**MINE DEVELOPMENT ASSOCIATES**

MINE ENGINEERING SERVICES

# TECHNICAL REPORT AND ESTIMATED RESOURCES FOR THE SAN FELIPE PROJECT, SONORA, MEXICO

Report Date: May 3, 2018
Effective Date: March 15, 2018

**Submitted to:**

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**MINE DEVELOPMENT ASSOCIATES**
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## CONTENTS



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## TABLES

## FIGURES



## APPENDICES

# 1.0 SUMMARY

Mine Development Associates ("MDA") has prepared this independent technical report on the San Felipe project, located in Sonora, Mexico, at the request of Americas Silver Corporation ("Americas Silver" or the "Company"). The purpose of this report is to provide a technical summary and updated mineral resource estimate on the San Felipe project.

This report and the resource estimates have been prepared in accordance with the disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101"), Companion Policy 43-101CP, and Form 43-101F1, as well as with the Canadian Institute of Mining, Metallurgy and Petroleum's "CIM Definition Standards - For Mineral Resources and Reserves, Definitions and Guidelines" ("CIM Standards") adopted by the CIM Council on May 10, 2014.

Americas Silver is a Canadian reporting issuer listed on the Toronto Stock Exchange ("TSX") and New York Stock Exchange ("NYSE") exchange. The Company's corporate office is in Toronto, Canada. Americas Silver is involved in the acquisition, exploration, development and mining of silver and base metal properties in North, Central and South America.

## 1.1 Property Description and Ownership

The San Felipe project is located in the Sonora River basin in the state of Sonora, northwest Mexico, within the San Felipe de Jesús and Huépac municipalities. The project is located 160 km north-northeast of the city of Hermosillo, Sonora's capital city, and 6 km west of the village of San Felipe de Jesús.

The San Felipe property consists of approximately 16,265 ha of mineral concessions under lease from the government of Mexico. The area is covered by 14 mineral concessions, all of which have been titled as Mining Concessions, according to Mexican mining law. The titles are valid for 50 years from the date titled and can be renewed for another 50 years. All of the concessions are held by Minera Hochschild Mexico S.A. de C.V. ("Hochschild").

The part of the project area that covers the resource is all in the municipality of San Felipe de Jesús and the surface rights are owned by the San Felipe ejido. A surface access agreement has been in place with the San Felipe ejido since 2008 providing the owner, or current option holder of the concession, rights to conduct exploration, development work and exploitation in a defined 1,596.5 ha area.

On March 2, 2017, Americas Silver entered into an agreement with Impulsora Minera Santacruz S.A. de C.V. ("Impulsora"), a wholly-owned subsidiary of Santacruz Silver Mining Ltd. ("Santacruz"), to acquire an option agreement (the "San Felipe Option Agreement") between Impulsora and Hochschild. By acquiring the San Felipe Option Agreement, Americas Silver will have the right to acquire a 100% interest in the San Felipe property for total consideration of $15 million in cash.

Upon completion of the balance of payments to Hochschild totaling, at the time of this report, $7,000,000 plus applicable VAT on or before December 31, 2018, 100% of the Property will have been acquired by the Company, free of any underlying net smelter return royalties.

The San Felipe property is not encumbered by any royalties to land holders, concession holders or former project operators, exclusive of government obligations that exist in Mexico for producing mines. Additionally, no royalties exist as part of the option agreement between Hochschild and Americas Silver.

Except for reclamation associated with past drilling (surface roads and drill sites), there are no known environmental liabilities on the property. Americas Silver has all the required permits to conduct work on the property. The author is not aware of any other significant factors and risks that may affect access, title or the right or ability to perform work on the property.

## 1.2 Exploration and Mining History

Mining on the San Felipe Property dates back to about 1900 with workings developed on the Artemisa, Cornucopia, La Ventana, San Felipe and Lamas structures. The first known company to work in the area was the Artemisa Mining Company which operated the Artemisa Mine from 1920 to 1944. No historical mine production records are available from this period, but average production is estimated at up to 100 tonnes/day. Mining was suspended in 1944 due to low metal prices.

Mining resumed again briefly from 1957 to 1959, and then again from 1963 to 1968. No records exist, but total production from this time is estimated at around 100,000 tonnes of ore.

The property was then briefly owned by Metalurgica Peñoles ("Peñoles") before being sold to Minera Serrana ("Serrana") in 1973. Serrana constructed a 100 tonne/day flotation plant processing ore from the San Felipe district until 1991. Total production from this time was approximately104,000 tonnes at average grades of 10.4% zinc, 2.6% lead, 0.3% copper, and 75.7 g silver per tonne. No production has occurred from the property since 1991.

Modern exploration began in 1998 when Boliden Ltd, after completing a surface geochemical sampling program along with airborne and ground geophysical surveys, drilled 26 diamond-core ("core") holes within the San Felipe property. Boliden completed work in 1999.

Hochschild purchased the property and conducted reconnaissance mapping and geochemical sampling in 2006 and 2007, and drilled 183 holes in 2006 through 2008. The drilling targeted the La Ventana, San Felipe, and Las Lamas structural zones, leading to an initial estimation of potential resources. Work associated with potential future mine development included the drilling of 26 development holes (mill site condemnation, geotechnical, hydrological, etc.), along with the construction of a decline accessing the La Ventana deposit. Hochschild stopped work on the project in 2008.

Santacruz optioned the property from Hochschild and completed additional geochemical sampling before drilling 126 core holes in 2013 and 2014. The drilling followed up on Hochschild's results at La Ventana and San Felipe, along with testing other vein targets at Transversales, Artemisa-Cornucopia, and Santa Rosa.

Americas Silver optioned the property in 2017 and drilled six core holes for confirmation and geotechnical purposes; three of these targeted the La Ventana zone and three were within the San Felipe zone.

### 1.3 Geology and Mineralization

The San Felipe project is located in the San Felipe mining district within the southeast end of the North American Block, northeastern Sonora, Mexico. The San Felipe district represents a cluster of deeply-eroded, late-Mesozoic, distal skarn-type, Pb-Zn-Ag vein deposits. These deposits are hosted within the upper plate of the El Amol detachment fault, hypothesized as a mid-crustal basal detachment associated with Miocene extensional tectonics. It is proposed that the San Felipe deposits detached from the Aconchi batholith leaving their roots several kilometers west.

The oldest rocks exposed in the San Felipe district, and the primary host to San Felipe mineralization, belong to a Lower Cretaceous sequence that includes andesitic lavas and tuffs interbedded with siltstone and rare lensoidal-shaped, discontinuous beds of micritic limestone. The Cretaceous rocks, which are metamorphosed to siliceous hornfels or altered to chlorite-albite-epidote, are named the Lower Metamorphic Sequence ("LMS") in the project area. Small isolated dikes of the San Felipe rhyolite porphyry and sills of fragmental rhyolite porphyry intrude the LMS in the central part of the district; whereas, the Aconchi granite pluton dominates in the south part of the district.

Vein systems in the LMS are hosted in steeply dipping and easterly-striking fault zones hypothesized as right lateral, oblique-slip normal faults. Veins are crosscut by N-S trending fracture zones and northwest-striking normal faults. The northwest-striking normal faults are hypothesized as listric extensions from the detachment surface that displace all veins and porphyry intrusions. Geologic estimates suggest that upper-plate rocks were displaced approximately 40 km east-northeast from the original location; however, the roots of the San Felipe vein system have never been found and likely were eroded.

The district hosts five principal vein systems, containing structurally-controlled massive sulfide and quartz-sulfide mineralization, that include Artemisa-Cornucopia, Las Lamas, San Felipe, Transversales and La Ventana. Primary minerals are sphalerite, galena, pyrite, and magnetite, with lesser native silver, chalcopyrite, arsenopyrite, scheelite, and covelite within a gangue of garnet, pyroxene, epidote, quartz, rhodonite, and carbonate. Quartz-sulfide veins are late and crosscut all rock types. Hydrothermal fluid flow paths followed the dike margins and the same fractures and minor faults that controlled the rhyolite porphyry intrusions. The mineralized veins occur with larger encompassing structural zones and the potentially economic veins can be stacked and/or discontinuous due to post-mineral fault movement.

## 1.4 Project Database

The San Felipe database contains records for a total of 68,929 m of drilling in 342 holes in the San Felipe property. Core drilling accounts for approximately 95% of the meters drilled and reverse circulation ("RC") drilling accounts for the balance. Americas Silver drilled six core holes in 2017, all other project drilling was completed by historical operators from the late 1990s through 2014. Except for 21 vertical development holes drilled by Hochschild, the drilling is inclined to best target the near-vertical mineralized structures.

The project assay database contains 15,782 sample intervals containing Au, Ag, Cu, Pb, and Zn data. Of this total, 14,732 are within the four mineral resource areas and 7,771 are within the modeled domains and contribute data to the mineral resource estimate.

Of the project-wide drill total within the current database, 293 holes (275 core and 18 RC) for a total of 60,682 m are within or directly adjacent to the four San Felipe project resource areas and contribute data used in the current resource models. Drilling targeting the La Ventana deposit totals 129 holes, though about two/thirds of these holes are north-directed angle holes collared on Peñoles ground to the immediate south of Americas' La Ventana concession. All of the project drill data, including drill data on Peñoles ground, were used in the grade estimate, though those portions of the model outside the concession boundary were not included in the current mineral resources.

The San Felipe project data is in UTM NAD27 Zone 12 coordinates.

## 1.5 Metallurgical Testing and Mineral Processing

Hochschild and Santacruz conducted metallurgical testing in 2008 and 2014, respectively. The studies included:

- scoping-level flotation tests,
- bulk mineralogy analyses, and
- process flowsheet evaluations.

The results of this testwork indicated estimated recoveries for sulfide mineralization of 86% for Pb and Zn, and 80% for Ag. The testing did not produce a viable copper concentrate. This information is being used within this report solely for the purposes of deriving appropriate metal equivalencies and reasonable and appropriate cutoffs for mineral resource reporting.

## 1.6 Mineral Resource Estimate

The mineral resource estimates reported in this technical report occur within the La Ventana, San Felipe, Las Lamas, and Transversales vein systems.

Upon completion of the database validation process, MDA constructed four sets of cross sections, one for each of the vein systems. The drill-hole information, including geology, metal grades, and the topographic surface were plotted on the cross sections.

The assay statistics were analyzed for the La Ventana deposit and then also with all four deposits together. Due to the good to excellent correlation, both statistically and spatially, seen between zinc and the three other primary metals (lead, silver and copper), the zinc assay values were used to create distinct mineral domains. These domains represent low-grade (domain 100), mid-grade (domain 200) and high-grade (domain 300) assay populations which can be correlated with specific geologic characteristics. Though the database contains gold values, the gold mineralization is generally very low-grade and shows less correlation with the other metals. It is possible that the gold represents another minor mineralizing event. Accordingly, gold was not included in the data evaluation or in the grade estimate.

Approximate locations of the historical San Felipe and Las Lamas workings were noted on the cross-sections and excluded from the mineral domain interpretations and therefore removed from consideration within the mineral resource estimate.

The zinc mineral-domain polygons were used to code drill samples and control grade estimation for all four metals. Quantile plots, along with domain statistics and spatial location of higher-grade samples, were made to assess validity of these domains and to determine capping levels for the individual mineral domain metal populations. Compositing was done to 1.5 m down-hole lengths (half the model's vertical block size), using the capped assays and honoring all mineral-domain boundaries. The volume inside each mineral domain was estimated using only composites from inside that domain. The final block-diluted metal grade assigned to each model block is a volume-weighted average based on the proportion of each domain within the block.

The density values used in the current resource model and mineral resource estimate are based on 875 density measurements collected by Santacruz from drill core in the San Felipe project area. MDA grouped the density samples by zinc mineral domains and analyzed the data for each deposit and then in total for all deposits. The density values used in the model are 2.65g/cm$^3$ for background and domain 100, 2.9 g/cm$^3$ for domain 200, and 3.25 g/cm$^3$ for domain 300. As with the assay data, the density assigned to each model block is a volume-weighted average based on the proportion of each domain within the block.

