrate only, Malpaso started a separating and producing zinc concentrate since 2015 December.

Metal recoveries to lead concentrate (Figure 13-1) appear consistent with an upward trend for the period in question as follows:

- Lead metal recovery initially in the 75% to 80% range has improve to values ranging from 80% to 88%. Lead grade in concentrate has been improved over time, and is approaching 40% which is in the lower end of a typical commercial quality lead concentrate.
- Silver metal is preferably deported to lead concentrate reaching recovery ranging from 70% to 80%. For the period in question, silver grade in lead concentrate is ranging from approximately 3,000 g/t to 7,000 g/t.
- Other metals in lead concentrate include gold with concentration ranging approximately between 4 g/t to 7 g/t which is above the typical payable grade in lead concentrates. Since Cusi started producing zinc concentrate, zinc metal concentration in lead concentrate ranges between 6% and 10% which is possibly translating to a penalty. No deleterious metals are present in concentrations high enough to translate into penalty payments.

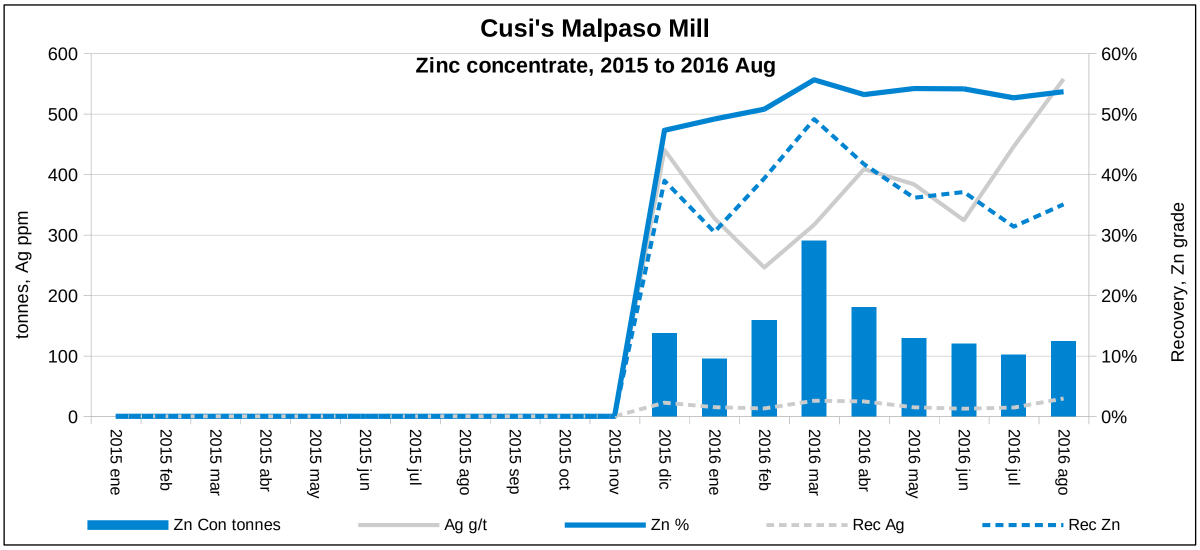


Source: Dia Bras, 2016

Figure 13-1: Lead Concentrate Tonnes and Grades

Deportment of metals to zinc concentrate (Figure 13-2) shows zinc recovery ranging approximately from 30% to 50%, and reaching grade consistently above 50%.

Silver deportment to zinc concentrate is in the range of 1% to 3% and its grade reaches 300 g/t to 560 g/t which is within commercially payable range.



Source: Dia Bras, 2016

Figure 13-2: Zinc Concentrate Tonnes and Grades

Based on the performance of the Malpaso Mill in 2016, the projected production from the mill in 2017 is as summarized in Table 13-1. SRK notes that this information is provided by Dia Bras and is based on actual recoveries from the existing mine, projected using the expected tonnes and grades from their operational plan. SRK notes that the head grade for Au is more than 2X less than the lower limit of detection for the Malpaso analytical laboratory.

Table 13-1: Projected Metallurgical Balance for Malpaso Mill – 2017

Metallurgical Balance			Assays				Recovery %			
Type	**Tonnes**	**%**	**Au (g/t)**	**Ag (g/t)**	**Pb (%)**	**Zn (%)**	**Au**	**Ag**	**Pb**	**Zn**
Head	221,000	100	0.18	184.3	0.89	1.04				
Conc. Pb	6,305	2.85	3.21	4,785.3	25.38	5.00	52.04	74.07	81.00	59.26
Conc. Zn	2,718	1.23	0.50	350.0	1.26	50.00				
Final Tails	211,977	95.92	0.08	45.3	0.16	0.29				

Source: Dia Bras, 2017

13.2.2 January to December 2017

During the second half of 2017, the Dia Bras metallurgical team implemented the following improvements in the processing plant:

- Material classification in the primary crusher stockpile to reduce variability of the mineralized material;
- Use of minimal lime dosing in the mill to improve the absorption of the chemical reagents;

- Enhance of the water use in the milling process to raise the milling grade above the 60% minus 200 mesh;
- Reagents dosing in the rougher-scavenger flotation stage.

These changes resulted in better metallurgical recoveries for the mineralized material mined at Cusi. The table 13-2 presents the Cusi metal recoveries obtained in the plant for the period January-December 2017.

Table 13-2: Cusi Metallurgical Recoveries– January – December 2017

Product	Metallurgical Recovery (%)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Ag	58.74	66.26	58.98	61.94	67.03	60.31	79.42	83.6	82.97	86.17	86.62	87.36
Pb	75.97	84.63	81.91	83.21	71.22	69.17	79.33	86.29	84.82	87.79	89.8	86.99
Zn	24.2	53.65	34.8	48.51	34.93	46.42	47.83	55.8	48.81	52.47	47.73	36.38
Au	51.1	63.95	61.12	58.06	65.68	59.1	50.32	58.01	58.53	61.58	56.06	59.27

Source: Dia Bras, 2017

The average recoveries in 2017 were 58.41% for Au, 70.34% for Ag and 81.14% for Pb. The average grades of the Lead concentrate were 4.88 g/t Au, 3,949 g/t Ag, 29.41% Pb and 8.74 % Zn.

14 Mineral Resource Estimate

The estimation presented in this report is an update of the previous estimation carried out by SRK. The new drilling was primarily focused on the area of SRL – San Nicolas area and some few holes intersected few mineralized structures of the Promontorio Area. The veins were re-modeled by the geology staff of Dia Bras using the new data to update the 3-D geological model.

The previous estimation was completed by Matthew Hastings, Senior Consultant, SRK Consulting (U.S.) Inc. conducted the resource estimation for the San Juan vein. Bart Stryhas, Principal Consultant, SRK Consulting (U.S.) Inc., conducted the resource estimation for the Santa Eduwiges veins, Candelaria veins, and Durana veins. This was done using a combination of mining software including Leapfrog Geo ™, Maptek Vulcan™, and statistical analysis software such as Snowden Supervisor™ and X10 Geo™. Methods and validations for these estimations are detailed in the previous 2017 technical report, and are not necessarily detailed herein.

Giovanny Ortiz, Associate Geologist of SRK Consulting (U.S.) conducted the updated the resources for August 31, 2017 for the SRL veins (SRL, SRL_ALT_1, SRL_ALT_2, SRL_ALT_3 SRL_ALT_4 and SRL_ALT_5), San Nicolas vein, and the mineralized structures of the Promontorio area. The methodology and validations for this update are summarized below, and are similar to those provided in the previous technical report.

14.1 Drillhole Database

The drilling and channel sample databases are kept in separate Microsoft Excel files with six tabs for drill collars, surveys, lithology, geotechnical parameters, geochemistry, and assays. The lithologies logged are used in combination with the assay data to identify mineralization for the geologic model. Geotechnical parameters are recorded for drilling and features rock quality designation (RQD), and recovery. Both geochemistry and assays feature the analyses for the primary elements to be reported at Cusi (Ag, Au, Pb, Zn), but the assays feature only these assays plus Cu, Fe, and Mn. The geochemistry table also features other elements that have been analyzed for a small percentage of samples for other purposes.

The drillhole and channel assay database was provided to SRK by Dia Bras on November 15, 2017. It features both drilling and channel samples which are updated to August 31 of 2017. The final database contains over 65,000 assays from drilling and over 36,000 from channel sampling. The two data sets have been merged for the purposes of statistical analysis and estimation. The distribution of samples between types and elements is summarized in Table 14-1.

Table 14-1: Summary of Sample Counts by Type

Element	Drill Assays	Channel Assays
Ag	65,563	38,684
Au	50,912	36,956
Pb	65,039	39,797
Zn	65,633	39,796

Source: SRK, 2017

The database features incomplete analyses for Au compared to the other elements, which are relatively consistently analyzed for all intervals. The reason for the partial Au assays is unclear, but is likely related to older analyses not using fire assay or inability to transcribe from historic assay sheets.

SRK assigned a value of 0.001 to any element with missing assays. Cu is also partially assayed at Cusi, but features comparably fewer missing assays than the Au, and is generally quite low grade. Cu was not used in the estimation for Cusi.

SRK notes that the database contains several drillholes that have no assay intervals due to lost data or other doubts regarding data accuracy. In some cases, Dia Bras has used these to guide the geology model, but they have been ignored for the purposes of the estimation. Any other missing or unsampled intervals in the drilling are given a value of 0 for all elements, on the assumption that the geologists logging did not identify any mineralization or alteration of interest in the rock. SRK notes that, due to the aforementioned inaccuracy of some of the unsurveyed drilling, that these unsampled intervals may cut through historic areas of production, and would artificially bias the grades low.

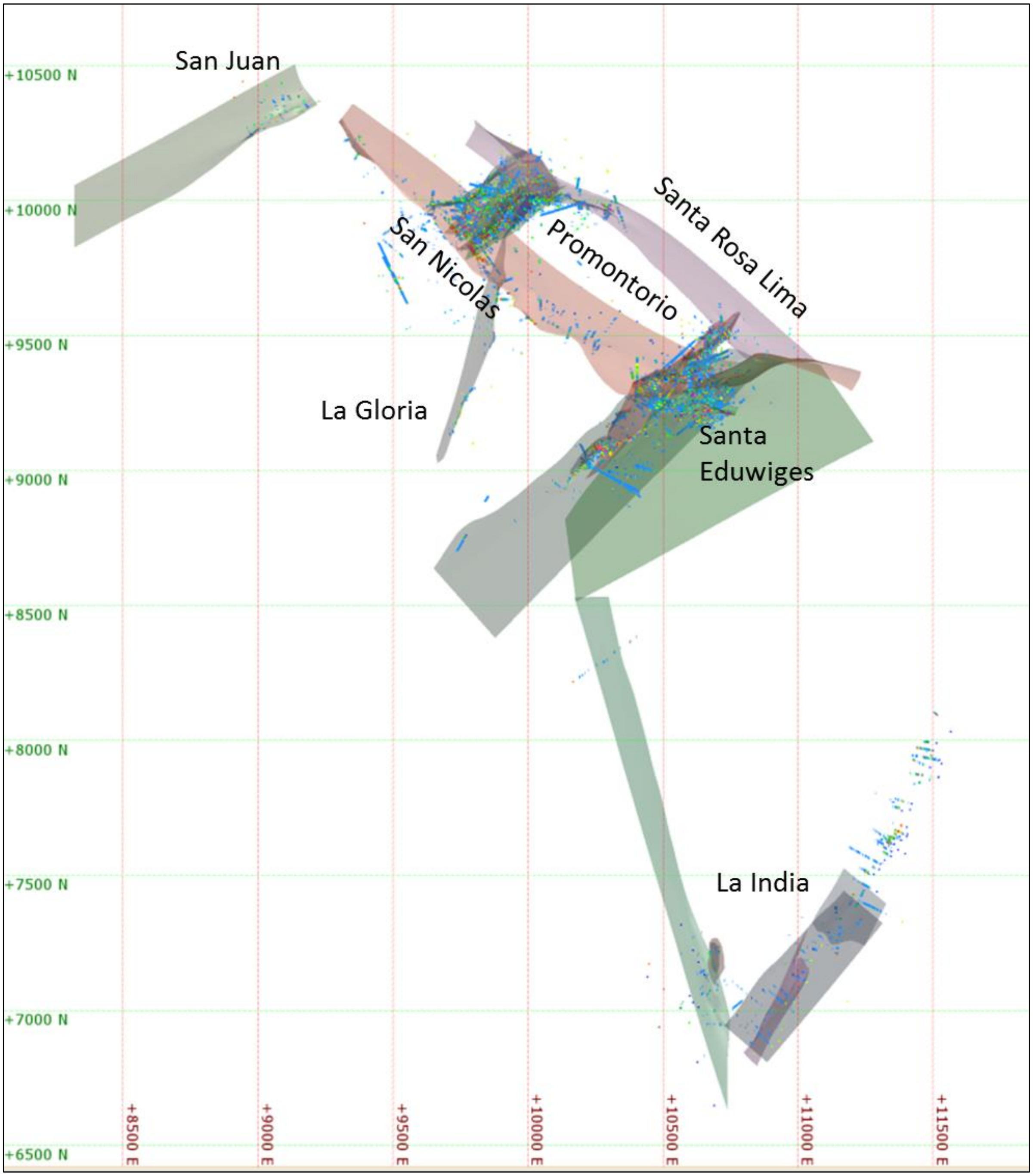
14.2 Geologic Model

The updated three-dimensional wireframe models for the Cusi veins were constructed by Dia Bras using Leapfrog Geo™ software. SRK reviewed the Leapfrog project files. The geology models are developed on a combination of geology codes and Ag grades, and effectively are built using hanging wall and footwall surfaces derived through selection of these points in the drilling and channel sample database, with subsequent interpolation of the points into 3D surfaces and volumes.

There are five mineralized areas within the greater Cusi area (Figure 14-1), defined based on similarity of mineralization or orientation of structures. These areas were used to define capping limits, on the assumption that all mineralization within the area is related to the same processes, based on the cross-cutting relationships of the veins. Within these areas, the geologic model defines 33 separate structures or stockwork zones (in the case of Azucarera), all of which are considered discrete domains for the purposes of resource estimation. The volumes defined in the geologic model serve to constrain and guide the estimation. Descriptions of the areas, resource domains, and general geology are summarized in Table 14-2.

Examples of the geology models are shown in Figure 14-2, Figure 14-3, and Figure 14-4.

SRK notes that the surveyed channel samples play a critical role in modeling of the mineralized structures. Where an unsurveyed drillhole intercept does not align with the projection of the vein from nearby channel samples, the drillhole intercept is ignored in favor of the geometry from the mine workings. Dia Bras and SRK agree the working are more accurate than the drilling in these cases. The net result of this is improved and valid vein geometries but locally includes samples within the vein that may not be within the vein due to the deviation from the drillhole that was not measured. This generally occurs in the vicinity of previous production as all new drillholes are being surveyed and appear to track well with the projection of the veins from the mine workings.



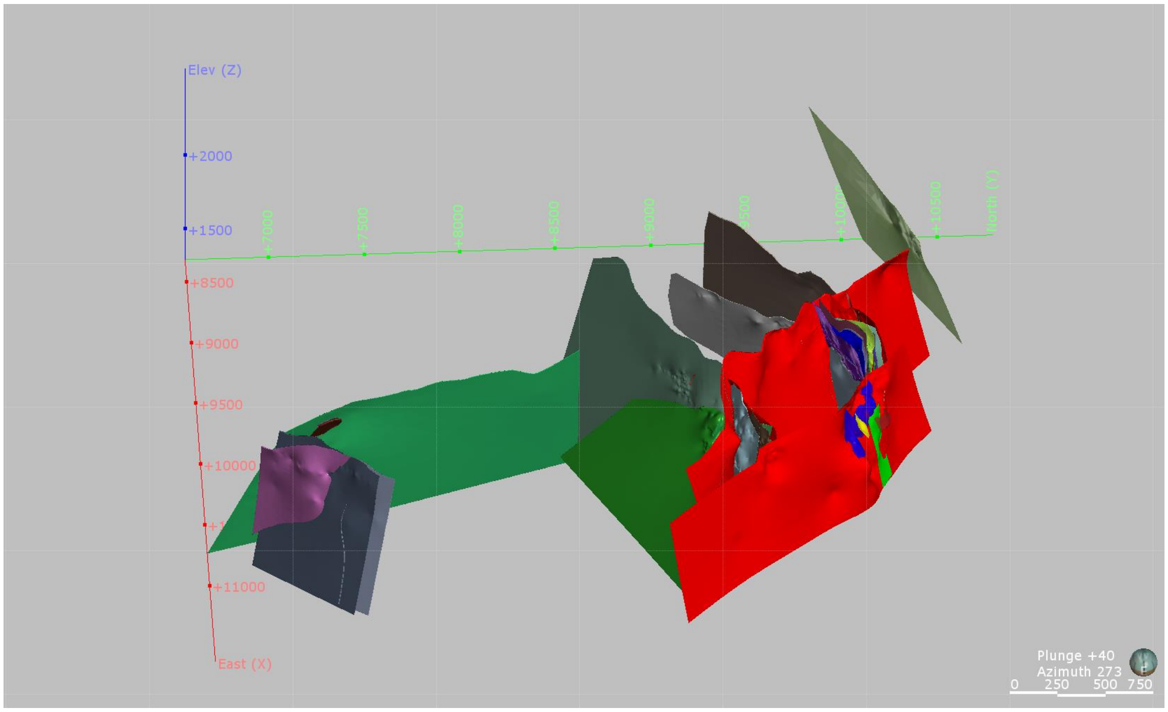
Source: SRK 2017

Figure 14-1: Plan View of Areas within Cusi District

Table 14-2: Summary of Project Areas and Relationships to Resource Estimation Domains

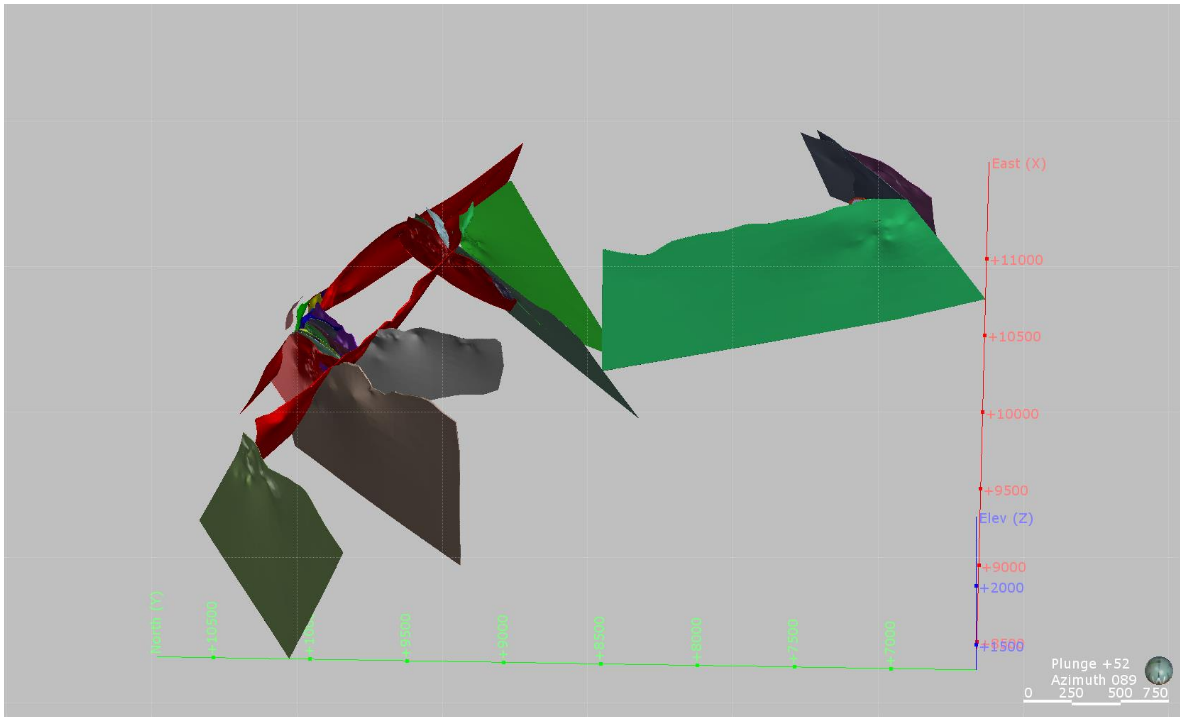
Area	Veins	Description
Promontorio	Alto El Gallo Bajo L El Gallo El Gallo Bajo H J K K' L L' Promontorio V1 V2 VBP Azucarera San Juan	Anastomosing sequence of NE-trending steeply dipping veins, locally appearing stacked or sheeted. Numerous crossings and truncations within the sequence. Locally featuring extraneous stockwork zones or splay structures, which may not be defined in drilling. The Azucarera domain is a stockwork zone which has been accessed by workings and appears to be related to the intersection of multiple structures. Truncated to the north and south by the SRL and San Nicolas structures respectively. Explored extensively through drilling and exploration/development drifts. Primary production source.
Eduwiges	San Antonio San Bartolo Santa Marina Mexicana Milagros Milagros Ramal 1 Moctezuma Portilla	Series of moderately to steeply dipping veins with variable strike trends. Thicknesses vary dramatically. The majority trend NE similar to Promontorio, but local cross structures are orthogonal. Some structures appear to be related to the trend of the San Nicolas vein, while others are perpendicular and appear to cross San Nicolas. All appear truncated by the SRL structure to the north. Extensively explored through drilling and exploration/development drifts. Primary production source.
San Nicolas	San Nicolas SRL SRL_Alt_1 SRL_Alt_2 SRL_Alt_3 SRL_Alt_4 SRL_Alt_5	Two anastomosing NW/SE trending, steeply-dipping structures with the most significant strike length of the modeled veins. Appear to truncate most structures, although others have been demonstrated to cross San Nicolas with small (5 to 10 m) offsets. Significant potential for exploration and addition of resources. Features drilling and limited channel sampling along development drifts. Primary production source.
La India	Candelaria 1 Candelaria 2 Durana Durana Ramal 1 Durana Ramal 2 20 de Noviembre	Two sets of variable thickness and orientation veins with NW/SE trends (Durana) and NE/SW trends (Candelaria) to the extreme south of the project. Although generally lower grade, there are selected areas of very high-grade mineralization noted. Exploration is not as extensive as other areas, and is based almost exclusively on drilling. No production of note.
La Gloria	Minerva	Anasotomosing NE/SW trending steeply-dipping vein to the south of the San Nicolas vein. Dominantly explored via exploration drift. Limited production.

Source: SRK, 2017



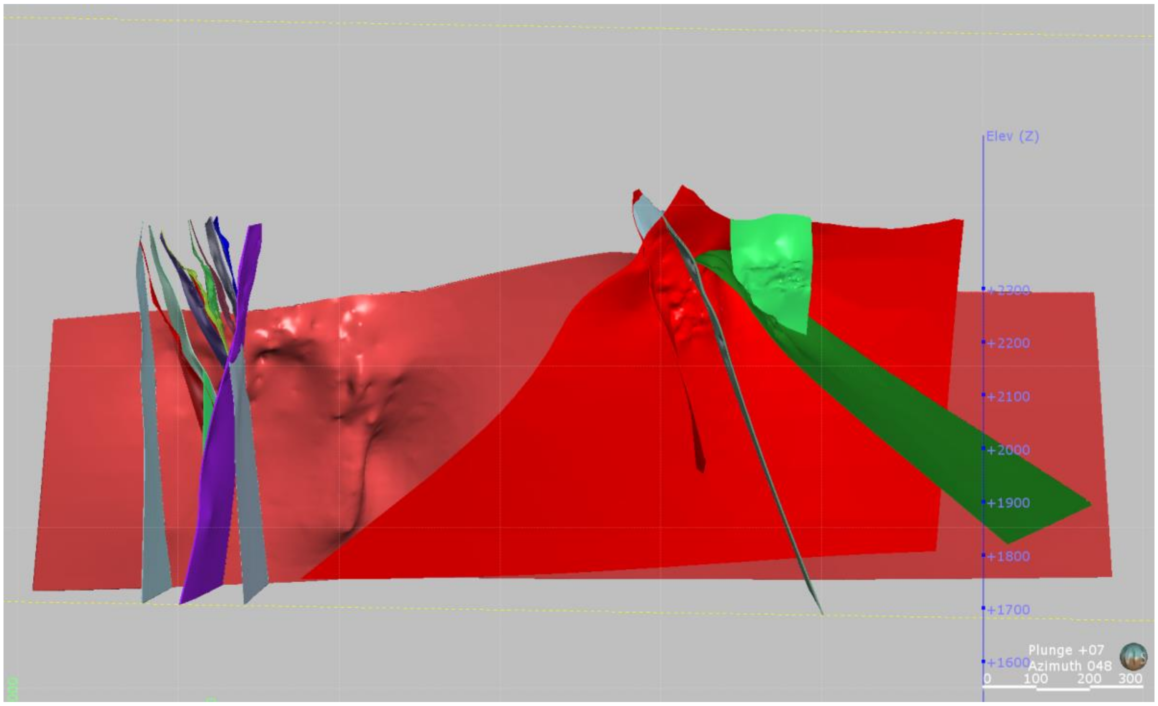
Source: SRK 2017

Figure 14-2: Oblique View of the Cusi Geologic Model



Source: SRK 2017

Figure 14-3: Oblique View of the Cusi Geologic Model, Looking East

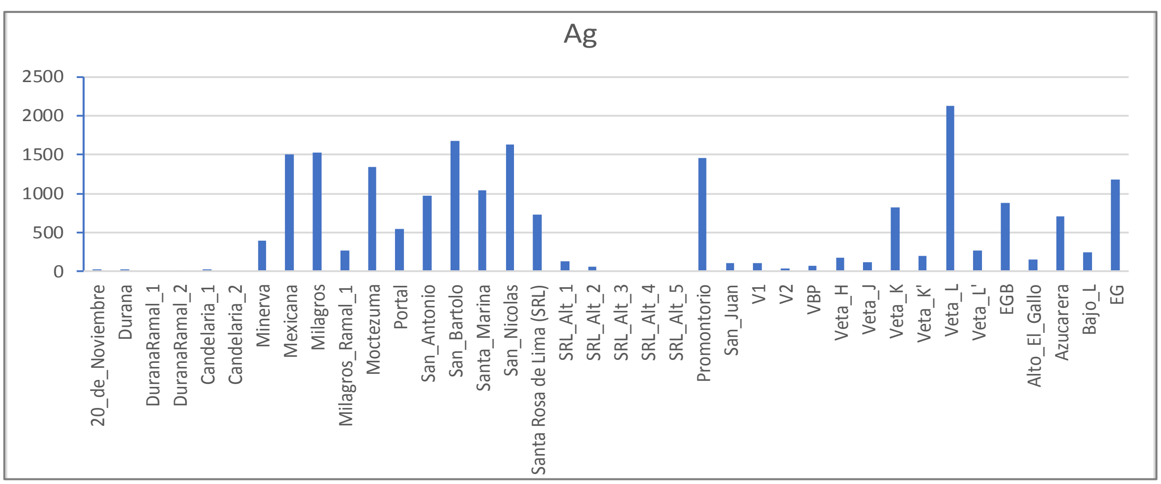


Source: SRK

Figure 14-4: Northeast Cross-Section Through the Cusi Geologic Model, Showing Complex Vein Interactions

14.2.1 Domain Analysis

SRK considered each vein its own domain for the purposes of statistical analysis and estimation. As shown in Figure 14-5, the number of samples per vein domain are highly variable, influenced largely by the amount of channel sampling in development along structures.



Source: SRK, 2016

Figure 14-5: Sample Count by Vein Domain

The individual resource domains also feature a wide range of grade distributions. The mean grades for each element by vein are shown in Table 14-3. As shown, Ag is the obvious and most dominant contributor to the economic value of the mineralization. Veins in the Eduwiges area commonly feature more base metals than others.

Table 14-3: Grade Means by Structure

Name	Mean Ag	Mean Au	Mean Pb	Mean Zn
All	233.1	0.30	0.81	0.86
Alto El Gallo	125.0	0.02	0.13	0.22
San Antonio	229.3	0.20	1.58	1.92
Azucarera	288.5	0.10	0.28	0.31
Bajo L	134.7	0.05	0.19	0.23
San Bartolo	271.4	0.32	1.56	1.06
Candelaria 1	123.4	0.06	0.25	0.38
Candelaria 2	153.6	0.19	0.58	1.07
Durana	63.7	0.04	0.15	0.16
Durana Ramal 1	132.3	0.07	0.02	0.01
Durana Ramal 2	156.8	0.06	0.05	0.02
El Gallo	270.1	0.50	0.34	0.40
El Gallo Bajo	269.2	0.17	0.29	0.35
H	204.0	0.10	0.29	0.29
J	177.0	0.04	0.20	0.27
San Juan	152.2	0.35	0.11	0.13
K	276.9	0.09	0.42	0.42
K'	195.6	0.08	0.21	0.22
L	371.5	0.12	0.32	0.34
L'	145.0	0.07	0.26	0.32
Santa Marina	201.2	0.31	1.29	1.06
Mexicana	160.1	0.36	1.16	1.77
Milagros	220.9	1.62	1.28	1.67
Milagros Ramal 1	133.0	0.52	0.85	1.30
Minerva	93.9	0.22	0.08	0.04
Moctezuma	150.3	0.22	3.05	2.93
San Nicolas	292.4	0.27	0.48	0.45
20 de Noviembre	45.3	0.02	0.22	0.27
Portilla	301.4	0.33	1.72	1.37
Promontorio	233.3	0.08	0.36	0.33
SRL	247.4	0.22	0.66	0.84
SRL_ALT_1	203.8	0.14	0.39	0.37
SRL_ALT_2	160.9	0.20	0.23	0.26
SRL_ALT_3	216.5	0.20	0.98	0.48
SRL_ALT_4	340.1	0.12	0.26	0.38
SRL_ALT_5	103.9	0.04	0.19	0.15
V1	165.4	0.03	0.28	0.29
V2	136.2	0.08	0.47	0.48
VBP	145.8	0.20	0.34	0.40

Source: SRK, 2017

14.3 Assay Capping and Compositing

In order to minimize the variance in the estimation due to inherent variability in grade distributions within domains and provide a more homogenous data set for estimation, SRK used capping of high grades as well as compositing of sample lengths.

14.3.1 Outliers

SRK limited high grade outlier samples by capping the maximum grades for each area, and limiting samples above the cap to the grade of the cap. Capping analysis was done on the raw sample data, evaluating each data set by relevant area of mineralization and using only the assayed samples. Capping was not reviewed for every individual vein, as the paucity of sampling for many of the veins did not yield appropriate populations for statistical analysis. Thus, areas of the model were selected for similarity in mineralization style, orientation, and other parameters that would suggest that the grouped veins were related to a single mineralizing event.

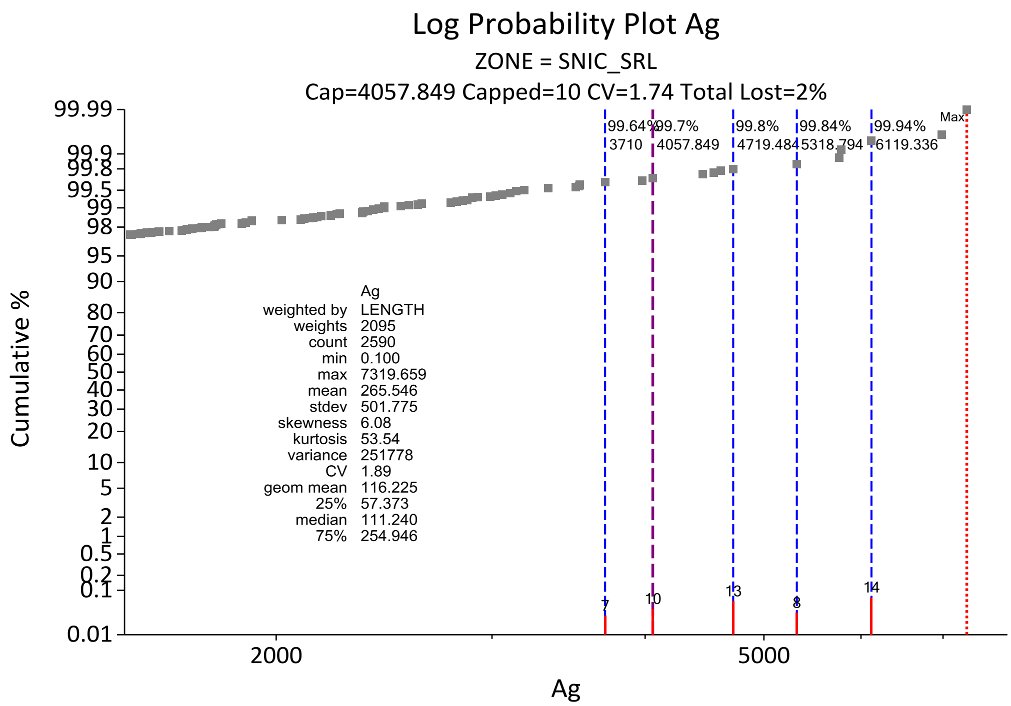
After the data was grouped by these areas, SRK generated log probability plots (to assess the frequency at various grade ranges and evaluate continuity, changes in slope, and other factors that would indicate high grade sub-populations within the domained assay data. As these were identified, sample plots were generated within the domained areas to determine if any high grade continuity could be developed and modeled. In the case of Cusi, the veins are considered highly variable and no significant high grade chutes or zones within the structures were modeled separately. Using the probability plots and statistics of the capping (i.e. percentages of data capped, impact of capping on CV/Mean, total metal lost to capping, etc.) SRK selected appropriate capping limits for each of the areas, as shown in Table 14-4.

Examples of the capping analysis can be seen in Figure 14-6 and Table 14-5.