Separate orthogonal block models were created for each of the four deposits. All have a 2 m by 2 m by 3 m block size that is appropriate for the application of underground mining methods. The mineral domain cross sections were sliced to levels on 3 m intervals to coincide with the center of each row of blocks in each of the four models. The sliced mineral domains were reinterpreted on those 3 m intervals, and these interpretations were used to code the block models with the percent of block in each mineral domain.

Grade estimation used inverse distance to the third power ("ID$^3$") to interpolate grades into the domains, as this technique was judged to provide results superior to those obtained by ordinary kriging. Ordinary kriging and nearest neighbor estimates were also made as checks on the ID$^3$ estimate. To aid in determining search distances, variograms for zinc were made in numerous orientations and at various lag lengths. The La Ventana deposit provided the most useful variograms and these distances were used in all four deposits.

The mineralization within each deposit has a unique orientation and the search ellipsoids reflect these different orientations. Two search orientations are used in the La Ventana deposit to indicate the change from a near-vertical structure/vein orientation in the upper and eastern portions of the deposit, to a south-dipping orientation in the lower and western portions of the deposit.

The Las Lamas and Transversales estimated resources are restricted to an Inferred classification due to the relatively widely spaced drilling and uncertain continuity. The criteria for assigning an Indicated classification to a La Ventana or San Felipe mineralized block are that the average distance to the nearest two drill holes, with at least one composite sample per drill hole, is no greater than 35 m. The samples used for the classification criteria are independent of the modeled domains.

Table 1.1 shows the project total reported mineral resources along with the reported mineral resources for the four deposits, all reported at a 2.5% ZnEq grade. Copper has been excluded from the reported mineral resources due to its generally low-grade, uncertain metallurgy, and erratic QA/QC data. The San Felipe resources are based on exploitation by underground mining methods.

**Table 1.1 San Felipe Project Reported Mineral Resources**

| MINERAL RESOURCE ESTIMATE AS OF MARCH 15, 2018<br>Americas Silver Corporation - San Felipe Project | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Tonnes | Grades | | | Contained Metal | | |
| Classification | (000) | Zn (%) | Ag (g/t) | Pb (%) | Zn lbs (000) | Ag oz (000) | Pb lbs (000) |
| Indicated | 4,685 | 5.42 | 60.6 | 2.48 | 559,714 | 9,125 | 255,899 |
| Inferred | 2,008 | 3.57 | 48.2 | 1.43 | 157,845 | 3,110 | 63,166 |

| INDICATED MINERAL RESOURCE ESTIMATE AS OF MARCH 15, 2018<br>Americas Silver Corporation - San Felipe Project | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Tonnes | Grades | | | Contained Metal | | |
| Zone | (000) | Zn (%) | Ag (g/t) | Pb (%) | Zn lbs (000) | Ag oz (000) | Pb lbs (000) |
| La Ventana | 3,846 | 5.44 | 55.0 | 2.62 | 461,589 | 6,802 | 222,038 |
| San Felipe | 839 | 5.30 | 86.1 | 1.83 | 98,125 | 2,323 | 33,861 |
| **Total** | **4,685** | **5.42** | **60.6** | **2.48** | **559,714** | **9,125** | **255,899** |

| INFERRED MINERAL RESOURCE ESTIMATE AS OF MARCH 15, 2018<br>Americas Silver Corporation - San Felipe Project | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Tonnes | Grades | | | Contained Metal | | |
| Zone | (000) | Zn (%) | Ag (g/t) | Pb (%) | Zn lbs (000) | Ag oz (000) | Pb lbs (000) |
| La Ventana | 675 | 2.95 | 29.8 | 1.99 | 43,912 | 646 | 29,658 |
| San Felipe | 398 | 4.53 | 67.7 | 1.46 | 39,753 | 866 | 12,814 |
| Las Lamas | 351 | 5.75 | 82.6 | 0.25 | 44,478 | 932 | 1,935 |
| Transversales | 584 | 2.31 | 35.5 | 1.46 | 29,702 | 666 | 18,759 |
| **Total** | **2,008** | **3.57** | **48.2** | **1.43** | **157,845** | **3,110** | **63,166** |

1. CIM Definition Standards were followed for mineral resource estimates.
2. Mineral resources are fully diluted to the 2mx3mx2m block size and estimated at a cut-off grade of 2.5% zinc equivalent (“ZnEq”).
3. ZnEq is calculated using the formula: %ZnEq = %Zn + (1.054 * %Pb) + (0.017 * g Ag/t). This formula uses metal prices of US$18.00/oz Ag, US$1.05/lb Pb, and US$1.05/lb Zn, along with expected metal recoveries.
4. Numbers may not add due to rounding.

The primary risk with the resource model is continuity of mineralization within the structural zones. Multiple vein intervals can be encountered in one hole and correlating individual vein or massive sulfide intervals between drill holes carries some uncertainty. Moderate to poor core recovery is common, though core recovery versus zinc grade analyses indicates that metal grades decrease with lower core recovery so the resource estimate is potentially conservative. There is minor uncertainty in hole locations due to a lack of downhole surveys and some original collar surveys. None of these risks are high enough to preclude classifying portions of the San Felipe and La Ventana deposits as Indicated mineral resources.

### 1.7 Conclusions and Recommendations

The San Felipe resource models reflect the structurally-related, vein-style massive sulfide distal skarn mineralization as interpreted for the four deposits. The potentially economic (>2.5% ZnEq) sulfide veins are usually 2 to 10 m wide and occur within the much wider near-vertical structural zones marked by strongly silicified, weakly brecciated, andesite country rock. There is significant pre- and post-mineral fault displacement within, and apparently sub-parallel to the structural/mineral zones that often disrupts continuity of the mineralized veins.

It is believed that the current mineral resource model and estimate is a reasonable portrayal of the San Felipe structure/vein deposits and can be used in future economic analyses. The resource is open at depth at San Felipe and Transversales, while the La Ventana deposit is limited in growth due to current land constraints from concession boundaries. Additional core drilling at Las Lamas, San Felipe, and Transversales would likely allow for the conversion of Inferred resources to Indicated resources, while also potentially expanding the current resources.

MDA believes that the San Felipe project is a project of merit and warrants additional exploration and development work. The recommended work would include core drilling, along with geochemical and geophysical analyses to assist in target generation, plus additional metallurgical testing. The recommended work totals approximately $2.0 million.

Continued core drilling is recommended in order to:

- upgrade and expand the resources at San Felipe, Las Lamas, and Transversales;
- provide material for additional metallurgical and geotechnical testing at Las Lamas and Transversales; and
- increase the project-wide resources by targeting additional vein systems such as at Artemisa-Cornucopia.

A flexible drill program of approximately 10,000 meters of drilling is recommended to complete the above tasks. Total costs for the drill program would be approximately $1,500,000.

Additional metallurgical testing is recommended at La Ventana and San Felipe along with initial testing of Las Lamas and Transversales mineralization. The drill plan would allow for the infill and expansion drilling to also provide samples for the proposed metallurgical testing. Costs for the metallurgical testing would be approximately $300,000.

Upon drilling completion, and positive drill and metallurgical results, an updated mineral resource estimate and a preliminary economic assessment (“PEA”) is recommended. The estimated cost, including the accompanying technical reports, is approximately $150,000.

## 2.0 INTRODUCTION AND TERMS OF REFERENCE

Mine Development Associates ("MDA") has prepared this independent technical report on the San Felipe project, located in Sonora, Mexico, at the request of Americas Silver Corporation ("Americas Silver" or the "Company")), a Canadian reporting issuer listed on the Toronto Stock Exchange ("TSX") and New York Stock Exchange ("NYSE") exchange.

This report has been prepared in accordance with the disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101"), Companion Policy 43-101CP, and Form 43-101F1, as well as with the Canadian Institute of Mining, Metallurgy and Petroleum's "CIM Definition Standards - For Mineral Resources and Reserves, Definitions and Guidelines" ("CIM Standards") adopted by the CIM Council on May 10, 2014.

### 2.1 Project Scope and Terms of Reference

The purpose of this report is to provide a technical summary and updated resource estimate on the San Felipe project. The mineral resources were estimated and classified under the supervision of Paul Tietz, Senior Geologist for MDA. Mr. Tietz is a qualified person under NI 43-101 and has no affiliations with Americas Silver except that of independent consultant/client relationship. The mineral resources reported herein are estimated to the standards and requirements stipulated in NI 43-101.

The scope of this study included a review of pertinent technical reports and data provided to MDA by Americas Silver relative to the general setting, geology, project history, exploration activities and results, methodology, quality assurance, interpretations, drilling programs, and metallurgy. The author has fully relied on the data and information provided by Americas Silver for the completion of this report, including the supporting data for the estimation of the mineral resources.

Mr. Tietz visited the San Felipe project on April 12-14, 2017. The site visit included a brief update on the project status in the San Felipe office and a field tour focused on the geology and drilling results within the various vein systems on the property. Field verification of the historical drilling was also conducted.

This report is subsequent to a previous technical report issued by Santacruz Silver Mining and authored by Smit, H., et al, titled, "*2014 Technical Report and Preliminary Economic Assessment, San Felipe Project, Sonora Mexico*" dated October 23, 2014 and amended June 29, 2016 (the "2014 technical report"). The 2014 technical report has been used as a primary source for much of the project history, geology, and prior exploration and drilling activities discussed in this report.

Mr. Tietz has relied almost entirely on data and information derived from work done by Americas Silver and its predecessor operators of the San Felipe project. The author has reviewed much of the available data and made a site visit, and has made judgments about the general reliability of the underlying data. Where deemed either inadequate or unreliable, the data were either eliminated from use or procedures were modified to account for lack of confidence in that specific information. The author has made such independent investigations as deemed necessary in his professional judgment to be able to reasonably present the conclusions discussed herein.

The Effective Date of this technical report is March 15, 2018. The database used in the resource estimate was finalized October 24, 2017. The QA/QC analyses, and final review of the mineral resource estimate, was not completed until March 15, 2018.

The San Felipe project data is in UTM NAD27 Zone 12 coordinates.

## 2.2 Frequently Used Acronyms, Abbreviations, Definitions, and Units of Measure

In this report, measurements are generally reported in metric units. Where information was originally reported in English units, MDA has made the conversions as shown below.

Currency, units of measure, and conversion factors used in this report include:

**Linear Measure**

| | | |
|---|---|---|
| 1 centimeter | = 0.3937 inch | |
| 1 meter | = 3.2808 feet | = 1.0936 yard |
| 1 kilometer | = 0.6214 mile | |

**Area Measure**

| | | |
|---|---|---|
| 1 hectare | = 2.471 acres | = 0.0039 square mile |

**Capacity Measure (liquid)**

| | |
|---|---|
| 1 liter | = 0.2642 US gallons |

**Weight**

| | | |
|---|---|---|
| 1 tonne | = 1.1023 short tons | = 2,205 pounds |
| 1 kilogram | = 2.205 pounds | |

**Currency** Unless otherwise indicated, all references to dollars ($) in this report refer to currency of the United States.

**Frequently used acronyms and abbreviations**

| | |
|---|---|
| AA | atomic absorption spectrometry |
| Ag | silver |
| Au | gold |
| cm | centimeters |
| core | diamond core-drilling method |
| Cu | copper |
| ºC | degrees centigrade |
| °F | degrees Fahrenheit |
| g/t | grams per tonne |
| ha | hectares |
| ICP | inductively coupled plasma analytical method |
| kg | kilograms |
| km | kilometers |
| l | liter |
| lbs | pounds |
| µm | micron |
| m | meters |
| Ma | million years old |
| mm | millimeters |
| NSR | net smelter return |
| oz | ounce |
| Pb | lead |
| ppm | parts per million |
| ppb | parts per billion |
| QA/QC | quality assurance and quality control |
| RC | reverse-circulation drilling method |
| RQD | rock-quality designation |
| t | metric tonne or tonnes |
| Zn | zinc |

## 3.0 RELIANCE ON OTHER EXPERTS

The author is not an expert in legal matters, such as the assessment of the legal validity of mining claims, private lands, mineral rights, and property agreements in Mexico. Furthermore, the author did not conduct any investigations of the environmental, permitting, or social-economic issues associated with the San Felipe project, and the author is not an expert with respect to these issues.