Table 14-4: Capping Limits Utilized for the Cusi MRE

Area	Capping Limit			
	Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)
Promontorio	3.25	4,000	7	6
Santa Eduwiges	15	4,000	18.5	19
San Nicolas - SRL	3.8	4,058	5.3	6.8
La India	0.5	750	3	4
La Gloria	2.3	500	0.42	0.31

Source: SRK, 2017



Source: SRK, 2017

Figure 14-6: Example Log Probability Plot –San Nicolas – SRL - Ag

Table 14-5: Example Capping Analysis – San Nicolas – SRL - Ag

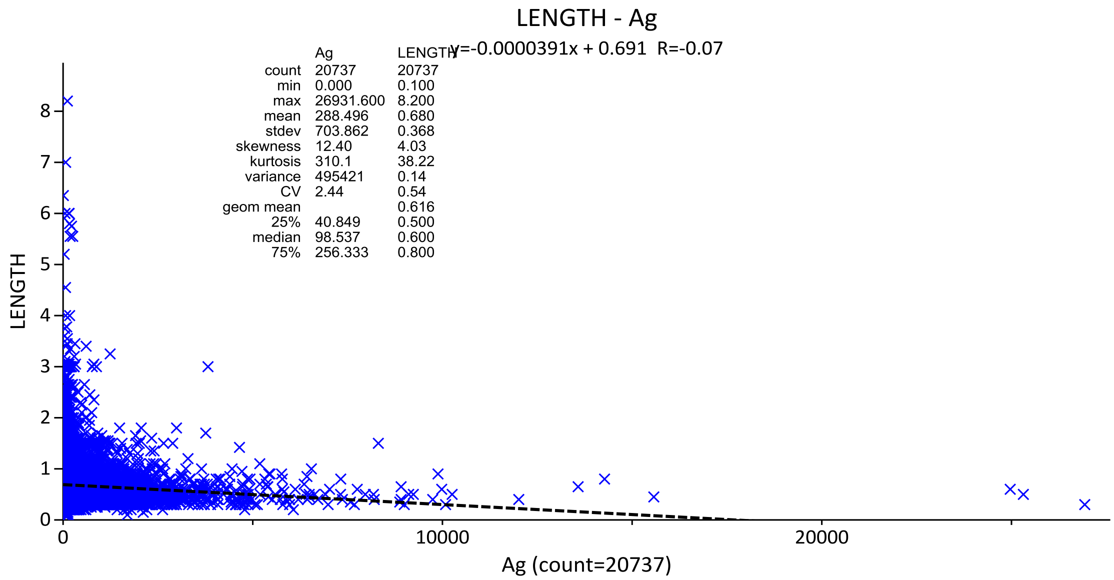
Cap	Capped	Percentile	Capped %	Lost %	CV %	Count	Max	Mean	CV
NA	NA	100%	0.00%	NA	NA	2,590	7,319.659	265.546	1.89
6,119.3	3	99.94%	0.10%	0.27%	1.30%		6,119.336	264.963	1.87
5,318.8	6	99.84%	0.20%	0.70%	3.10%		5,318.794	263.948	1.83
4,719.5	7	99.80%	0.30%	1.20%	5.10%		4,719.484	262.746	1.79
4,057.8	10	99.70%	0.40%	2%	7.70%		4,057.849	260.936	1.74
3,710	12	99.64%	0.50%	2.50%	9.30%		3,710	259.718	1.71

Source: SRK, 2017
Red = Capping Limit

14.3.2 Compositing

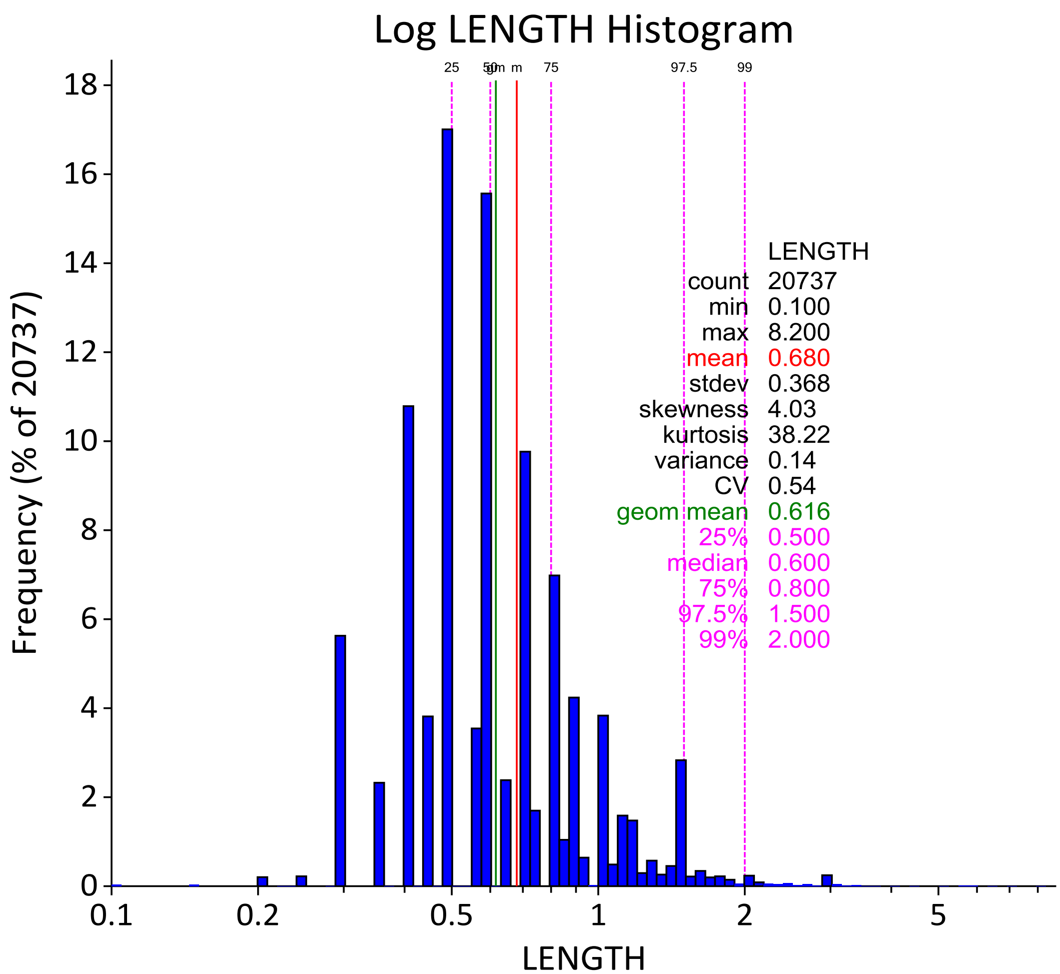
SRK evaluated the sample lengths within the mineralized domains defined by the geological model. The mean sample length within the mineralized domains is 0.68 m, with a maximum sample length of 8.2 m. The mean sample length above the 97.5% percentile is 1.5 m. SRK examined the relationship between sample length and Ag grade to determine if there were significant populations of high grade samples that were greater than 1.5 m. The overwhelming majority of samples with significant grade are in samples where the length is less than 1.5 m as shown in Figure 14-7. SRK notes that there are very few samples that would be affected by a compositing length of 1.5 m that would in turn affect the estimation.

A histogram distribution of sample lengths (Figure 14-8) within the mineralized domains shows that the relative percentages of sample lengths above the 1.5 m composite length is very small. SRK selected a nominal composite length of 1.5 m, retaining short samples for use in the estimation. Any bias due to short samples is handled using length-weighting during the estimation.



Source: SRK, 2017

Figure 14-7: Scatter Plot of Length vs. Ag



Source: SRK, 2017

Figure 14-8: Histogram of Sample Lengths

14.4 Density

Bulk densities are assigned on the basis of the results of specific gravity samples analyzed by the Servicio Geologico Mexicano (SGM) on behalf of Dia Bras. The 11 samples were taken from various areas throughout the Promontorio and Santa Eduwiges areas, but are considered by Dia Bras geologists to be representative of the material types in mineralized areas of all of the Cusi veins. Samples were ground to 100% passing -100 mesh (150 microns) and were analyzed via the use of a pycnometer using ethanol as a solution. Distilled water is used as a reference (0.99712 g/cm3) in the evaluations. The results of this analysis are presented in Table 14-6.

The average density of the samples is 2.73 g/cm^3, and this density was flagged into the block model for use in the resource calculations.

Table 14-6: Results for Density Analyses

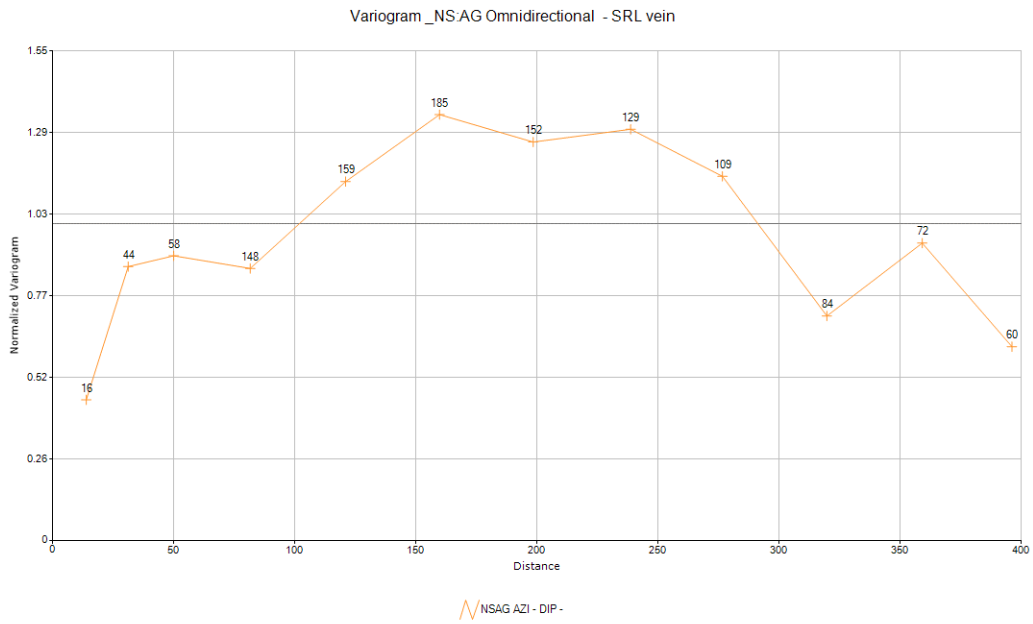
Sample ID	Stope	Area	Vein	Level Elevation	Density (g/cm^3)
1	REB 668	Promontorio	San Nicolas	8 1850	2.71
2	REB 9461	Sta. Eduwiges	Moctezuma	13A 1801	2.98
3	REB 9400	Sta. Eduwiges	Veta B	13 1839	2.69
4	REB 9315	Sta. Eduwiges	San Antonio	15 1769	2.99
5	REB 627	Promontorio	El Gallo	8 1865	2.66
6	REB 9306	Sta. Eduwiges	Sta. Marina	13 1817	2.78
7	REB 786	Promontorio	Promontorio	6 1910	2.68
8	REB 9400	Sta. Eduwiges	Riodacita	12 1839	2.57
9	REB 652	Promontorio	Gallo Back	6 1930	2.63
10	REB 1024	Promontorio	Promontorio	10 1910	2.68
11	REB 1024	Promontorio	Promontorio	10 1910	2.67
Average					**2.73**

Source: Dia Bras, 2017

14.5 Variogram Analysis and Modeling

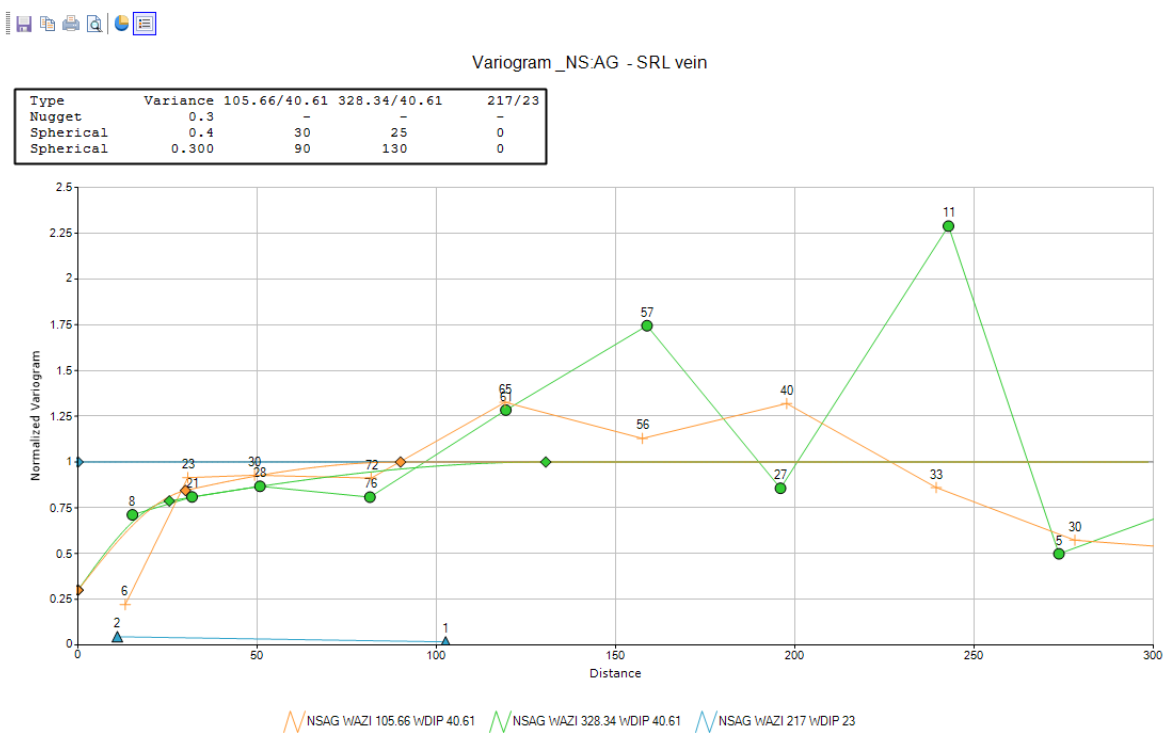
Previous efforts have noted issues with production of good variograms sufficient for informing kriging equations, and SRK's efforts produced similar results. As has been described previously, the inherent local variability in the mineralization and the complex relationships between the veins make assessing continuity through the use of geostatistics very difficult. In addition, the level of domaining that has resulted in the definition of the individual veins means that there are fewer samples within each vein to use for spatial statistical analysis.

With the updated closely-spaced drilling and sampling for the SRL vein, a variogram analysis was performed using the capped vein composites. To perform the analysis, the vein composites were transformed to a normal distribution using the process NSCORE of gslib. The Figure 14-9 shows the variograms obtained.



Source: SRK, 2017

Figure 14-9: Omnidirectional Variogram – Transformed Ag (NScore) – SRL vein composites



Source: SRK, 2017

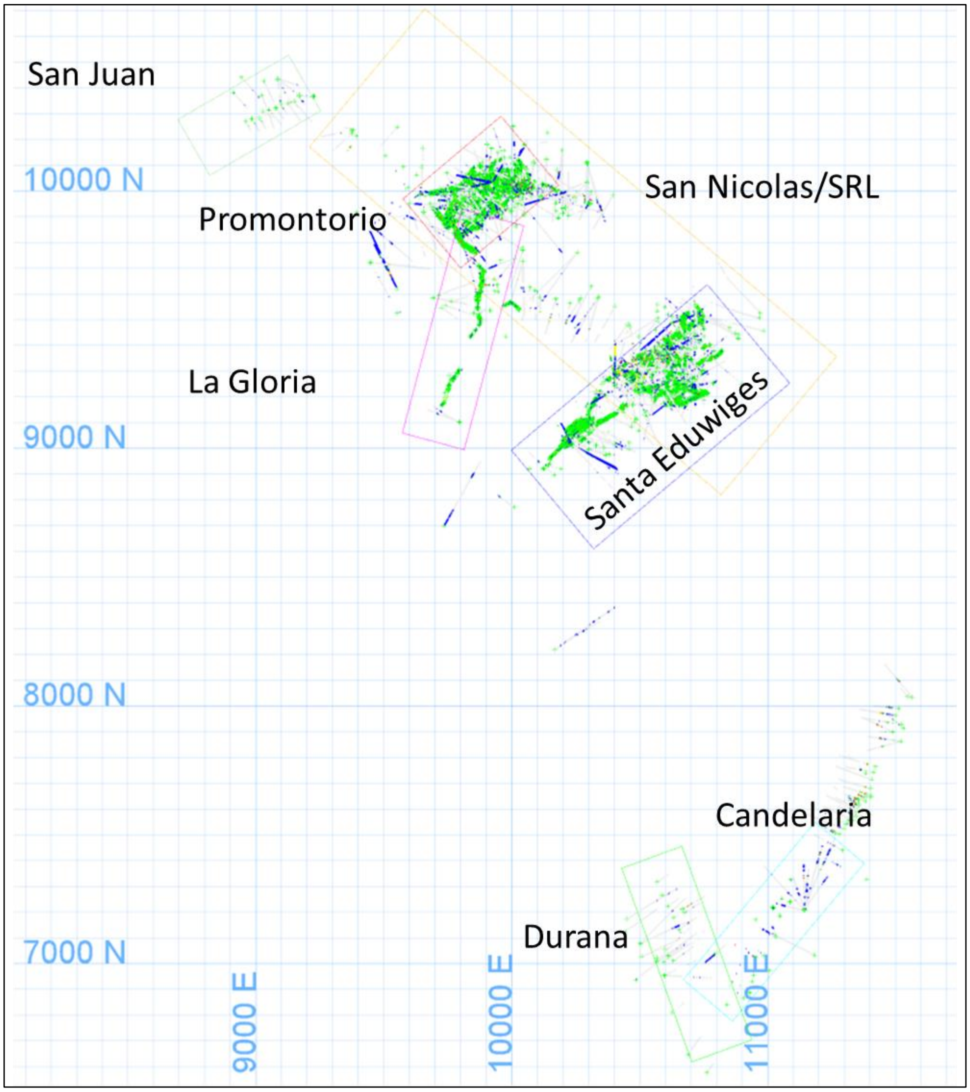
Figure 14-10: Variograms – Transformed Ag (NScore) – SRL vein composites

The variograms obtained (Figures 14-9 and 14-10) show high nugget effect and a rapid reduction of dependence of silver grades as distances increase, forming a first structure in the variogram between 20 to 30 m, and then reaching the sill at approximately 90 m. Strong anisotropy directions were not observed for variogram analysis in this vein.

SRK is of the opinion that the this variogram analysis supports, to some degree, the search distances and classification criteria used in the resource estimation. Besides this, the orientations of continuity are established through the mapped or logged interpretation of the veins, and that the ranges of the estimation should be dependent on the drill spacing, ensuring selection of multiple holes/channel samples from different areas to interpolate grade between these points.

14.6 Block Model

Seven block models were built in Maptek Vulcan™ software and are designed to approximate the orientation of the strike for the major structures contained in each model. The models are rotated about the Z axis (and only the Z axis) and limited to the footprint of the structures contained in each model. The model extents are shown in Figure 14-11. The models are sub-blocked along the mineralized domain margins. Details regarding the block models and their parameters are shown in Table 14-7. All models have been sub-blocked to a minimum of 1 m x 1 m x 1 m with the exception of San Nicolas and SRL, which are sub-blocked to a minimum of 1 m x 0.5 m x 1 m and Promontorio with 0.5 m x 0.5 m x 1 m.



Source: SRK, 2017

Figure 14-11: Block Model Extents and Positions

Table 14-7: Block Model Details

Model	Origin			Bearing	Extents (m)			Numbers of Blocks
	X	Y	Z		X	Y	Z	
Promontorio	9,800	9,700	1,280	50	700	350	1,000	1,884,104
Eduwiges	10,320	8,610	1,380	50	1000	500	1,000	1,065,127
San Nicolas - SRL	9,050	10,220	1,180	130	2700	900	1,100	3,054,452
Minerva	9,814	8,995	1,380	15	900	250	1,000	156,997
Durana	10,430	7,370	1,380	160	800	250	1,000	149,178
Candelaria	10,863	6,776	1,380	40	800	250	1,000	365,489
San Juan	8,820	10,060	1,380	60	500	250	1,000	102,640

Source: SRK, 2017

14.7 Estimation Methodology

SRK interpolated grades for Ag, Au, Pb, and Zn using an inverse distance squared estimation method. In general, a nested three-pass estimation was used with higher restrictions on sample selection criteria in the initial shorter search passes, to less restrictive criteria in the subsequent, larger ellipsoids. Ellipsoid orientations are controlled by the hanging wall and footwall surface of each structure. A flattened "pancake" ellipsoid shape is used to mirror the vein anisotropy, with the orientations varying as a function of the bearing, dip, and plunge of the structure. These three parameters are estimated in to the block model from the hanging wall and footwall surfaces of each vein, using the varying local anisotropy tool in Vulcan. They ultimately control the orientation of the search ellipsoid at each block in the model. In Promontorio and San Nicolas – SRL areas the isotropic ellipsoid was used.

Maximum numbers of samples per hole in combination with sample minimums of 3 ensure that all estimates in the first and second passes must use more than one hole.

The variations in the distribution of samples and the issue of clustering of high grade channel samples is dealt with using an octant restriction on the estimation. This permits a maximum number of samples to be selected from one octant, working with the sample selection criteria to force a minimum number of octants to be used in the estimate. In this way, the amount of data used to estimate from a single area is limited, and other samples must be used from areas that may not be as clustered. SRK implemented this methodology for the estimation on every domain.

SRK varied parameters like the minor ellipsoid ranges, sample selection criteria, and octant restrictions based on performance of the estimation during review of the validation, but notes that the parameters selected are very similar between the individual structures and seem to work well given the wide variety of data spacing. The estimation parameters used for each area are summarized in Table 14-8.

Table 14-8: Estimation Parameters

Promontorio/San Juan	ID2									
Pass	Bearing (Z) (1)	Plunge (Y) (1)	Dip (X) (1)	Major	Semi-Major	Minor	Min	Max	Max/DH	Max/Octant
1	NA	NA	NA	25	25	25	3	16	2	2
2				50	50	50	3	16	2	2
3				75	75	75	1	16	2	NA

Eduwiges	ID2									
Pass	Bearing (Z) (1)	Plunge (Y) (1)	Dip (X) (1)	Major	Semi-Major	Minor	Min	Max	Max/DH	Max/Octant
1	NA	NA	NA	25	25	10	3	16	2	2
2				50	50	20	3	16	2	2
3				75	75	30	1	16	2	NA

San Nicolas - SRL	ID3									
Pass	Bearing (Z) (1)	Plunge (Y) (1)	Dip (X) (1)	Major	Semi-Major	Minor	Min	Max	Max/DH	Max/Octant
1	NA	NA	NA	25	25	25	3	16	2	2
2				50	50	50	3	16	2	2
3				100	100	100	1	16	2	NA

Azucarera	ID2									
Pass	Bearing (Z) (1)	Plunge (Y)(1)	Dip (X) (1)	Major	Semi-Major	Minor	Min	Max	Max/DH	Max/Octant
1	315	-60	0	25	25	5	3	16	2	2
2				50	50	10	3	16	2	2
3				75	75	20	1	16	2	NA

Candelaria Durana	ID2									
Pass	Bearing (Z) (1)	Plunge (Y) (1)	Dip (X) (1)	Major	Semi-Major	Minor	Min	Max	Max/DH	Max/Octant
1	NA	NA	NA	25	25	10	3	16	2	2
2				50	50	20	3	16	2	2
3				75	75	30	1	16	2	NA

Minerva	ID2									
Pass	Bearing (Z) (1)	Plunge (Y) (1)	Dip (X) (1)	Major	Semi-Major	Minor	Min	Max	Max/DH	Max/Octant
1	NA	NA	NA	25	25	10	3	16	2	2
2				50	50	20	3	16	2	2
3				75	75	30	1	16	2	2

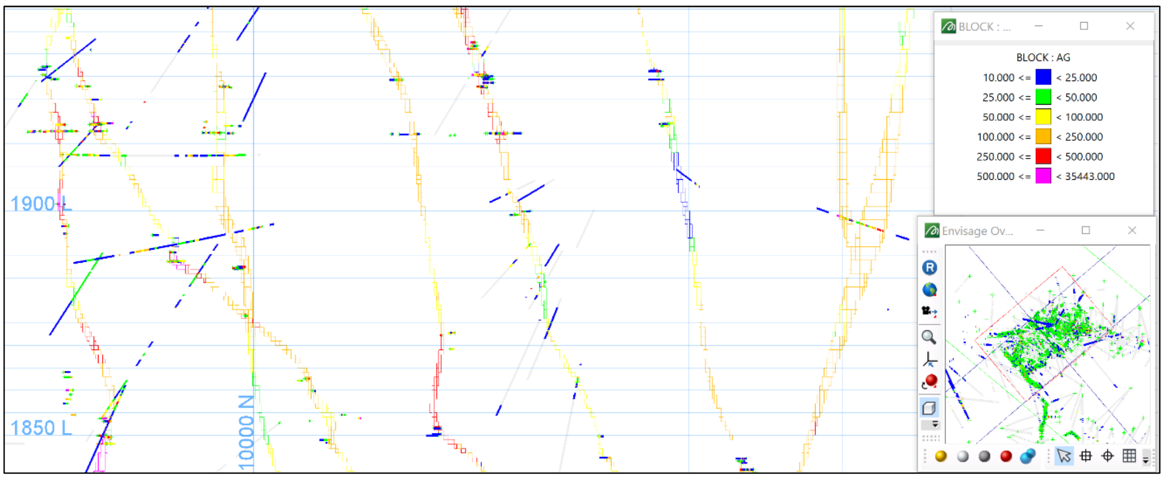
Source: SRK, 2017
(1) Controlled by VLA unfolding using fault block-specific hangingwall and footwall surfaces

14.8 Model Validation

SRK has validated the estimation for each model using a variety of methods considered to be industry standard. These include a visual comparison of the blocks versus the composites, an assessment of the quality of the estimate, and comparative statistics of block vs. composites. As Ag is the primary commodity at Cusi, validation is focused primarily on this rather than the other elements. Cursory validation of the other elements was performed to ensure no material overestimation.

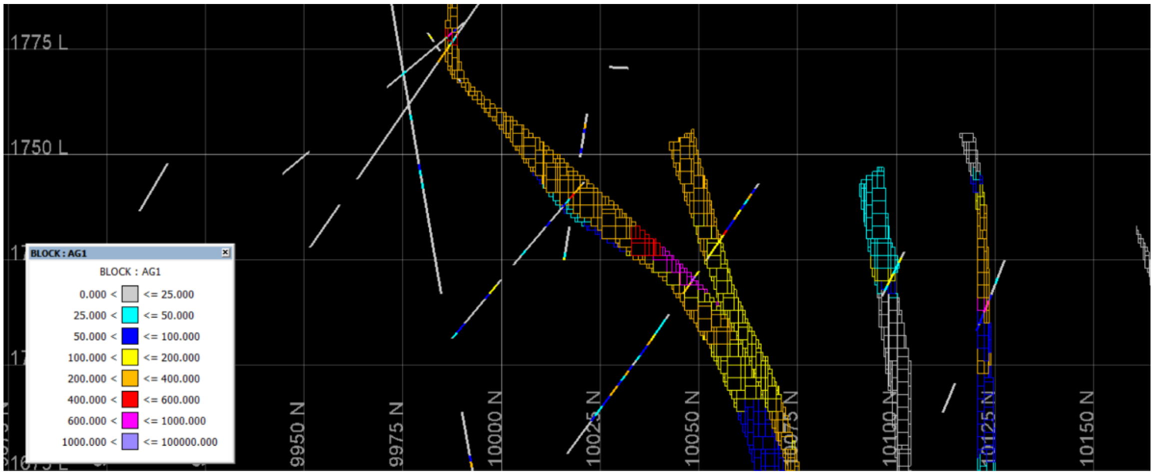
14.8.1 Visual Comparison

SRK reviewed the block estimation visually in comparison with the composite grades to determine any potential for obvious bias. In general, the objective is to identify areas where the composites do not closely approximate the blocks. SRK reviewed all models in this context and noted that they all seem to match the drilling well. Examples are shown in Figure 14-12 and Figure 14-13.



Source: SRK, 2017

Figure 14-12: Example of Visual Validation – Promontorio Area



Source: SRK, 2017

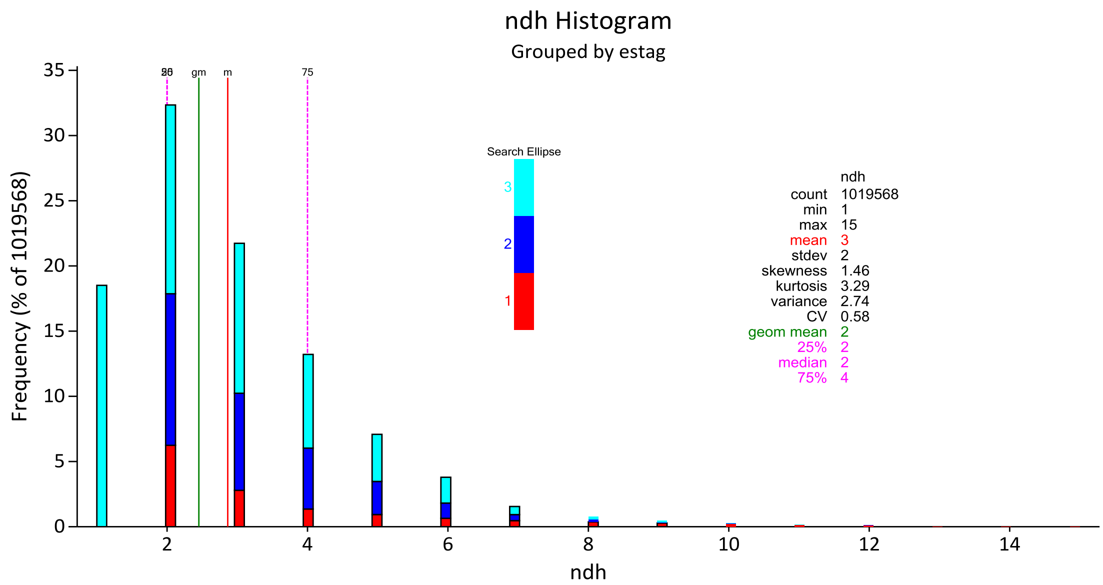
Figure 14-13: Example of Visual Validation – SRL Veins Area

14.8.2 Estimation Quality

SRK reviews the quality of the estimation using a combination of statistical comparisons of the number of holes, samples, and average distances per estimation pass. As the estimation passes are used to help assign confidence to the estimate, it is helpful to understand how much data is being used in the passes to have confidence that the passes are ensuring high quality estimates in passes 1 and 2 and complete estimation of the blocks in the ranges in the third pass.

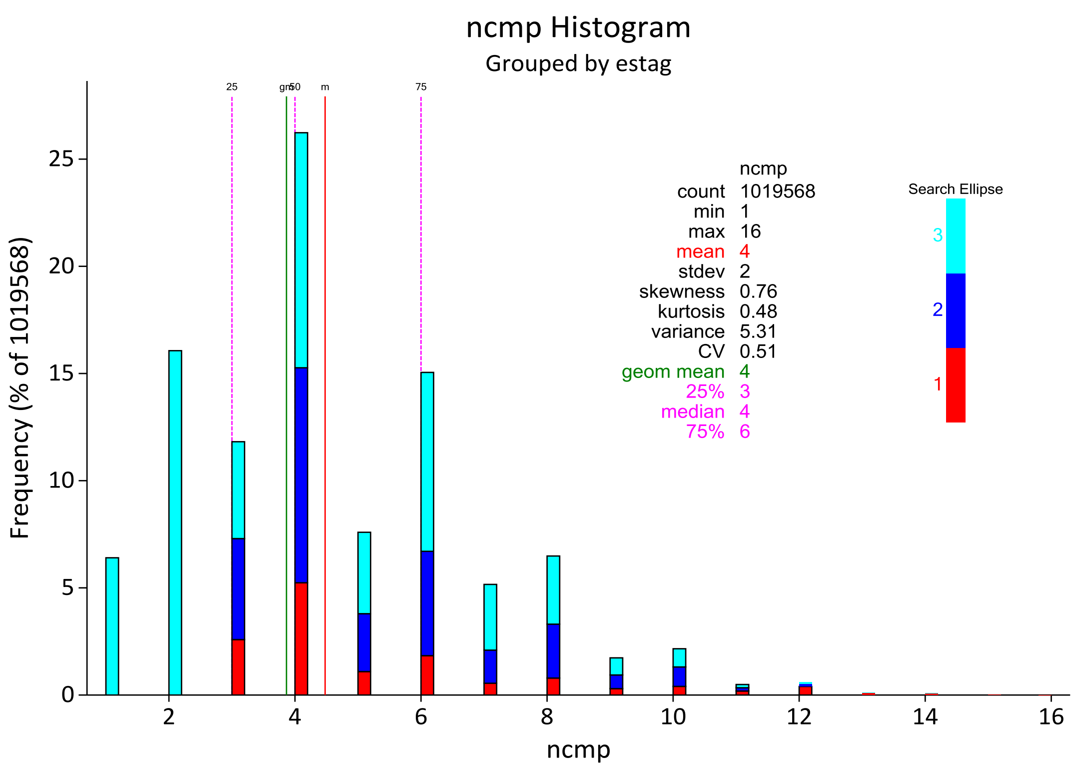
The example histograms shown in Figure 14-14, Figure 14-15, and Figure 14-16 illustrate that the San Nicolas – SRL estimation passes are using more data in the first and second passes, at closer spacing than the third pass. Importantly, the first and second passes are always using more than one hole to estimate, and for the most part are using three to six holes with three to eight composites. Average distances for all estimation passes are only about 39 m, with the majority of blocks in the first and second passes estimated with less than 30 m.

SRK is satisfied from this analysis that the estimations are appropriate for each model.



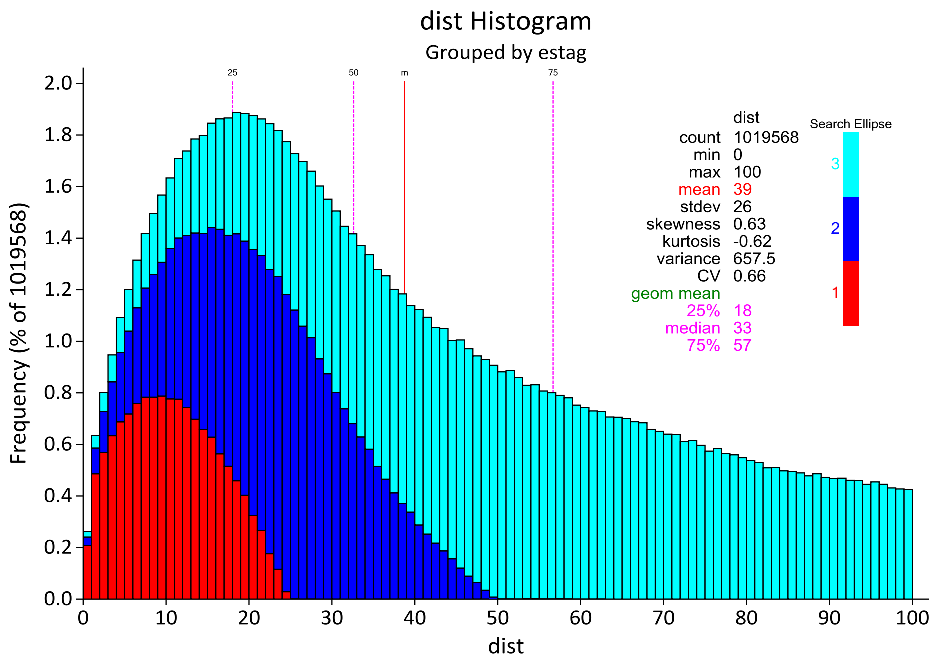
Source: SRK, 2017

Figure 14-14: Histogram of Number of Holes – San Nicolas –SRL



Source: SRK, 2017

Figure 14-15: Histogram of Number of Composites - San Nicolas – SRL



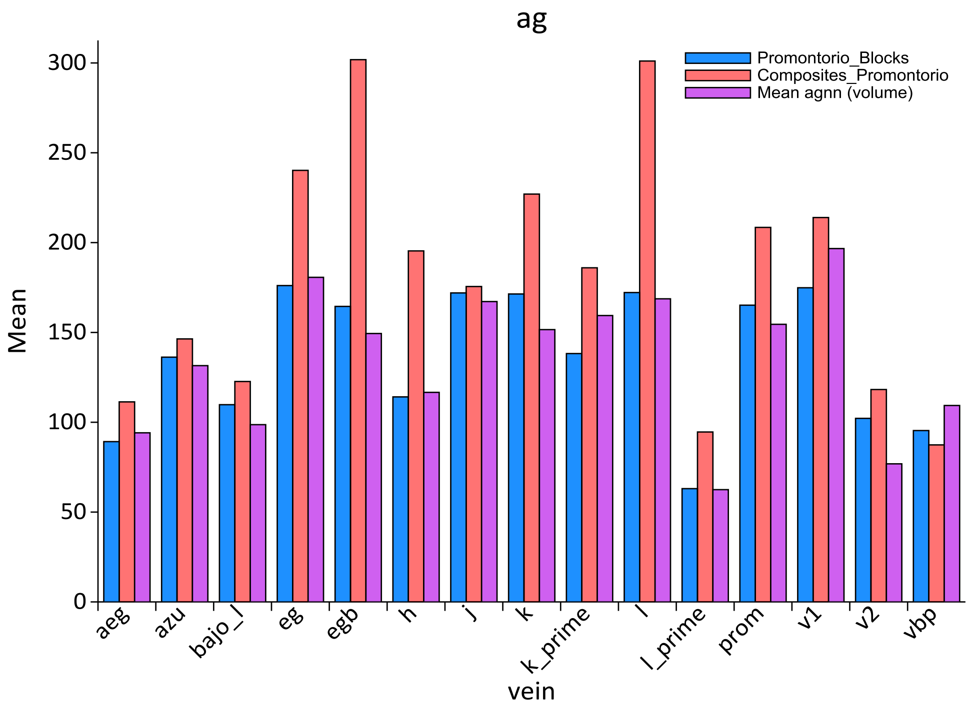
Source: SRK, 2017

Figure 14-16: Histogram of Average Distances - San Nicolas – SRL

14.8.3 Comparative Statistics

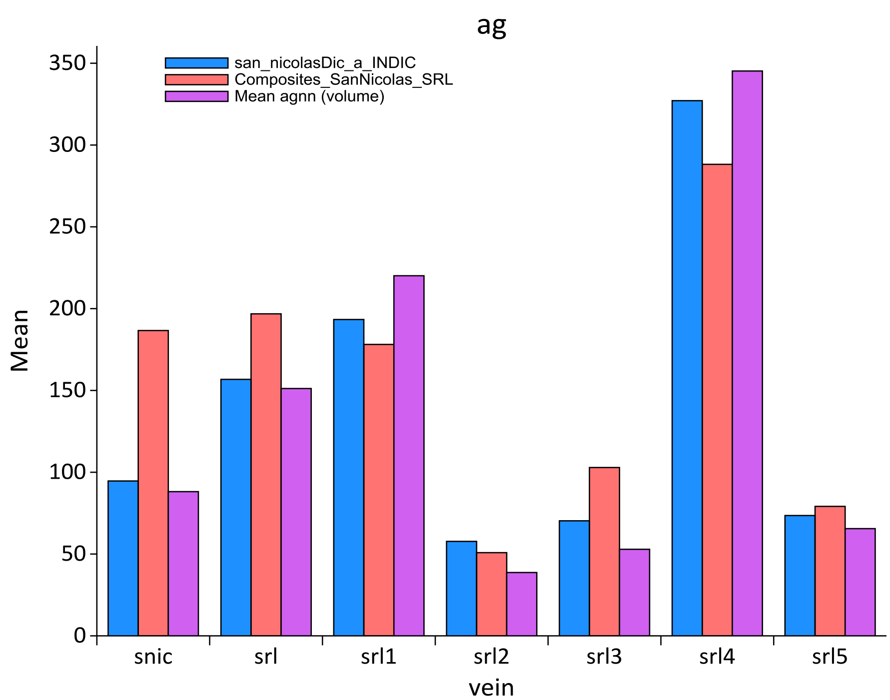
SRK compared the estimated block grades to the composite grades on a vein by vein basis as well as a global basis, assessing for local and global biases which may indicate over-estimation. Means are compared against the raw composite data as well as a nearest neighbor estimate (the theoretical declustered composite mean). In the case of many of the Cusi veins, the composite grades tend to be biased high due to the concentration of channel samples which are collected predominantly in the mineralized areas. The degree of bias depends on a number of factors including the relative number of channel samples and the percentage of these samples taken in high grade areas (tends to be higher). Thus, SRK reviewed the estimates in areas featuring higher number of channel samples using a nearest-neighbor declustered mean to assess the degree of impact of the clustered channel samples on the estimate.