The author has fully relied on Americas Silver to provide complete information concerning the legal status of Americas Silver and related companies, as well as current legal title, material terms of all agreements, and material environmental and permitting information that pertain to the San Felipe project.

# 4.0 PROPERTY DESCRIPTION AND LOCATION

The author is not an expert in land, legal, environmental, and permitting matters. This Section 4.0 is based on information provided to the author by Americas Silver. The author presents this information to fulfill reporting requirements of NI 43-101 but expresses no opinion regarding the legal or environmental status of San Felipe.

All monetary amounts are in U.S. dollars unless otherwise indicated.

## 4.1 Location

The San Felipe Project is located in the Sonora River basin in the state of Sonora, northwest Mexico, within the San Felipe de Jesús and Huépac municipalities. The Project is located 160 km north-northeast of the city of Hermosillo, Sonora's capital city, 6km west of the village of San Felipe de Jesús and 350 km south of Tucson, Arizona (Figure 4.1).

San Felipe is located at 29°53'N latitude and 110°18'W longitude. UTM coordinates are: NAD 27, Zone 12, 567,400 m E, 3,305,700 m N.

**Figure 4.1 Location of the San Felipe Project**


AMERICAS SILVER CORPORATION

Source: INEGI, April 2018

## 4.2 Land Tenure

The San Felipe property located in Sonora, Mexico (the "Property") consists of approximately 16,265 hectares ("ha") of mineral concessions under lease from the government of Mexico (Figure 4-2). The area is covered by 14 mineral concessions, all of which have been titled as Mining Concessions, according to Mexican mining law. The titles are valid for 50 years from the date titled and can be renewed for another 50 years. All of the concessions are held by Minera Hochschild Mexico S.A. de C.V. ("Hochschild"). Americas Silver currently holds an option agreement with Hochschild on the San Felipe Project comprising the concessions listed in Table 4-1.

On March 2, 2017, Americas Silver through its wholly owned subsidiary, Minera Platte River Gold S. de R.L. de C.V., entered into an agreement with Impulsora Minera Santacruz S.A. de C.V. ("Impulsora"), a wholly-owned subsidiary of Santacruz Silver Mining Ltd. ("Santacruz"), (the "Option Acquisition Agreement") to acquire an option agreement (the "San Felipe Option Agreement") between Impulsora and Hochschild. By acquiring the San Felipe Option Agreement, the Company has the right to acquire a 100% interest in the San Felipe property for total consideration of $15 million in cash.

Upon completion of the balance of payments to Hochschild totaling, at the time of this report, $7,000,000 plus applicable VAT on or before December 31, 2018, 100% of the Property will have been acquired by the Company, free of any underlying net smelter return royalties.

All of the mineral concessions have been legally surveyed by qualified and government-approved surveyors. The surveys have been registered with the titles at the Department of Mines in Mexico City and are in compliance with Mexican mining laws.

The concessions at San Felipe are located within two municipalities, San Felipe de Jesús and Huépac. The part of the project area that covers the resource is all in the municipality of San Felipe de Jesús and the surface rights are owned by the San Felipe Ejido. Ejidos are registered communal organizations that own much of the surface rights to rural land in Mexico. A surface access agreement has been in place with the San Felipe Ejido since 2008 providing the owner or current option holder of the concession, rights to conduct exploration, development work and exploitation in a defined area consisting of 1,596.5 hectares (Figure 4-2).

**Figure 4.2 San Felipe Property Map**
(from Americas Silver, 2018)

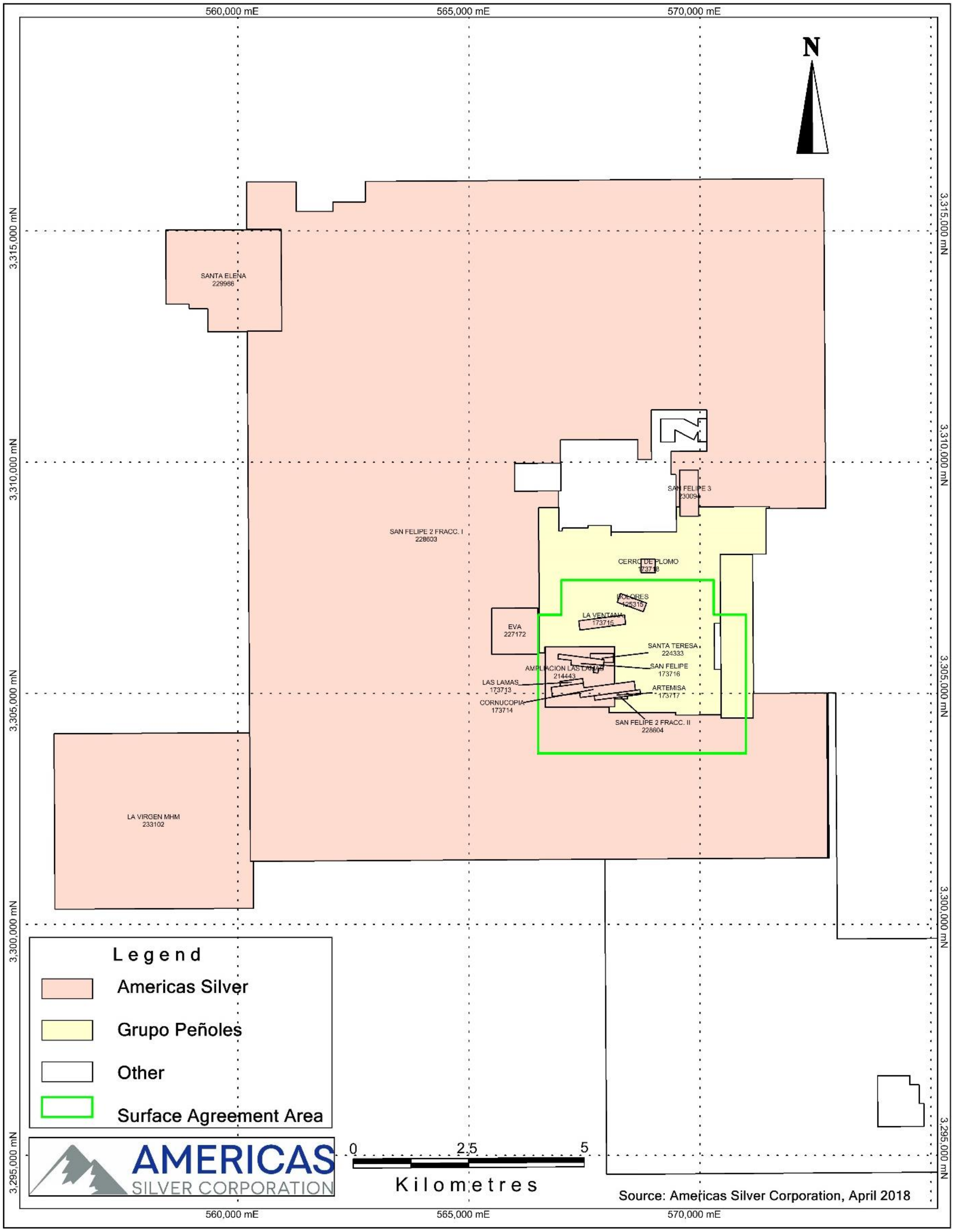


**Table 4.1 San Felipe Mineral Concessions**

Americas Silver Corporation – San Felipe Project

| Concession | Area (ha) | Title | Title Date | Expiry Date |
|---|---|---|---|---|
| Ampliación Las Lamas | 131.7133 | 214443 | Sept 06, 2001 | Sept 05, 2051 |
| Artemisa | 10.0000 | 173717 | Apr 11, 1985 | Apr 10, 2035 |
| Cerro de Plomo | 9.0000 | 173718 | Apr 11, 1985 | Apr 10, 2035 |
| Cornucopia | 37.0000 | 173714 | Apr 11, 1985 | Apr 10, 2035 |
| Dolores | 12.0000 | 125315 | Feb 25, 1961 | Feb 24, 2061 |
| La Ventana | 20.0000 | 173715 | Apr 11, 1985 | Apr 10, 2035 |
| La Virgen MHM | 1217.847 | 233102 | Dec 10, 2008 | Dec 9, 2058 |
| Las Lamas | 5.0000 | 173713 | Apr 11, 1985 | Apr 10, 2035 |
| San Felipe | 18.0000 | 173716 | Apr 11, 1985 | Apr 10, 2035 |
| Santa Teresa | 7.6016 | 224333 | Apr 26, 2005 | Apr 26, 2055 |
| San Felipe 2 Fracc. I | 14256.0509 | 228603 | Dec 12, 2006 | Dec 11, 2056 |
| San Felipe 2 Fracc. II | 1.2039 | 228604 | Dec 12, 2006 | Dec 11, 2056 |
| San Felipe 3 | 39.8320 | 230094 | Jul 18, 2007 | Jul 17, 2057 |
| Santa Elena | 500.0000 | 229986 | Jul 04, 2007 | Jul 03, 2057 |

Hochschild controls 100% of the concessions and Americas Silver has the right to acquire these concessions through the San Felipe Option Agreement. All of the concessions are in good standing with the mining law obligations through semi-annual tax payments and required assessment work. All concession taxes are being paid on a semi-annual basis by Americas Silver while it holds the San Felipe Option Agreement on the San Felipe Project.

The San Felipe property is not encumbered by any royalties to land holders, concession holders or former project operators, exclusive of government obligations that exist in Mexico for producing mines. Additionally, no royalties exist as part of the option agreement between Hochschild and Americas Silver.

## 4.3 Environmental Liabilities

An old mill site was located near the Artemisa vein within the project area but the buildings have been removed. A small amount of mineralized material exists near some of the old workings. A larger mill site and old tailings facility are located close to the village of San Felipe. Some of these tailings are from material previously mined within the San Felipe project but are located outside of the San Felipe Project area. Drilling activities by previous operators have resulted in the creation of a significant number of drill roads and pads. Reclamation of these areas should be completed as warranted by the progress of the project.

## 4.4 Environmental Permitting

Exploration and mining activities at the San Felipe Project are subject to regulation by the Secretary of the Environment and Natural Resources (*Secretaria Del Medio Ambiente y Recursos Naturales*, "SEMARNAT"). Regulations require that an environmental impact statement, known in Mexico as a Manifesto Impacto Ambiental ("MIA"), be prepared by a third-party contractor for submittal to SEMARNAT. Americas Silver has a MIA on the property that expires on December 2023. The current MIA covers the following activities: construction of a processing plant, tailings dam, potable drinking water line and exploitation of an underground mine. To conduct any of these activities a current change of land-use (*Cambio de Uso de Suelo*, "CUS") permit is required and the Company will need to submit a Justifying Technical Study (*Estudio Técnico Justificativo*, "ETJ") to SEMARNAT. It typically takes four to six weeks to receive this approval.

The author is not aware of any other significant factors and risks that may affect access, title or the right or ability to perform work on the property.

# 5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRPHY

## 5.1 Access to Property

A paved highway (highway 17) provides year-round access from Hermosillo, the capital of Sonora. The road distance from Hermosillo to San Felipe is approximately 160 km. The access road to the village of San Felipe from highway 17, while paved, crosses the Sonora River via a ford. During the rainy season the river occasionally floods and it is not possible to drive across the ford for a period of hours to rarely a few days. An elevated foot bridge allows access by walking during these periods.