An example of a simple mean comparison at Promontorio is shown in Figure 14-17. This shows that the block estimates (blue) are generally comparing well against the composite means (red). Nearest-neighbor means are shown in purple, and are generally approximating the grades of the ID2 estimate. However, in some cases such as the El Gallo Bajo (EGB) vein, there is a clear bias in the composites due to highly clustered channel samples (more samples, less blocks) vs. a smaller number of drillholes (less samples, more blocks) that is reflected in both the ID2 estimate and the nearest-neighbor estimate. In other cases, SRK notes slight over-estimations in the structures such as the VBP vein, where a condition may exist that features a small percentage of higher grade samples influencing a larger amount of blocks, perhaps on the margins of the vein. SRK is of the opinion that this is acceptable. Another comparison is shown in Figure 14-18 for the area of San Nicolas - SRL.



Source: SRK, 2017

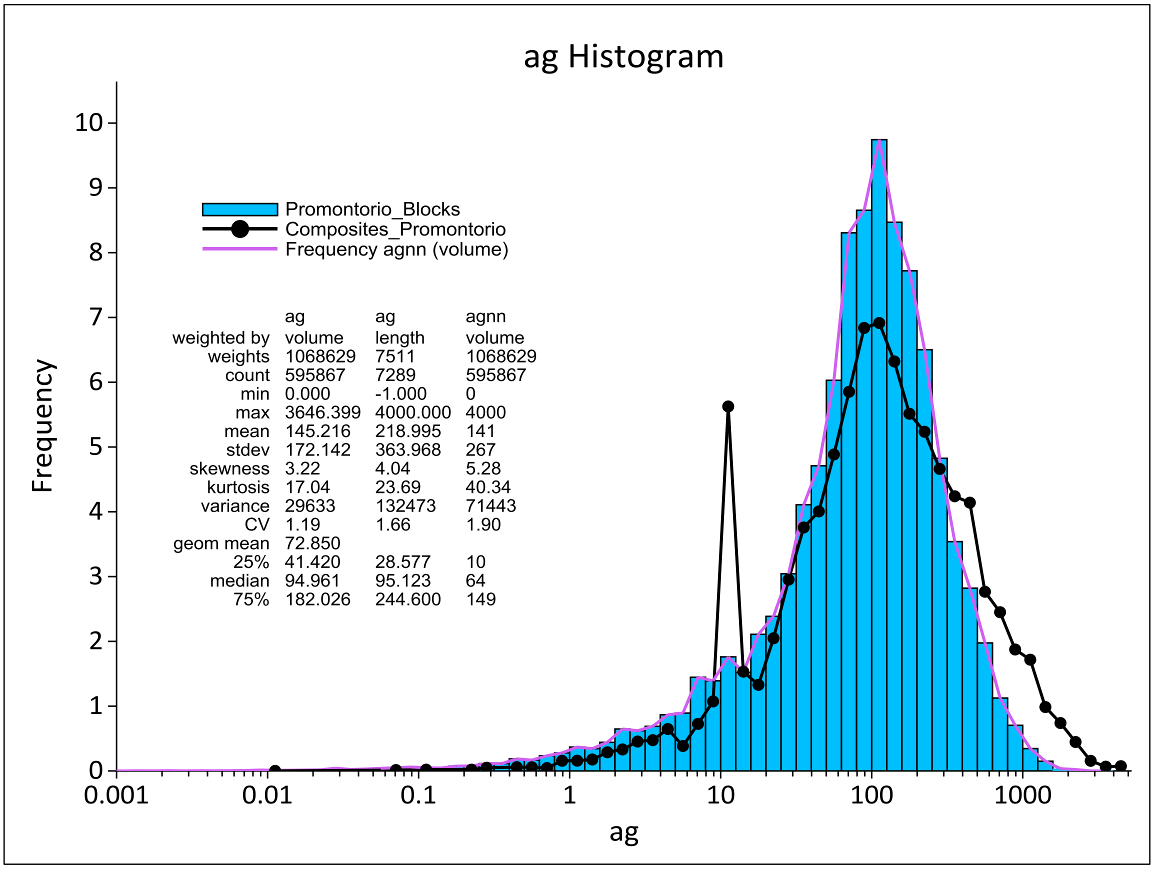
Figure 14-17: Mean Analysis by Domain – Promontorio Ag (g/t)



Source: SRK, 2017

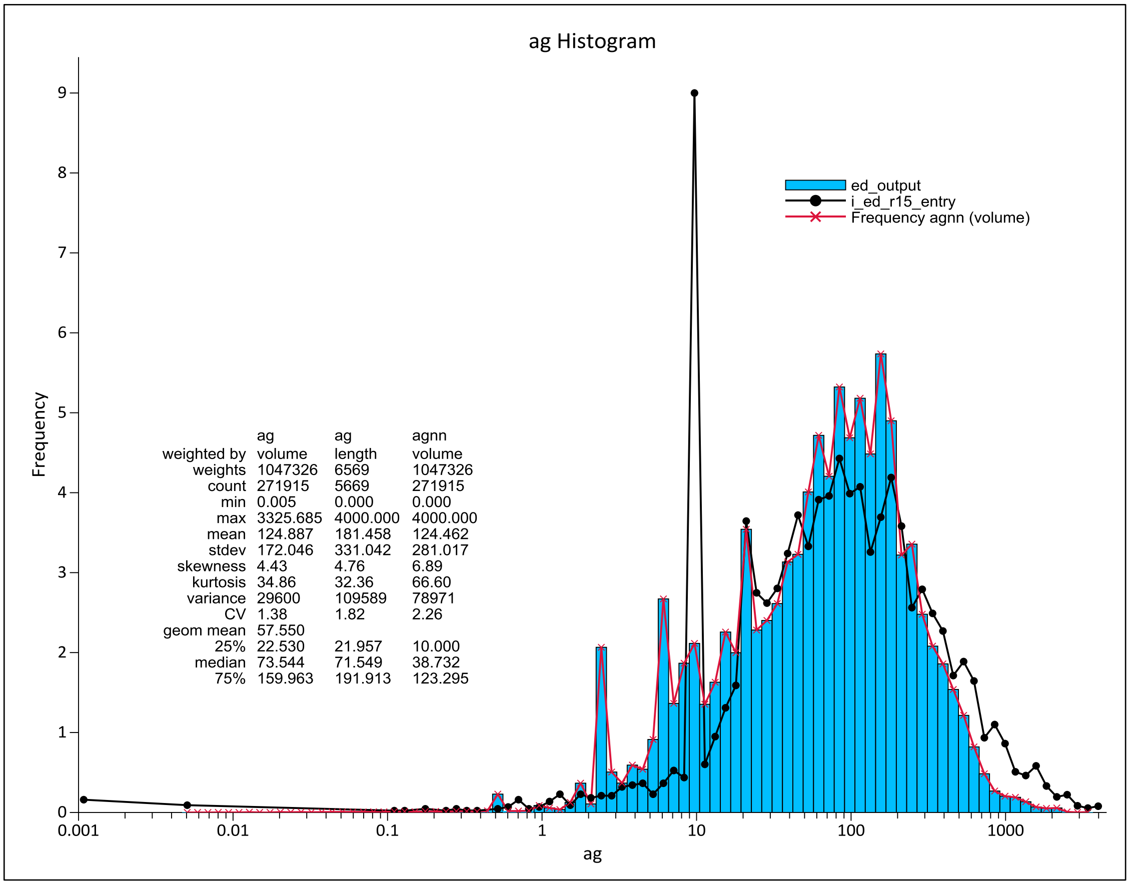
Figure 14-18: Mean Analysis by Vein Domain – San Nicolas - SRL Ag

Global comparisons were also conducted for the models against the composites and the nearest neighbor estimations. These were done by examining histogram distributions as well as global statistics for each model. SRK notes that the comparison to the global sample mean is somewhat misleading due to the number of higher grade channel samples compared to drillholes. Thus, the comparison is somewhat more meaningful against the nearest neighbor estimate. SRK notes that the bias due to channel sampling is reduced by almost 50% in the declustered nearest neighbor estimate, which closely approximates the mean of the ID2 estimate. These comparisons have been conducted for each area and each metal, and the plots for Ag are shown in Figure 14-19, Figure 14-20, Figure 14-21, Figure 14-22, Figure 14-23, Figure 14-24, and Figure 14-25.



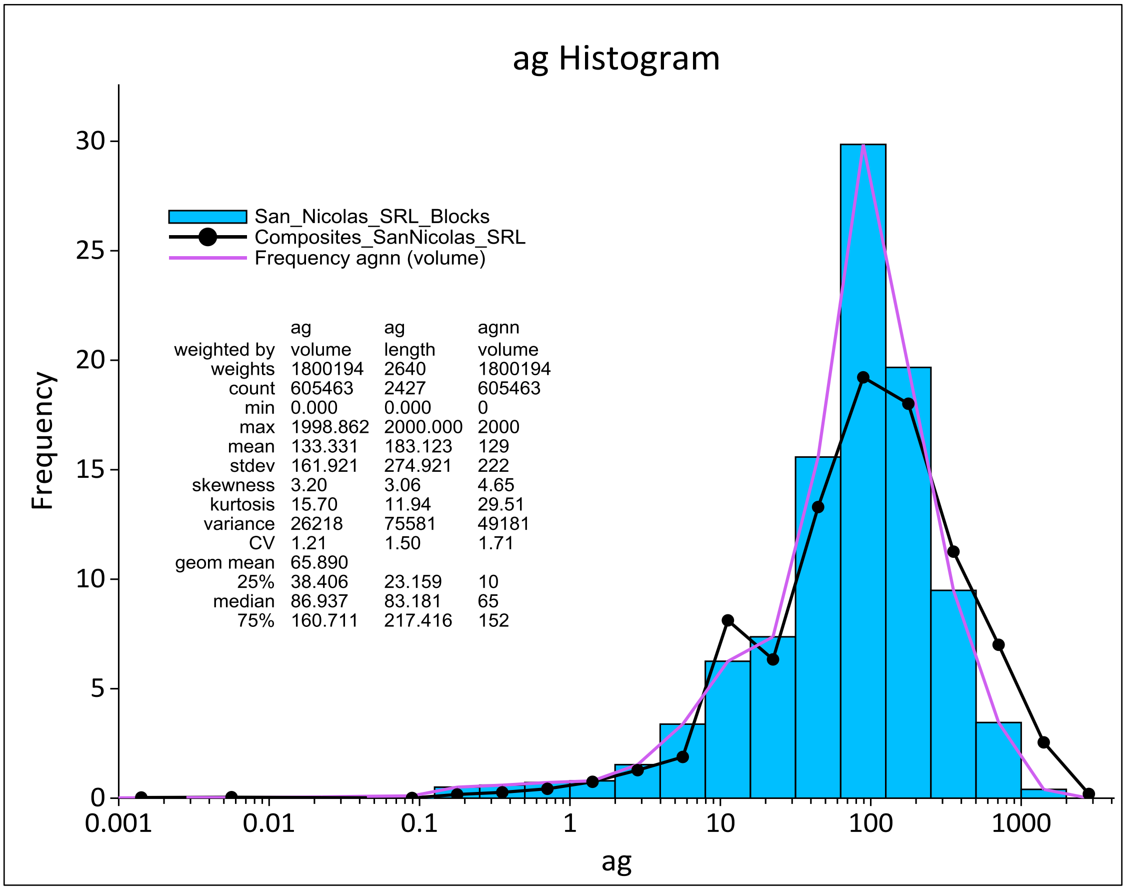
Source: SRK, 2017

Figure 14-19: Histogram of Block vs. Composites - Promontorio



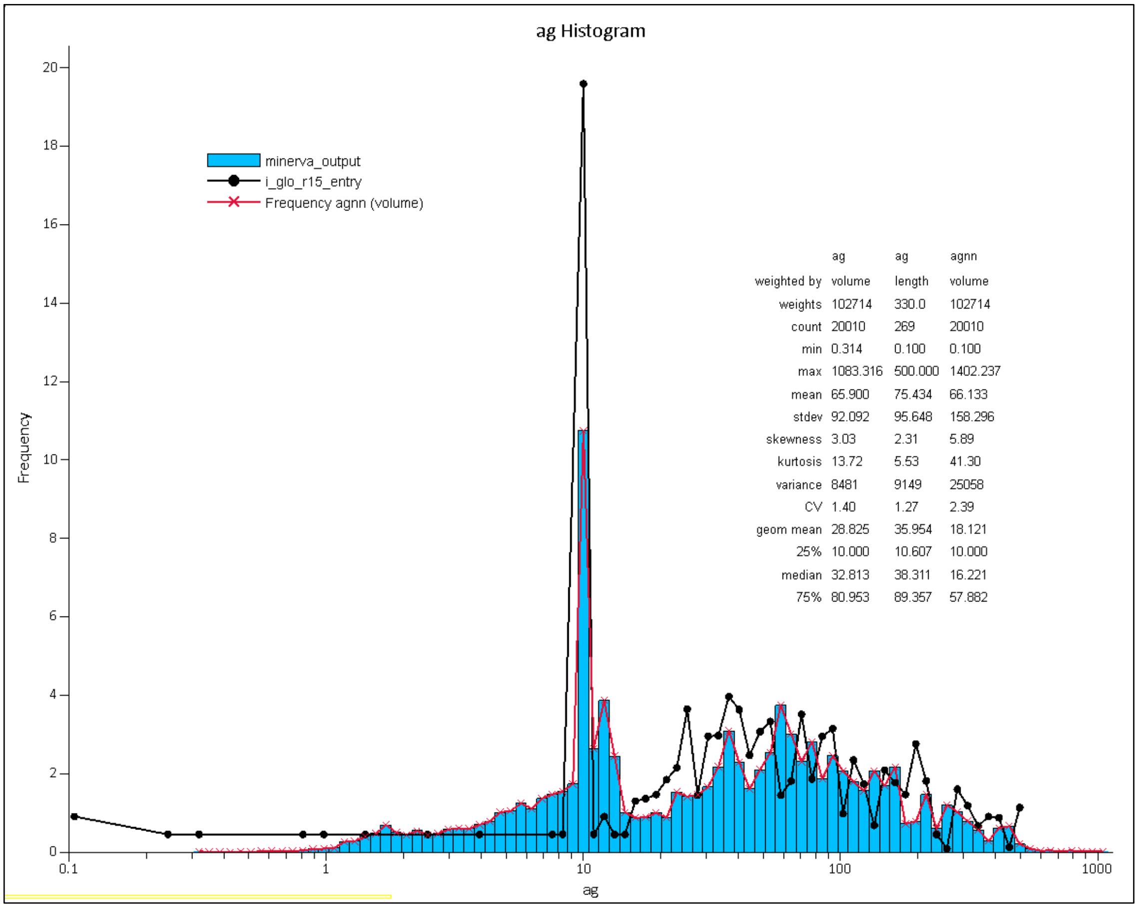
Source: SRK, 2017

Figure 14-20: Histogram of Block vs. Composite – Santa Eduwiges



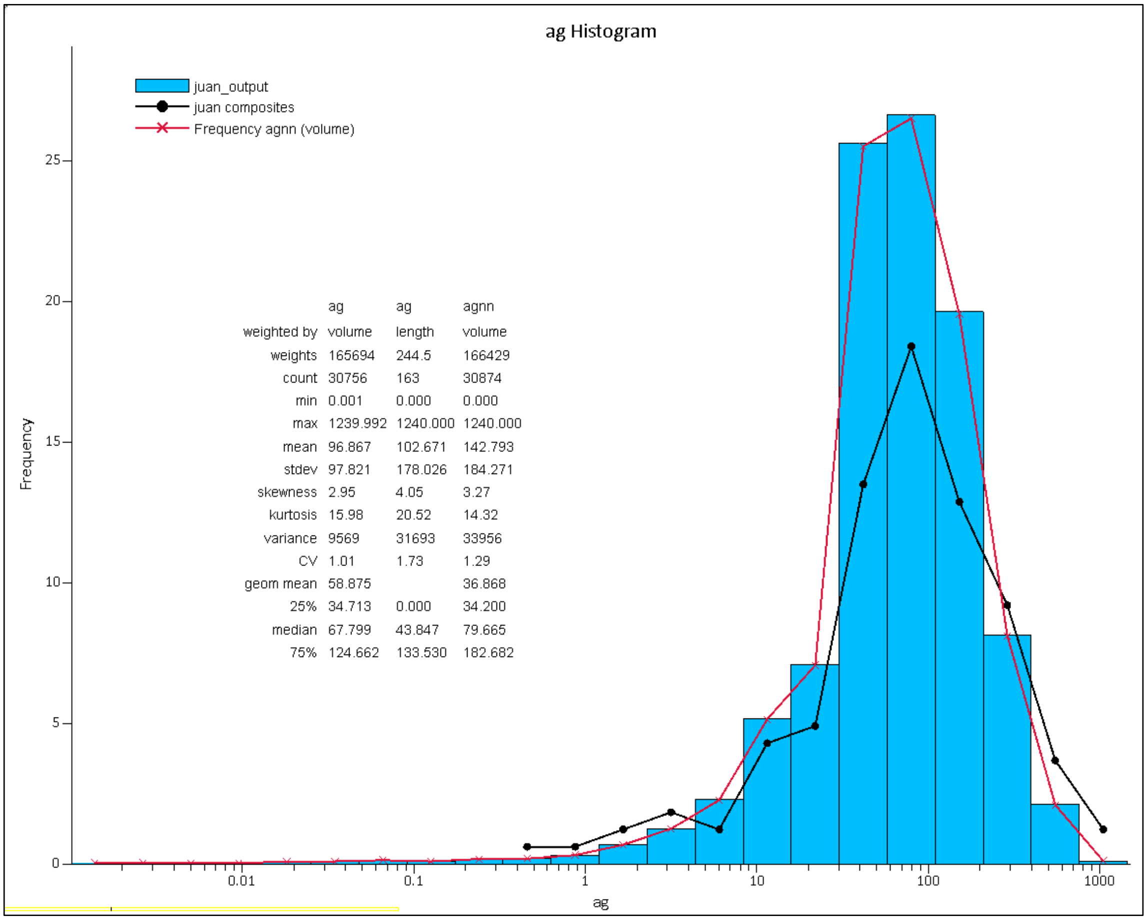
Source: SRK, 2017

Figure 14-21: Histogram of Block vs. Composite – San Nicolas - SRL



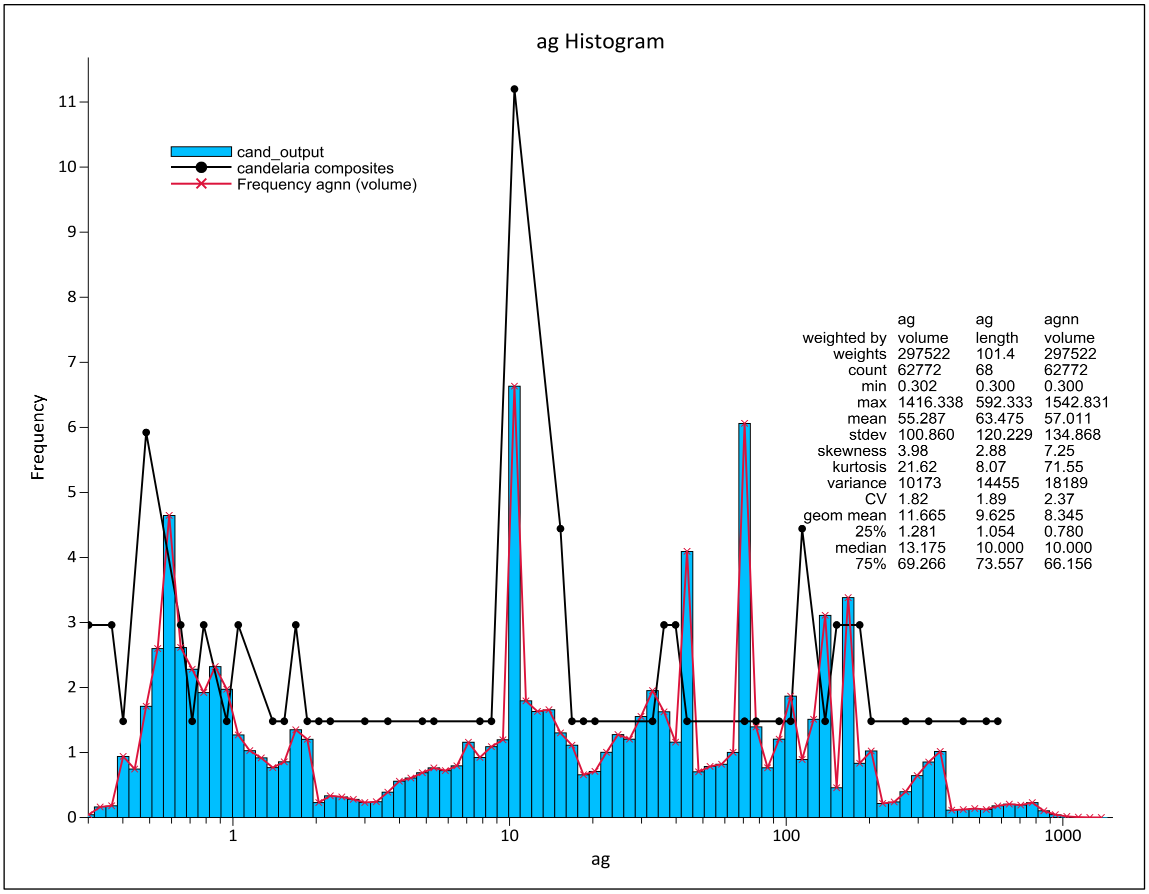
Source: SRK, 2017

Figure 14-22: Histogram of Block vs. Composites – Minerva



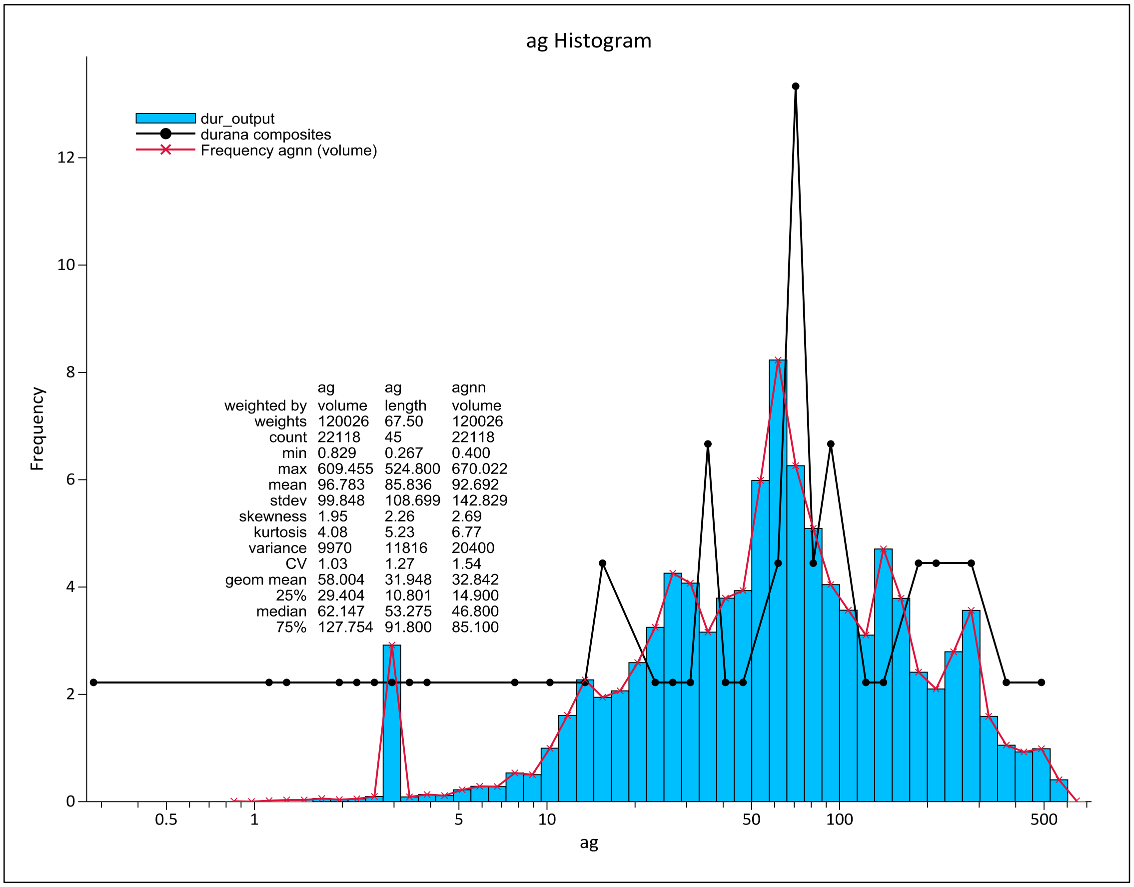
Source: SRK, 2017

Figure 14-23: Histogram of Block vs. Composites – San Juan



Source: SRK, 2017

Figure 14-24: Histogram of Block vs. Composites - Candelaria



Source: SRK, 2017

Figure 14-25: Histogram of Block vs. Composites – Durana

14.9 Resource Classification

Mineral resource classification is a subjective concept, and industry best practices suggest that resource classification should consider both the confidence in the geological continuity of the mineralized structures, the quality and quantity of exploration data supporting the estimates and the geostatistical confidence in the tonnage and grade estimates. Appropriate classification criteria should aim at integrating all of these concepts to delineate regular areas of similar resource classification.

SRK is satisfied that the geological modeling honors the current geological information and knowledge. The location of the samples and the assay data are sufficiently reliable to support resource estimation. The sampling information was acquired primarily by core drilling and channel sampling from mine development.

Significant factors affecting the classification include:

- Lack of historic and consistent QA/QC program;
- Lack of downhole surveys for most drillholes and measured deviations from planned and actual azimuths;
- Spacing of drilling compared to observed geologic continuity; and

- Cusi is a producing mine with a successful operating history dating more than 10 years.

As is mentioned in the Section 12.1.1., by recommendation of SRK, in 2016 Sierra Metals carried out the re-analysis in ALS lab of 233 samples (Rejects) previously analyzed in Malpaso lab that were supporting the resources estimation. The samples from various areas of Cusi included QA/QC controls. The intra-lab check samples did not show close agreement to expectations for the analysis quality and data between labs. SRK noted that the higher-grade samples occurring in a sequence of similar samples are repeated between the labs. The improved QA/QC procedures used in the recent work for SRL provided more confidence.

SRK has classified the resources according to CIM Definition Standards on Mineral Resources and Mineral Reserves, December 2005.

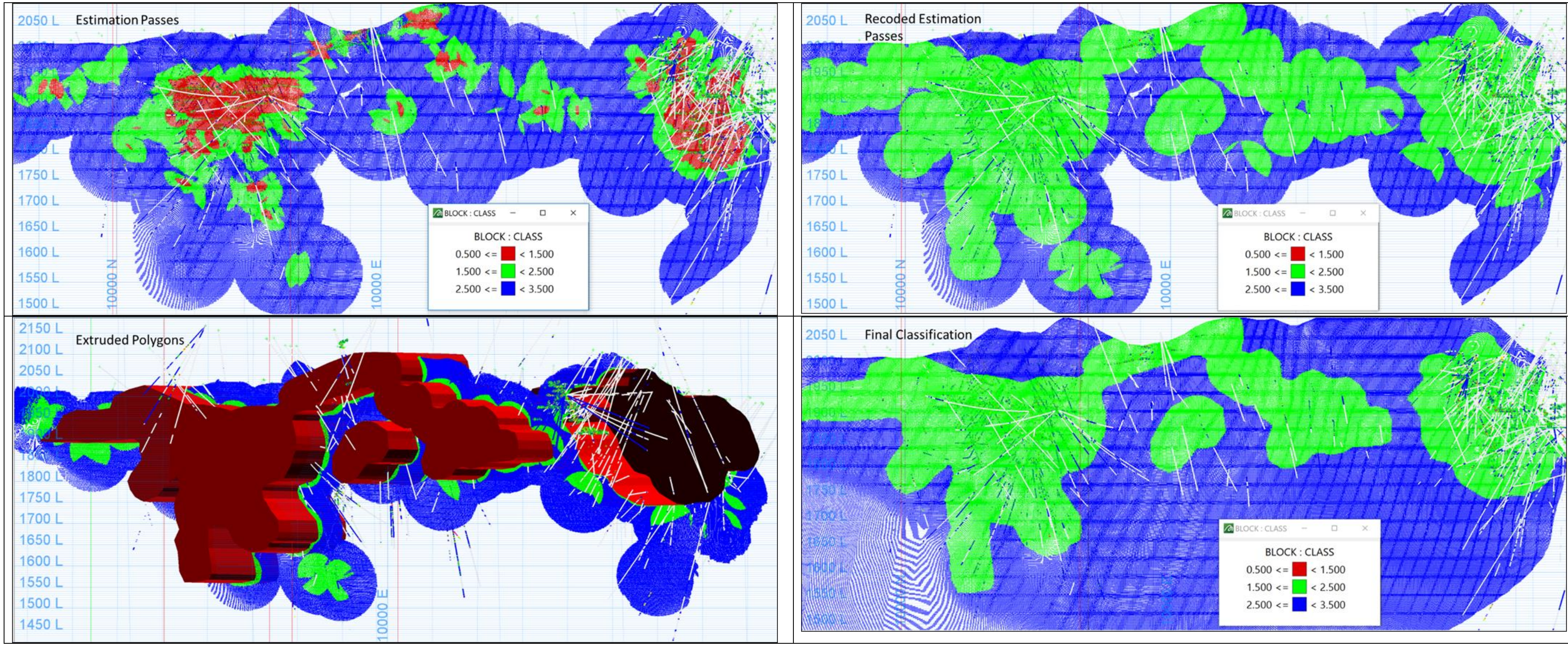
In order to classify mineralization as Measured or Indicated Mineral Resource, SRK has based both on the continuity observed in well-drilled areas of the Project, as well as geologic continuity observed from underground exposures of the mineralization.

The classification is generally based on the block estimation passes, using the amount of data and ranges of interpolation from the nested passes to flag blocks, which are then considered to guide a manually digitized polygon to assign the final classification and eliminate local inconsistencies in the block-by-block classification of the estimation pass. In the cases of Promontorio, San Nicolas, and San Juan, a secondary script was employed to better approximate the continuity for classification. An example of the classification results from San Nicolas is shown in Figure 14-26.

SRK classified Measured resources only in the veins of SRL where the recent drilling campaign was carried out implementing a recently improved QA/QC program.

The general category for classification is as follows:

- Measured: Blocks estimated in the first or second pass, with continuity along strike between more than three holes.
  - For SRL veins, a script flagging blocks where the average distance is less than 25 m and the number of drillholes was more than 3 was used to flag Measured blocks.
- Indicated: Blocks estimated in the first or second pass, with continuity along strike between more than two holes.
  - For Promontorio veins, San Nicolas, and San Juan, a script flagging blocks where the average distance is less than 50 m and the number of drillholes was more than 2 was used to flag Indicated blocks.
  - For the Azucarera area, a script flagging blocks where the average distance is less than 15 m and number of holes greater than 3 was used to flag Indicated blocks.
- Measured and Indicated blocks are based on the estimation passes or scripts, but are manually flagged using extruded polygons to eliminate small areas of lower classification within otherwise continuous Measured or Indicated mineralization and vice versa.
- All estimated blocks not assigned to the Measured or Indicated category were assigned to the Inferred category.



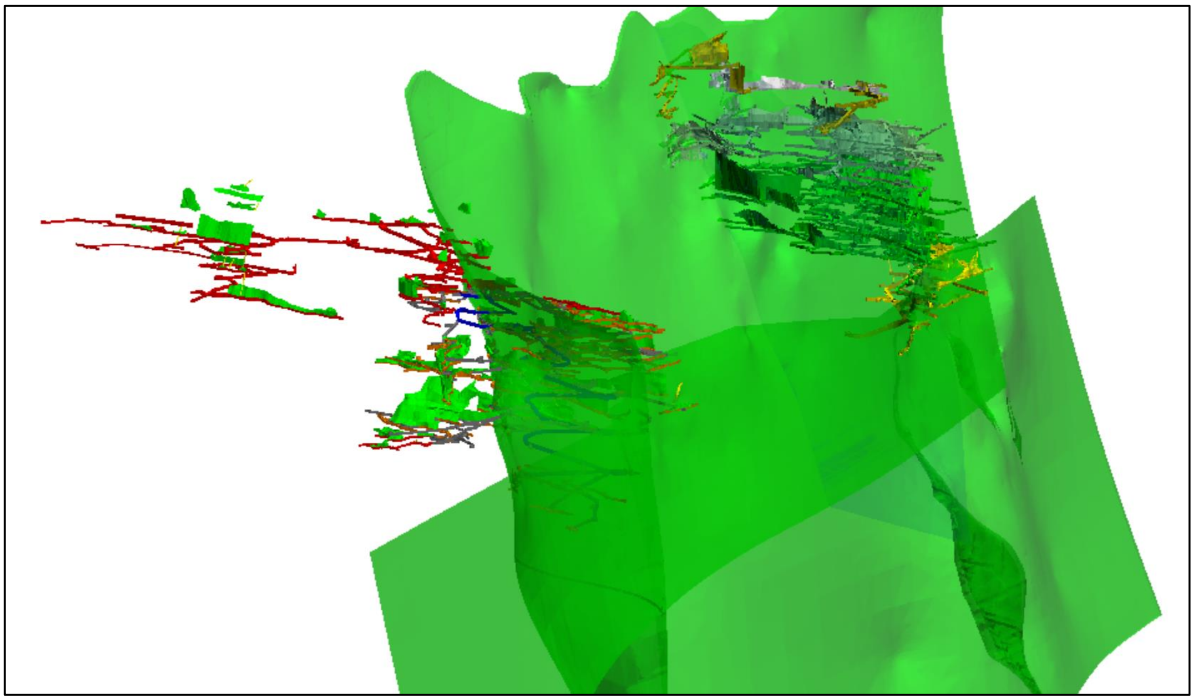
Source: SRK, 2017

Figure 14-26: Example Classification Methods and Results – San Nicolas

14.10 Depletion for Mining

SRK depleted the block models for previous mining prior to reporting. A variable called "mined" is coded into all models that contain any areas with existing mine workings. The variable is coded between 0-1, with 0 being completely available for mining and 1 being completely mined out. This variable is used in Vulcan's reporting tools to eliminate mined tonnes from the resource reporting.