The project area is accessed by gravel roads from the San Felipe village. During the rainy season the local creeks experience flooding and there will be periods when creek crossings are not passable. Experience from the last few years suggests these periods will be infrequent and generally last only a few hours.

## 5.2 Climate

San Felipe is located in a semi-arid region typical of the Sonoran Desert. Average day time temperatures vary from around 18ºC in the winter to 35ºC in the summer (June through August). Night-time averages vary from around 6ºC to 28ºC. Summer temperatures can be as hot as 50ºC. Occasionally night temperatures in the winter can fall below zero. Snow is very rare.

Rainfall typically averages around 400 mm per year, with most rain falling in July, August and the first part of September. Over the last 50 years, annual average rainfall has varied from a low of 279 mm to a high of 700 mm. The maximum estimated 100 year-return 24-hour rain event is 145 mm.

Mining and exploration can be conducted year-round.

## 5.3 Physiography

The San Felipe property is situated in moderately to locally rugged topography with elevations ranging from to 610 m to 1,830 m. The area is characterized by moderate to steep hills with ephemeral creeks in the valleys. Cattle ranching is the main non-mining use of the land. The vegetation in the San Felipe area is classified as subtropical shrublands with spineless shrubs, and secondary vegetation usually found in semiarid areas.

## 5.4 Local Resources and Infrastructure

The village of San Felipe has an estimated population of 400 people. There are only minimal services available in San Felipe.

The communities in the vicinity of San Felipe along the Sonora River have an estimated total population of 10,000 people, mostly engaged in agriculture and support industries. The main source of industrial supplies and services is the city of Hermosillo. While some labor for mining could be sourced locally, it is likely that a significant proportion of the labor force would have to be brought in from Hermosillo.

San Felipe is connected to the national power grid; however, the existing line is too small to support a major industrial operation. The closest high-tension power line is 40 km to the south.

Santacruz, a previous operator, had water rights and two wells located in the flat Sonora River valley. No production tests have been done on these wells, but a number of wells are currently being used in the valley for agriculture and there appears to be a productive aquifer within the valley gravels.

# 6.0 HISTORY

The information presented in this section is derived primarily from Smit et al. (2014). Mr. Tietz has reviewed this information and has no reason to believe that this summary does not accurately represent the history of the San Felipe property as presently understood.

## 6.1 Ownership/Mining History

Mining on the San Felipe Property dates back to about 1900 with workings developed on the Artemisa, Cornucopia, La Ventana, San Felipe and Las Lamas structures. The first known company to work in the area was the Artemisa Mining Company which operated the Artemisa Mine from 1920 to 1944. Sampling from the mine workings in 1932 by Schramm and Hammond (Turner, 1999) reported grades of up to 16.21 oz/t silver, 21.7% lead, 29.5% zinc and 27.65% copper. No historical mine production records are available from this period, but average production is estimated at up to 100 tonnes/day (Turner, 1999). Mining was suspended in 1944 due to low metal prices.

Mining resumed again briefly from 1957 to 1959 when a small concentration plant was constructed at La Cuchilla by Pablo Mesa (located adjacent to the San Felipe core shed in San Felipe de Jesús village). In 1963, Mineral Metalurgica San Felipe resumed operations until 1968. No records exist, but total production from this time is estimated at around 100,000 tonnes of ore (Turner, 1999).

The property was then briefly owned by Metalurgica Peñoles ("Peñoles") before being sold to Minera Serrana ("Serrana") in 1973. Serrana constructed a 100 tonne/day flotation plant processing ore from the San Felipe district as well as from El Gachi and Moctezuma until 1991. Total production from this time is shown in Table 6.1 (Turner, 1999). No production has occurred from the property since 1991.

**Table 6.1 Production Data from the San Felipe District by Serrana 1975 – 1991**

| | | Average Grades | | | |
|---|---|---|---|---|---|
| **Mine** | **Tonnage** | **Zn %** | **Pb %** | **Cu %** | **Ag g/t** |
| San Felipe | 42,000 | 9.0 | 3.0 | 0.2 | 84.0 |
| Santa Rosa | 50,000 | 10.5 | 0.6 | 0.3 | 70.0 |
| Artemisa | 12,000 | 15.0 | 9.5 | 0.5 | 70.0 |
| Total | 104,000 | 10.4 | 2.6 | 0.3 | 75.7 |

In 1996, Silver Eagle Resources Ltd., through its Mexican subsidiary Liximin, S.A. de C.V. ("Liximin"), entered into an exploration agreement with Serrana. Shortly after, Liximin entered into an agreement with Boliden Ltd. Boliden did not spend the total required money on the property and ownership reverted 100% to Serrana after the four-year period ended in 2000.

Hochschild entered into a joint venture with Serrana in 2006 and took 100% ownership of the project in June 2008. Santacruz entered into a purchase agreement with Hochschild in 2011. Americas Silver entered into an option agreement to control 100% of the San Felipe project in 2017.

## 6.2 Exploration History

The author has no information on exploration completed prior to 1998.

In 1998 and 1999, Boliden completed a surface geochemical sampling program consisting of 763 soil and 52 stream sediment samples. Soil anomalies were present over all of the known mineralized areas though some anomalies were related to the presence of surface mining dumps.

Boliden completed 91 line-km of airborne magnetic and very low frequency ("VLF") geophysical surveys in 1997 though problems with the operator (Aerophysics Mexico) rendered the surveys not being reliable for use. Boliden also had Lloyd Geophysics Inc. complete 16 line-km of ground magnetics and 14 line-km of induced polarization ("IP") surveys. There was a weak magnetic response over the Ventana structure with no other apparent geophysical response at Lamas and San Felipe.

Boliden drilled 26 holes within the current San Felipe property; these are discussed further in Section 10.0.

Hochschild conducted reconnaissance mapping over about 1,690 ha in 2006 and 2007 and collected 64 rock chip samples in 2008 and 2009. Hochschild completed an extensive drill program totaling 183 drill holes in 2006 through 2008, which included 26 development holes (mill site condemnation, geotechnical, hydrological, etc.). See Section 10.0 for drilling details.

In 2007-2008, Hochschild constructed two declines to access the upper portions of the La Ventana deposit. The first decline was abandoned before reaching the mineralized structure due to poor ground conditions. The second 150m-long decline successfully reached the target, but work was stopped when Hochschild shut down all work on the project. The decline portals are both located within a north-south drainage on the southwest side of the deposit.

Santacruz mapped about 5,000 ha in 2014 and collected about 348 rock chip samples. Santacruz drilled 126 core holes in 2013 through 2014, targeting the primary mineralized structures. See Section 10.0 for drilling details.

Exploration and drilling by Americas Silver is discussed in Sections 9.0 and 10.0, respectively

## 6.3 Historical Mineral Resource Estimates

There have been three prior mineral resource estimates completed on the San Felipe project: by Hochschild in 2008, and by Santacruz in 2012 and 2014. These "historical" estimates were prepared before Americas Silver entered into the option agreement to acquire the property and have not been verified by Americas Silver or the report author. The estimates are summarized below for historical completeness and to give the reader a sense of previous work completed on the project, but the author has not done sufficient work to classify these resources as current resources and they should not be relied upon. These historical estimates are not considered current and have been superseded by the current mineral resource estimate described in Section 14.0. Comparisons between the current mineral resource estimate and the most recent 2014 Santacruz estimate are noted in Section 14.10.

### 6.3.1 Hochschild (2008)

In 2008, as part of a scoping study on the project, Hochschild estimated resources for the La Ventana, San Felipe and Las Lamas zones (Hochschild, 2008). The estimate was reportedly prepared to JORC standards with an effective date of December 2008 but was not in accordance with NI 43-101.

The resource was estimated using an inverse distance squared (ID2) methodology and ordinary kriging (OK) - with block size varying by zone from 5 m by 5 m by 5 m to 10 m by 10 m by 10 m. Wireframes were constructed using Minesite software of the mineralized zones based on geologic logging of drill core. Metal recovery and metal prices used in 2008 are shown in Table 6.2.

**Table 6.2 Metal Prices and Recoveries Used in the 2008 Hochschild Resource**
(from Smit, et al. (2014)

| | Metal Price | Recovery |
|---|---|---|
| Au | $600/oz | 84% |
| Ag | $10.5/oz | 87% |
| Cu | $1.5/lb | 85% |
| Pb | $0.435/lb | 80% |
| Zn | $0.713/lb | 72% |

The Hochschild 2008 resource estimate at a $20/t cut off) is summarized in Table 6.3.

**Table 6.3 Resource Summary Table from Hochschild 2008.**
(from Smit, et al. (2014)

| | Tonnes | Au (g/t) | Ag (g/t) | Cu (%) | Pb (%) | Zn (%) |
|---|---|---|---|---|---|---|
| Measured | 1,393,716 | 0.02 | 69 | 0.39 | 3.10 | 7.12 |
| Indicated | 1,354,261 | 0.06 | 82 | 0.31 | 2.73 | 6.14 |
| M & I | 2,747,977 | 0.04 | 76 | 0.35 | 2.92 | 6.64 |
| Inferred | 1,257,731 | 0.05 | 84 | 0.19 | 2.26 | 6.18 |

1 *The author has not done sufficient work to classify the historical estimate as current mineral resources or mineral reserves;*

2 *Americas Silver is not treating the historical estimate as current mineral resources or mineral reserves; and*

3 *The historical estimate should not be relied on.*

### 6.3.2 Santacruz (2012)

In 2012, Santacruz commissioned Gustavson Associates LLC ("Gustavson") to prepare an independent technical report on the San Felipe Project and to estimate the mineral resources for Ag, Cu, Pb and Zn. The report had an effective date of April 5, 2012 and was reportedly prepared to NI 43-101 standards (Hulse, 2012).

Gustavson used indicator kriging (IK) to estimate Ag, Cu, Pb and Zn resources at the La Ventana, San Felipe and Lamas areas - no geologic models or wireframes were used to constrain mineralization. Samples with Ag >10 ppm were given an indicator value of 1 and were used to represent the "vein material". Block size was 10 m by 2 m by 5 m, and a density of 2.84 g/cm3 for mineralized rock and 2.5 g/cm3 for waste was used. The metal prices used for the silver equivalent ("AgEq") calculations are shown in Table 6.4 and the total estimated resources are shown in Table 6.5

**Table 6.4 Metal Prices and Recoveries Used by Gustavson 2012**
(from Smit, et al. (2014))

| | Metal Price | Recovery |
|---|---|---|
| Ag | $26.28/oz | 100% |
| Cu | $3.491/lb | 100% |
| Pb | $0.9988/lb | 100% |
| Zn | $0.9531/lb | 100% |

**Table 6.5 Gustavson 2012 Resource Table Showing 150 g/t AgEq Cutoff**
(from Smit, et al. (2014))

| | Tonnes | Ag (g/t) | Cu (%) | Pb (%) | Zn (%) | AgEq (g/t) | AgEq (koz) |
|---|---|---|---|---|---|---|---|
| Measured | 1,524,000 | 92.21 | 0.38 | 3.4 | 6.52 | 385.95 | 18,913 |
| Indicated | 329,000 | 81.35 | 0.34 | 3.38 | 6.32 | 366.05 | 3,869 |
| M & I | 1,853,000 | 90.28 | 0.37 | 3.39 | 6.49 | 382.42 | 22,782 |
| Inferred | 317,000 | 63.82 | 0.33 | 3.63 | 6.01 | 346.58 | 3,533 |

1 *The author has not done sufficient work to classify the historical estimate as current mineral resources or mineral reserves;*

2 *Americas Silver is not treating the historical estimate as current mineral resources or mineral reserves; and*

3 *The historical estimate should not be relied on.*

### 6.3.3 Santacruz (2014)

Santacruz drilled an additional 117 holes after the 2012 estimate. An updated mineral resource estimate and a Preliminary Economic Assessment ("PEA") were completed in 2014 (Smit et al, 2014). Giroux Consultants Ltd. completed the mineral resource estimate on six separate mineralized structures: La Ventana, Las Lamas, San Felipe, two San Felipe hanging wall structures, and the Transversales vein. Wireframe solids were constructed for each of the structures and metal grades were interpolated into blocks 5 m by 2.5 m by 5 m using ordinary kriging. The metal prices used in the silver equivalent calculation are shown in Table 6.6 while metal recoveries are shown in Table 6.7. Copper was not considered in the determination of project resources because the metallurgical testwork did not produce an economic copper concentrate.

**Table 6.6 Metal Prices Used in 2014 Resource Estimate**

| | Metal Price |
|---|---|
| Ag | $20.06/oz |
| Pb | $0.96/lb |
| Zn | $0.92/lb |

**Table 6.7 Recoveries for Each Metal used in 2014**

| Zone | Ag Rec. | Pb Rec. | Zn Rec. |
|---|---|---|---|
| Ventana | 70% | 86% | 87% |
| Las Lamas | 73% | 82% | 88% |
| San Felipe & Transversales | 69% | 86% | 79% |

The 2014 resources, sorted by potential mining method and mineral zone, are shown in Table 6.8. The resource contains no edge dilution.

## Table 6.8 Summary of 2014 Silver Equivalent Resources
(Smit et al, 2014)

| Zone | Classification | Cut-off AgEq (g/t) | Tonnes > Cut-off | Grades > Cut-off | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | (tonnes) | Ag (g/t) | Pb (%) | Zn (%) | AgEq (g/t) | AgEq Ozs. |
| **Within Conceptual Open Pits** | | | | | | | | |
| Ventana | Indicated | 75 | 10,000 | 70.61 | 0.11 | 7.69 | 378.11 | 121,565 |
| San Felipe | Indicated | 75 | 87,000 | 82.27 | 1.39 | 4.07 | 283.26 | 792,310 |
| **Total** | **Indicated** | **75** | **97,000** | **81.07** | **1.26** | **4.44** | **293.04** | **913,875** |
| Ventana | Inferred | 75 | 252,000 | 54.37 | 1.66 | 6.31 | 370.29 | 3,000,083 |
| San Felipe | Inferred | 75 | 261,000 | 83.07 | 1.28 | 4.56 | 297.48 | 2,496,255 |
| Transversales | Inferred | 75 | 345,000 | 55.40 | 1.41 | 1.33 | 159.84 | 1,772,945 |
| **Total** | **Inferred** | **75** | **858,000** | **63.51** | **1.44** | **3.78** | **263.52** | **7,269,283** |
| **Below Pits Possible Underground** | | | | | | | | |
| Ventana | Indicated | 150 | 815,000 | 72.91 | 2.96 | 6.78 | 460.35 | 12,062,477 |
| San Felipe | Indicated | 150 | 118,000 | 91.38 | 1.76 | 5.79 | 368.79 | 1,399,110 |
| Las Lamas | Indicated | 150 | 84,000 | 76.18 | 0.25 | 5.29 | 286.28 | 773,145 |
| **Total** | **Indicated** | **150** | **1,017,000** | **75.32** | **2.60** | **6.54** | **435.35** | **14,234,732** |
| Ventana | Inferred | 150 | 1,201,000 | 59.67 | 2.86 | 5.78 | 403.57 | 15,583,056 |
| San Felipe | Inferred | 150 | 712,000 | 56.33 | 1.61 | 4.09 | 267.06 | 6,113,354 |
| Las Lamas | Inferred | 150 | 383,000 | 95.27 | 0.36 | 5.50 | 317.54 | 3,910,101 |
| **Total** | **Inferred** | **150** | **2,296,000** | **64.57** | **2.06** | **5.21** | **346.89** | **25,606,511** |

1 *The author has not done sufficient work to classify the historical estimate as current mineral resources or mineral reserves;*

2 *Americas Silver is not treating the historical estimate as current mineral resources or mineral reserves; and*

3 *The historical estimate should not be relied on.*

# 7.0 GEOLOGIC SETTING AND MINERALIZATION

The information presented in this section is drawn from Smit et al., (2014) along with additional sources, as cited. Mr. Tietz has reviewed this information and believes this summary accurately represents the geology and mineralization of the San Felipe property as presently understood.

## 7.1 Regional Geology

The San Felipe project is located in the San Felipe mining district within northeastern Sonora, Mexico.

The following section is summarized from Longo (2014). The trace of the Mojave-Sonora Megashear ("MSM"), a Mid-Jurassic age left-lateral strike-slip fault zone, is proposed to pass through the district and juxtaposes two distinct Proterozoic basement provinces (Figure 7.1). Rocks of the Mazatzal province lie north of the MSM and extend northeast into Arizona and rocks belonging to the Caborca Terrane lie south and extend northwest into Baja California (Silver and Anderson, 1974; Valencia-Moreno et al., 2001; Molina-Garza and Iriondo, 2007; Gray et al., 2008). Mazatzal province rocks belong to the North American Block and are comprised of a series of Precambrian metamorphic rocks that includes metavolcanics and schists (1.72-1.62 Ga) that extend into southern Arizona and New Mexico (Barra et al, 2005). Proterozoic rocks are overlain by Upper Paleozoic quartzites and carbonates, and Middle to Upper Jurassic volcanic rocks, all intruded by coeval Jurassic granites. The Caborca Terrane represents a thick sequence (3.3 km- thick) of pre- Middle Jurassic rocks that rest with disconformity atop the Proterozoic (1.8-1.7 Ga) crystalline basement (Anderson, 2005). Paleozoic rocks include eugeoclinal deep-water sediments with both siliciclastic and carbonate rocks, and lesser chert and volcanic rocks. Upper Triassic rocks overlie the latter with angular unconformity and include continental red beds, conglomerates, and a series of shallow marine to fluvial sediments (Molina-Garza and Iriondo, 2007).

During the Triassic and Jurassic, a period of plutonism and volcanism swept eastward across Sonora from the Paleozoic continental margin. These igneous rocks are characterized by granitic to syenitic plutons (170-150 Ma) with associated felsic volcanic flows, tuffs and interbedded volcaniclastic sandstone and quartzite (180-170 Ma). Tectonics changed, the subducted Farallon Plate flattened, the arc migrated eastward, and the early andesitic island arc was accreted to the new continental margin. Early Mesozoic magmatism and subduction ended in the Late Jurassic. Sonoran volcanism flared up again in late Jurassic to early Cretaceous time, with lavas of intermediate compositions, and magmatism continued its eastward migration into northwestern Mexico.

By late Cretaceous through mid-Eocene time (~90 to 40 Ma), the large igneous complexes intruded Lower Cretaceous rocks at San Felipe and included three Laramide-age granitoids (Roldan-Quintana, 1979; Calmus et al., 1996; Valencia-Moreno et al., 2001): the late Cretaceous El Jaralito granodiorite (69.6 – 51.8 Ma), the early Eocene San Felipe rhyolite porphyry (50.47 Ma), and the late Eocene two-mica granite from the Aconchi batholith (36 Ma). Figure 7.2 shows the geology of the San Felipe region including the location of the Aconchi batholith immediately to the west and south of the San Felipe property.

**Figure 7.1 Regional Geologic Setting of Sonora and the San Felipe Area**
(from Smit, et al., 2014; modified from Valencia-Moreno, 2001)

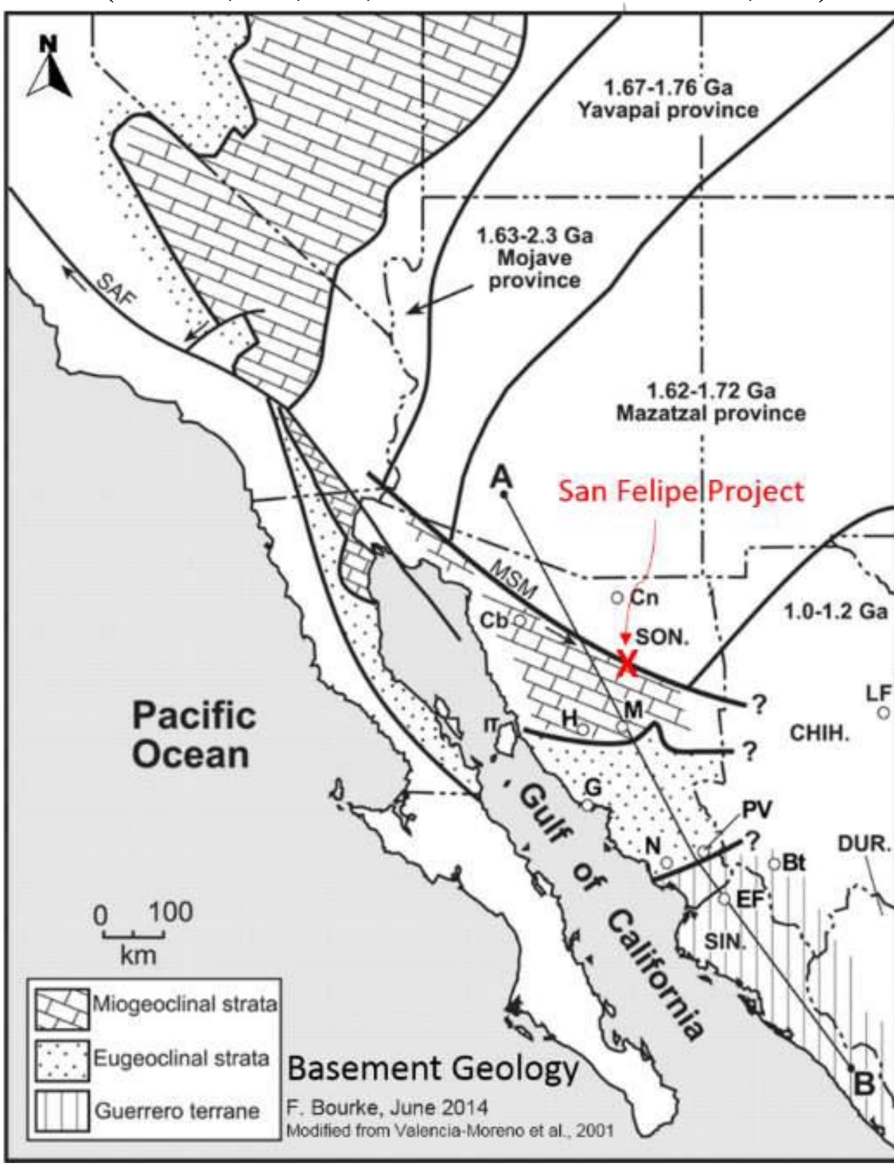
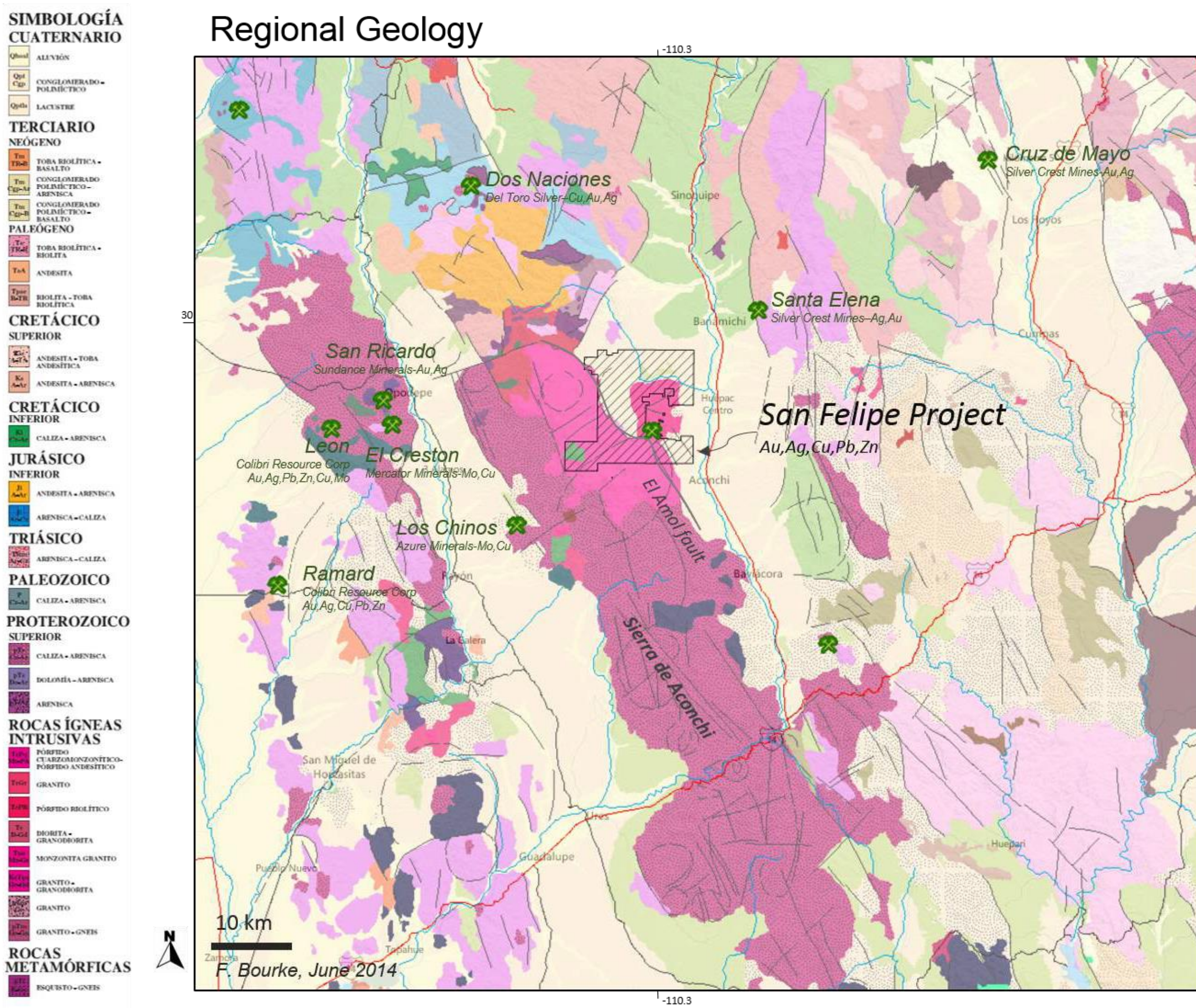