Two methods have been employed to account for mined areas. First, the 3D asbuilt mine workings were provided to SRK by Dia Bras for all surveyed areas. SRK noted that these are locally reasonable and well-surveyed, but are also inaccurate in other areas, where the channel samples do not plot inside of the surveyed workings, or where drilling does not approximate the location of the workings. It is suspected that poor survey practices are to blame for these discrepancies. Regardless, the 3D solids were used to complete an initial pass at depleting the models. An example of the surveyed 3D is shown in Figure 14-27.

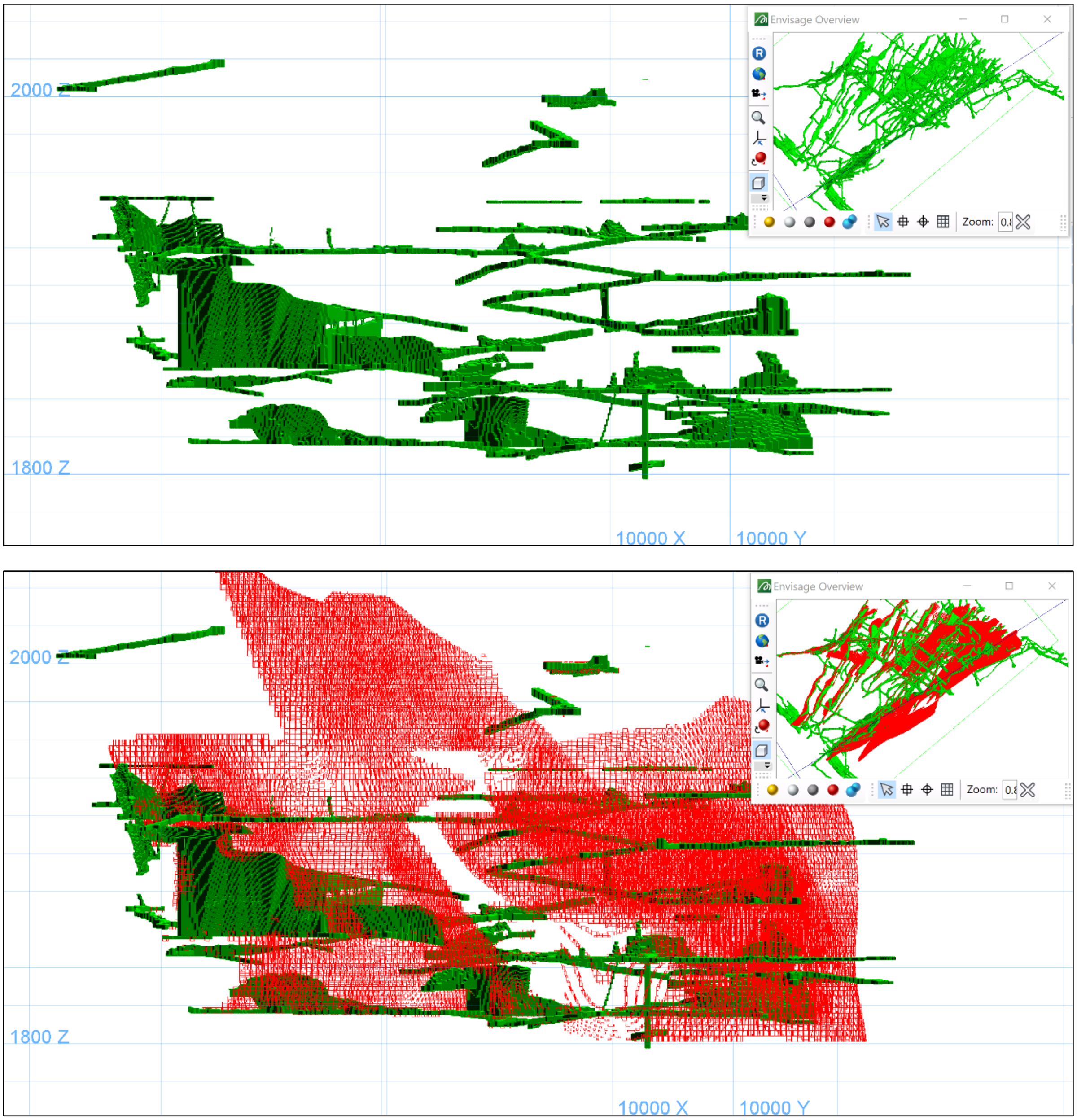


Source: SRK, 2017

Figure 14-27: 3D As-built Shapes

In addition to the surveyed workings, Dia Bras also provided simple polygons projected onto long sections of each vein, which delineate areas where mining has occurred that have not been consistently surveyed. Many of these are historical. The differences between the surveyed workings and the provided polygons are dramatic, as noted in Figure 14-28. These polygons were made into extruded 3D solids, and the veins were flagged as mined = 1 within the extruded polygons.

All mined solids and polygon projections are actualized to August 31, 2017.



Note: Green shapes are surveyed 3D as-builts. Red areas are blocks mined using extruded 3D polygons.

Source: SRK, 2017

Figure 14-28: Example of Mined Polygons vs. 3D As-builts

14.11 Mineral Resource Statement

CIM Definition Standards for Mineral Resources and Mineral Reserves (December 2005) defines a mineral resource as:

"A concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for

economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge".

The "reasonable prospects for economic extraction" requirement generally implies that the quantity and grade estimates meet certain economic thresholds and that the Mineral Resources are reported at an appropriate cut-off grade taking into account extraction scenarios and processing recoveries. SRK adjusted the costs for mining and processing used in the previous resource estimation by 10%. Costs were broken down as follows; Mining US$29.41/t, Processing US$18.3/t, and General and Administrative US$3.74/t. These costs aggregate to US$51.45. Assuming a price for Ag of US$18.30/oz, Lead US$/LB 0.93, Zinc US$/lb 1.15 and Gold US$/oz 1,283.00.

The metallurgical recoveries used were based on averages obtained from production data of the last 6 months provided by Dia Bras when some improvements have been implemented. The metallurgical recoveries used are: 84% Ag, 57% Au, 86% Pb, 51% Zn.

This cost equates to a grade of about 105 g/t AgEq. SRK has reported the mineral resource for Cusi at this cut-off.

The August 31, 2017, consolidated mineral resource statement for the Cusi area is presented in Table 14-9. SRK notes a nomenclature issue from the previous report, which resulted in some veins being mislabeled in the resource tables. This has been corrected for the current resource estimation, and should be considered in any comparisons to previous estimates.

Table 14-9: Cusi Mine Mineral Resource Estimate as of August 31, 2017 – SRK Consulting (U.S.), Inc.

Source	Class	AgEq (g/t)	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Tonnes (000's)
SRL	**Measured**	268	225	0.13	0.55	0.68	362
Total Measured		**268**	**225**	**0.13**	**0.55**	**0.68**	**362**
Promontorio	**Indicated**	241	213	0.08	0.37	0.44	1097
Eduwiges		293	198	0.26	1.35	1.32	928
SRL		296	242	0.32	0.62	0.64	1435
San Nicolas		195	176	0.13	0.21	0.22	414
San Juan		208	189	0.13	0.2	0.21	121
Minerva		222	198	0.4	0.09	0.05	57
Candelaria		386	366	0.14	0.17	0.28	46
Durana		224	219	0.06	0.05	0.02	97
Total Indicated		267	217	0.21	0.64	0.66	4,195
Measured+Indicated		**267**	**217**	**0.21**	**0.63**	**0.66**	**4,557**
Promontorio	**Inferred**	218	185	0.1	0.35	0.62	308
Eduwiges		229	115	0.09	1.78	1.79	147
SRL		216	158	0.22	0.55	1.04	658
San Nicolas		181	161	0.14	0.21	0.23	340
San Juan		200	186	0.04	0.15	0.27	44
Minerva		149	143	0.05	0.08	0.06	5
Candelaria		185	125	0.16	0.62	1.17	128
Durana		124	115	0.01	0.17	0.09	3
Total Inferred		**207**	**158**	**0.16**	**0.54**	**0.84**	**1,633**

(1) Mineral resources are reported inclusive of ore reserves. Mineral resources are not ore reserves and do not have demonstrated economic viability. All figures rounded to reflect the relative accuracy of the estimates. Gold, silver, lead and zinc assays were capped where appropriate.

(2) Mineral resources are reported at a single cut-off grade of 105 g/t AgEq based on metal price assumptions*, metallurgical recovery assumptions, mining costs (US$29.41/t), processing costs (US$18.3/t), and general and administrative costs (US$3.74/t).

* Metal price assumptions considered for the calculation of the cut-off grade and equivalency are: Silver (Ag): US$/oz 18.30, Lead (US$/LB 0.93), Zinc (US$/lb 1.15) and Gold (US$/oz 1,283.00).

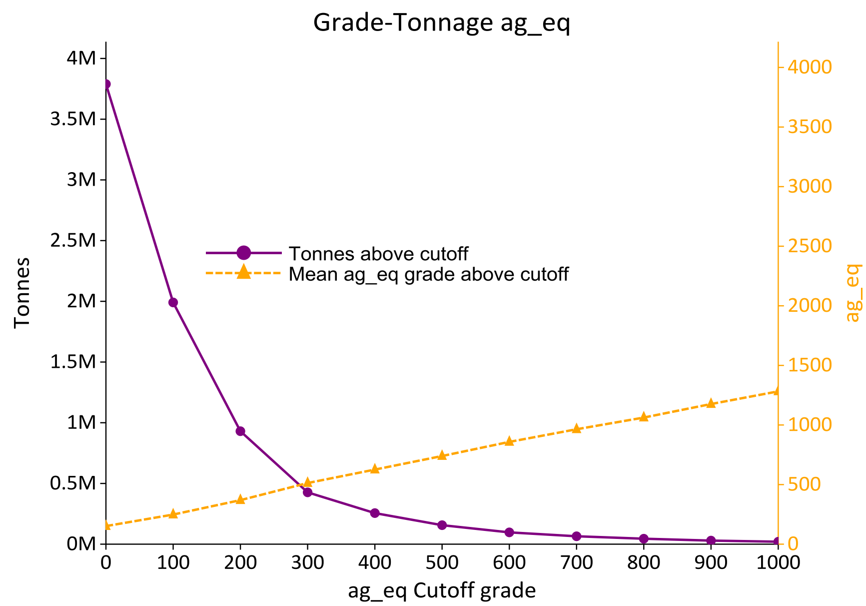
The resources were estimated by SRK. Giovanny Ortiz, B.Sc., PGeo, FAusIMM #304612 of SRK, a Qualified Person, performed the resource calculations for the Cusi Mine.

** Based on the historical production information of Cusi, the metallurgical recovery assumptions are: 84% Ag, 57% Au, 86% Pb, 51% Zn.

14.12 Mineral Resource Sensitivity

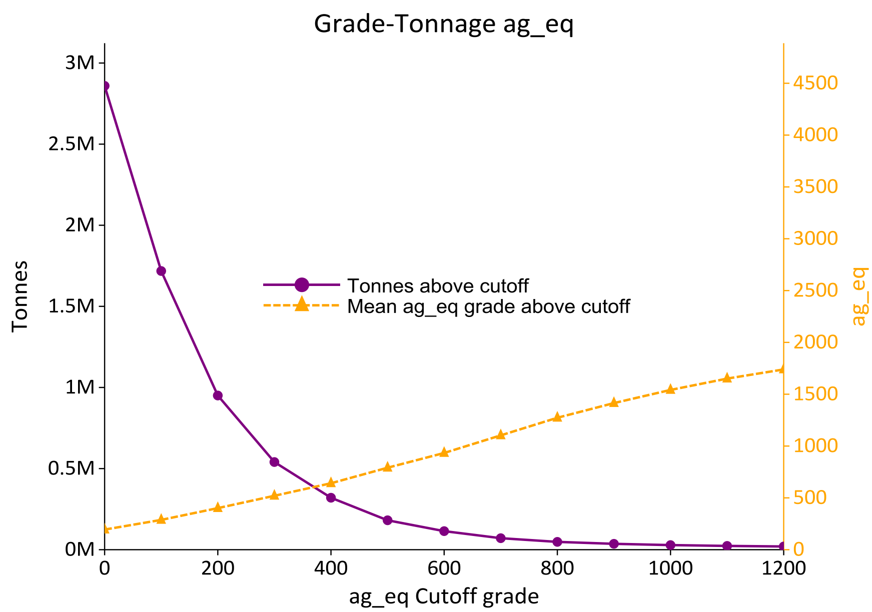
SRK has generated grade-tonnage charts which illustrate the fluctuations of tonnage and AgEq grade as a function of the cut-off. These charts are shown in Figure 14-29, Figure 14-30, Figure 14-31, Figure 14-32, Figure 14-33, Figure 14-34, Figure 14-35 and Figure 14-36.

SRK notes that Cusi is very sensitive to the cut-off, in Measured, Indicated and Inferred mineralization.



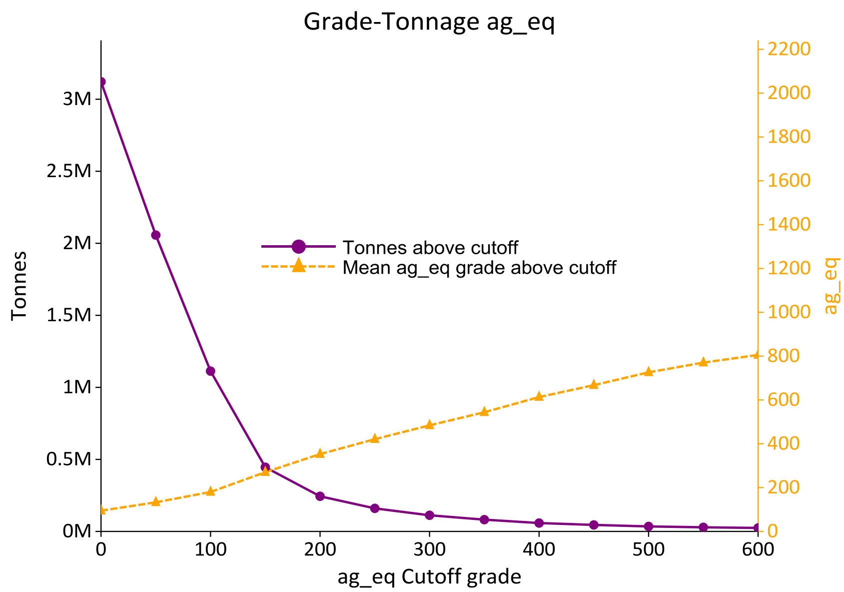
Source: SRK, 2017

Figure 14-29: Grade-Tonnage Chart – Promontorio Area



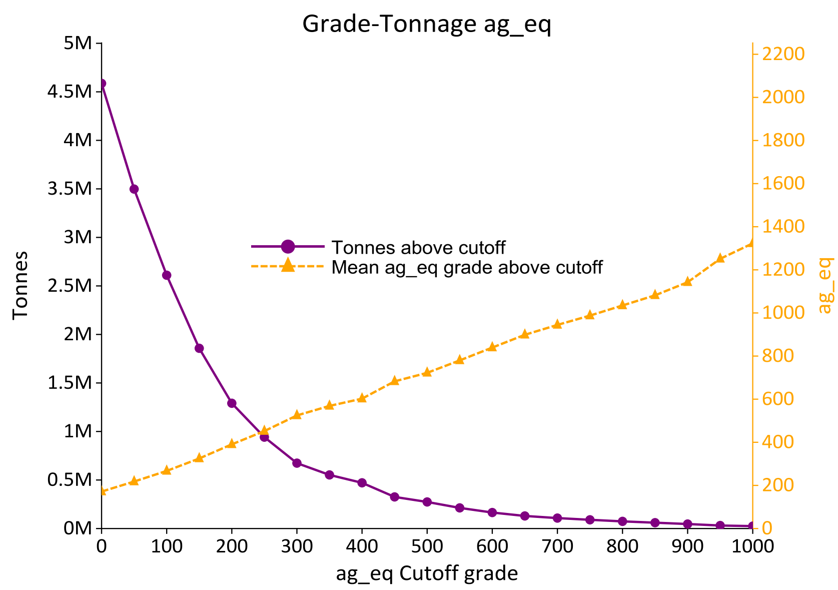
Source: SRK, 2017

Figure 14-30: Grade-Tonnage Chart – Santa Eduwiges Area



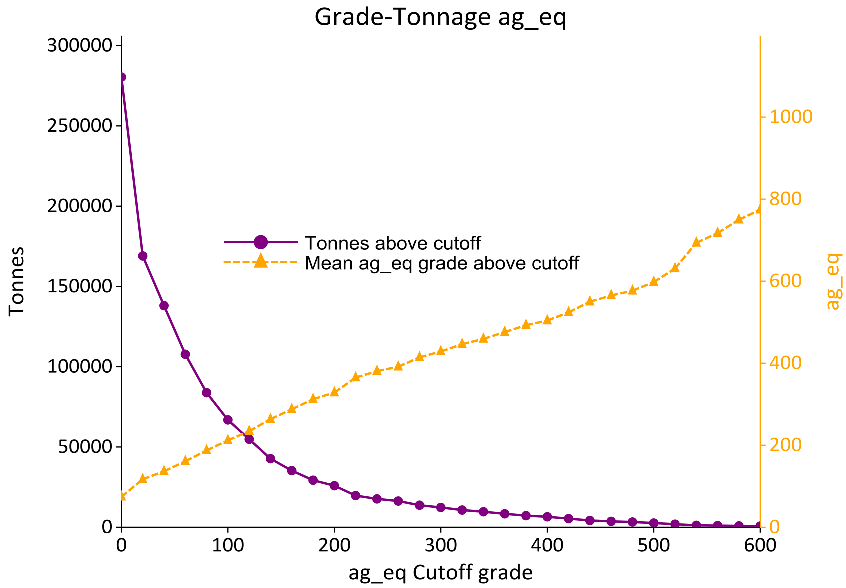
Source: SRK, 2017

Figure 14-31: Grade Tonnage Chart – San Nicolas



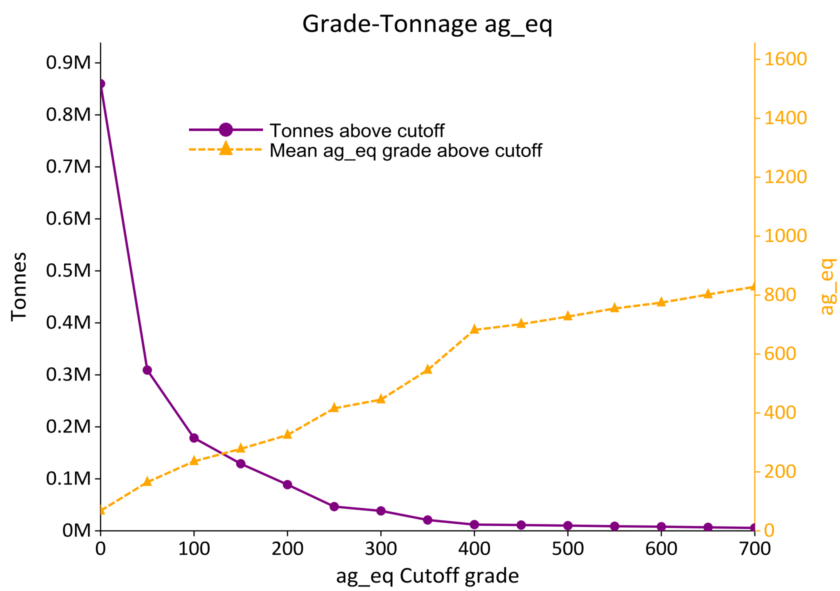
Source: SRK, 2017

Figure 14-32: Grade Tonnage Chart – SRL



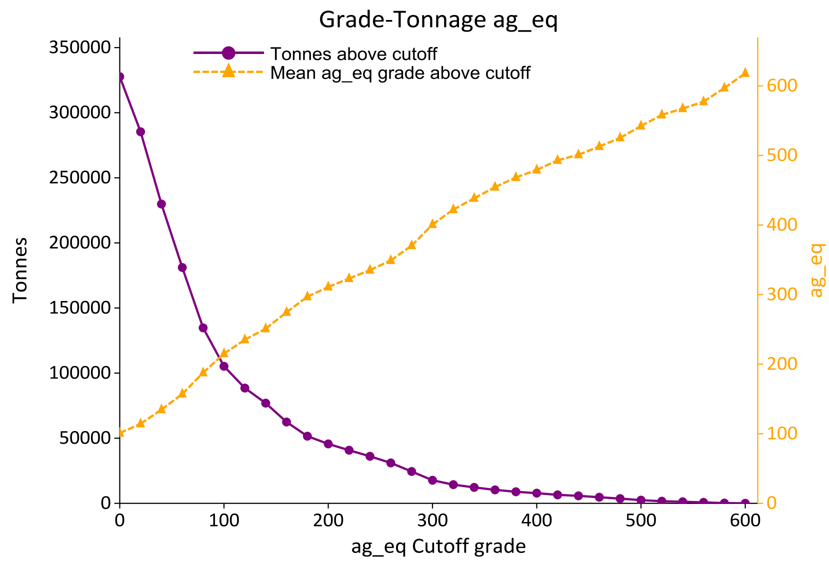
Source: SRK, 2017

Figure 14-33: Grade Tonnage Chart – Minerva Area



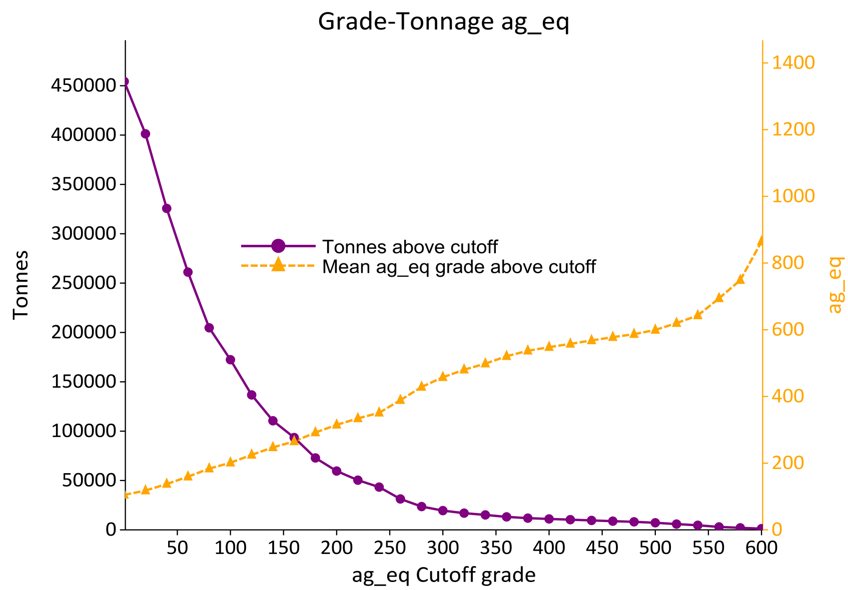
Source: SRK, 2017

Figure 14-34: Grade Tonnage Chart – Candelaria



Source: SRK, 2017

Figure 14-35: Grade Tonnage Chart – Durana



Source: SRK, 2017

Figure 14-36: Grade Tonnage Chart – San Juan

14.13 Relevant Factors

SRK is not aware of any additional relevant factors that would impact the statement of mineral resources at this time.

15 Mineral Reserve Estimate

SRK did not conduct a reserve estimate at this time, given that exploration and development is ongoing in areas that are currently too speculative for Measured and Indicated classification that could be included in a reserve. Sierra Metals does not consider a release of reserves to be appropriate or of value at this time until sufficient work has been done to better delineate these resource areas. The company plans to perform further work to eventually produce an industry best practice reserve statement. The timeline for this work is yet to be defined but the company has started on many aspects of this work. These costs are likely to be absorbed as a part of the normal operating budget of Cusi.

SRK recommends the following work program to achieve mineral reserves:

- Field work to gather geotechnical information;
- Geotechnical analysis to confirm mining method parameters and safety analysis;
- Hydrogeological field work and generation of hydrogeological model;
- Additional drilling to increase resource confidence to Measured and Indicated category;
- Detailed mine design followed by mine schedule and ventilation analysis;
- Ensure that tailings and future metallurgical assumptions are appropriate for the next level of study; and
- Economic evaluation with detailed operating and capital costs.

16 Mining Methods

The primary underground mining method employed at Cusi in 2017 is overhand cut and fill which represents 93% of the production with the remaining 7% by shrinkage stoping. Sierra Metals intends to adjust the mining methods in the near term to a combined cut and fill with longhole stoping, thereby eliminating the shrinkage method entirely.

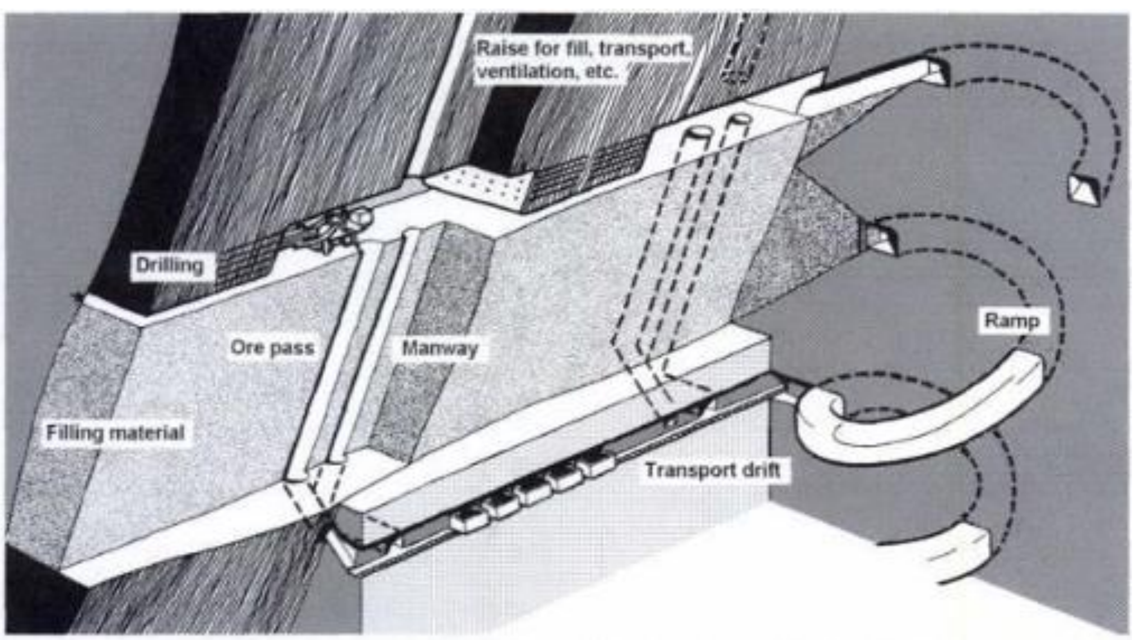
As of December 2017, the mining operation produced an average of approximately 270 tonnes of ore per day, and 214 tonnes of waste per day. The source of mined material is split between the Promontorio (83%) and Santa Eduwiges (17%) mine areas at this time.

16.1 Cut and Fill Mining

The primary underground mining method currently employed at Cusi is overhand cut and fill (Figure 16-1). This mining method is appropriate for the narrow and anastomosing veins at Cusi. Minimum mining widths are generally about 2.5 m with this method, with small 1 cu yd Scooptrams used for mucking ore from these zones and drilling facilitated by pneumatic jacklegs.

Ore zones are developed from the bottom up in 3-m-high slices along strike. Access ramps, also known as attack ramps, are developed at one end of the mineralized zone and driven initially at a negative 15% grade. Once the bottom-most mineralized cut has been mined out, the cavity is filled with waste rock generated by development to other mineralized zones. This material is stored underground in unused drifts and on the surface.

The waste rock allows mining to continue on similar 3-m-high cuts upward. Typically, a total of five 3 m cuts make up a stope block at Cusi. Because of the competent rock in the mineralized zone and waste area, ground support at Cusi is used infrequently, and is generally utilized in areas of fault zones.



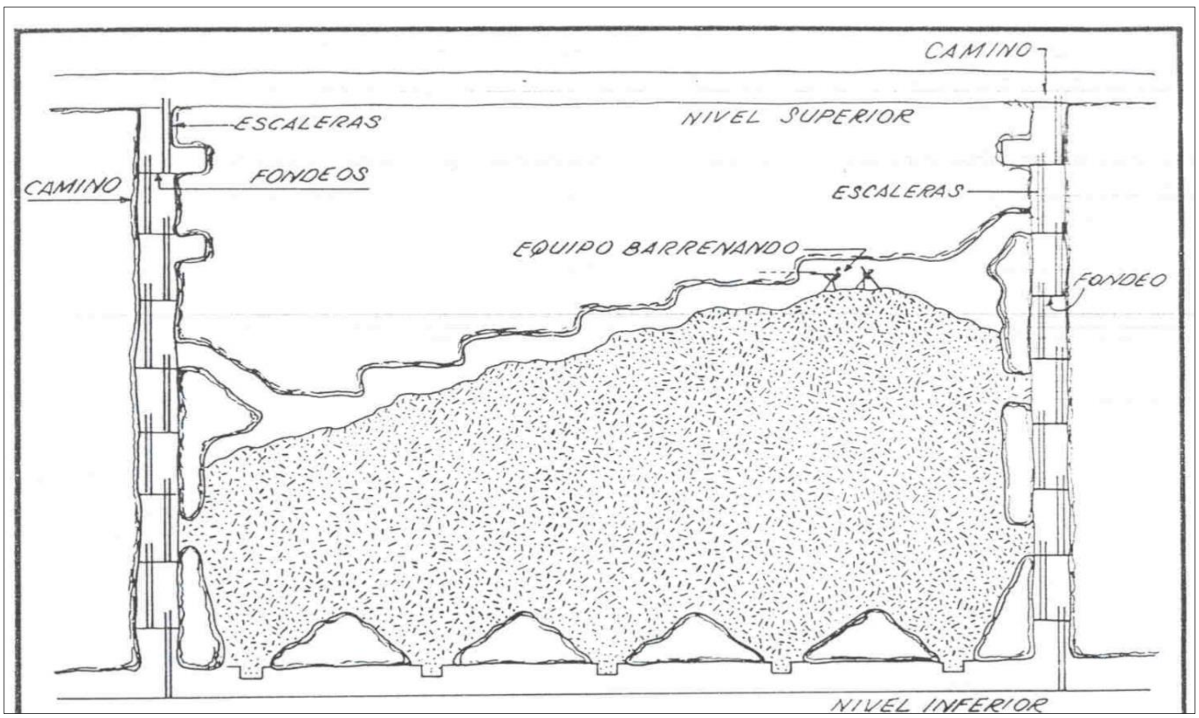
Source: SME, 1998

Figure 16-1: Schematic Overhand Cut and Fill Diagram

16.2 Shrinkage Stope Mining

SRK also notes that shrinkage stoping has been used in modern mining at Cusi, but currently makes up a comparably minor portion of the active mining operations. Sierra intends to eliminate this method entirely and implement longhole mining methods in the near term.

The sublevel shrinkage stope is accomplished by developing a haulage level drift in the lower portion of the vein structure and creating draw points for the removal of ore. A raise is constructed on each end of the vein and a cross–cut in the vein is established with the broken ore falling down into the draw points. The mining is then accomplished by drilling out the vein and working off the broken material from the bottom of the vein working up the vein. Figure 16-2 shows an example of the mining method.



Source: Dia Bras, 2016

Figure 16-2: Shrinkage Stope Method

Jackleg drills that are capable of drilling approximately 2.6 m (8 ft) cut are used as the primary drilling tool in shrinkage stoping scenarios. The holes are loaded and shot. The haulage then takes place with a mini-scoop loading out of the drawpoint into a truck or to an ore pass to the ultimate level. This mining method allows following the vein, and mining width can adjust with the vein thickness. The majority of the veins that are 1 to 1.5 m thick, and SRK would consider 1.5 m a minimum sustainable mining width for use with the jackleg drilling method.

16.3 Production

Despite lacking a prefeasibility or feasibility study in the public market, which discloses reserves, Cusi is in fact in operation and producing mineralized material from the underground mine. SRK notes that pre-feasibility and feasibility studies are required for statement of reserves, but are not required for a company to initiate production for a property.

The mining operation produced in December 2017 approximately 270 tonnes of ore per day, and 214 tonnes of waste per day. The source of mined material is split evenly between the Promontorio (83%) and Santa Eduwiges (17%) mine areas at this time. Approximately 20 m of development is done per heading per day. Historical mining recovery is estimated by Dia Bras at about 75%, with a planned dilution factor of 16%. The monthly mine production for the January 2017 to December 2017 period is shown in Table 16-1.