**Figure 7.2 Geology of San Felipe Region**
(from Smit, et al., 2014; modified from Servicio Geologico Mexicano, 1999)



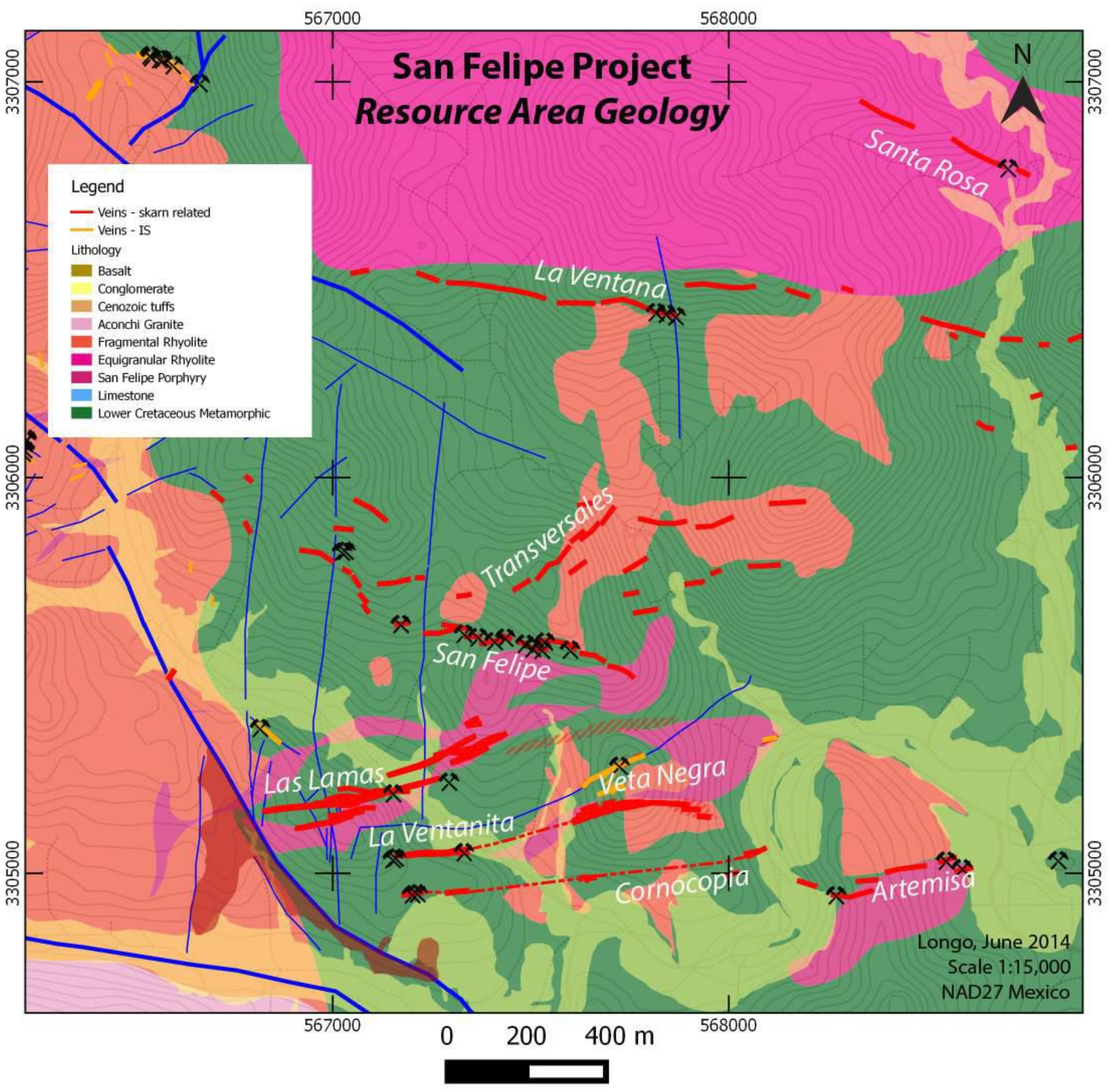

## 7.2 Property Geology

The San Felipe district represents a cluster of deeply eroded, late Mesozoic, distal Pb-Zn-Ag skarn vein deposits. These deposits are hosted with the upper plate of the El Amol detachment fault, hypothesized as a mid-crustal basal detachment associated with Miocene extensional tectonics. It is proposed that the San Felipe deposits detached from the Aconchi batholith during Miocene regional extension and are tectonically displaced from several kilometers to the west of the district (Calmus et al., 1996).

The oldest rocks exposed in the San Felipe district belong to a Lower Cretaceous sequence that includes andesitic lavas and tuffs interbedded with siltstone and rare, lensoidal-shaped, discontinuous beds of micritic limestone. These rocks are similar to a package of Lower Cretaceous

(Aptian-Albian) age rocks that contain well preserved fossils 63 km northwest of San Felipe near Cucurpe. The Cretaceous rocks at San Felipe are metamorphosed to siliceous hornfels or altered to chlorite-albite-epidote rock. Presumed to be the result of contact metamorphism (Roldan-Quintana, 1979; Calmus et al., 1996), these rocks are named the Lower Metamorphic Sequence ("LMS") in the project area. Small isolated dikes of the San Felipe porphyry and sills of fragmental rhyolite porphyry intrude the LMS in the central part of the district, while a larger mass of equigranular rhyolite occurs on the north side of the district, immediately north of the La Ventana deposit. The Aconchi granite pluton dominates in the south part of the district (Figure 7.3).

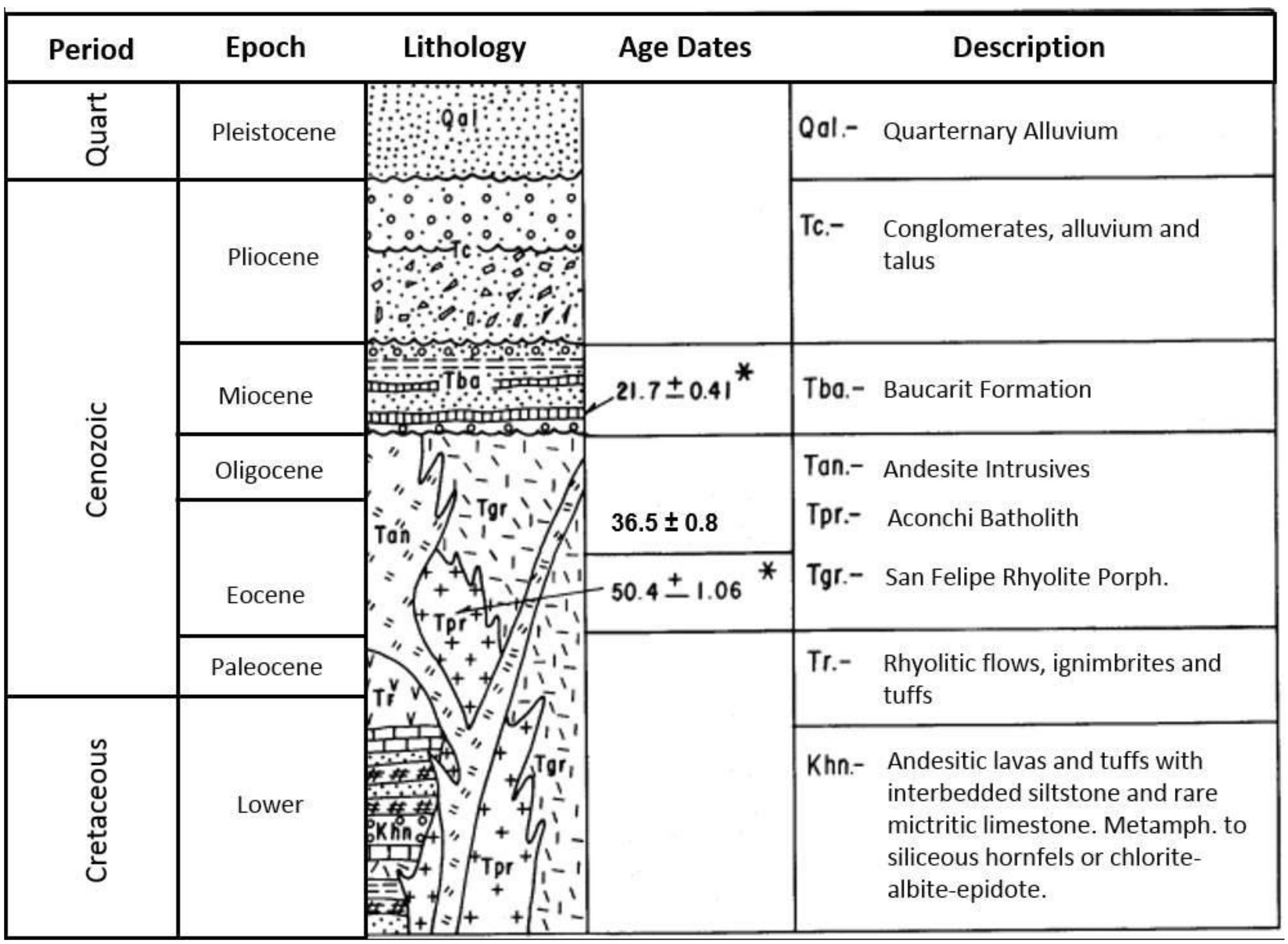
**Figure 7.3 Resource Area Geology Map**
(from Longo, 2014)



Oligocene volcanic and sedimentary rocks in the San Felipe district include felsic pyroclastic rocks and andesitic flows intercalated with polygenetic conglomerates. Overlying these are the clastic rocks of the Baucarit Formation which are widespread in valleys of Central Sonora and have an age range of 27.7 – 14.1 Ma based on stratigraphic relationships. Baucarit strata include basaltic-andesite lavas at the base that decrease in abundance upward in the sequence and are interbedded with alternating polygenetic conglomerates and sandstones. These rocks filled grabens related to extensional tectonics of the Basin and Range Province. Overlying the Baucarit Formation are Pliocene-age basaltic lava flows.