Table 16-1: Cusi Monthly Production January 2017- December 2017

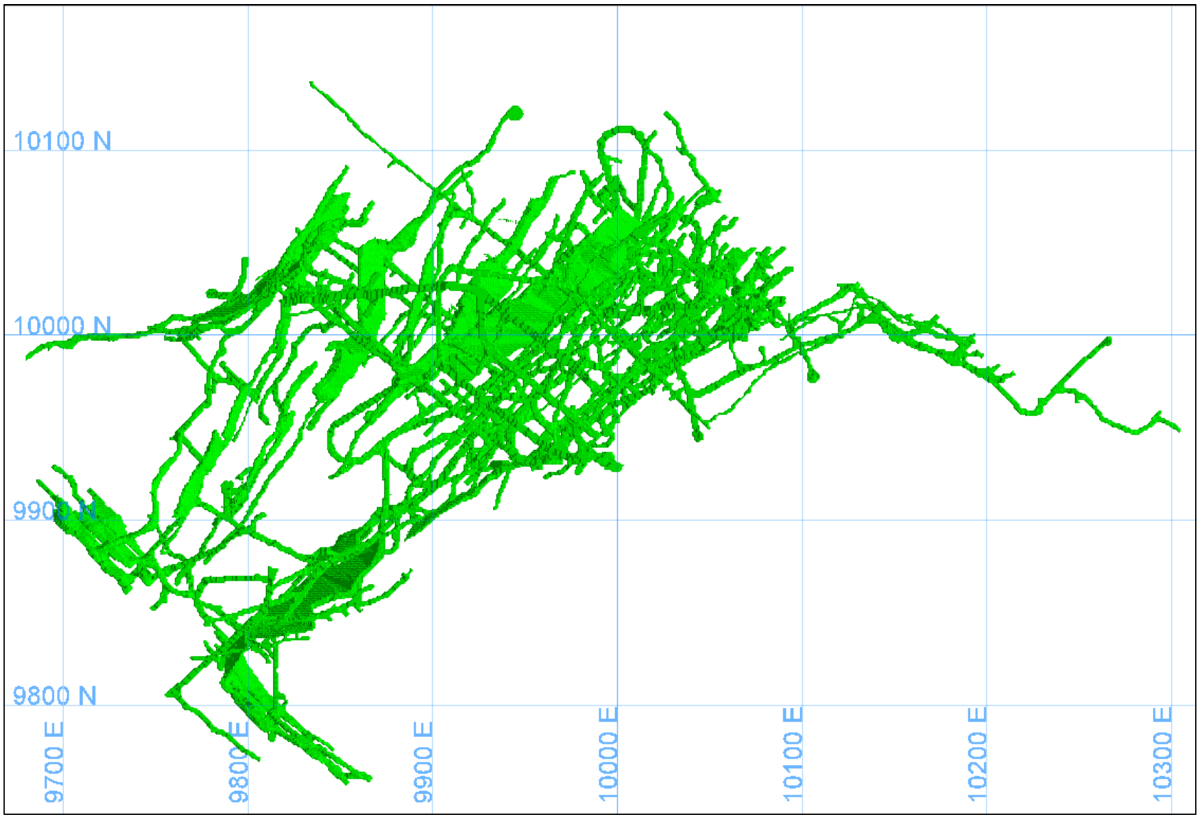
Month/2017	Milled Tonnes	Head Grade			
		Au (g/t)	Ag (g/t)	%Pb	%Zn
January	11,747	0.21	128.8	0.95	0.99
February	11,439	0.26	157.1	1.22	1.20
March	11,354	0.27	153.0	1.59	1.59
April	10,198	0.26	178.1	1.56	1.72
May	7,169	0.28	172.9	0.78	0.64
June	6,590	0.28	223.2	0.77	0.57
July	4,744	0.24	154.4	0.92	0.83
August	3,512	0.26	138.8	1.26	1.38
September	4,979	0.28	163.6	0.92	1.11
October	3,553	0.26	153.3	0.68	0.85
November	4,342	0.24	215.6	0.95	0.89
December	8,385	0.23	225.0	0.85	0.87
Total	**88,011**	**0.25**	**170.2**	**1.10**	**1.11**

Source: Dia Bras, 2017

16.3.1 Mine Design

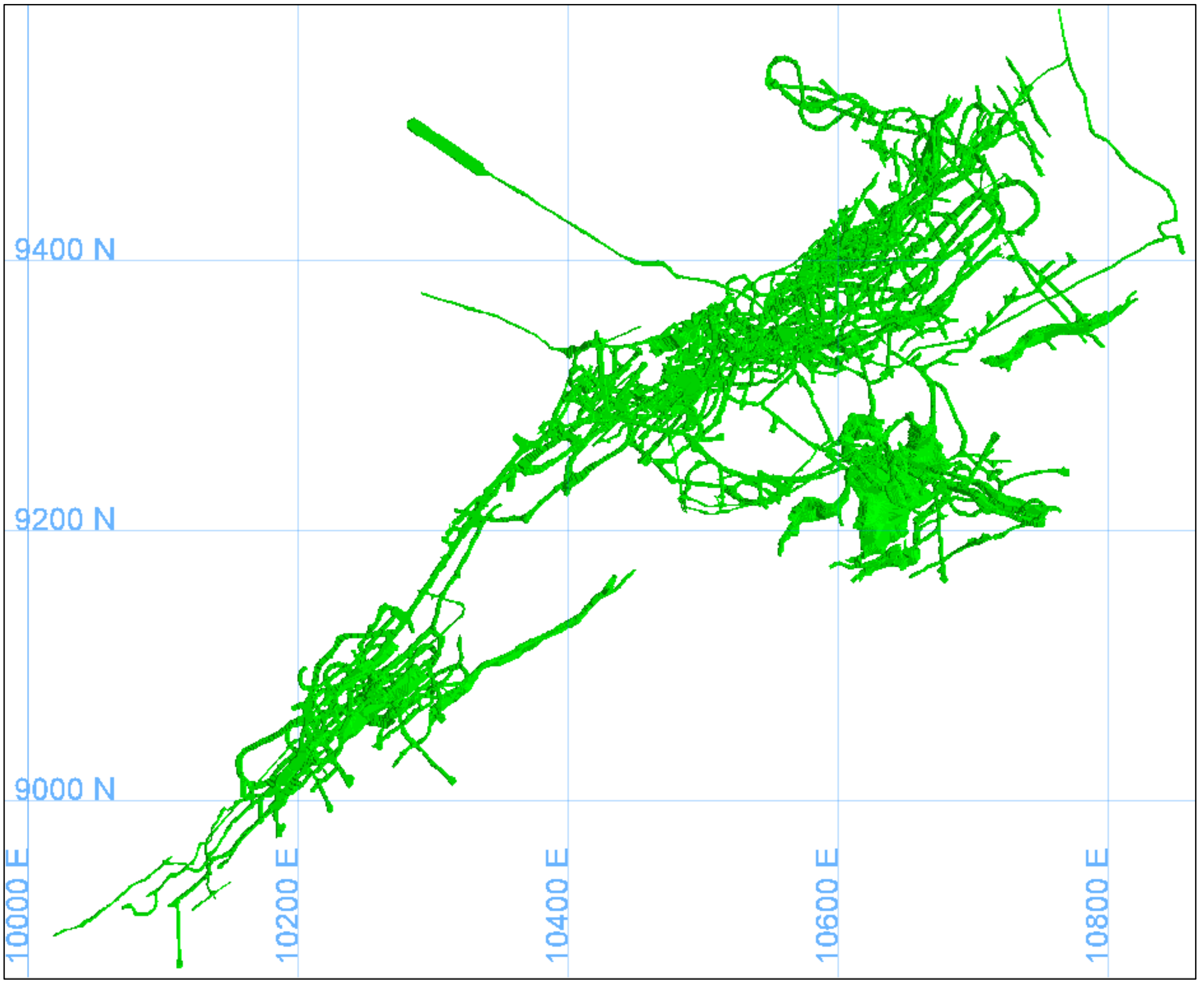
The Promontorio and Santa Eduwiges mines both benefit from extensive mine development as a result of the long history of underground mining in the area. Each mine area is accessed from a spiral ramp, as well as a single shaft in each area. Minimal development is needed to exploit mineralized zones, and contract miners are developing ramps at both mines to exploit ores at depth.

In addition to the shaft systems at Promontorio and Santa Eduwiges, a spiral ramp, 4 meters square also accesses the mine from surface to the 9 level and is used primarily to haul waste out of the mine and for access of men and equipment. The current mine asbuilts for each area are shown below. SRK notes that, in certain areas, stopes have been surveyed and provided in 3D. In other areas, the stopes have not been surveyed or provided in 3D. For this reason, Dia Bras provided subsequent polygons projected on long sections for each vein, delineating historic areas which have been mined.



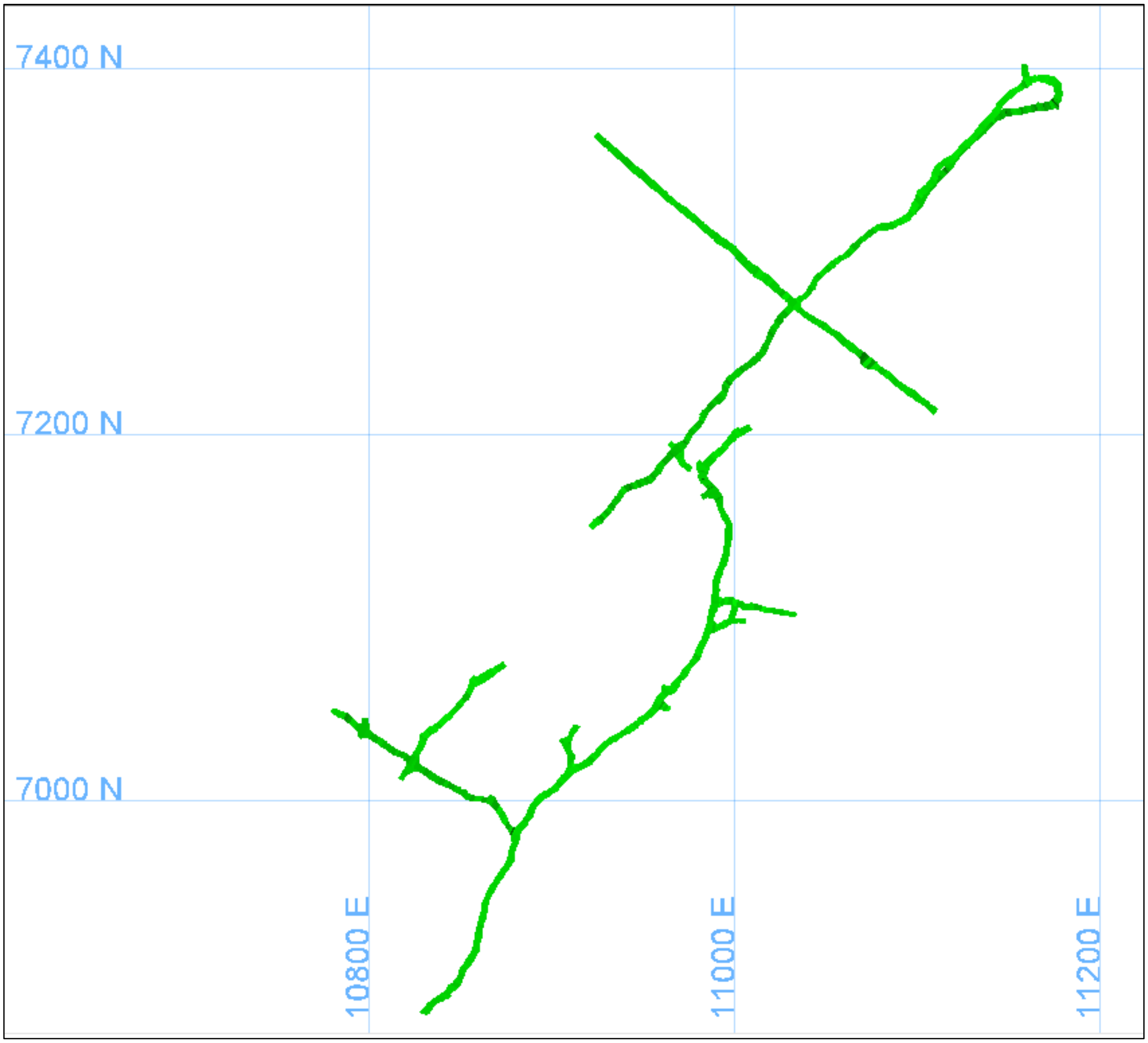
Source: SRK, 2017

Figure 16-3: Plan View of Promontorio 3D Mine Asbuilts



Source: SRK, 2017

Figure 16-4: Plan View of Santa Eduwiges 3D Mine Asbuilts

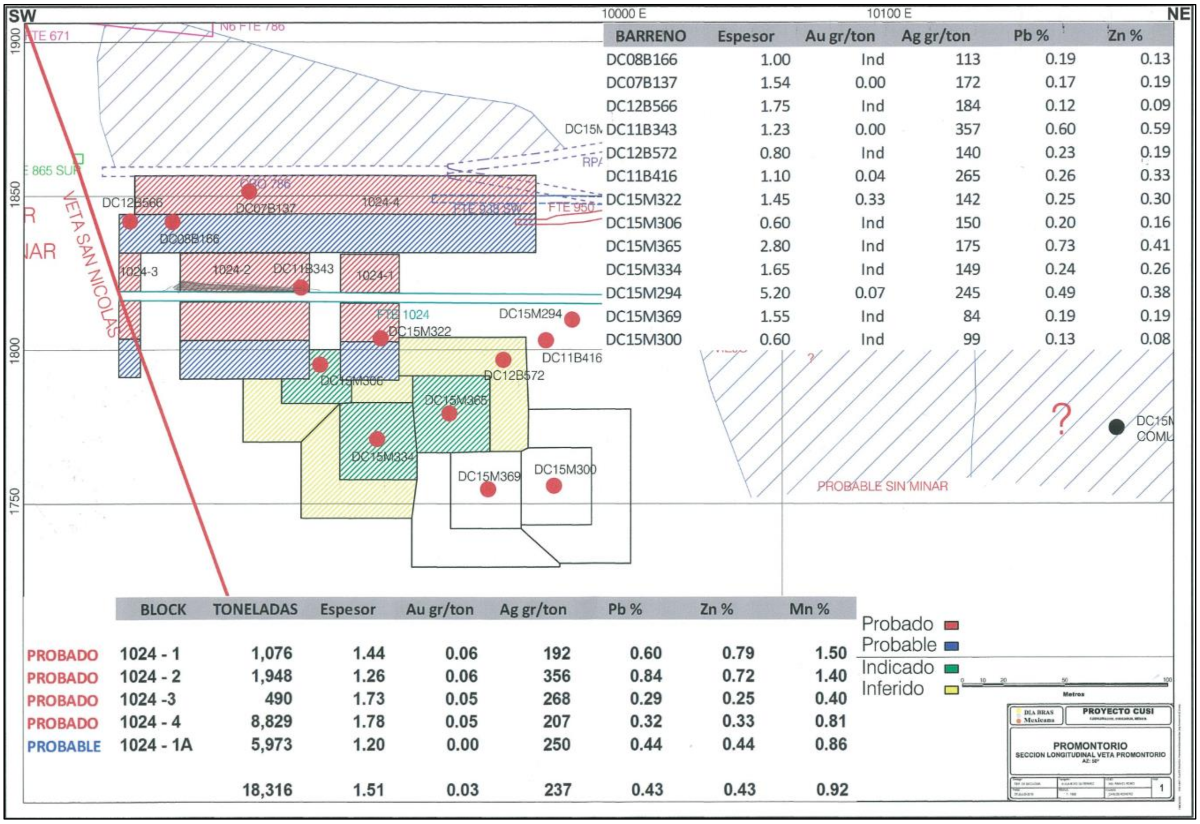


Source: SRK, 2016

Figure 16-5: Plan View of La India 3D Mine Asbuilts

SRK notes that no stope optimization or detailed 3D design for the mine plan was provided by Dia Bras, and that the individual stopes are effectively designed using 2D polygonal long sections upon reaching the level through development, with detailed channel sampling influencing the design of the stopes, in addition to the polygonal 2D grade-thickness derived from nearby exploration drilling. SRK notes that this is regarded as a high-risk approach to mine design, but one commonly in use in highly-variable epithermal veins systems in Mexico.

SRK notes that Dia Bras has historically used a system of resources vs. “reserves” to facilitate confidence in mine design. The internal designation is not consistent with CIM guidelines or industry best practices, and is only referred to herein to facilitate explanation of Dia Bras’ internal practices. Stope blocks were designed in 2D on the basis of the drilling and channel sampling, per vein, as shown in Figure 16-6. Estimated grade thicknesses based on nearby drill holes are projected from existing mine levels distances of 12.5 m vertically and varying distances laterally (along strike) for Proven and up to 25 m vertically (again varying along strike) for Probable material. Areas with no access to mine levels, but featuring exploration drilling, are left as Indicated and Inferred using a similar distance criteria.



Source: Dia Bras, 2016

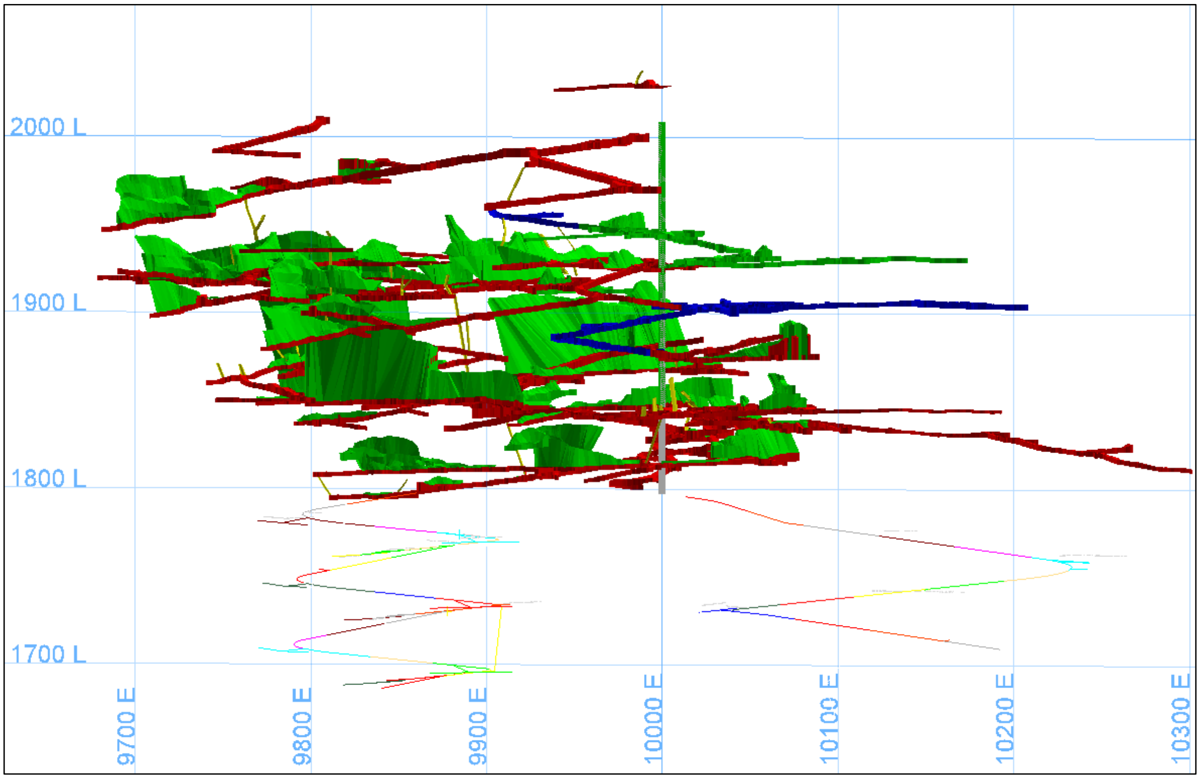
Figure 16-6: Example of Dia Bras Stope Block Design – Promontorio

SRK notes that only material which is designated in the "Proven and Probable" categories as defined by Dia Bras is brought into the mine's production schedule. SRK notes that this method for designing the stope blocks is not based on the current resource estimation, which utilizes industry-standard 3D geologic models and block model estimates to derive tonnes and grade.

It is expected that Sierra Metals would modify the practice of stope design and eventually produce industry-standard reserve estimates based on more modern practices, and SRK understands that this is a near-term objective for Sierra Metals.

16.3.2 Development

Development to access these stope blocks is designed up to two years in advance. An example of the development design is shown in Figure 16-7. Dia Bras' approach to development design is more consistent with industry standards than is the approach to stope design, likely due to the necessity to more accurately project development meters and related costs. A development schedule is based on these designs, and broken down by general ramps, cross cut access, faces, raises, and ventilation.



Note: Long section view looking northwest.
Source: SRK, 2017

Figure 16-7: Example of Mine Development Design – Promontorio Area

16.3.3 Schedule

SRK has not produced a production schedule, and has not reviewed internal production schedules provided by Dia Bras in detail. SRK cannot comment on the accuracy of the current mining schedule provided by Cusi in the context of the statement of the resources in this report, as the schedule is not based on the mineral resources stated herein. SRK notes that Cusi does not have a publicly stated reserve.

Dia Bras maintains a monthly schedule for mine production in Microsoft Excel format, out to approximately two years in advance. The schedule then devolves to a less detailed quarterly schedule for years 3-4, and an annual plan for year 5. This schedule is based on general expectations of production from various areas of the mine from as many as 16 working faces in a month. SRK notes that the production tonnages and grades are derived from the aforementioned 2D stope block designs, although development scheduling is derived from the 3D designs to reach the relevant stope block. An example of the production schedule used by Dia Bras is shown in Table 16-2.

Table 16-2: Example of Dia Bras Monthly Production Schedule - 2016

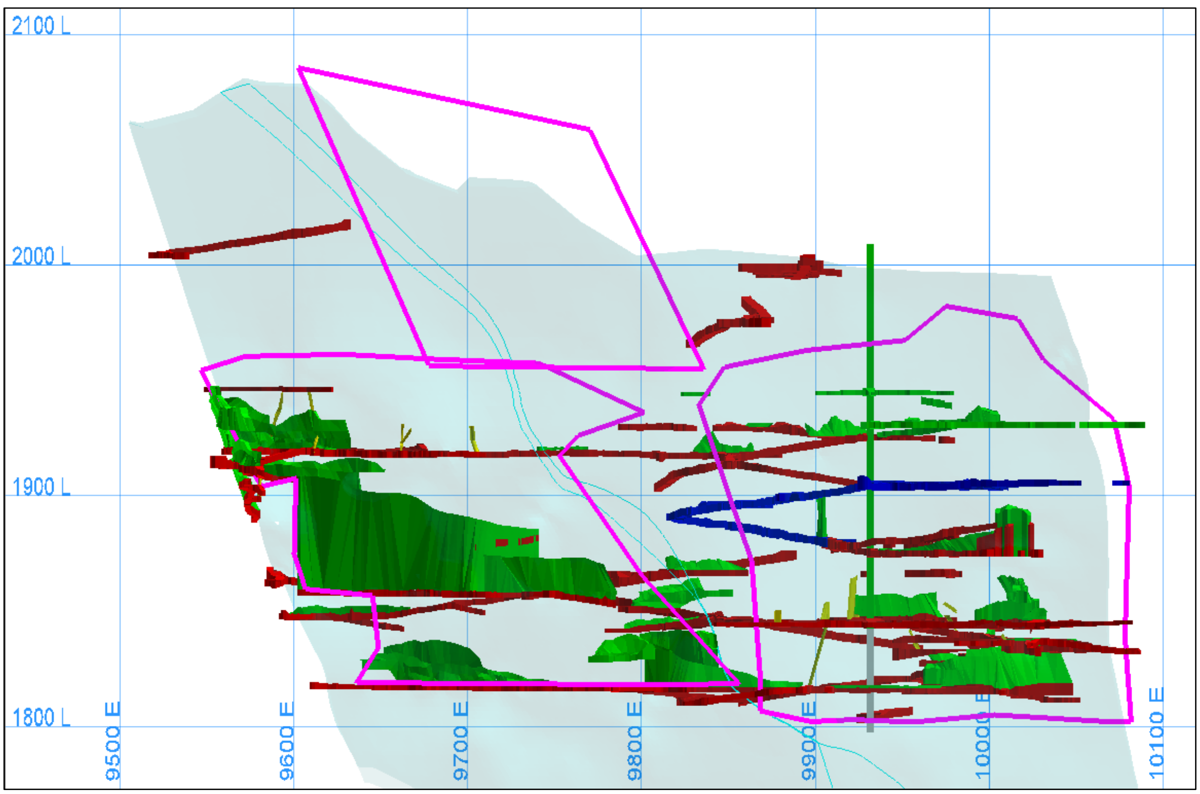
MINA	CUERPO	ELEVACION		Recursos remanentes para 2018	Au g/t	Ag g/t	Pb %	Zn %	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	PRODUCCION ENE - DIC 2018
STA ED	SAN NICOLAS	1878	1766	11,489	0.3	241	0.3	0.14	1,500	1,500	1,500	1,500	1,500	1,500	2,000	489	0	0	0	0	11,489
STA ED	EDW NE			11,888	0.14	262	1.2	1.8	1,000	1,157	1,200	1,200	1,500	1,500	2,000	2,311	0	0	0	0	11,868
PROM	EGB	1845	1794	11,901	0.0796	154.34	0.3518	0.438	2,000	2,000	2,000	2,000	2,000	1,901	0	0	0	0	0	0	11,901
PROM	SN_PROM	1853	1819	4,500	0.2043	188.51	0.1891	0.2687	1,500	1,500	1,500	0	0	0	0	0	0	0	0	0	4,500
PROM	SN_PROM	1816	1776	7,023	0.3893	175	0.30	0.57	1,500	1,500	1,500	1,500	1,023	0	0	0	0	0	0	0	7,023
PROM	PROM	1815	1775	18,679	0.0418	226.5	0.4937	0.4946	1,743	1,743	2,000	2,000	2,000	2,000	2,000	2,500	2,600	0	0	0	18,586
FÁTIMA	FATIMA	2000	1750	8,816	0.61	238	2.71	3.75	1,500	1,500	1,500	1,500	1,500	1,300	0	0	0	0	0	0	8,800
STA ED	SAN NICOLAS	1720	1780	28,752	0.12	187	0.05	0.10	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	3,500	3,500	3,500	2,252	28,752
STA ED	SAN NICOLAS	1660	1720	10,530	0.05	141	0.13	0.17	0	0	0	0	0	0	0	0	0	1,500	1,500	2,500	5,500
STA ED	SN ANTONIO	1720	1766	29,569	0.1053	160.79	4.1374	4.1192	2,000	1,000	2,000	2,000	2,000	2,000	2,000	3,000	3,000	4,000	3,300	3,248	29,548
STA ED	STA EDUWIGES	1720	1780	557	0.00	187	0.07	0.08	557	0	0	0	0	0	0	0	0	0	0	0	557
STA ED	La Mexicana	13	11	3,578	0	65.727	5.559	5.1299	1,000	1,000	1,000	578	0	0	0	0	0	0	0	0	3,578
STA ED	La Mexicana	14	13	10,110	0	59.154	9.5031	4.6169	1,000	1,000	1,000	1,322	1,500	1,500	2,700	0	0	0	0	0	10,022
STA ED	MOCTEZUMA	14	13	14,886	0.1111	195.82	3.5256	2.7631	1,000	1,000	1,000	1,500	1,500	1,899	2,000	3,000	1,987	0	0	0	14,886
PROM	AZUCARERA	1720	1780	50,629	0.16	307	0.63	0.68	0	0	0	0	0	0	0	0	0	0	0	1,500	1,500
PROM	EGB	1720	1780	38,361	0.39	223	0.12	0.11	0	0	0	0	1,277	2,000	2,000	2,000	2,500	3,600	3,600	3,600	20,577
PROM	PROMONT. SUR	1720	1780	63,343	0.04	300	0.64	0.69	0	0	0	0	0	0	0	0	0	0	0	0	0
PROM	SAN NICOLAS	1720	1780	127,480	0.06	229	0.17	0.14	0	0	0	0	0	0	1,600	2,000	3,013	3,700	3,700	3,700	17,713
PROM	SAN NICOLAS	10	9	38,598	0.13	169	0.09	0.14	2,000	2,000	2,100	2,500	2,500	2,000	2,000	3,000	3,000	4,000	4,000	3,500	32,600
PROM	STA ROSA DE LIMA	1720	1780	272,074	0.12	431	0.26	0.26	0	0	0	0	0	0	0	0	0	0	0	0	0
PROM	STA ROSA DE LIMA	1660	1720	647,240	0.05	313	0.22	0.15	0	0	0	0	0	0	0	0	0	0	0	0	0
			Total	1,410,004	0.09	305	0.47	0.41	20,300	18,900	20,300	19,600	20,300	19,600	20,300	20,300	19,600	20,300	19,600	20,300	239,400

Source: Dia Bras, 2016

16.3.4 Depletion

As noted in Section 14, the mineral resources have been depleted using a combination of the surveyed 3D mine asbuilts, as well as polygonal mined areas provided by Dia Bras. The major reason for this approach is the lack of 3D surveys in historic areas which have since been filled or are currently inaccessible. A secondary reason for this is due to the fact that the projections of the veins based on drilling locally do not agree with the surveyed locations of the stopes. This is due primarily to the inadequate survey data being used to project drilling. The simplest solution to this inaccuracy was for Dia Bras to simply utilize the historic long sections, as well as the modern 3D survey data, and project these mined areas through the relevant structure. SRK notes that there are sets of polygons for each of the veins which have undergone mining.

SRK notes that there is significant uncertainty associated with these generalized polygons, but that they appear rather conservative in their application, effectively sterilizing major areas of veins (see Figure 16-8) for which it may be assumed that pillars or remnant areas remain. The close proximity of the veins in areas like Promontorio requires care in allocating mined areas, as one vein may have seen significantly more production than one immediately adjacent by only a few meters. In some cases, this can be seen with areas of asbuilt data that plot very close to some of the veins, but are not used to mine them as they access one of these adjacent structures. SRK has depended on Dia Bras geological personnel to define these areas and delineate using the polygon method.



Source: SRK, 2017
Note: 3D shapes are representing surveyed 3D mine asbuilts. Pink poly-lines are “mined” areas provided by Dia Bras. The blue transparent shape is the footprint of the Promontorio vein, depleted using the two aforementioned data sets.

Figure 16-8: Example of Surveyed 3D Asbuilt Data vs. Polygonal Mined Projections – Promontorio

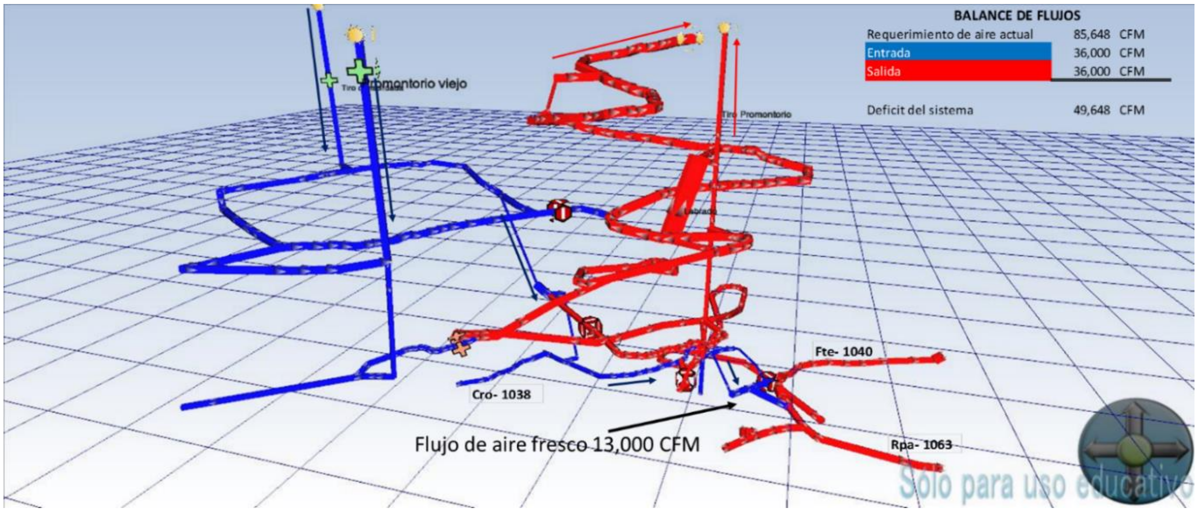
16.4 Ventilation

Cusi currently uses natural ventilation dependent on the circulation of warmer versus colder air in the mine. As a result, airflow through the mine varies in quantity and direction as the atmospheric conditions on the surface change. A study conducted by Dia Bras in early 2017 shows that the mine needs at least 85,000 cfm of air flow to appropriately dilute contaminants from dust, diesel exhaust, explosives, etc. The current estimates of inflow of fresh air show only 36 Kcfm entering the mine, creating a deficit of more than 49 Kcfm. A simple Ventsim model was built by Dia Bras and is shown in Figure 16-9. The study states that the calculation for the ventilation requirements has been done to the standards of NOM-023-STPS-2012.

SRK notes that nothing has been provided by Dia Bras demonstrating that the mine achieves these rates of flow, and in fact show a major deficit in ventilation. In addition, SRK does not suspect that the degree of flow from natural ventilation is sufficient to produce adequate ventilation at the working levels of the mine. The inflow diagram in Figure 16-9 show fresh air entering at lower levels of the mine, without demonstrated access to vent raises or other means of inflow. In addition, the degree of modeling in Ventsim™ is not consistent with the actual asbuilts of the mine, making this analysis unreliable. SRK's experience in the mine is that temperatures are extremely elevated in most working levels, with limited air flow. A well-designed forced-air system would remediate this issue, and Dia Bras has noted that such a system is in the process of being installed as of June 2017.

SRK recommends that the site implement a whole-of-mine ventilation plan. The main objectives of the plan would be to:

- Develop a whole-of-mine ventilation strategy that will ultimately achieve best practice;
- Provide additional data for the detailed design and construction of the forced ventilation system;
- Identify areas of the mine that may need to be sealed in order for the ventilation system to function as designed;
- Identify auxiliary ventilation requirements; and
- Train personnel in the operation of the system as well as how the mine plan and operational practices can impact the performance of the system.



Source: Dia Bras, 2017

Figure 16-9: Example Ventsim Ventilation Diagram

16.5 Mining Equipment

A list of the major mining equipment used underground is included in Table 16-3. The equipment appears to be of sufficient quantity and appropriate size for the operation. Some equipment is notably in poor condition or features very high work hours. SRK notes that good maintenance practices, proper ventilation, and properly timed equipment overhaul or replacement will be important as the mine progresses deeper and further from the surface access.

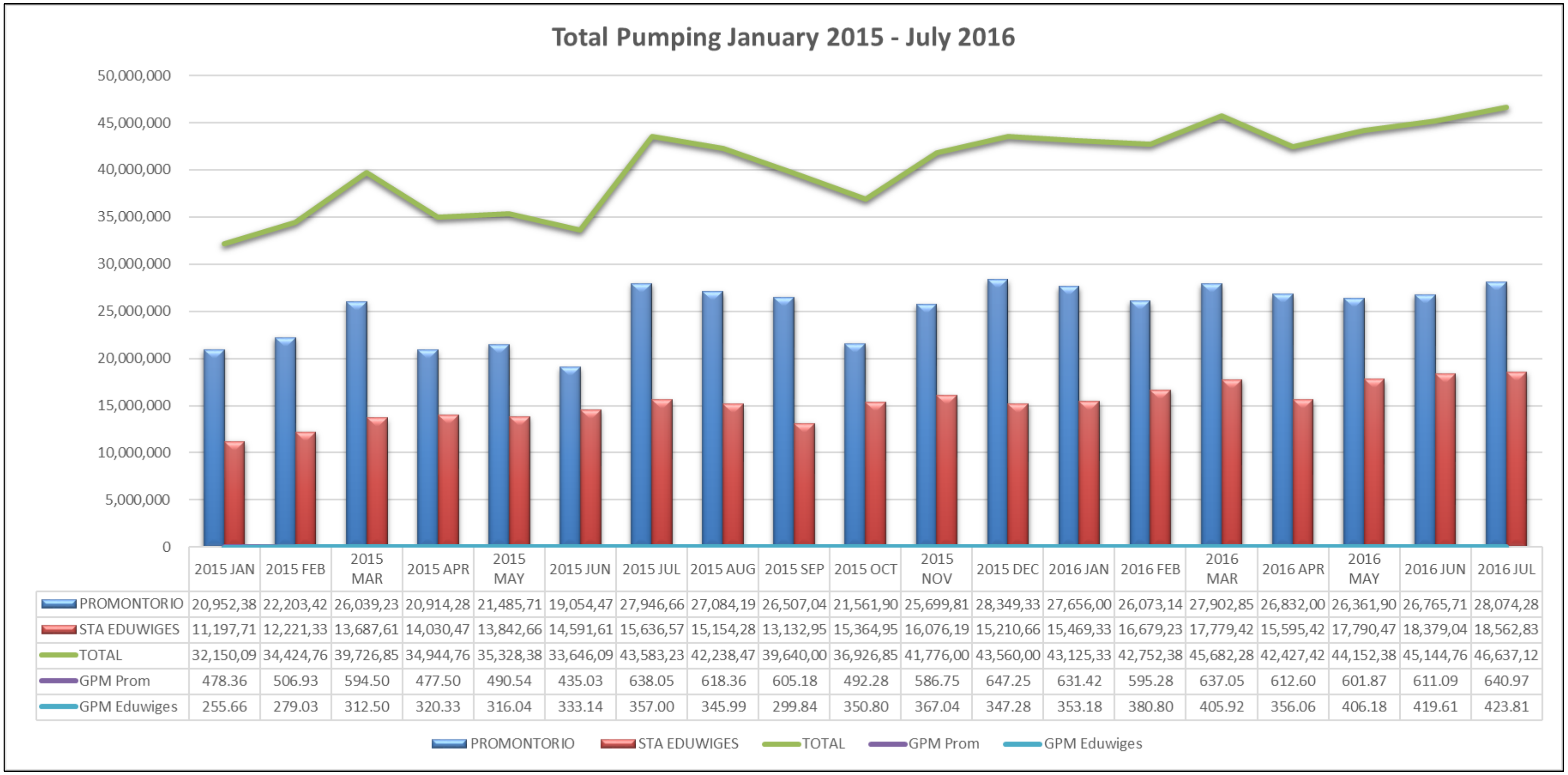
Table 16-3: Equipment List for Cusi

Equipment	Make	Model	Capacity
Scooptram	Joy Global	LT-270 (2015)	1.5 yd^2
Scooptram	Joy Global	LT-270 (2015)	1.5 yd^2
Scooptram	Joy Global	LT-270 (2015)	1.5 yd^2
Scooptram	Tamrock	EJC 65	1,25 yd^2
Scooptram	Wagner	ST-2D	2 yd^2
Scooptram	MTI	JCI-125	1.5 yd^2
Scooptram	MTI	LT-210	1,25 yd^2
Scooptram	MTI	JCI-250	2.5 yd^2
Scooptram	MTI	LT-350 (2014)	2.5 yd^2
Scooptram	Joy Global	LT-350 (2015)	2.5 yd^2
Jarvis	Jarvis Clark	JDT 413	10 T
Jarvis	Jarvis Clark	JDT 413	10 T
Jarvis	MTI	JCI-1304	13 to 16 T
Jarvis	Sandvik	EJC-417	17 T
Jarvis	MTI	DT-1604	16 T
Truck	International		16 T
Traxcavo	Case	721C	3 yd^2
Bulldozer	Caterpillar	D6 C	NA

Source: Dia Bras, 2016

16.6 Dewatering

Cusi currently pumps an average of about 570 gpm from the Promontorio mine area and about 350 gpm from the Santa Eduwiges area. SRK was provided with the total pumping from January of 2015 to July of 2016, and notes that the pumping requirements have increased over that period of time, from a total of about 32,000,000 gallons per month to over 46,000,000 gallons per month. A plot of the total pumping requirements and rates for Cusi during this period of time are shown below in Figure 16-10.