### 7.2.1 Lithology

**Figure 7.4 Stratigraphic Column, San Felipe Project**
(from Smit, et al., 2014; modified from Roldan-Quintana, 1979)




The stratigraphy of the San Felipe project (Figure 7.4) is divided from top to bottom into the following units:

**Quaternary Cover**

Extensive alluvial conglomerates and sandstones cover most of the lower elevation valleys. These are widespread in the northern part of the property.

**Baucarit Formation**

Middle Miocene conglomerates, sandstones and clayey siltstones, and interbedded volcanic strata. The formation as defined by King (1939) consists of slightly indurated, well-bedded sandstones, conglomerates and some clays. The conglomerates contain rounded to subangular fragments of older volcanic rocks. The lower and upper parts of the formation contain interbedded basaltic flows. The formation has been dated based on stratigraphic relationships and ranges from 27.7 to 14.1 Ma (Bartolini, et al., 1994).

There is only limited outcrop of the Baucarit Formation, which is exposed mainly in the western and northern parts of the property. Outcrop is difficult to find and distinguish as it is overlain by the extensive Quaternary conglomerates which cover most of the lower-elevation valley floors.

**Aconchi Granite**

The Aconchi Granite is characterized by the association of two micas, biotite and muscovite, which have been dated at 36.5 and 32 Ma (cited in Calmus et al, 1996). The granite is exposed in the south-west part of the property. Crosscutting the Aconchi Granite are N-S and NW-SE oriented pegmatite dikes ranging in width up to 4 meters. They are crosscut by numerous andesite dikes more abundant near the edge of the batholith. The andesite dikes have been dated at 28.3 and 26.7 Ma (cited in Calmus et al, 1996) and strike predominantly W-NW and NW.

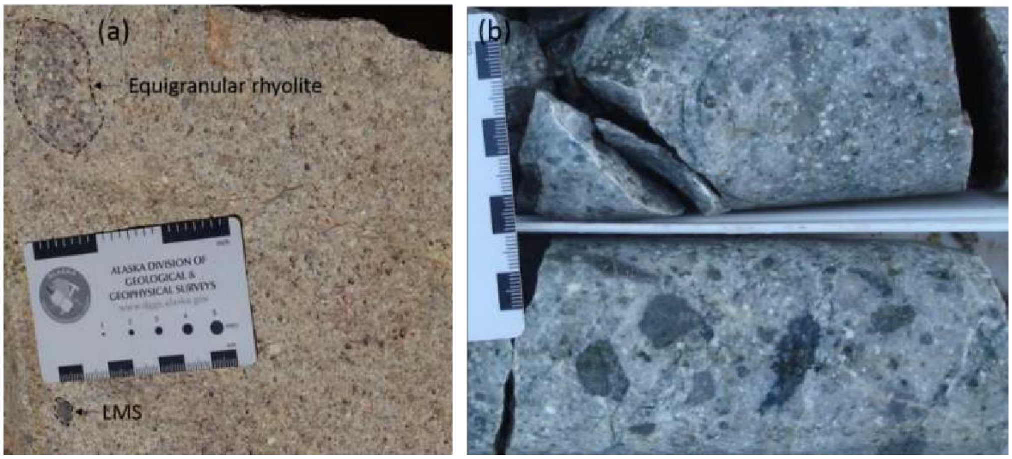
**Oligocene Volcanics and Sediments**

Composed predominantly of felsic pyroclastics and some andesitic flows, polygenic conglomerates are intercalated in the unit. The unit crops out in the western edge of the resource area.

**Fragmental Rhyolite Porphyry**

Light gray, medium-grained fragment-rich rhyolite porphyry (Figure 7.5) which contains up to 40% fragments ranging in size from 0.5 to 30 cm. In drilling near the resource area, fragments include: LMS, San Felipe porphyry, equigranular rhyolite and mineralized epidote skarnoids.

**Figure 7.5 Fragmental Rhyolite**
(from Smit et al., 2014)




*Note: fragments of equigranular rhyolite and LMS*

## El Jaralito Granitoid

A subduction related calc-alkaline granite to monzogranite. The unit has been dated between 69.6 and 51.8 Ma (cited in Calmus et al., 1996). There is only limited outcrop on the property, mainly in the area to the west of the Aconchi granite, near Los Locos.

## Equigranular Rhyolite

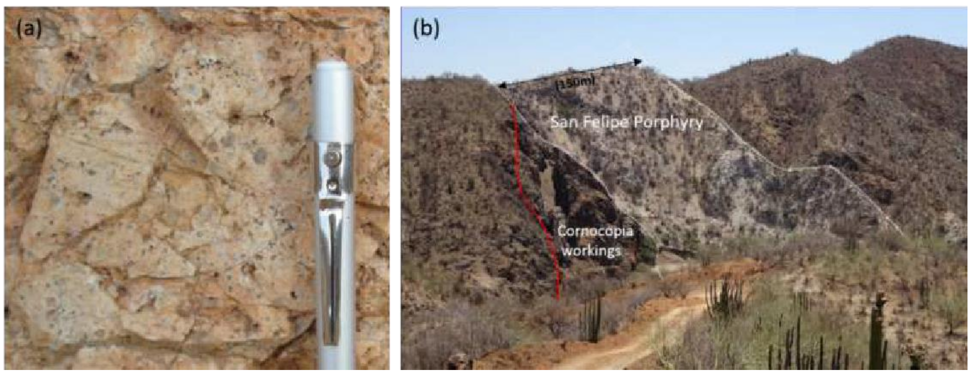
Light gray, medium-grained, granitic textured rhyolite (Figure 7.6) with a typical mineral composition (volume percent) of quartz 50%, plagioclase 15%, K-feldspar 25%, and biotite 10%. The equigranular rhyolite is exposed predominantly to the north and west of the resource area.

**Figure 7.6 Equigranular Rhyolite**
(from Smit, et al., 2014)

**San Felipe Porphyry**

The San Felipe ("SF") porphyry contains characteristic amoeboid quartz-eye phenocrysts up to 1 cm in size in a fine grained, commonly pink to cream, siliceous groundmass composed predominantly of quartz and feldspar (Figure 7.7). The intrusion is dated at 50.47 Ma and has undergone quartz-sericite alteration dated at 49.5 Ma (cited in Calmus et al, 1996). The SF porphyry is interpreted as the subvolcanic facies of the calc-alkaline magma of the El Jaralito granitoid. The porphyry commonly strikes N, E-NE and W-NW, ranging from 1 to 150 meters thick.

**Figure 7.7 San Felipe Porphyry**
(from Smit, et al., 2014)




(a) outcrop showing amoeboid quartz eyes, (b) SF porphyry dike looking SW, Cornucopia mineralization along dike footwall contact.

**Lower Metamorphic Sequence (LMS)**

LMS rocks are primarily meta-andesites and siliceous hornfels, often altered to chlorite, albite, and epidote, that are typically very fine grained with little discernible mineralogy in hand sample. The LMS contains interbedded porphyritic flows (feldspar phenocrysts 1-3 mm) and rare discontinuous beds of micritic limestone. Modal mineralogy (volume percent) determined from petrographic study is epidote 60%, calcite 25%, chlorite 10%, and quartz 5%

### 7.2.2 Structure

The early Tertiary El Amol detachment fault separates the upper-plate mineralized LMS in the San Felipe district from the lower-plate late Laramide-age Aconchi batholith (Calmus et al., 1996). Vein systems in the LMS are hosted in steeply dipping and easterly-striking fault zones hypothesized as right lateral, oblique-slip normal faults. Veins are crosscut by N-S trending fracture zones and northwest-striking normal faults. Small low-angle faults cut the veins with little displacement. The northwest-striking normal faults are hypothesized as listric extensions from the detachment surface that displace all veins and porphyry intrusions. Geologic estimates suggest that upper-plate rocks were displaced approximately 40 km east-northeast from the original location; however, the roots of the San Felipe vein system have never been found and likely were eroded (Calmus et al., 1996; Rodriguez-Castaneda, 1999).

## 7.3 Mineralization

The San Felipe district contains a series of easterly-trending Zn-Ag-Pb-Mn veins and pipes that cut the LMS and intrusive rocks. The veins are considered the distal expression of a larger skarn system which has been disconnected from the San Felipe veins due to movement along the El Amol detachment fault.

The district hosts five principal vein systems that include Artemisa-Cornucopia, Las Lamas, San Felipe, Transversales and La Ventana (Figure 7.3). Primary minerals are sphalerite, galena, pyrite, and magnetite with lesser native silver, chalcopyrite, arsenopyrite, scheelite, and covelite within a gangue of garnet, pyroxene, epidote, quartz, rhodonite, and carbonate (Roldan-Quintana, 1979: Calmus et al., 1996).

Mineralized veins in the district are spatially associated with three types of felsic intrusions. These are the San Felipe porphyry, the fragmental rhyolite porphyry, and the equigranular rhyolite, a medium-grained, equigranular plutonic rock with rhyolitic composition.

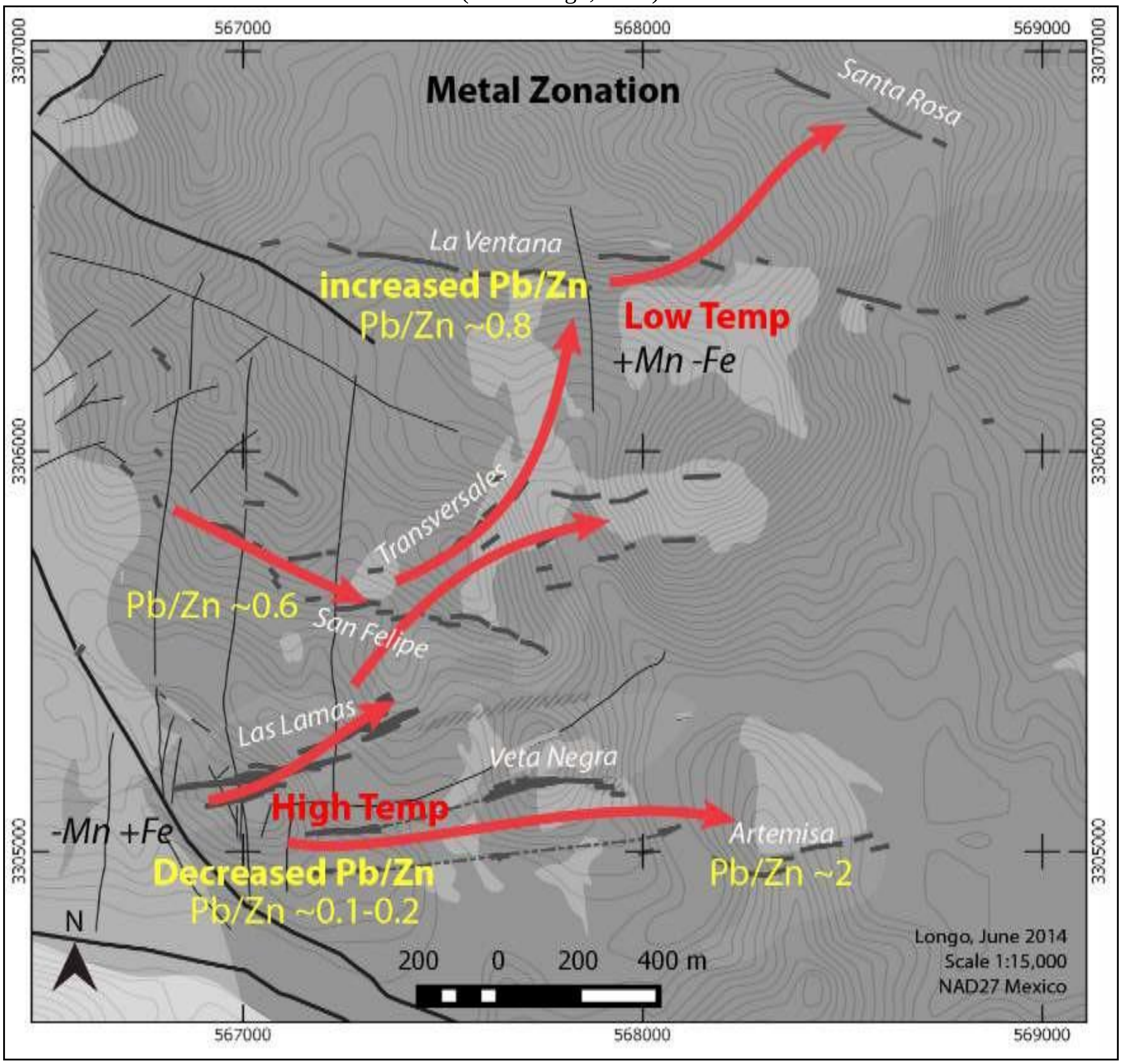
The distal skarn veins are primarily late, structurally controlled, and crosscut all rock types. Hydrothermal fluid flow paths followed the dike margins and the same fractures and minor faults that controlled the various types of rhyolite porphyry intrusions. Disseminated sulfide mineralization occurs at Las Lamas within the calc-silicate altered vein wallrock possibly indicating emplacement more proximal to the intrusive source.