	2015 JAN	2015 FEB	2015 MAR	2015 APR	2015 MAY	2015 JUN	2015 JUL	2015 AUG	2015 SEP	2015 OCT	2015 NOV	2015 DEC	2016 JAN	2016 FEB	2016 MAR	2016 APR	2016 MAY	2016 JUN	2016 JUL
PROMONTORIO	20,952,38	22,203,42	26,039,23	20,914,28	21,485,71	19,054,47	27,946,66	27,084,19	26,507,04	21,561,90	25,699,81	28,349,33	27,656,00	26,073,14	27,902,85	26,832,00	26,361,90	26,765,71	28,074,28
STA EDUWIGES	11,197,71	12,221,33	13,687,61	14,030,47	13,842,66	14,591,61	15,636,57	15,154,28	13,132,95	15,364,95	16,076,19	15,210,66	15,469,33	16,679,23	17,779,42	15,595,42	17,790,47	18,379,04	18,562,83
TOTAL	32,150,09	34,424,76	39,726,85	34,944,76	35,328,38	33,646,09	43,583,23	42,238,47	39,640,00	36,926,85	41,776,00	43,560,00	43,125,33	42,752,38	45,682,28	42,427,42	44,152,38	45,144,76	46,637,12
GPM Prom	478.36	506.93	594.50	477.50	490.54	435.03	638.05	618.36	605.18	492.28	586.75	647.25	631.42	595.28	637.05	612.60	601.87	611.09	640.97
GPM Eduwiges	255.66	279.03	312.50	320.33	316.04	333.14	357.00	345.99	299.84	350.80	367.04	347.28	353.18	380.80	405.92	356.06	406.18	419.61	423.81

Source: Dia Bras, 2016

Figure 16-10: Total Pumping by Month

The current dewatering capacity for Cusi is supported by a system of nine electric pumps located in various levels and locations throughout the Promontorio and Santa Eduwiges mine complexes. A major pumping station which collects water from other areas of the mine, and removes it to the surface, is located in the shaft located near San Bartolo, on level 12 of the mine. Seven 15-40 HP pumps located throughout the two mine areas move water to the pumping station, or other discharges. Two 125 to 150 HP vertical pumps lift water to the surface from the pumping station to the Eduwiges arroyo. The dewatering equipment is shown in Table 16-4. An additional seven pumps are kept in stand by for replacement in the case of mechanical failure or unexpected inflow. SRK notes that the capacity of some of the stand by pumps are in excess of the primary pumps, mitigating the risk associated with high inflow levels based on surface condition or hydrogeologic conditions.

Table 16-4: Cusi Pumping Equipment

Type	Make	Model	Series	Liters/Second	Column	Capacity (HP)	Location	Discharge
Vertical	KLASSEN	10CHO-10		40	250 t	125 HP	ESTACION DE BOMBEO POR TIRO SAN BARTOLO NIVLE 12 CAPACIDAD DE PILETA 1198 M3	*DESCARGA A SUPERFICIE ARROYO EDUWIGES*
Vertical	WARSON	11WL - 1C	7-11290	50	250 t	150 HP	ESTACION DE BOMBEO POR TIRO SAN BARTOLO NIVLE 12 CAPACIDAD DE PILETA 1198 M3	*DESCARGA A SUPERFICIE ARROYO EDUWIGES*
Submersible	TSURUMI	LH430W-61	15471717002	20	127 t	40 HP	RAMPA 9319	*DESCARGA A PILETA NIVEL 12 AREA SAN BARTOLO*
Submersible	TSURUMI	LH430W-61		20	127 t	40 HP	LABRADO STA. MARINA	*DESCARGA A PILETA NIVEL 12 AREA SAN BARTOLO*
Submersible	FRANKLIN	K6MA240		14	160 t	30 HP	LABRADO STA. MARINA	*DESCARGA A PILETA NIVEL 12 AREA SAN BARTOLO*
Submersible	GRUNFOS	80KDEH11-2T4	OP1462OO1001	15	50 t	15 HP.	REBAJE 9315	*DESCARGA EN CARCAMO DE RAMPA 9384*
Submersible	GRUNFOS	80KDEH11-2T4	OP1462OO1001	15	50 t	15 HP	CARCAMO 9450	*DESCARGA A LABRADO SAN ANTONIO 9440*
Submersible	GRINDEX	MATADOR - H	1530429	20	70 t	27 HP	RAMPA 9383	*DESCARGA EN LABRADO SANTA MARINA*
Submersible	GRINDEX	MASTER- H	1530945	20	50 t	15 HP	CARCAMO 9384	*DESCARGA EN LABRADO SANTA MARINA*

Source: Dia Bras, 2016

17 Recovery Methods

The Cusi concentrator is located in the outskirts of Cuauhtemoc City, approximately 50 km by road from Cusi operations. Dump trucks each hauling approximately 20 t of ore delivered 186,898 t during the 2016 period.

The Cusi processing facilities include two interconnected process plants, which are the Malpaso mill purchased from Rio Tinto, and the El Triunfo mill. Both mills are conventional ball mill and flotation plants fed from a single crushing circuit. The flotation circuit has the ability to produce lead concentrate and zinc concentrate, although the Pb circuit represents a comparably higher percentage of concentrate production. For example, no zinc concentrate was produced in 2015, with over 5,000 tonnes of Pb concentrate reported. For 2016, 5,442 tonnes of Pb concentrate were produced, with 1,540 tonnes of Zn concentrate.

The summary of concentrate production for the previous two years, including a monthly breakdown of 2016, is shown in Table 17-1. El Triunfo includes a cyanide leach plant that has been used to process legacy tailings and, at times, fresh tails from Malpaso. The leach plant was idled in mid-2012 with no indication that it is scheduled to restart. The previous years of performance of the Cusi concentrator facility is shown in Table 17-1.

Table 17-1: Cusi Concentrate Production (2015 to January 2017)

Date	Pb concentrate (t)	Zn Concentrate (t)
2015	5,329	0
Jan 2016	477	96
Feb 2016	595	159
Mar 2016	792	290
Apr 2016	577	181
May 2016	460	129
Jun 2016	334	120
Jul 2016	400	102
Aug 2016	485	125
Sep 2016	375	117
Oct 2016	452	168
Nov 2016	228	8
Dec 2016	267	46
2016	5,442	1,540

Source: Dia Bras, 2017

Table 17-2: Cusi Metallurgical Balance (2014 to 2016)

	2014	2015	2016
Tonnage	**155,268**	**202,033**	**186,898**
Head Grades			
Ag (gr/t)	166.69	175.88	171.78
Pb	0.78%	0.78%	1.21%
Zn	0.00%	0.71%	1.16%
Au (gr/t)	0.42	0.22	0.26
Metallurgical Recoveries			
Pb concentrate			
Ag recovery	76%	76%	70%
Pb recovery	79%	79%	82%
Pb grade in concentrate %	28%	23%	34%
Au recovery	62%	57%	62%
Zn concentrate*			
Ag recovery	na	na	1%
Zn recovery	na	na	38%
Zn grade in concentrate %	na	na	53%
Metal Production (combined in concentrates)			
Ag (oz)	630,160	873,496	739,707
Zn (t)	na	na	818
Pb (t)	962	1,246	1,864
Au (oz)	1,289	831	954

Source: Dia Bras, 2017
Note: Zn concentrate details not reported in 2014 to 2015 as the Zn recovery circuit was being commissioned.

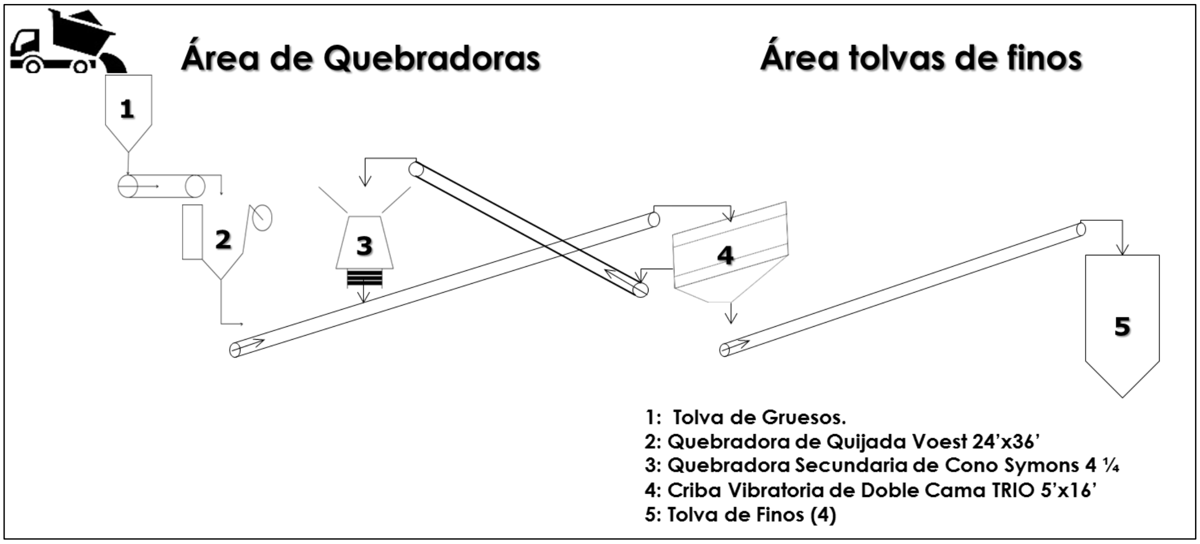
17.1 Plant Design and Equipment Characteristics

Based on the provided schematic process flowsheets a single crushing plant reduces ROM feed to minus ¼ inch feeding both mills. Primary crushing is done through a 36 inch X 24 inch Voest jaw crusher. Primary crush material is screened with oversize reporting to a Symons gyratory 4 ½ crusher. Fine ore, minus ¼ inch, is conveyed to any of four fine ore silos: two each 70 t capacity and two each 150 t.

The Malpaso flowsheet indicates three ball mills: one 4.5 ft X 6 ft, one 4 ft X 6 ft and one 5' X 8'. Each mill is operated in closed circuit through cyclones. Fine cyclone overflow reports to lead flotation through two conditioner tanks. Lead flotation is arranged with three rougher cells followed by three scavengers (all 50 ft^3). Rougher con advances to two first cleaners (50 ft^3) and four second cleaners (30 ft^3). The concentrates are thickened and filtered but this equipment in not indicated on the flow sheet.

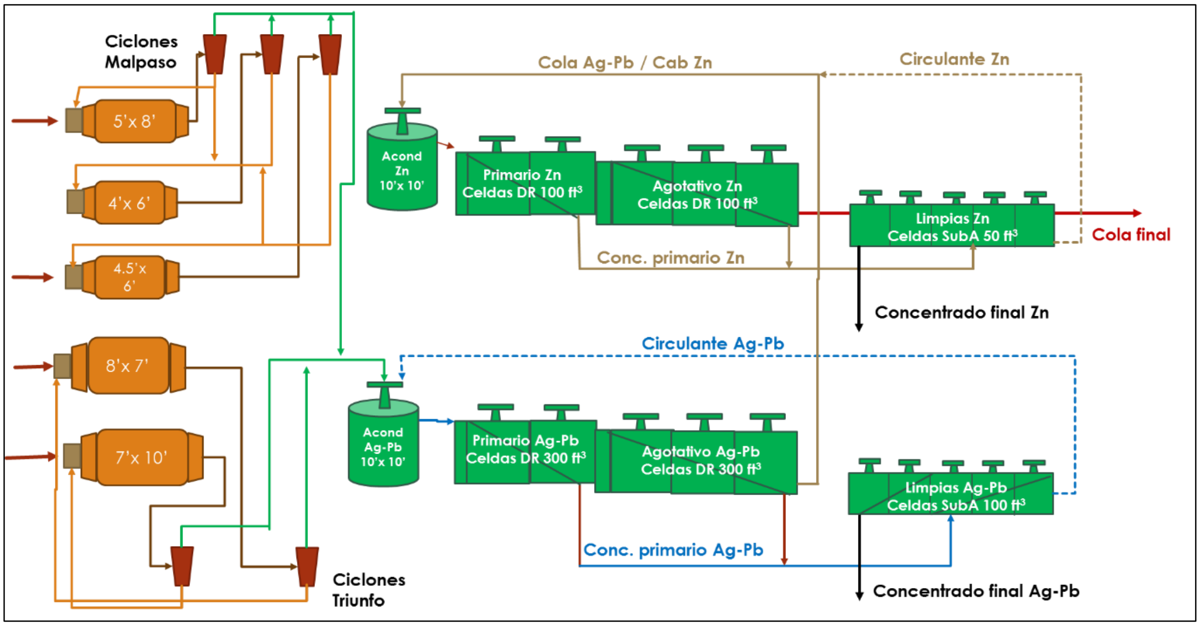
El Trimfo plant includes two ball mills: one 8 ft X 7 ft and one 7 ft X 10 ft., each operating in closed circuit. Lead flotation includes an 8 ft X 8 ft conditioning tank, six rougher cells followed by four scavenger cells, all (50 ft^3). Lead concentrate advances to 3 first cleaner cells and two second cleaners (not sized on the flow sheet but presumed to be 50 ft^3 cells).

The flowsheets provided to SRK are shown in Figure 17-1 and Figure 17-2. No diagrams are presented for the cyanide circuit, as this area of the plant is currently not operating.



Source: Dia Bras, 2017

Figure 17-1: Flow Chart for Crushing Circuit



Source: Dia Bras, 2017

Figure 17-2: Flow Diagram for Malpaso/Triunfo Plant

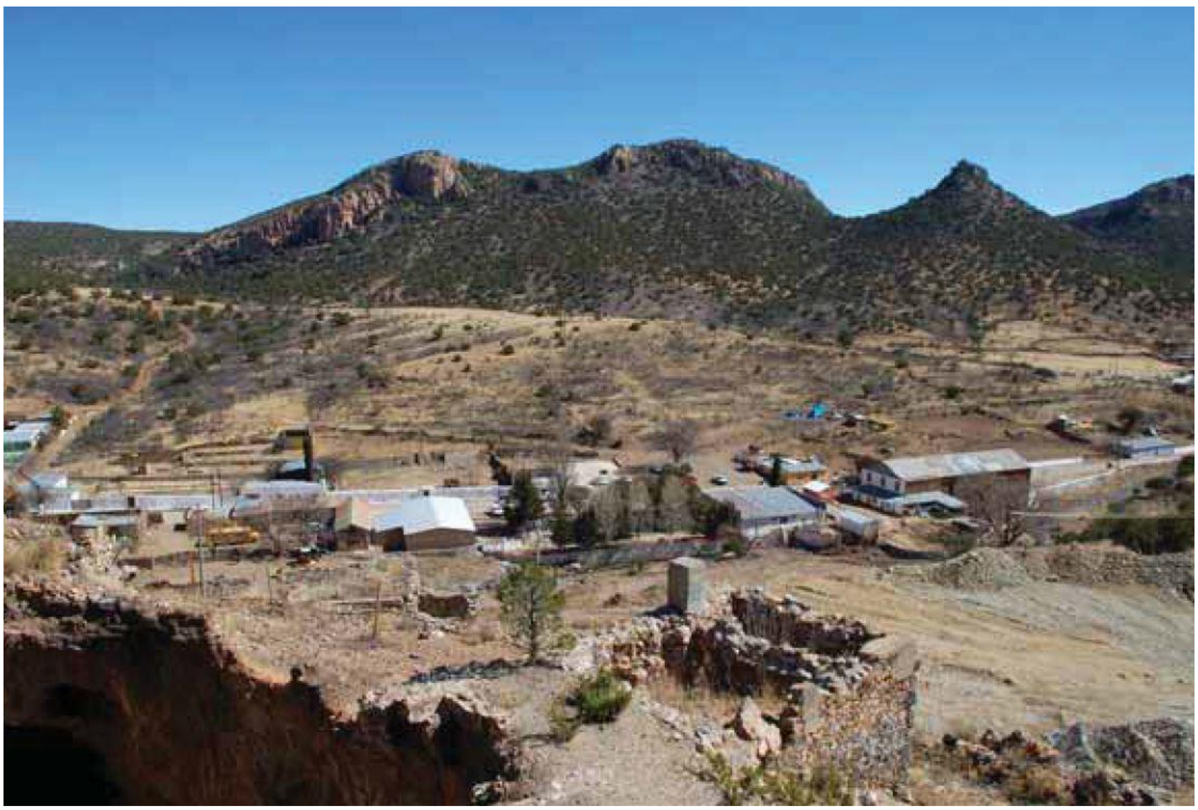
18 Project Infrastructure

The Project has fully developed infrastructure including access roads, an exploration camp, administrative offices, a processing plant and associated facilities, tailings storage facility, a core logging shed, water storage reservoir and water tanks.

The site has electric power from the Mexican power grid, backup diesel generators, and heating from site propane tanks. The overall Project infrastructure is built out and functioning and adequate for the purpose of the planned mine and mill.

18.1 Access and Local Communities

Access to the Cusi Property is by paved road, approximately 105 km from Chihuahua to Cuauhtémoc via Federal Highway No. 16, then 22 km by paved road, and then approximately 8 km by all-season gravel roads to the Village of Cusihuiriachi, which is located within the property. The total road distance from Chihuahua is approximately 135 km.



Source: Geostats, 2008

Figure 18-1 Photo of Cusihuiriachi Village

The City of Cuauhtémoc, the largest town in the area, is situated some 22 km north of the Cusi Property, and is an agro-industrial town. Infrastructure support and availability of trained miners proximal to the various concessions is limited, but is available at Cuauhtémoc and Chihuahua. Numerous towns and villages are located throughout the area and are used as a local base for exploration activities on the various concessions. The land around the Cusi Property is used for agriculture. The villages in the area use the land to raise cattle, and to grow crops. Wildlife in the area includes various species of insects, lizards, snakes, birds, and small mammals.

18.2 Service Roads

The site has developed and functioning gravel service roads that access the mine portals, water storage reservoir, camp, and process facilities. The roads between the mine and processing plant are used daily by the fleet of contract trucks that move the ore from the mine ore pads to the processing plant.

18.3 Mine Operations and Support Facilities

Source: Google Earth

Figure 18-2: Aerial View of Cusi

Sierra Metals owns a small processing plant equipped with crushers and flotation circuits located approximately 40 km by car from the Cusi property. The plant is equipped with crushers and two flotation circuits. The Triungo circuit, which has a capacity of 400 tonnes/day, produces a copper concentrate and a zinc concentrate. The Malpaso circuit, which has a capacity of 150 tonnes/day, produces a lead concentrate and a zinc concentrate. The capacity of the Malpaso processing facilities is expected to be sufficient for future mining operations.

18.4 Process Support Facilities

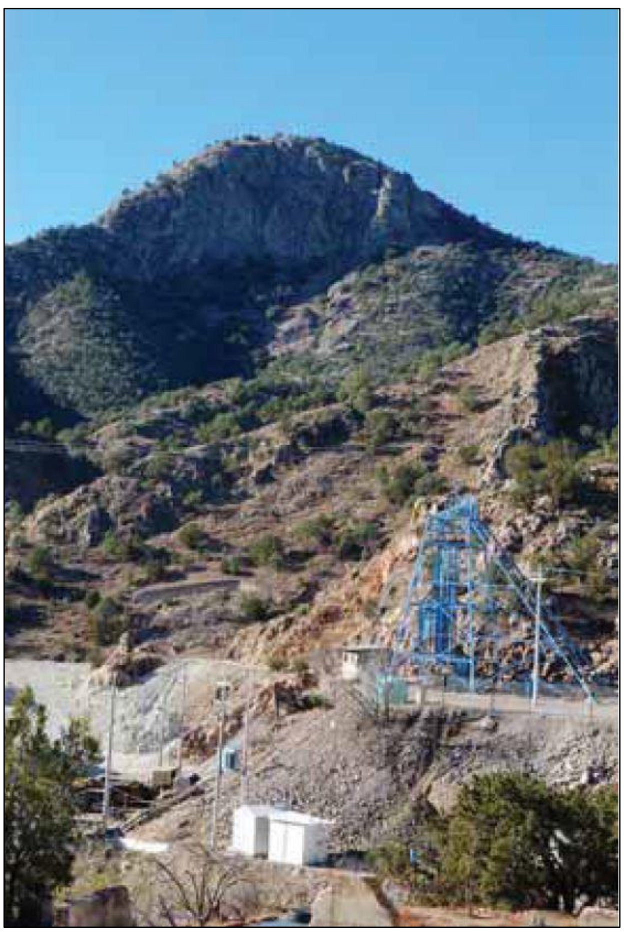
18.5 Energy

Electrical power at the Cusi Mine and Malpaso Mill is provided by the Mexican Electricity Federal Commission (Comisión Federal de Electricidad). At the Cusi mine, electricity is conveyed in 33,000-Volt power lines. At the Malpaso Mill, electricity is delivered on a 1,290-kilowatt power line. Existing electricity supply is expected to be adequate for foreseeable mining operations. Backup power is available via diesel generators at the mine site. Heating is provided via propane tanks on-site.

Details regarding energy consumption of the operation have been provided by Dia Bras. In 2016, for example, average monthly usage was about 850,000 kWh at a cost of approximately MXN$1.07/kWh.

18.6 Water Supply

Water, both industrial and potable, is drawn from local sources. At Cusi, Sierra Metals utilizes water recovered from the underground workings for process water and support of mining operations. Water is generated from dewatering operations in the Promontorio and Santa Eduwiges Mines. Potable water is trucked in as needed from nearby public water facilities and wells.



Source: Geostats, 2008

Figure 18-3 On-site Electric and Water Supply

18.7 Site Communications

The site is equipped with a satellite communications system, including telephone and internet that allows communications between the plant and office facilities. A radio system is also in use. The mine has hard line telephone service.

18.8 Site Security

There is a head of security on site with a staff of four personnel. In addition to this group, is a mine rescue team trained in rescue techniques, as well as an on-site paramedic for minor medical emergencies. A central guardhouse is located near the access ramp for the Santa Eduwiges mine. Other guardhouses exist at the entrances to the mines where security personnel ensure that mine personnel entering the mine are properly equipped, as well as where they will be going in the mine.

A municipal Cusihuiriachi police station is located approximately 150 meters from the mine access area for Santa Eduwiges, and also has an ambulance in cases of medical emergencies. The Mexican army base in the municipality of Cuahtemoc is approximately 17 km from the mine site in situations that may need more support.

18.9 Logistics

Concentrates produced from Cusi are shipped overland in trucks to the Manzanillo-Colima shipping complex approximately 1.600 km south.

18.10 Waste Handling and Management

Waste from the Promontorio and Santa Eduwiges mines is stored near the entry portals and ramps of these mines. Waste is used as backfill for the mine, and thus requirements for waste storage are minimal. Waste disposal areas are expected to be sufficient for expected future operations.

18.11 Tailings Management

Two tailings dams are located in the vicinity of the Malpaso Mill. Land position within the Malpaso Mill area is expected to be adequate to support anticipated mining operations. SRK notes that Dia Bras has engaged tailings design consultants as of 2015 to develop new tailings impoundments and consider dry-stacking of tailings. The existing tailings facility is scheduled to be filled as of Q1 2018, at which point additional storage will be required.

Dia Bras has permitted additional tailings storage on site to take on additional tailings in early 2018. Subsequent to this, additional areas on previously permitted and dried tailing facilities as well as upstream from the latest dam and tailings impoundment are in the permitting process. All three of these areas combined should allow up to 4 years of capacity using filtered stack tails deposition. Studies are underway to complete assessment of the dry stack option, and SRK understands that Dia Bras is already scheduling construction.

19 Market Studies and Contracts

19.1 Introduction

This section of the report will present the market assumptions used for the definition of the disclosed resources and also discuss all contracts held by the Project that cover the sales of the various concentrates and metals produced by the Mine.

The market studies combined with the contracts information should present the reader with enough information to assess how much revenue the Mine can potentially yield.

19.2 Market Studies

No specific market study was produced for this report, as reserves are not disclosed here. Nonetheless, SRK subscribes to a number of market forecast analysts and prepares a consensus market forecast analysis based on the information provided by these subscriptions.

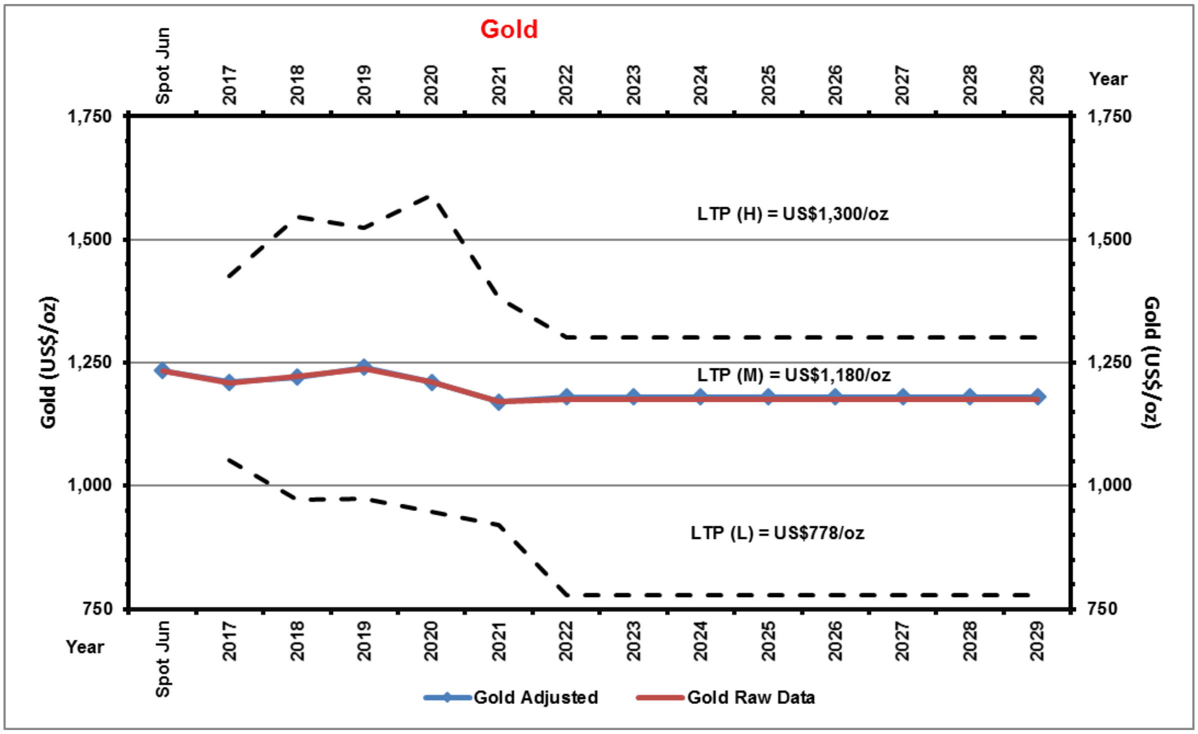
This Mine produces lead and zinc concentrates yielding payable quantities of gold and silver, the sections below will disclose SRK's consensus market forecast for each of these metals based on information available for Q1 2017, with an effective date of March 20, 2017. All price analysis here presented are based on a Free-On-Board (FOB) basis, which, on the case of this Project, can be considered as loaded at the mine gate. SRK notes that the commodity pricing for the calculation of cut-off grades in the mineral resource statement has been provided by Sierra Metals, and approximates what they internally use for their own calculations.

19.2.1 Gold

The spot price of gold, as of March 20, 2017, is US$1,234/oz. The consensus market forecast here presented is based on the data provided by nine different analysts, where the highest long-term price projection from these professionals is US$1,300/oz and the lowest is US$778/oz.

The graph below combines the data from these nine analysts to produce an average price curve for this precious metal and an effective long-term price of US$1,180/oz. This is the price that SRK internally considers for the disclosure of ore reserves, in the case of resources disclosure a premium of 30% is considered, bringing the price to US$1,530/oz.

The prices here presented are for 99.9% pure gold and do not consider the effect of transportation to market, smelting and refining charges, payability factors, price participation and penalties, these will be discussed in the Contracts sections.



Source: SRK, 2017

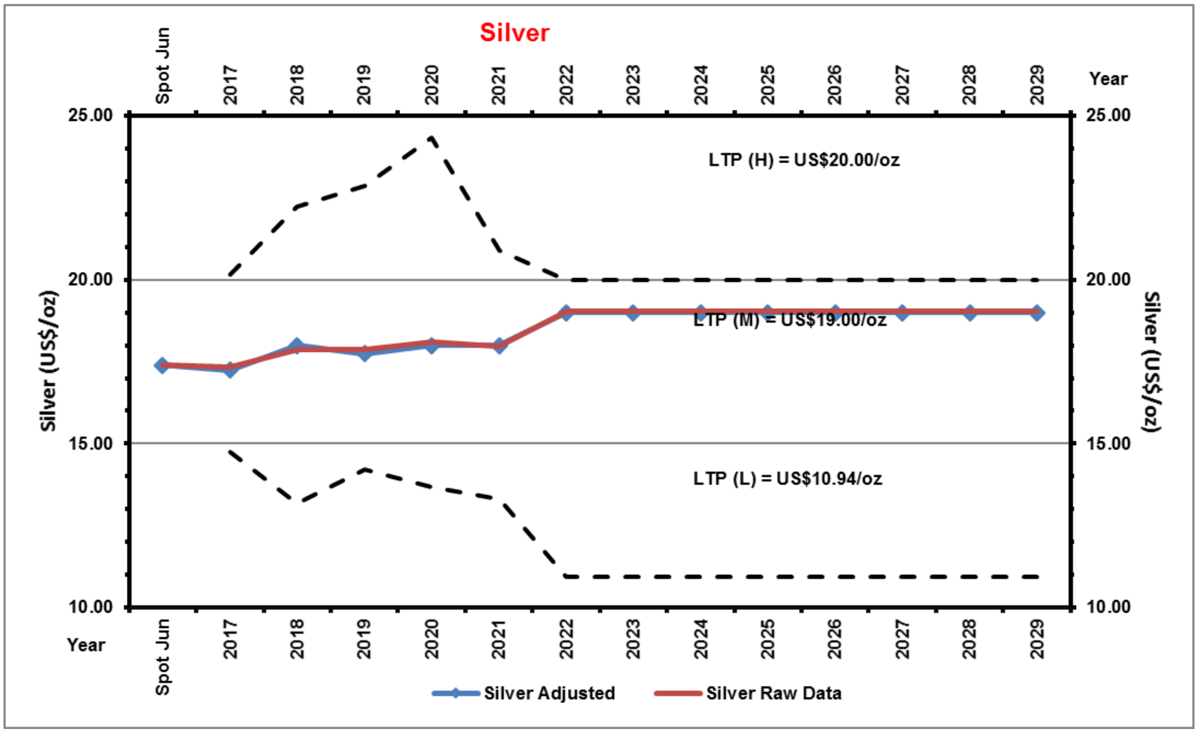
Figure 19-1: Gold Price Curve and Long-Term Price

19.2.2 Silver

The spot price of silver, as of March 20, 2017, is US$17.40/oz. The consensus market forecast here presented is based on the data provided by eight different analysts, where the highest long-term price projection from these professionals is US$20.00/oz and the lowest is US$10.94/oz.

The graph below combines the data from these eight analysts to produce an average price curve for this precious metal and an effective long-term price of US$19.00/oz. This is the price that SRK internally considers for the disclosure of ore reserves, in the case of resources disclosure a premium of 30% is considered, bringing the price to US$24.75/oz.

The prices here presented are for 99.9% pure silver and do not consider the effect of transportation to market, smelting and refining charges, payability factors, price participation and penalties, these will be discussed in the Contracts sections.



Source: SRK, 2017

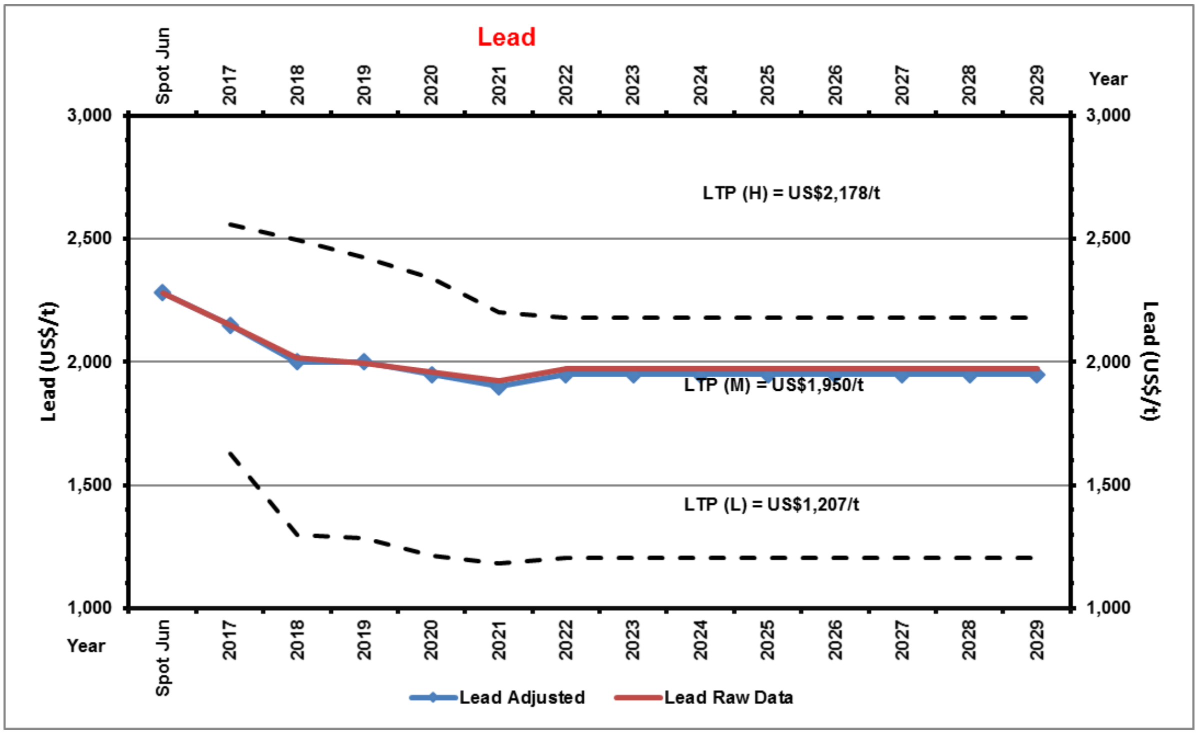
Figure 19-2: Silver Price Curve and Long-Term Price

19.2.3 Lead

The spot price of lead, as of March 20, 2017, is US$1.03/lb (US$2,281/t). The consensus market forecast here presented is based on the data provided by ten different analysts, where the highest long-term price projection from these professionals is US$0.99/lb (US$2,178/t) and the lowest is US$0.55/lb (US$1,207/t).

The graph below combines the data from these ten analysts to produce an average price curve for this base metal and an effective long-term price of US$0.88/lb (US$1,950/t). This is the price that SRK internally considers for the disclosure of ore reserves, in the case of resources disclosure a premium of 30% is considered, bringing the price to US$1.14/lb (US$2,550/t).

The prices here presented are for pure lead metal and do not consider the effect of transportation to market, smelting and refining charges, payability factors, price participation and penalties, these will be discussed in the Contracts sections.



Source: SRK, 2017

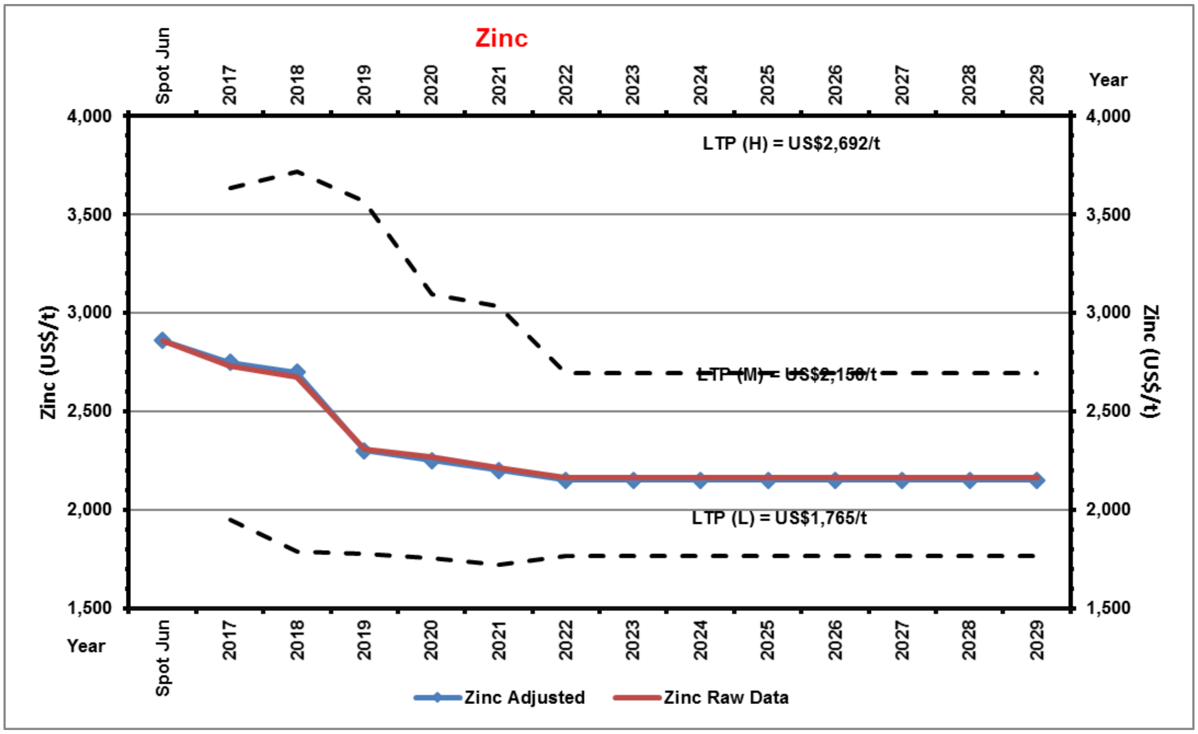
Figure 19-3: Lead Price Curve and Long-Term Price

19.2.4 Zinc

The spot price of zinc, as of March 20, 2017, is US$1.30/lb (US$2,861/t). The consensus market forecast here presented is based on the data provided by nine different analysts, where the highest long-term price projection from these professionals is US$1.22/lb (US$2,692/t) and the lowest is US$0.80/lb (US$1,765/t).

The graph below combines the data from these nine analysts to produce an average price curve for this base metal and an effective long-term price of US$0.98/lb (US$2,150/t)). This is the price that SRK internally considers for the disclosure of ore reserves, in the case of resources disclosure a premium of 30% is considered, bringing the price to US$1.27/lb (US$2,800).

The prices here presented are for pure zinc metal and do not consider the effect of transportation to market, smelting and refining charges, payability factors, price participation and penalties, these will be discussed in the Contracts sections.



Source: SRK, 2017

Figure 19-1: Zinc Price Curve and Long-Term Price

19.3 Contracts

SRK was provided with signed contracts that provide the terms and conditions for the sales of all lead and zinc concentrates produced by the Mine. These contracts establish the point of sale, quantities, qualities, basis of price, payment conditions, charges and penalties associated with the sales of these concentrates. Both documents have the same validity of two years, which is the entirety of 2016 and 2017, and provide support for the sales of the whole quantities of concentrates produced by the Project. The following sections present the details of these contracts and the terms governing the sales of these two concentrates.

19.3.1 Lead Concentrate

Delivery, Quantity and Quality

The contract establishes the purchase of an estimated total production of 6,200 dry metric tons (±10%) over the period of one year. Approximately 520 dry metric tons of concentrate will be sold and delivered every month of the contract validity. The concentrate delivery is established as Delivery at Place (DAP) as defined by Incoterms 2010, which means that the mine is responsible for all cost and liability of the quantities sold until the products reach a warehouse or point of destination chosen by the buyer. Delivery is established to a specific region of the country of Mexico. The contracted quality of the lead concentrate is summarized in Table 19-1.

Table 19-1: Lead Concentrate Contracted Quality

Item	Value	Unit
Pb	min. 15	%
Au	2 to 30	g/t
Ag	3,000 to 7,000	g/t
Zn	10 to 20	%
Cu	1 to 5.5	%
Fe	10 to 18	%
Mn	0.3 to 0.6	%
As	0.10 to 0.45	%
Sb	0.15 to 0.30	%
Bi	0.03 to 0.06	%
Sb	18 to 22	%

Source: Sierra Metals, 2017

<u>Price, Payment, Charges and Penalties</u>

Payment is defined as the sum of the payment of all payable metals contained in the concentrate minus deduction factors, charges and penalties associated with their processing and recovery.

Lead payment is subject to a 95% factor and a minimum deduction of 3 percent units, its considered price if defined as the LME Cash Settlement Price for Standard Lead in US$, as published in the London Metal Bulletin average over the Quotational Period.

Silver payment is subject to a 95% factor and a minimum deduction of 50 grams per ton, its considered price is defined as LMBA Silver Price in US$, as published in the London Metal Bulletin average over the Quotational Period.

Gold payment is subject to a 95% factor and a minimum deduction of 1.5 grams per ton, its considered price is defined as Daily Mean of the Morning and Afternoon LMBA Gold Price in US$, as published in the London Metal Bulletin average over the Quotational Period.

A treatment charge of US$230/t will be applied to the dry mass of concentrate, which is based on a lead price of US$1,725/t, an increment of US$0.16 for every dollar increase from the lead prices of US$1,725/t to US$1,850/t, and an increment of US$0.18 for every dollar increase for lead prices over US$1,850/t are also due.

A silver refining charge of US$1.50 for every troy ounce of payable silver will be deduced, this charge will be increased by US$0.11 for every US$ over the defined base price. Base prices are defined as US$16.00/oz for 2016 and US$17.00/oz for 2017. A gold refining charge of US$15.00 for every troy ounce of payable gold will be deduced.

Penalties are defined at a prorated basis as the following:

- Zinc: US$3.00 for every percent point over 14%;
- Arsenic: US$2.50 for every 0.10% that exceeds 0.30% until the maximum grade of 1.0%. Every 0.10% over 1.0% will be subject to a penalty of US$3.50;
- Antimony: US$2.50 for every 0.10% that exceeds 0.30% until the maximum grade of 1.0%. Every 0.10% over 1.0% will be subject to a penalty of US$3.50;
- Lead: US$3.00 for every percent point below the minimum grade of 15%; and

- Silica: US$3.00 for every 1% of silica grade above the maximum grade of 15%.

19.3.2 Zinc Concentrate

Delivery, Quantity and Quality

The contract establishes the purchase of an estimated total production of 2,000 wet metric tons (+-10%) over the period of one year. Approximately 170 wet metric tons of concentrate will be sold and delivered every month of the contract validity. The concentrate delivery is established as Delivery at Place (DAP) as defined by Incoterms 2010, which means that the mine is responsible for all cost and liability of the quantities sold until the products reach a warehouse or point of destination chosen by the buyer. Delivery is established to a specific region of the country of Mexico. The contracted quality of the lead concentrate is summarized in the table below.

Table 19-1: Zinc Concentrate Contracted Quality

Item	Value	Unit
Zn	53.09	%
Pb	1.14	%
Ag	350	g/t
Zn	0.4	g/t

Source: Sierra Metals, 2017

Price, Payment, Charges and Penalties

Payment is defined as the sum of the payment of all payable metals contained in the concentrate minus deduction factors, charges and penalties associated with their processing and recovery.

Zinc payment is subject to a 85% factor and a minimum deduction of 8 percent units, its considered price if defined as the LME Cash Settlement Price for Special High Grade Zinc in US$, as published in the London Metal Bulletin average over the Quotational Period.

Silver payment is subject to a deduction of 3.5 ounces per metric ton and a 70% factor of the remaining metal balance, its considered price is defined as LMBA Silver Price in US$, as published in the London Metal Bulletin average over the Quotational Period.

A treatment charge of US$225/t will be applied to the dry mass of concentrate, which is based on a zinc price of US$1,600/t, an increment of US$0.18 for every dollar increase from the aforementioned base price is also due.

Penalties are defined at a prorated basis as the following:

- Silicon Dioxide: US$1.50 for every percent point over 5% and up to 8%, US$2.50 for every percent point over 8% and up to 12%, and US$4.00 for every percent point over the 12%; and
- Cadmium: US$2.00 for every 0.10% over the grade of 0.30%.

20 Environmental Studies, Permitting and Social or Community Impact

20.1 Environmental Studies and Background Information

SRK's environmental specialist did not conduct a site visit of the Cusi Mine or Malpaso Mill operations. As such, the following information is predicated on a review of available documentation and direct communications with the operator.

20.2 Environmental Studies and Liabilities

Cusi is located within the municipality of Cusihuiriachi in the central portion of Chihuahua State, Mexico, approximately 135 km from the City of Chihuahua. The Project area encompasses 11,657 ha over a range of elevation of 1,950 to 2,460 meters above sea level (masl) in the Sierra Madre Occidental Mountain Range. Details of environmental studies completed for these operations was not available for this review.

Based on communications with representatives from Sierra Metals, it does not appear that there are currently any known environmental issues that could materially impact the extraction and beneficiation of mineral resources or reserves. However, given the pre-regulation vintage of the original tailings storage facilities (piles), the likelihood is high that these facilities are not underlain by low-permeability liners, increasing the risk of a long-term liability of metals leaching and groundwater contamination. Sierra Metals intends to cover these facilities during decommissioning in order to minimize this risk. (Gustavson, 2014)

20.3 Environmental Management

20.3.1 Tailings Management

Tailings generated from the milling operations are stored in two tailings piles in the vicinity of the Malpaso Mill. SRK is uncertain if these older disposal areas are underlain by low-permeability liner material, as the Malpaso Mill has been in operation since the 1970s, prior to the promulgation of environmental laws governing extractive mineral wastes. At the current time, no environmental permit is necessary for operation of the Malpaso Mill. At closure, it is Sierra Metals' intent to cover these tailings piles.

In 2015, Sierra Metals initiated construction of a new tailings storage facility. The new impoundment is located immediately adjacent to the former tailings pile(s). SRK understands that the expanded capacity of the new impoundment should allow an additional four years of operational capacity at the current processing rates. In the dry climate of the Chihuahuan desert, the need for additional water resources has led Sierra Metals to consider dry-stack tailings disposal in this new facility. This new impoundment required permitting under the current regulatory regime, including environmental impact analyses.

20.3.2 Waste Rock Management

Waste rock generated from the underground workings at Promontorio and Santa Eduwiges is deposited near the entrances of the respective mines. Management of these waste rock piles does not require permits.

20.3.3 Geochemistry

Geochemical characterization data for the waste, ore and tailings generated at the Cusi Mine and Malpaso Mill, respectively, were not available for this review.

20.4 Mexican Environmental Regulatory Framework

20.4.1 Mining Law and Regulations

Mining in Mexico is regulated through the Mining Law, approved on June 26, 1992 and amended by decree on December 24, 1996, Article 27 of the Mexican Constitution.

Article 6 of the Mining Law states that mining exploration; exploitation and beneficiation are public utilities and have preference over any other use or utilization of the land, subject to compliance with laws and regulations.

Article 19 specifies the right to obtain easements, the right to use the water flowing from the mine for both industrial and domestic use, and the right to obtain a preferential right for a concession of the mine waters.

Articles 27, 37 and 39 rule that exploration; exploitation and beneficiation activities must comply with environment laws and regulations and should incorporate technical standards in matters such as mine safety, ecological balance and environmental protection.

The Mining Law Regulation of February 15, 1999 repealed the previous regulation of March 29, 1993. Article 62 of the regulation requires mining projects to comply with the General Environmental Law, its regulations, and all applicable norms.

20.4.2 General Environmental Laws and Regulations

Mexico's environmental protection system is based on the General Environmental Law known as *Ley General del Equilibrio Ecológico y la Protección al Ambiente* - LGEEPA (General Law of Ecological Equilibrium and the Protection of the Environment), approved on January 28, 1988 and updated December 13, 1996.

The Mexican federal authority over the environment is the *Secretaría de Medio Ambiente y Recursos Naturales* - SEMARNAT (Secretariat of the Environment and Natural Resources). SEMARNAT, formerly known as SEDESOL, was formed in 1994, as the *Secretaría de Medio Ambiente Recursos Naturales y Pesca* (Secretariat of the Environment and Natural Resources and Fisheries). On November 30th, 2000, the Federal Public Administration Law was amended giving rise to SEMARNAT. The change in name corresponded to the movement of the fisheries subsector to the *Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación* - SAGARPA (Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food), through which an increased emphasis was given to environmental protection and sustainable development.

SEMARNAT is organized into a number of sub-secretariats and the following main divisions:

- INE – Instituto Nacional de Ecología (National Institute of Ecology), an entity responsible for planning, research and development, conservation of national protection areas and approval of environmental standards and regulations.

- PROFEPA - Procuraduría Federal de Protección al Ambiente (Federal Attorney General for the Protection of the Environment) responsible for law enforcement, public participation and environmental education.
- CONAGUA – Comisión Nacional del Agua (National Water Commission), responsible for assessing fees related to water use and discharges.
- Mexican Institute of Water Technology.
- CONANP – Comisión Nacional de Areas Naturales Protegidas (National Commission of Natural Protected Areas).

The federal delegation or state agencies of SEMARNAT are known as *Consejo Estatal de Ecología* – COEDE (State Council of Ecology).

PROFEPA is the federal entity in charge of carrying out environmental inspections and negotiating compliance agreements. Voluntary environmental audits, coordinated through PROFEPA, are encouraged under the LGEEPA.

Under LGEEPA, a number of regulations and standards related to environmental impact assessment, air and water pollution, solid and hazardous waste management and noise have been issued. LGEEPA specifies compliance by the states and municipalities, and outlines the corresponding duties.

Applicable regulations under LGEEPA include:

- Regulation to LGEEPA on the Matter of Environmental Impact Evaluations, May 30, 2000;
- Regulation to LGEEPA on the Matter of Prevention and Control of Atmospheric Contamination, November 25, 1988;
- Regulation to LGEEPA on the Matter of Environmental Audits, November 29, 2000;
- Regulation to LGEEPA on Natural Protected Areas, November 20, 2000;
- Regulation to LGEEPA on Protection of the Environment Due to Noise Contamination, December 6, 1982;
- Regulation to LGEEPA on the Matter of Hazardous Waste, November 25, 1988.

Mine tailings are listed in the Regulation to LGEEPA on the Matter of Hazardous Waste. Norms include:

- Norma Oficial Mexicana (NOM)-CRP-001-ECOL, 1993, which establishes the characteristics of hazardous wastes, lists the wastes, and provides threshold limits for determining its toxicity to the environment.
- NOM-CRP-002-ECOL, 1993 establishes the test procedure for determining if a waste is hazardous.
- On September 13, 2004, SEMARNAT published the final binding version of its new standard on mine tailings and mine tailings dams, NOM-141-SEMARNAT-2003. The new rule has been renamed since the draft version was published in order to better reflect the scope of the new regulation. This NOM sets out the procedure for characterizing tailings, as well as the specifications and criteria for characterizing, preparing, building, operating, and closing a mine tailings dam. This very long (over 50 pages) and detailed standard sets out the new criteria for characterizing tailings as hazardous or non-hazardous, including new test methods. A series of technical annexes address everything from waste classification to construction of the dams. The rule is applicable to all generators of non-radioactive tailings and to all dams constructed after this NOM goes into effect.

- Existing tailings dams will have to comply with the new standards on post-closure. The NOM formally went into effect sixty (60) days after its publication date.

PROFEPA "Clean Industry"

The *Procuraduría Federal de Protección al Ambiente* (the enforcement portion of Mexico's Environmental Agency, referred to as PROFEPA), administers a voluntary environmental audit program and certifies businesses with a "Clean Industry" designation if they successfully complete the audit process. The voluntary audit program was established by legislative mandate in 1996 with a directive for businesses to be certified once they meet a list of requirements including the implementation of international best practices, applicable engineering and preventative corrective measures.

In the Environmental Audit, firms contract third-party PROFEPA-accredited auditors, considered to be experts in fields such as risk management and water quality, to conduct the audit process. During this audit, called "Industrial Verification," auditors determine if facilities are in compliance with applicable environmental laws and regulations. If a site passes, it receives designation as a "Clean Industry" and is able to utilize the Clean Industry logo as a message to consumers and the community that it fulfills its legal responsibilities. If a site does not pass, the government can close part, or all of a facility if it deems it necessary. However, PROFEPA wishes to avoid such extreme actions and instead prefers to work with the business to create an "Action Plan" to correct problem areas.

The Action Plan is established between the government and the business based on suggestions of the auditor from the Industrial Verification. It creates a time frame and specific actions a site needs to take in order to be in compliance and solve existing or potential problems. An agreement is then signed by both parties to complete the process. When a facility successfully completes the Action Plan, it is then eligible to receive the Clean Industry designation.

PROFEPA believes this program fosters a better relationship between regulators and industry, provides a green label for businesses to promote themselves and reduces insurance premiums for certified facilities. The most important aspect, however, is the assurance of legal compliance through the use of the Action Plan, a guarantee that ISO 14001 and other Environmental Management Systems cannot make.

According to Sierra Metals, the company has initiated the PROFEPA "Clean Industry" application process for the Malpaso Mill. The site is currently preparing for the third-party external audit, and anticipated obtaining the certification in 2017.

SIGA

Many companies in Mexico adopt the corporate policy, *Sistema Integral de Gestión Ambiental* (SIGA) (Integral System of Environmental Management), for the protection of the environmental and prevention of adverse environmental impacts. SIGA emphasizes a commitment to environmental protection along with sustainable development, as well as a commitment to strict adherence to environmental legislation and regulation and a process of continuous review and improvement of company policies and programs. The companies continue to improve their commitments to environmental stewardship through the use of the latest technologies that are proven, available, and economically viable.

SRK is not aware if the Cusi operations participate in the SIGA program at this time, but recommends that they do so.

Other environmental/social industry programs that the mine could participate in include:

- Seeking accreditation under the voluntary self-management program for health and safety with the Mexican Department of Labor and Social Welfare (PASST); and
- Strive to receive the Social Responsible Company (ESR) Distinctive, which is awarded by the Mexican Center of Philanthropy.

20.4.3 Other Laws and Regulations

Water Resources

Water resources are regulated under the National Water Law, December 1, 1992 and its regulation, January 12, 1994 (amended by decree, December 4, 1997). In Mexico, ecological criteria for water quality is set forth in the Regulation by which the Ecological Criteria for Water Quality are Established, CE-CCA-001/89, dated December 2, 1989. These criteria are used to classify bodies of water for suitable uses including drinking water supply, recreational activities, agricultural irrigation, livestock use, aquaculture use and for the development and preservation of aquatic life. The quality standards listed in the regulation indicate the maximum acceptable concentrations of chemical parameters and are used to establish wastewater effluent limits. Ecological water quality standards defined for water used for drinking water, protection of aquatic life, agricultural irrigation and irrigation water and livestock watering are listed.

Discharge limits have been established for particular industrial sources, although limits specific to mining projects have not been developed. NOM-001-ECOL-1996, January 6, 1997, establishes maximum permissible limits of contaminants in wastewater discharges to surface water and national "goods" (waters under the jurisdiction of the CONAGUA).

Daily and monthly effluent limits are listed for discharges to rivers used for agricultural irrigation, urban public use and for protection of aquatic life; for discharges to natural and artificial reservoirs used for agricultural irrigation and urban public use; for discharges to coastal waters used for recreation, fishing, navigation and other uses and to estuaries; and discharges to soils and to wetlands. Effluent limitations for discharges to rivers used for agricultural irrigation, for protection of aquatic life and for discharges to reservoirs used for agricultural irrigation have also been established.

The Cusi operations currently consume water recovered from the underground workings for process water and support of surface operations. Fresh make-up water is sourced from a well located approximately two kilometers away on private property. A contract with the landowner allows Cusi to pump water to a surface storage tank, and subsequently to the plant site for use. Make-up water consumption is approximately 1.0 m^3/t of ore. Potable water is trucked in from off site.

Ecological Resources

In 2000, the National Commission of Natural Protected Areas (CONANP) (formerly CONABIO, the National Commission for Knowledge and Use of Biodiversity) was created as a decentralized entity of SEMARNAT. As of November 2001, 127 land and marine Natural Protected Areas had been proclaimed, including biosphere reserves, national parks, national monuments, flora and fauna reserves, and natural resource reserves.

Ecological resources are protected under the *Ley General de Vida Silvestre* (General Wildlife Law). (NOM)-059-ECOL-2000 specifies protection of native flora and fauna of Mexico. It also includes conservation policy, measures and actions, and a generalized methodology to determine the risk category of a species.

Other ecological laws and regulations that may affect the Cusi operations include:

- Forest Law, December 22, 1992, amended November 31, 2001, and the Forest Law Regulation, September 25, 1998.
- Fisheries Law, June 25, 1992, and the Fisheries Law Regulations, September 29, 1999.
- Federal Ocean Law, January 8, 1986

Regulations Specific to Mining Projects

All aspects related to Mine Safety and Occupational Health are regulated in Mexico by NOM-023-STPS-2003 issued by the Secretariat of Labor. Appendix D of this regulation refers specifically to ventilation for underground mines, such as Bolívar Mine, and establishes all the requirement underground mines should comply with, which are subject of regular inspections.

New tailings dams are subject to the requirements of NOM-141-SEMARNAT-2003, Standard that Establishes the Requirements for the Design, Construction and Operation of Mine Tailings Dams. Under this regulation, studies of hydrogeology, hydrology, geology and climate must be completed for sites considered for new tailings impoundments. If tailings are classified as hazardous under NOM-CRP-001-ECOL/93, the amount of seepage from the impoundment must be controlled if the facility has the potential to affect groundwater. Environmental monitoring of groundwater and tailings pond water quality and revegetation requirements is specified in the regulations.

NOM-120-ECOL-1997, November 19, 1998 specifies environmental protection measures for mining explorations activities in temperate and dry climate zones that would affect xerophytic brushwood (*matorral xerofilo*), tropical (*caducifolio*) forests, or conifer or oak (*encinos*) forests. The regulation applies to “direct” exploration projects defined as drilling, trenching, and underground excavations. A permit from SEMARNAT is required prior to initiating activities and SEMARNAT must be notified when the activities have been completed. Development and implementation of a Supervision Program for environmental protection and consultation with CONAGUA is required if aquifers may be affected. Environmental protection measures are specified in the regulations, including materials management, road construction, reclamation of disturbance and closure of drillholes. Limits on the areas of disturbance by access roads, camps, equipment areas, drill pads, portals, trenches, etc. are specified.

20.4.4 Expropriations

Expropriation of ejido and communal properties is subject to the provisions of agrarian laws.

20.4.5 NAFTA

Canada, the United States and Mexico participate in the North American Free Trade Agreement (NAFTA). NAFTA addresses the issue of environmental protection, but each country is responsible for establishing its own environmental rules and regulations. However, the three countries must comply with the treaties between themselves; and the countries must not reduce their environmental standards as a means of attracting trade. At this time, SRK is not aware of any impacts to the Cusi operations from the requirements of NAFTA.

20.4.6 International Policy and Guidelines

International policies and/or guidelines that may be relevant to the Bolívar Mine include:

- International Finance Corporation (Performance Standards) – social and environmental management planning; and
- World Bank Guidelines (Operational Policies and Environmental Guidelines).

These items were not specifically identified and included in SRK's environmental scope of work; however, given that Sierra Metals is a Canadian entity, general corporate policy tends to be in compliance with IFC, World Bank and Equator Principles.

SRK recommends that a more comprehensive audit of Cusi be conducted with respect to these guidelines and performance standards.

20.4.7 Required Permits and Status

According to Sierra Metals, the Cusi Mine and Malpaso Mill are exempt from a number of permit requirements since the operations predate the environmental laws. Sierra has received formal recognition from SEMARNAT of the permit exemption for the Malpaso Mill and the Cusi Mine operations.

The required permits for continued operation at the Cusi Mine and Malpaso Mill, including exploration of the site, have been obtained. SRK has not independently verified the current status of all the site permits. At this time, SRK has not been made aware of any outstanding permits or any non-compliance issues that would affect the ability of the operator to extract rock, process ore, and/or disposal of tailings. The following information regarding the permits was provided by Sierra Metals.

Table 20-1: Permit and Authorization Requirements for the Cusi Mine and Malpaso Mill

Permit	Agency	Approval Date (or anticipated Approval Date)
Mining Law Concession	President via the Minister of Commerce and Industrial and the General Directorate of Mines Promotion - *Mexican Secretaría de Economía*	See Table 20-2
Manifestación de Impacto Ambiental (MIA) - Environmental Impact Statement	*Secretaría de Medio Ambiente y Recursos Naturales* (SEMARNAT) - Secretariat of the Environment and Natural Resources	The following concessions are exempt from having to apply for the MIA, according to the document SG.IR.08-20141 / 93 from SEMARNAT dated May 2014 that recognizes the exception because Dia Bras proved that the mining concessions operated prior to the 1988 regulations. Any other concession will need a MIA or prove operation prior to this date: • San Bartolo (Title 150395) • La India (Title 150569) • Promontorio (Title 163582) • La Consolidada (Title 165102) • La Perla (Title 165968) • El Milagro (Title 163580) • La Ilusión (Title 166611) • La Rumorosa (Title 163512) • Los Pelones (Title 166981) • La Hermana de la India (Title 180030) • Nueva Santa María (Title 182002) • La Gloria (Title 179400) • La Perlita (Title 163565)
Análisis de Riesgo - Risk Analysis Report	*Dirección Estatal de Proteccion Civil Chihuahua* (with	A risk analysis is in process by *La dirección de Protección Civil de Gobierno del estado de Chihuahua*. It is focused on the security in

Permit	Agency	Approval Date (or anticipated Approval Date)
	assistance from external consultant)	the mine and the use of explosives. Resolution is expected in the coming weeks; In August 2013, an external consultant (Rodrigo de la Garza Aguillar) presented a geohydrological and geotechnical study on the San Bartolo Mine; and In December 2016 an external constant (Ing. Alfredo Rodriguez) presented a Geo-hydrological study for the San Bartolo and Santa Eduwiges mines.
Operating License (and Air Quality Permit)	SEMARNAT	In the Cusihuiriachi mines, there are no atmospheric emissions. At the Malpaso mill, SEMARNAT issued a *Licencia Unica Ambiental* (unique environmental license) dated August 2013.
Cambio de Uso de Suelo - Land Use Change Permit	SEMARNAT	The following concessions are exempt from having to apply for the *Cambio de Uso de Suelo*, according to the document SG.IR.08-20141 / 93 from SEMARNAT dated May 2014 that recognizes the exception because Dia Bras proved that the mining concessions operated prior to the 1988 regulations. Any other concession will need the *Cambio de Uso de Suelo* permit or prove that it was in operation prior to that year: • San Bartolo (Title 150395) • La India (Title 150569) • Promontorio (Title 163582) • La Consolidada (Title 165102) • La Perla (Title 165968) • El Milagro (Title 163580) • La Ilusión (Title 166611) • La Rumorosa (Title 163512) • Los Pelones (Title 166981) • La Hermana de la India (Title 180030) • Nueva Santa María (Title 182002) • La Gloria (Title 179400) • La Perlita (Title 163565)
Concession Title for Underground Water Extraction	*Comisión Nacional del Agua* (CONAGUA) - National Water Commission)	Mine dewatering is regulated under the Mining Law and no permit is required to extract mine water.
Wastewater Discharge Permit	CONAGUA	For the Malpaso Mill, a discharge permit (02CHI141178/34EMDL15) was issued in August 2015. For the Cusi Mine, CONAGUA documents No B00.E.22.4.-420 and No B00.E.22.4.-419, dated November 12, 2014, exempt Dia Bras from requiring discharge permits, as the water does not contain contaminants or is used in industrial processes.
Hazardous Waste Registration	SEMARNAT	The last update to this registration was November 04, 2016.
Explosives Use Permit	*Secretaría de la Defensa Nacional* (SEDENA)	Permit Number 4599 – last updated December 1, 2016. Expires in 1 year.

Source: Permit information provided by Sierra Metals, and not independently verified by SRK

Table 20-2: Cusi Mine Concessions

Held By	Name	Type	Area	File No.	Title No.	Registration Date Rpm	Expiry Date
Dia Bras Mexicana	Base*	Exploration	23.8090	016/30975	217584	06/08/2002	05/08/52
Dia Bras Mexicana	Flor de Mayo*	Exploration	14.4104	016/32699	224700	31/05/2005	30/05/55
Dia Bras Mexicana	Base 1	Exploration	3.9276	016/33729	227657	28/07/2006	27/07/56
Dia Bras Mexicana	Santa Rita	Exploration	16.6574	016/34624	229081	06/03/2007	05/03/57
Dia Bras Mexicana	Sayra I	Exploration	7.2195	016/34623	229064	2-3-20070	01/03/57
Dia Bras Mexicana	San Miguel	Exploration	96.2748	016/33730	229166	21/03/2007	20/03/57
Dia Bras Mexicana	San Miguel I	Exploration	98.6218	016/33731	228484	24/11/2006	23/11/56
Dia Bras Mexicana	San Miguel II	Exploration	100.00	016/33732	227363	14/06/2006	13/06/56
Dia Bras Mexicana	San Miguel III	Exploration	100.00	016/33733	227364	14/06/2006	13/06/56
Dia Bras Mexicana	San Miguel IV	Exploration	96.9850	016/33734	227485	27/06/2006	26/06/56
Dia Bras Mexicana	San Miguel VI	Exploration	98.9471	016/34642	228058	29/09/2006	28/09/56
Dia Bras Mexicana	San Miguel VII	Exploration	52.6440	016/34640	229084	06/03/2007	05/03/57
Dia Bras Mexicana	Saira	Exploration	16.00	016/33735	227365	14/06/2006	13/06/56

Held By	Name	Type	Area	File No.	Title No.	Registration Date Rpm	Expiry Date
Dia Bras Mexicana	Manuel	Exploration	100.00	016/33714	227360	14/06/2006	13/06/56
Dia Bras Mexicana	Santa Rita Fracc. I	Exploration	9.00	016/34624	229082	06/03/2007	05/03/57
Dia Bras Mexicana	Santa Rita Fracc. II	Exploration	8.8141	016/34624	229083	06/03/2007	05/03/57
Dia Bras Mexicana	San Miguel V	Exploration	6.5328	016/34641	227984	26/09/2006	25/09/56
Dia Bras Mexicana	San Juan	Exploration	12.3587	016/31500	218657	03/12/2002	02/12/52
Dia Bras Mexicana	San Juan Fracc. A	Exploration	0.1727	016/31500	218658	03/12/2002	02/12/52
Dia Bras Mexicana	San Juan Fracc. B	Exploration	0.1469	016/31500	218659	03/12/2002	02/12/52
Dia Bras Mexicana	Norma	Exploration	12.2977	016/31700	218851	22/01/2003	21/01/53
Dia Bras Mexicana	Norma 2	Exploration	1.7561	016/31715	219283	25/02/2003	24/02/53
Dia Bras Mexicana	Cima	Exploration	9.9637	016/30957	217231	02/07/2002	01/07/52
Dia Bras Mexicana	Manuel 1 Fracc A	Exploration	1.1858	016/34849	229747	13/06/2007	12/06/57
Dia Bras Mexicana	Manuel 1 Fracc B	Exploration	1.3425	016/34849	229748	13/06/2007	12/06/57
Dia Bras Mexicana	Alma	Exploration	80.4612	Valid	227982	25/09/2006	25/09/56
Dia Bras Mexicana	San Bartolo	Exploitation	6.00	Valid	150395	30/09/1968	29/09/18
Dia Bras Mexicana	Marisa	Exploration	5.08	Valid	220146	17/06/2003	16/06/53
Dia Bras Mexicana	La India	Exploitation	15.76	Valid	150569	29/10/1968	27/10/18
Dia Bras Mexicana	Alma	Exploration	87.2041	Valid	227650	27/07/2006	27/07/56
Dia Bras Mexicana	Alma I	Exploration	106.00	Valid	226816	09/03/2006	09/03/56
Dia Bras Mexicana	Alma II	Exploration	91.00	Valid	227651	27/07/2006	27/07/56
Dia Bras Mexicana	Nueva Recompensa	Exploitation	21.00	Valid	195371	15/09/1992	13/09/42
Dia Bras Mexicana	Monterrey	Exploitation	5.4307	Valid	183820	22/11/1988	21/11/38
Dia Bras Mexicana	Nueva Santa Marina	Exploitation	16.00	Valid	182002	08/04/1988	07/04/38
Dia Bras Mexicana	San Ignacio	Exploitation	3.00	Valid	165662	28/11/1979	27/11/29
Dia Bras Mexicana	Promontorio	Exploitation	8.00	Valid	163582	30/10/1978	29/10/28
Dia Bras Mexicana	La Perla	Exploitation	15.00	Valid	165968	13/12/1979	12/12/29
Dia Bras Mexicana	La Perlita	Exploitation	10.00	Valid	163565	10/10/1978	09/10/28
Dia Bras Mexicana	Luís	Exploitation	3.1946	Valid	194225	19/12/1991	18/12/41
Dia Bras Mexicana	La Consolidada	Exploitation	22.00	Valid	165102	23/08/1979	22/08/29
Dia Bras Mexicana	La Doble Eufemia	Exploitation	9.00	Valid	188814	29/11/1990	28/11/40
Dia Bras Mexicana	La Gloria	Exploitation	10.00	Valid	179400	09/12/1986	08/12/36
Dia Bras Mexicana	La Indita	Exploration	9.9034	Valid	212891	13/02/2001	12/02/49
Dia Bras Mexicana	La Suerte	Exploration	10.5402	Valid	216711	28/05/2002	27/05/52
Minera Cusi	El Hueco	Exploitation	1.8379	Valid	172321	23/11/2003	23/11/33
Dia Bras Mexicana	El Presidente	Exploitation	8.1608	Valid	209802	09/08/1999	08/08/49
Dia Bras Mexicana	El Salvador	Exploitation	7.7448	Valid	190493	29/04/1991	28/04/41
Dia Bras Mexicana	Cusihuiriachi c Dos	Exploitation	87.6748	Valid	220576	28/08/2003	27/08/53
Dia Bras Mexicana	La Bufa Chiquita	Exploitation	3.6024	Valid	220575	28/08/2003	27/08/53
Dia Bras Mexicana	Aguila	Exploration	4.2772	Valid	216262	23/04/2002	22/04/52
Dia Bras Mexicana	Año Nuevo	Exploration	12.00	Valid	192908	19/12/1991	18/12/41
Dia Bras Mexicana	Ampl. Nueva Josefina	Exploitation	18.2468	Valid	177597	02/04/1986	31/03/36
Dia Bras Mexicana	El Milagro	Exploitation	26.8259	Valid	166580	27/06/1980	26/06/30
Dia Bras Mexicana	Los Pelones	Exploitation	16.3018	Valid	166981	05/08/1980	04/08/30
Dia Bras Mexicana	La Ilusión	Exploitation	6.00	Valid	166611	27/06/1980	26/06/30
Dia Bras Mexicana	La Hermana de la India	Exploitation	13.1412	Valid	180030	23/03/1987	22/03/37
Dia Bras Mexicana	La Rumorosa	Exploitation	20.00	Valid	166612	27/06/1980	26/06/30
Dia Bras Mexicana	La Nueva Josefina	Exploitation	10.00	Valid	181221	11/09/1987	10/09/37
Dia Bras Mexicana	Mina Vieja	Exploitation	8.25	Valid	165742	11/12/1979	10/12/29
Dia Bras Mexicana	Margarita	Exploitation	14.00	Valid	165969	13/12/1979	12/12/29
Minera Cusi	Cusihuiriachi c	Exploitation	472.2626	Valid	240976	16/11/2012	15/11/62
Dia Bras Mexicana	CUSI-DBM	TCM	4,716.6621	Valid	229299	03/04/2007	02/04/57
Dia Bras Mexicana	CUSI-DBM 02	TCM	4,695.1748	Valid	232028	10/06/2008	09/06/58
Dia Bras Mexicana	Bronco 1 A	Exploration	55.6309	Valid	240329	23/05/2012	22/05/62

Held By	Name	Type	Area	File No.	Title No.	Registration Date Rpm	Expiry Date
Dia Bras Mexicana	Bronco 1 B	Exploration	0.8801	Valid	240330	23/05/2012	22/05/62
Dia Bras Mexicana	Bronco 2	Exploration	7.5296	Valid	239311	13/12/2011	13/12/61
Dia Bras Mexicana	Bronco 3	Exploration	8.1186	Valid	243011	30/05/2014	29/05/64
Dia Bras Mexicana	Bronco 4	Exploration	0.5224	Valid	239312	13/12/2011	13/12/61
Dia Bras Mexicana	Bronco 5	Exploration	6.7121	Valid	239335	13/12/2011	13/12/61
Dia Bras Mexicana	Bronco 6	Exploration	9.00	Valid	239321	13/12/2011	13/12/61
Dia Bras Mexicana	Zapopa	Exploration	8.3867	Valid	240189	13/04/2012	12/04/62
Minera Cusi	La Mexicana	Exploration	2.00	To be Registered	165883	12/12/1979	13/12/82
Fernando Holguin	Sayra	Exploration	78.84	Valid	239403	14/12/2011	14/12/61
Fernando Holguin	Bibiana	Exploration	71.89	Valid	239262	07/12/2011	07/12/61
			11,815.3072				

Source: Concession information provided by Sierra Metals, and not independently verified by SRK.

According to Sierra Metals, Dia Bras is the identified owner of the La India concession title (No. 150569); however, there is currently no contract in place with the San Bernabe Ejido, the owner of the surface land, for access and occupation. In the past, the Ejido has allowed Dia Bras to explore on this concession and is apparently willing to sign a contract with the operations to allow for additional exploration (and possible exploitation) in the future. No documentation to this effect was made available for this review.

20.4.8 MIA and CUS Authorizations

In April 2014, SEMARNAT conducted an inspection of the Dias Bras Cusi operations. During this site visit, the inspectors met with security and mine planning personnel, who were asked to provide a copy of the Environmental Impact Assessment (MIA) to legally support, in terms of environmental impact, the work being carried out by the company. However, the MIA could not be provided by the company's employees. Since the MIA authorization could not be produced, SEMARNAT issued a notice of violation against the company.

The following month, in a letter addressed to Arturo Valles Chávez, legal representative of Dia Bras Mexicana SA de CV, SEMARNAT acknowledges that Dia Bras is the legitimate holder of the following concessions in the municipality of Cusihuiriaci, Chihuahua: San Bartolo, Promontorio, La Consolidad, La Perla, El Milagro, La Ilusión, La Rumurosa, Los Pelones, La Hermana de la India, Nueva Santa Marina, La Gloria, and La Perlita, and that these concessions pre-date the General Law for Sustainable Forest Development, as well as the General Law on Ecological Equilibrium and Environmental Protection, regarding to Environmental Impact Assessment. As such, SEMARNAT agreed the existing operations (and minor alteration thereto), should not be subject to the Environmental Impact Assessment procedure. However, SEMARNAT did stipulate that, in case of disturbance and/or removal of vegetation, Dia Bras must comply with the regulations regarding to land use change before the Federal delegation, as well as the proper management of waste generated during mining and processing (i.e., tailings).

SEMARNAT officially dismissed the notice of violation on May 14, 2015 in Administrative Record No. PFPA/15.212C.27.1/0055-14.

20.4.9 Inspections

In April 2014, during the same inspection by SEMARNAT of the Cusi operations, the agency found no irregularities in the emission of pollutants to the environment. There was also no mention of any irregularities regarding the process of mineral extraction and storage disposal.

On November 17, 2015, Chihuahua State regulators, through the Secretary of Urban Development and Ecology, inspected Promotorio Mine and found that the water discharged by Dia Bras complies with the parameters established by NOM-001/SEMARNAT 2015. At the same time, Dia Bras presented the argument that a special waste water discharge permit from CONAGUA is not required to discharge water from mining activities developed in Promontorio and San Bartolo mines.

20.5 Social Management Planning and Community Relations

SRK was not provided with any information regarding public consultation or stakeholder engagement activities on the part of Dia Bras for Cusi operations.

20.6 Closure and Reclamation Plan

Current regulations in México require that a preliminary closure program be included in the MIA and a definite program be developed and submitted to the authorities during the operation of the mine (generally accepted as three years into the operation). These closure plans tend to be conceptual and typically lack much of the detail necessary to develop an accurate closure cost estimate. However, Sierra Metals has attempted to prescribe the necessary closure activities for the operation.

In February 2017, Treviño Asociados Consultores presented to Dia Bras Mexciana, S.A. de C.V. a work breakdown of the anticipated tasks for closure and reclamation of the Cusi Mine and Malpaso Mill. This breakdown, and the associated costs, is summarized in Table 20-3.

Table 20-3: Cusi Mine and Malpaso Mill Cost of Reclamation and Closure of the Mine

Closure Activity	Cost Estimate MXN$
Cusi Waste Rock Piles (regrading, soil preparation, revegetation) (5 Ha)	$231,650
Exploration Drill Pads (remove contaminated soils, soil preparation, revegetation, erosion control) (4 Ha)	$42,000
Roads (Border reconstruction, ditches, revegetation) (5 Ha)	$52,500
Building Demolition (Dismantling buildings and removing equipment and machinery)	$594,000
Sub-Total Cusi Reclamation and Closure Costs	**$920,150**
Malpaso Mill Tailings Impoundment (regrading, soil cover and preparation, revegetation) (14 Ha = 2 × 7 Ha)	$1,901,200
Stream Restoration (gabion installation) (50 0m)	$1,750,000
Roads (Border reconstruction, ditches, revegetation) (3 Ha)	$31,500
Facilities and Buildings (offices, laboratory, warehouses – dismantle and remove, remediate spills, restore soil and revegetation)	$2,035,000
Sub-Total Malpaso Reclamation and Closure Costs	**$5,717,700**
Total (MXN)	**$6,637,850**
Total (US$) (1)	**$325,385**

Source: Dia Bras, 2017
(1) Based on exchange rate of US$1 = MXN$20.4 (February 22, 2017)

SRK's scope of work did not include an assessment of the veracity of this closure cost estimate, but, based on projects of similar nature and size within Mexico, the estimate appears low in comparison. SRK recommends that Sierra Metals conduct an outside review of this estimate, with an emphasis on benchmarking against other projects in northern Mexico.

While Mexico requires the preparation of a reclamation and closure plan, as well as a commitment on the part of the operator to implement the plan, no financial surety (bonding) has thus far been required of mining companies. Environmental damages, if not remediated by the owner/operator, can give rise to civil, administrative and criminal liability, depending on the action or omission carried out. PROFEPA is responsible for the enforcement and recovery for those damages, or any other person or group of people with an interest in the matter. Also, recent reforms introduced class actions as a means to demand environmental responsibility from damage to natural resources.

21 Capital and Operating Costs

Cusi has provided the previous years of actual and projected operational expenses (OPEX) as well as capital expenses (CAPEX) as summarized in Table 21-1. Note that these are different slightly compared to the costs used to calculate the mineral resource cut-off grade, as certain all-in mining costs are not incorporated in this calculation.

SRK did not conduct an economic analysis, and has not estimated costs needed to support the mine going forward, as the mine currently has no publicly-reported reserves. SRK recommends that Cusi generate a reserve estimate as well as a detailed mine plan based on the updated mineral resource estimation, and cash flow model supporting the operation.

Table 21-1: OPEX and CAPEX for Cusi (2014 to 2017)

Item	2014	2015	2016	2017	*2018*
Tonnage	**155,268**	**202,033**	**186,898**	**87,690**	***201,540***
OPEX					
Mine cost US$/t					
Labor	1.89	1.86	9.07	22.31	*14.19*
Explosives	0.49	1.53	2.81	2.30	*2.29*
Diesel	0.40	1.72	2.02	2.47	*2.65*
Energy	0.95	0.86	0.93	2.26	*3.75*
Drill bits	0.04	0.08	0.09	0.35	*0.96*
Oil	0.21	0.43	0.52	0.75	*0.19*
Tires	0.23	0.85	0.97	1.08	*1.01*
Gasoline	0.05	0.16	0.16	0.35	*0.30*
Spare parts	0.80	1.69	2.23	2.38	*1.37*
Dining hall services	0.55	0.36	0.36	0.72	*0.66*
External services	0.00	5.81	5.38	6.03	*0.04*
Other materials	4.37	2.35	2.80	7.55	*4.98*
Mineral Transportation	4.49	3.91	3.24	3.92	*3.89*
Total US$/t	**$14.47**	**$21.60**	**$30.59**	**$52.48**	***$36.26***
Plant cost US$/t					
Labor	6.36	5.05	5.31	11.59	*6.56*
Reagents	1.87	1.20	2.30	3.41	*2.57*
Ball mill	1.27	1.09	1.22	1.15	*1.09*
Energy	4.71	3.06	3.28	5.27	*5.04*
Oil	0.28	0.38	0.24	0.40	*0.29*
Diesel	0.25	0.25	0.23	0.47	*0.46*
Tires	0.01	0.00	0.02	0.04	*0.01*
Gasoline	0.17	0.15	0.15	0.34	*0.13*
Water well rights	0.85	0.43	0.60	1.32	*0.74*
Spare parts	0.97	1.63	1.00	0.96	*0.32*
External services	0.44	0.58	0.58	0.89	*0.33*
Other materials	2.94	3.53	2.94	5.59	*4.41*
Total US$/t	**$20.13**	**$17.37**	**$17.86**	**$31.42**	***$21.94***
CAPEX (US$000)					
Exploration	1,190	1,937	501	4,437	*2,228*
Mine Development	11,356	8,155	3,593	3,594	*1,031*
Resource study - PFS	352	234	127	164	*150*
Equipment	1,571	2,391	755	2,172	*1,437*
Santa Eduwiges Shaft	412	2,250	297	0	*0*

Plant Improvements	462	645	331	330	*680*
Tailings Dam	1,654	1,026	15	1,827	*1,545*
Other	1	52	0	3,004	*0.00*
CAPEX (US$000)	**$16,998**	**$16,690**	**$5,619**	**$15,528**	***$7,071***

Source: Dia Bras, 2017

22 Economic Analysis

SRK has not conducted any economic analysis as a part of this study. Further work needs to be performed to generate an economic analysis that is based on the new resource statement, a detailed mine design, mineral reserve estimation, and production schedule.

23 Adjacent Properties

As noted in Figure 4-2, a number of mining claims within the Cusi area are not controlled by Sierra Metals. Mineral resources are not reported within these areas. No publicly disclosed mineral resource or reserve estimates exist for these areas.

24 Other Relevant Data and Information

SRK is not aware of any additional relevant data and information for the mineral resource estimation at this time.

25 Interpretation and Conclusions

25.1 Exploration

SRK is of the opinion that the exploration efforts at Cusi are sufficient for the definition of mineral resources. The primary exploration method at Cusi has been diamond core drilling followed by limited underground development, which has been successful in delineating a system of discrete epithermal veins and related stockwork mineralization. The drilling appears to be able to target and identify mineralized structures with reasonable efficacy, and the majority of drilling is oriented in a fashion designed to approximate true thicknesses of the veins. The exploration planning should be designed to maximize conversion of higher grade Inferred areas with less dense drilling to Indicated and measured, or extending mineralization away from known areas accessed through channel sampling. Efforts should be focused on a single structure or perhaps two structures to continue to develop these areas along strike and down dip, rather than scattered around several veins with very limited drilling.

Mine development is also used for exploration, as direct access of the veins along underground drifts is an excellent and efficient way for Cusi to understand the mineralization on a more local basis. More effort should be made to improve underground survey data, channel sampling consistency, and 3D asbuilt data.

SRK notes that recent efforts have improved the quality of the drilling and information through more complete and thorough survey data (for drilling and underground development), as well as the implementation of QA/QC programs which are delivering reasonable results. This lends additional confidence to recently-defined resources or newly drilled portions of historic areas.

SRK also notes that struggles for the internal Malpaso Mill laboratory, identified in the previous technical reports, appear to continue. These are related to significant differences between the values reported for identical samples between Malpaso and third-party laboratories. These issues, combined with historic deficiencies in downhole surveying and QA/QC detract from the overall confidence in quality of the data. The improved QA/QC procedures used in the recent work for SRL provided more confidence.

SRK is aware that Malpaso and Dia Bras continue the implementation of procedures to improve the collection and reporting of data supporting mineral resource estimations. This includes improving down hole surveys, improved channel sampling and mine working surveys, acquiring commercial standards for QA/QC. Improvements of the Malpaso Mill to make sample preparation procedures and analyses consistent with ISO-certified laboratories like ALS has not completely been implemented. SRK is of the opinion that a combination of these factors, once demonstrated to be in full use and functioning appropriately, should be validated through a simple quarterly check sample process to ensure that the Malpaso lab is able to produce results to the same precision and accuracy as a commercial independent laboratory like ALS. The implementation of detailed downhole surveysand updated industry-standard QA/QC protocol in the recent infill drilling campaign has resulted in the definition of Measured resources in the SRL vein.

25.2 Mineral Resource Estimate

The geologic model has been constructed by Dia Bras geologists and reviewed by SRK using Leapfrog Geo™ software. Drilling and channel sample data, as well as sectional interpretation was used in development of the 3D geology shapes, defining veins and stockwork zones. These are used as resource domains to constrain and control the interpolation of grade during the estimation.

SRK built individual block models for the main resource areas, which have been rotated and sub-blocked to better fit the geologic contacts in each area. Grade was interpolated from capped and composited sample data using an inverse distance squared and cubed algorithm, with sample selection criteria designed to decluster the channel sample data compared to the drilling. A nested three-pass estimation was used, with decreasing data selection criteria.

SRK is of the opinion that the Mineral Resource Estimate has been conducted in a manner consistent with industry best practices and that the data and information supporting the stated mineral resources is sufficient for declaration of Measured, Indicated and Inferred classifications of resources. SRK classified resources in the Measured category in the SRL veins where the recent exploration drilling was carried out implementing a recently improved QA/QC program. Due to aforementioned uncertainties regarding the data supporting the Mineral Resource Estimate the other areas of the project do not contain Measured resources.

These deficiencies (for areas other than the SRL vein) include:

- The lack of a historic QA/QC program, which has only been supported by a recent resampling and modern QA/QC program for a limited number of holes. This will be required in order to continue achieving Measured resources which generally are supported by high resolution drilling or sampling data that feature consistently implemented and monitored QA/QC.
- The lack of consistently-implemented down-hole surveys in the historic drilling. Observations from the survey data which has been done to date show significant down-hole deviations that influence the exact position of mineralized intervals. These discrepancies are confirmed by nearby workings that project the mineralized structures in a different position than that defined by the unsurveyed holes.
- The lack of industry-standard 3D survey asbuilt data delineating mined areas. This has been defined using a combination of the existing survey data, as well as polygons defining other areas thought to be mined. SRK believes these polygons to be conservative, as it is likely that pillar areas or other partially mined areas exist within the limits of the polygons, but are being excluded by this rudimentary methodology.

25.3 Metallurgy and Mineral Processing

The metallurgical balance as stated by Dia Bras is based on actual production data as reported to SRK. SRK is of the opinion that this is more than sufficient support for the statement of mineral resources, where the cut-off grade is based partially on expectations of recovery.

The Cusi processing facilities include two interconnected process plants, which are the Malpaso mill purchased from Rio Tinto, and the El Triunfo mill. Both mills are conventional ball mill and flotation plants fed from a single crushing circuit.

Cusi's highly variable fresh feed head grades pose a challenge to the steady metallurgical performance of the processing facilities. Additional studies in mine optimization and tailoring of production schedules would potentially mitigate this risk.

25.4 Mining Methods

The primary underground mining method currently employed at Cusi is overhand cut and fill. SRK also notes that shrinkage stoping has been in use in modern mining at Cusi, but currently makes up a comparably minor portion of the active mining operations.

Despite lacking a prefeasibility or feasibility study in the public market, which discloses mineral reserves, the Cusi Mine is in fact in operation and producing mineralized material from the underground mine. SRK notes that pre-feasibility and feasibility studies are required for statement of reserves, but are not required for a company to initiate production for a property. SRK recommends that the Cusi Mine develop an industry-compliant mineral reserve estimation based on the updated mineral resource estimation, including a detailed mine design, production schedule, and cash flow model.

The current mining operation produces approximately 8,000 tonnes of ore per month. The production has been reduced due to preparation works in the area of SRL. The source of mined material is split evenly between the Promontorio and Santa Eduwiges.

25.5 Recovery Methods

The Cusi concentrator is located in the outskirts of Cuauhtémoc City, approximately 50 km by road from Cusi operations. Dump trucks each hauling approximately 20 t of ore delivered 186,898 t during the 2016 period.

The Cusi processing facilities include two interconnected process plants, which are the Malpaso mill purchased from Rio Tinto, and the El Triunfo mill. Both mills are conventional ball mill and flotation plants fed from a single crushing circuit. The flotation circuit has the ability to produce lead concentrate and zinc concentrate.

Recent improvements in the plant have resulted in higher metal recoveries.

25.6 Infrastructure

The Project has fully developed infrastructure including access roads, an exploration camp, administrative offices, a processing plant and associated facilities, tailings storage facility, a core logging shed, water storage reservoir and water tanks,

The site has electric power from the Mexican power grid, backup diesel generators, and heating from site propane tanks. The overall Project infrastructure is built out and functioning and adequate for the purpose of the planned mine and mill.

25.7 Environmental and Permitting

Based on communications with representatives from Sierra Metals, it does not appear that there are currently any known environmental issues that could materially impact the extraction and beneficiation of mineral resources or reserves. However, given the pre-regulation vintage of the original tailings storage facilities (piles), the likelihood is high that these facilities are not underlain by low-permeability liners, increasing the risk of a long-term liability of metals leaching and groundwater contamination.

25.8 Foreseeable Impacts of Risks

SRK notes that the main risk associated with the mineral resources at Cusi are in areas where historic drilling or poorly surveyed channel sampling defines the shape of the vein. It has been demonstrated, where new data juxtaposes old, that there can be material offsets to the projections of the structures. This will predominantly affect older areas of Cusi, many of which have been mined out, although SRK notes newer areas where the effect is material on the statement of mineral resources.

Ongoing risk associated with the performance of the Malpaso Mill internal laboratory is difficult to quantify, and is probably not material to the declaration of mineral resources beyond the reduction in confidence noted in this report. SRK finds the discrepancies between Malpaso and third-party laboratories to be troubling in the sense of defining precision for the analytical work that would support a Measured resource, unfortunately and notably in the vicinity of the workings where all channel samples are supported by Malpaso analyses.

No mineral reserves are stated for the Cusi Mine at this time, as the requisite mine planning, design, scheduling, and economic analysis were not a part of the scope of this report. SRK is aware that Sierra is aggressively pursuing improvements to the methods and procedures at Cusi.

26 Recommendations

26.1 Recommended Work Programs and Costs

SRK has the following recommendations for additional work to be performed at the Cusi mine:

- Continue Identifying and drilling areas that are dominantly supported by channel sample data. This should be done at a regular spacing of approximately 25 m.
  - Further to this, SRK notes opportunities where significant areas of veins have very few drillholes, but exhibit very high grades, resulting in local high grade Inferred blocks that could theoretically be converted to Measured and Indicated with additional drilling. These should be prioritized.
  - Areas of cross cutting veins could host high grade shoots that should be studied in detail.
- Continue the implementation and improvement of the current QA/QC program and include additional controls like coarse blanks, fine and coarse duplicates and second lab checks.
- Continue the use of commercial standards for QA/QC monitoring taking into the consideration the Ag, Au, Pb and Zn cutoff and average grades of the deposit
- All the core sample preparation process of samples supporting the mineral resource estimation should be done in the ISO-certified laboratory such as ALS Minerals and avoid using Malpaso lab for the crushing process.
- All analyses supporting a mineral resource estimation should continue to be analyzed by an ISO-certified independent laboratory such as ALS Minerals. The intra-lab performance of check samples shows significant and unexpected deviations between ALS and the internal Dia Bras lab.
- Continue the downhole surveys via Reflex or other appropriate survey tool. This is currently being implemented at the mine, but has not historically consistently been the case.
- SRK strongly recommends continuing the practice of consistent use of a total station GPS for surveying of drillhole collars and channel sample locations, as well as mine workings. Discrepancies between the precise locations of these three types of data occur regularly where they are closely spaced and reduces confidence in the data.
  - A 3D mine survey could be accomplished relatively easily and for minimal cost, and could be conducted on a quarterly basis to develop a better measurement of mined material to be used in reconciliation processes.
- Develop a simple method of reconciling the resource models to production, using stope shapes and grades derived from channel sampling.
- SRK recommends that Cusi evaluate the maximum head grade the mill is able to receive without compromising quality of its lead concentrate because of the high presence of zinc (currently grading at about 9%). Improving selectivity will likely improve the overall lead grade in concentrate that needs to be at 50% Pb or higher to achieve better economic value.

26.1.1 Costs

SRK notes that the costs for the majority of recommended work are likely to be a part of normal operating budgets, which Cusi has as an operating mine. These are cost estimates, and would depend on actual contractor costs and scope to be determined by Dia Bras/Sierra Metals. SRK notes that the recommendations for metallurgy, mine design, geotechnical studies, or economic analysis are not included in these costs, and that these recommendations solely impact the quality of the mineral resource estimation.

Table 26-1 presents the general estimated cost of the future exploration drilling according to the objectives of Sierra Metals.

Table 26-1: Summary of Costs for Recommended Work

Item	Cost (US$)
Drilling (infill - step out)	$3,200,000

Source: Dia Bras, 2017

27 References

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28 Glossary

The Mineral Resources and Mineral Reserves have been classified according to CIM (CIM, 2014). Accordingly, the Resources have been classified as Measured, Indicated or Inferred, the Reserves have been classified as Proven, and Probable based on the Measured and Indicated Resources as defined below.

28.1 Mineral Resources

A **Mineral Resource** is a concentration or occurrence of solid material of economic interest in or on the Earth’s crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.

An **Inferred Mineral Resource** is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

An **Indicated Mineral Resource** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

A **Measured Mineral Resource** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.

28.2 Mineral Reserves

A **Mineral Reserve** is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified.

The reference point at which Mineral Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported. The public disclosure of a Mineral Reserve must be demonstrated by a Pre-Feasibility Study or Feasibility Study. This has not been done as a part of this study.

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

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

28.3 Definition of Terms

The following general mining terms may be used in this report.

Table 28-1: Definition of Terms

Term	Definition
Assay	The chemical analysis of mineral samples to determine the metal content.
Capital Expenditure	All other expenditures not classified as operating costs.
Composite	Combining more than one sample result to give an average result over a larger distance.
Concentrate	A metal-rich product resulting from a mineral enrichment process such as gravity concentration or flotation, in which most of the desired mineral has been separated from the waste material in the ore.
Crushing	Initial process of reducing ore particle size to render it more amenable for further processing.
Cut-off Grade (CoG)	The grade of mineralized rock, which determines as to whether or not it is economic to recover its gold content by further concentration.
Dilution	Waste, which is unavoidably mined with ore.
Dip	Angle of inclination of a geological feature/rock from the horizontal.
Fault	The surface of a fracture along which movement has occurred.
Footwall	The underlying side of an orebody or stope.
Gangue	Non-valuable components of the ore.
Grade	The measure of concentration of gold within mineralized rock.
Hangingwall	The overlying side of an orebody or slope.
Haulage	A horizontal underground excavation which is used to transport mined ore.
Hydrocyclone	A process whereby material is graded according to size by exploiting centrifugal forces of particulate materials.
Igneous	Primary crystalline rock formed by the solidification of magma.
Kriging	An interpolation method of assigning values from samples to blocks that minimizes the estimation error.
Level	Horizontal tunnel the primary purpose is the transportation of personnel and materials.
Lithological	Geological description pertaining to different rock types.
LoM Plans	Life-of-Mine plans.
LRP	Long Range Plan.
Material Properties	Mine properties.
Milling	A general term used to describe the process in which the ore is crushed and ground and subjected to physical or chemical treatment to extract the valuable metals to a concentrate or finished product.
Mineral/Mining Lease	A lease area for which mineral rights are held.
Mining Assets	The Material Properties and Significant Exploration Properties.
Ongoing Capital	Capital estimates of a routine nature, which is necessary for sustaining operations.

Term	Definition
Ore Reserve	See Mineral Reserve.
Pillar	Rock left behind to help support the excavations in an underground mine.
RoM	Run-of-Mine.
Sedimentary	Pertaining to rocks formed by the accumulation of sediments, formed by the erosion of other rocks.
Shaft	An opening cut downwards from the surface for transporting personnel, equipment, supplies, ore and waste.
Sill	A thin, tabular, horizontal to sub-horizontal body of igneous rock formed by the injection of magma into planar zones of weakness.
Smelting	A high temperature pyrometallurgical operation conducted in a furnace, in which the valuable metal is collected to a molten matte or doré phase and separated from the gangue components that accumulate in a less dense molten slag phase.
Stope	Underground void created by mining.
Stratigraphy	The study of stratified rocks in terms of time and space.
Strike	Direction of line formed by the intersection of strata surfaces with the horizontal plane, always perpendicular to the dip direction.
Sulfide	A sulfur bearing mineral.
Tailings	Finely ground waste rock from which valuable minerals or metals have been extracted.
Thickening	The process of concentrating solid particles in suspension.
Total Expenditure	All expenditures including those of an operating and capital nature.
Variogram	A statistical representation of the characteristics (usually grade).

28.4 Abbreviations

The following abbreviations may be used in this report.

Table 28-2: Abbreviations

Abbreviation	Unit or Term
Ag	silver
Au	gold
AuEq	gold equivalent grade
°C	degrees Centigrade
CoG	cut-off grade
cm	centimeter
cm^2	square centimeter
cm^3	cubic centimeter
cfm	cubic feet per minute
°	degree (degrees)
dia.	diameter
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
g	gram
gal	gallon
g/L	gram per liter
gpm	gallons per minute
g/t	grams per tonne
ha	hectares
ID2	inverse-distance squared
ID3	inverse-distance cubed
kg	kilograms
km	kilometer
km^2	square kilometer
koz	thousand troy ounce
kt	thousand tonnes
kt/d	thousand tonnes per day

Abbreviation	Unit or Term
kt/y	thousand tonnes per year
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
L	liter
lb	pound
LoM	Life-of-Mine
m	meter
m^2	square meter
m^3	cubic meter
masl	meters above sea level
mg/L	milligrams/liter
mm	millimeter
mm^2	square millimeter
mm^3	cubic millimeter
Moz	million troy ounces
Mt	million tonnes
m.y.	million years
NI 43-101	Canadian National Instrument 43-101
oz	troy ounce
%	percent
ppb	parts per billion
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
RC	rotary circulation drilling
RoM	Run-of-Mine
RQD	Rock Quality Description
SEC	U.S. Securities & Exchange Commission
t	tonne (metric ton) (2,204.6 pounds)
t/h	tonnes per hour
t/d	tonnes per day
t/y	tonnes per year
TSF	tailings storage facility
V	volts
W	watt
y	year
yd^2	cubic yards

Appendices

Appendix A: Certificates of Qualified Persons

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CERTIFICATE OF QUALIFIED PERSON

I, Giovanny J. Ortiz, Geologist, FAusIMM do hereby certify that:

1. I am Senior Consultant Geology of SRK Consulting (U.S.), Inc., 1125 Seventeenth Street, Suite 600, Denver, CO, USA, 80202.
2. This certificate applies to the technical report titled "NI 43-101 Technical Report on Resources, Cusi Mine, Mexico" with an Effective Date of August 31, 2017 (the "Technical Report").
3. I am a Professional Geoscientist with the following academic qualifications: BSc (Geology), Universidad Industrial de Santander, Bucaramanga, Colombia (1994); Specialization (Management), Universidad Autónoma de Bucaramanga, Bucaramanga, Colombia (1994); Citation Applied Geostatistics University of Alberta (2007)

   I am a registered Geologist with the Colombian Council of Geology, Bogotá, Colombia, and a fellow (FAusIMM) in good standing of the Australasian Institute of Mining and Metallurgy (AusIMM 304612)I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Cusi Mine property on November 13, 2017 for two days.
6. I am responsible for the preparation of Geology and Mineral Resources, Sections 4 to 14 and portions of Sections 1, 25 and 26 summarized therefrom, of this Technical Report.
7. I am independent of the issuer applying all of the tests in section 1.5 of NI 43-101.
8. I have not had prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101 and Form 43-101F1 and the sections of the Technical Report I am responsible for have been prepared in compliance with that instrument and form.
10. As of the aforementioned Effective Date, to the best of my knowledge, information and belief, the sections of the Technical Report I am responsible for contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 9th Day of February, 2018.

<<signed>>

Giovanny J. Ortiz, BSc Geology, FAusIMM

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CERTIFICATE OF QUALIFIED PERSON

I, Fernando Rodrigues, BS Mining, MBA, MMSAQP do hereby certify that:

1. I am Practice Leader and Principal Consultant (Mining Engineer) of SRK Consulting (U.S.), Inc., 1125 Seventeenth Street, Suite 600, Denver, CO, USA, 80202.
2. This certificate applies to the technical report titled "NI 43-101 Technical Report on Resources, Cusi Mine, Mexico" with an Effective Date of August 31, 2017 (the "Technical Report").
3. I graduated with a Bachelors of Science degree in Mining Engineering from South Dakota School of Mines and Technology in 1999. I am a QP member of the MMSA. I have worked as a Mining Engineer for a total of 16 years since my graduation from South Dakota School of Mines and Technology in 1999. My relevant experience includes mine design and implementation, short term mine design, dump design, haulage studies, blast design, ore control, grade estimation, database management.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Cusi Mine property on March 11, 2015 for five days.
6. I am responsible for Mining Methods, Market Studies and Contracts, Capital and Operating Costs, Economic Analysis – Sections 15, 16, 18, 19, 21, 22 and portions of Sections 1, 25 and 26 summarized therefrom, of this Technical Report.
7. I am independent of the issuer applying all of the tests in section 1.5 of NI 43-101.
8. I have had prior involvement with the property that is the subject of the Technical Report. The nature of my prior involvement is a series of operational reviews and gap analyses that were conducted for Sierra Metals prior to the technical work supporting the technical report.
9. I have read NI 43-101 and Form 43-101F1 and the sections of the Technical Report I am responsible for have been prepared in compliance with that instrument and form.
10. As of the aforementioned Effective Date, to the best of my knowledge, information and belief, the sections of the Technical Report I am responsible for contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 9th Day of February, 2018.

<<signed>>

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Fernando Rodrigues, BS Mining, MBA, MMSAQP[01405QP]

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CERTIFICATE OF QUALIFIED PERSON

I, Daniel H. Sepulveda, B.Sc, SME-RM, do hereby certify that:

1. I am Associate Consultant (Metallurgy) of SRK Consulting (U.S.), Inc., 1125 Seventeenth Street, Suite 600, Denver, CO, USA, 80202.
2. This certificate applies to the technical report titled "NI 43-101 Technical Report on Resources, Cusi Mine, Mexico" with an Effective Date of August 31, 2017 (the "Technical Report").
3. I graduated with a degree in Extractive Metallurgy from University of Chile in 1992. I am a registered member of the Society of Mining, Metallurgy, and Exploration, Inc. (SME), member No 4206787RM. I have worked as a Metallurgist for a total of 23 years since my graduation from university. My relevant experience includes: employee of several mining companies, engineering & construction companies, and as a consulting engineer.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Cusi Mine property on October 19, 2016 for two days.
6. I am responsible for Mineral Processing and Metallurgical Testing, and Recovery Methods, Section 13, 17 and portions of Sections 1, 25 and 26 summarized therefrom, of this Technical Report
7. I am independent of the issuer applying all of the tests in section 1.5 of NI 43-101.
8. I have had prior involvement with the property that is the subject of the Technical Report. The nature of my prior involvement is a series of operational reviews and gap analyses that were conducted for Sierra Metals prior to the technical work supporting the Technical Report.
9. I have read NI 43-101 and Form 43-101F1 and the sections of the Technical Report I am responsible for have been prepared in compliance with that instrument and form.
10. As of the aforementioned Effective Date, to the best of my knowledge, information and belief, the sections of the Technical Report I am responsible for contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 9th Day of February, 2018.

<<signed>>

____

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CERTIFICATE OF QUALIFIED PERSON

I, Mark Allan Willow, SME-RM do hereby certify that:

1. I am Practice Leader of SRK Consulting (U.S.), Inc., 5250 Neil Road, Reno, Nevada 89502.
2. This certificate applies to the technical report titled “NI 43-101 Technical Report on Resources, Cusi Mine, Mexico” with an Effective Date of August 31, 2017 (the “Technical Report”).
3. I graduated with Bachelor's degree in Fisheries and Wildlife Management from the University of Missouri in 1987 and a Master's degree in Environmental Science and Engineering from the Colorado School of Mines in 1995. I have worked as Biologist/Environmental Scientist for a total of 22 years since my graduation from university. My relevant experience includes environmental due diligence/competent persons evaluations of developmental phase and operational phase mines through the world, including small gold mining projects in Panama, Senegal, Peru, Ecuador, Philippines, and Colombia; open pit and underground coal mines in Russia; several large copper and iron mines and processing facilities in Mexico and Brazil; bauxite operations in Jamaica; and a coal mine/coking operation in China. My Project Manager experience includes several site characterization and mine closure projects. I work closely with the U.S. Forest Service and U.S. Bureau of Land Management on permitting and mine closure projects to develop uniquely successful and cost effective closure alternatives for the abandoned mining operations. Finally, I draw upon this diverse background for knowledge and experience as a human health and ecological risk assessor with respect to potential environmental impacts associated with operating and closing mining properties, and have experienced in the development of Preliminary Remediation Goals and hazard/risk calculations for site remedial action plans under CERCLA activities according to current U.S. EPA risk assessment guidance.

   I am a Certified Environmental Manager (CEM) in the State of Nevada (#1832) in accordance with Nevada Administrative Code NAC 459.970 through 459.9729. Before any person consults for a fee in matters concerning: the management of hazardous waste; the investigation of a release or potential release of a hazardous substance; the sampling of any media to determine the release of a hazardous substance; the response to a release or cleanup of a hazardous substance; or the remediation soil or water contaminated with a hazardous substance, they must be certified by the Nevada Division of Environmental Protection, Bureau of Corrective Action;

   I am a Registered Member (No. 4104492) of the Society for Mining, Metallurgy & Exploration Inc. (SME).
4. I have read the definition of “qualified person” set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.
5. I did not visit the Cusi Mine property.
6. I am responsible for Environmental Studies, Permitting and Social or Community Impact Section 20, and portions of Sections 1, 25 and 26 summarized therefrom, of this Technical Report.
7. I am independent of the issuer applying all of the tests in section 1.5 of NI 43-101.
8. I have not had prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101 and Form 43-101F1 and the sections of the Technical Report I am responsible for have been prepared in compliance with that instrument and form.

10. As of the aforementioned Effective Date, to the best of my knowledge, information and belief, the sections of the Technical Report I am responsible for contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 9th Day of February, 2018.

<<signed>>

Mark A. Willow, M.Sc., CEM, SME-RM

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CERTIFICATE OF QUALIFIED PERSON

I, Matthew Hastings, MSc Geology, MAusIMM (CP) do hereby certify that:

1. I am Senior Consultant Resource Geologist of SRK Consulting (U.S.), Inc., 1125 Seventeenth Street, Suite 600, Denver, CO, USA, 80202.
2. This certificate applies to the technical report titled “NI 43-101 Technical Report on Resources, Cusi Mine, Mexico” with an Effective Date of August 31, 2017 (the “Technical Report”).
3. I graduated with a degree in B.S.-Geology from University of Georgia in 2005. In addition, I have obtained a M.S.-Geology from University of Nevada-Reno in 2007. I am a CP of the MAusIMM and Certified Professional Geology, PGL-1343. I have worked as a Geologist for a total of 10 years since my graduation from university. My relevant experience includes working in exploration and mineral resource definition for precious metals, base metals, iron ore, and rare earth element deposits worldwide.
4. I have read the definition of “qualified person” set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.
5. I visited the Cusi Mine property on March 11, 2015 for five days.
6. I am responsible for Geology and Mineral Resources, Adjacent Properties, and Other Relevant Data and Information; Sections 2-12 14, 23, 24 and portions of Sections 1, 25 and 26 summarized therefrom, of this Technical Report.
7. I am independent of the issuer applying all of the tests in section 1.5 of NI 43-101.
8. I have had prior involvement with the property that is the subject of the Technical Report. The nature of my prior involvement is a series of operational reviews and gap analyses that were conducted for Sierra Metals prior to the technical work supporting the technical report.
9. I have read NI 43-101 and Form 43-101F1 and the sections of the Technical Report I am responsible for have been prepared in compliance with that instrument and form.
10. As of the aforementioned Effective Date, to the best of my knowledge, information and belief, the sections of the Technical Report I am responsible for contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 9th Day of February, 2018.

<<signed>>

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Matthew Hastings, MSc Geology, MAusIMM (CP)