Skarn-related calc-silicate minerals and sphalerite are useful indicators of system zonation and temperatures. Those minerals with high Fe/Mn ratios formed at higher temperature closer to the hydrothermal source, and minerals with decreased Fe/Mn ratios formed at lower temperatures further from the source. The skarn mineralogy and Zn-Ag-Pb-bearing sulfides within the veins display a metal zonation across the district from high Zn, low Mn in the south, to high Pb, high Mn in the north (Figure 7.8).

Veins in the south parts of the district at Las Lamas and Artemisa-Cornucopia contain Fe-rich, dark brown garnets (andradite) and dark green pyroxenes (hedenbergite) with epidote, magnetite, quartz, carbonate, and low Pb/Zn ratios, low Mn content, and high Fe content. The sphalerite is dark brown to deep red with high Fe content and indicates high formation temperatures >300°C (Meinert, 2007).

In contrast, veins in the north part of the district at La Ventana and San Felipe contain Mn-rich pyroxenoids (pinkish-tan rhodonite and bustamite), Mn-rich epidote, and quartz, together with increased Mn and Ag content, increased Pb/Zn ratios, and decreased Fe content. The sphalerite is honey-colored, an indication of decreased iron content, the galena is argentiferous, and both are consistent with decreased temperatures of crystallization. Grossular garnet and wollastonite are common in areas with more abundant limestone, such as at Santa Rosa and Las Lamas.

**Figure 7.8 Metal Zoning Map of the San Felipe Resource Area**
(from Longo, 2014)




### 7.3.1 Deposit Characteristics

The following information describes the four primary deposits that contribute to the current resource estimate. The deposit locations with the resource outlines and drilling are shown in Figure 10.1. Cross-sections through all four deposits are in Section 14.0.

#### 7.3.1.1 La Ventana

La Ventana is the more northerly and the largest of the four deposits in terms of metal content. The drill-defined mineralization is generally east-west trending with a near-vertical to steep (-70º to -85º) southerly dip, has an 800 m strike length, and reaches a depth of over 400 m. The deposit extends onto Peñoles ground both along strike and at depth, so further growth is limited by the land constraints.

The mineralized structural zone, consisting primarily of variably silicified, and faulted/brecciated LMS andesite, is generally 25 to 100 m wide. Structurally deformed rhyolite intrusive bodies occur within the structural zone and in the hanging wall on the south side of the deposit. Mineralization occurs within the rhyolite as sulfide-quartz veins, but the rhyolite is less amenable to skarn alteration compared to the andesite country rock. A granodiorite intrusive occurs within the structural zone footwall and the contact appears to be primarily fault-controlled.

Within the structural zone, the high-grade intervals of increased sulfide-quartz veins are 2 to 20 m thick with the primary, through-going horizon usually just above the granodiorite footwall. Secondary, hanging wall high-grade structures are sub-parallel or splay off of the primary sulfide-quartz vein and can be encountered about 100 m above the primary vein.

Fault displacement appears to be both pre- and post-mineralization, with movement primarily sub-parallel to mineralization, though cross-faults are recognized in outcrop. At the resource model scale, mineral offsets along these latter faults are not apparent, though would likely come into play with further development.

#### 7.3.1.2 San Felipe

The San Felipe mineralization has been encountered over a 1,000 m west-northwesterly strike length and extends to a depth of 300 m within the center of the deposit. The tenor of mineralization appears to be weakening along strike to the west and east, though drilling also becomes more limited along strike extensions. Potentially economic metal grades occur primarily within the central 300 m of strike length.

San Felipe mineralization occurs within discontinuous, 5 to 20 m wide, near-vertical to 60º south-dipping, sulfide veins that occur within an approximate 100 m wide structural corridor. The veins coalesce and pull apart, and the primary mineralized structure is within the hanging wall of the structural zone. The intensity of mineralization, possibly related to decreased fault movement and ground preparation, is not as great as at La Ventana with only very minor wallrock mineralization between the mineralized structures.

As at La Ventana, the LMS andesite is the primary host, though mineralized structures cut structurally deformed rhyolite intrusive bodies. The structurally-controlled mineralization is often localized at rhyolite-andesite contacts.

#### 7.3.1.3 Las Lamas

The Las Lamas sulfide vein zone has a 500 m strike length, trending N70ºE, and reaches depths of 200 m. The structurally controlled vein is open along strike to the southwest, though significant extensions along this trend are limited by the Aconchi batholith. Along strike to the northeast, the Las Lamas zone appears to weaken as it trends into the San Felipe zone, though there is limited drilling where the structural trends intersect.

Las Lamas mineralization is primarily near-vertical, with potentially economic metal grades occurring over 2 to 5 m widths. The highest grades at Las Lamas occur at depth directly beneath the historic workings (adit and upper level stopes), which are in the south-central portions of the deposit.

Strongly fractured or brecciated LMS andesite is the primary host, though there is a spatial correlation with structurally deformed rhyolite intrusive bodies as at La Ventana and San Felipe, and intrusive-andesite contacts appear to be favorable sites for mineralization.

#### 7.3.1.4 Transversales

The Transversales zone lies immediately to the north of San Felipe and could be interpreted as a splay off of the San Felipe structure. Mineralization has been defined over a 500 m strike length, trending N55ºE, and to depths of 300 m.  The near-vertical mineralized zone is open at depth and along strike to the northeast, though Americas Silver's concession boundary is located about 100 m northeast of the current deposit extent.

The mineralization style is similar to Las Lamas with a 2 to 5 m wide, high-grade sulfide mineralized fault or vein within an anastomosing structural zone. The LMS andesite and andesite-intrusive contacts are the favorable hosts.

# 8.0 DEPOSIT TYPE

Mineralization at San Felipe can be classified as a zinc-lead skarn (Einaudi et al, 1981). These skarn systems commonly occur in continental settings associated with either subduction or rifting. They are sulfide-rich, with Zn + Pb commonly ranging from 10-20 % and Ag from 30 to 300 g/t. Zinc-lead skarns are often transitional to massive-sulfide veins and often lack significant calc-silicate alteration, which is a contrast to the San Felipe veins which do contain calc-silicate assemblages. Distinguishing features of this skarn type include:

- Mn - Fe rich mineralogy;
- Distal to intrusive source;
- Occurrence along structural and lithologic contacts;
- Absence of significant metamorphic aureoles;
- If present, pyroxene as dominant calc-silicate mineral; and
- Retrograde mineralogy of Mn-rich pyroxenoids, amphibole and chlorite are common.

The San Felipe district is characterized by a strong structural control on hydrothermal fluid movement and resulting alteration and mineralization in the northern areas (La Ventana, Transversales and San Felipe), and a more disseminated style to the south (Las Lamas). Calc-silicate alteration within the veins at San Felipe is Mn-rich including bustamite-rhodonite, piemontite, garnet and pyroxene. Some of the mineral compositions are unusual and all indicate distal alteration relative to the source of the hydrothermal fluids. A number of samples at San Felipe were analysed by XRD and electron microprobe by Meinert in 2007 as part of a site visit. Pyroxenoid at San Felipe varies from Rd 73-78 to Wo 15-20. The garnets found at Las Lamas are typical skarn andradite, while at La Ventana garnets are more unusual in that they are spessartine and grossular rich (Sp 59-73, Gr 17-34), which reflect a siliceous, Ca-poor system (Meinert, 2007).

The San Felipe district has characteristics in common with other intrusion-related skarn districts in North and South America. La Ventana and San Felipe are similar to the Japon and Manganesa breccias in the Cananea district (Meinert, 1982). These breccias are all resistant knobs due to silicification and are coated or cemented with Mn oxides. Both the Japon and Manganesa breccias overlie mineralized skarns at depth. The skarns are Zn-rich at surface and become more Cu-rich at depth.

Other analogous districts are Uchucchacua in Peru (Bussell et al., 1990) and the Darwin Ag-Zn-Pb skarn in California (Newberry et al., 1991). Uchucchacua is a large Pb-Zn-Ag district and one of the largest Ag producers in Peru. Uchucchacua contains both vein and skarn mineralization. The veins are zoned from sulfide-only at surface, to increasing amounts of calc-silicate minerals such as bustamite at depth. Darwin is a structurally-controlled Ag-Zn-Pb skarn similar to San Felipe. Garnet-quartz-carbonate veins and breccia pipes contain Ag-Pb-Zn bearing sulfides and crosscut all rock types, including dacite porphyry. Mineralization occurs in anastomosing, steeply inclined swarms of veins up to 100 m wide.

# 9.0 EXPLORATION

Exploration conducted by previous operators is summarized in Section 6.0. The reader is referred to Smit et al. (2014) for greater details on prior exploration. Other than the geotechnical drilling discussed in Section 10.0, the author is not aware of any other exploration activities conducted on the project by Americas Silver.

The author has not analyzed the sampling methods, quality, and representative nature of surface sampling on the San Felipe property because drilling results form the basis for the mineral resource estimate described in Section 14.0. Drilling is described in Section 10.0.

# 10.0 DRILLING

The information presented in this section is derived primarily from the author's review of the project data, though some details on the historical drilling are based on information in Smit et al. (2014).

## 10.1 Summary

The San Felipe database contains records for a total of 68,929 m of drilling in 342 holes in the San Felipe property, as summarized in Table 10.1. Diamond-core ("core") drilling accounts for approximately 95% of the meters drilled and reverse circulation ("RC") drilling accounts for the balance.

**Table 10.1 San Felipe Drill Database Summary**
(MDA database, March 2018)

| Year | Operator | Core Holes | Core (m) | RC Holes | RC (m) | Total Holes | Total Meters |
|---|---|---|---|---|---|---|---|
| 1998 - 2000 | Boliden | 27 | 4,945 | | | 27 | 4,945 |
| 2007 - 2008 | Hochschild* | 165 | 36,445 | 18 | 3,675 | 183 | 40,120 |
| 2013 - 2014 | Santacruz | 126 | 22,533 | | | 126 | 22,533 |
| 2017 | Americas Silver | 6 | 1,331 | | | 6 | 1,331 |
| ***Totals:*** | | ***324*** | ***65,254*** | ***18*** | ***3,675*** | ***342*** | ***68,929*** |

*Hochschild total includes 26 development holes drilled for condemnation, geotechnical, and hydrological purposes. Twelve of these holes are outside the current Americas concessions.

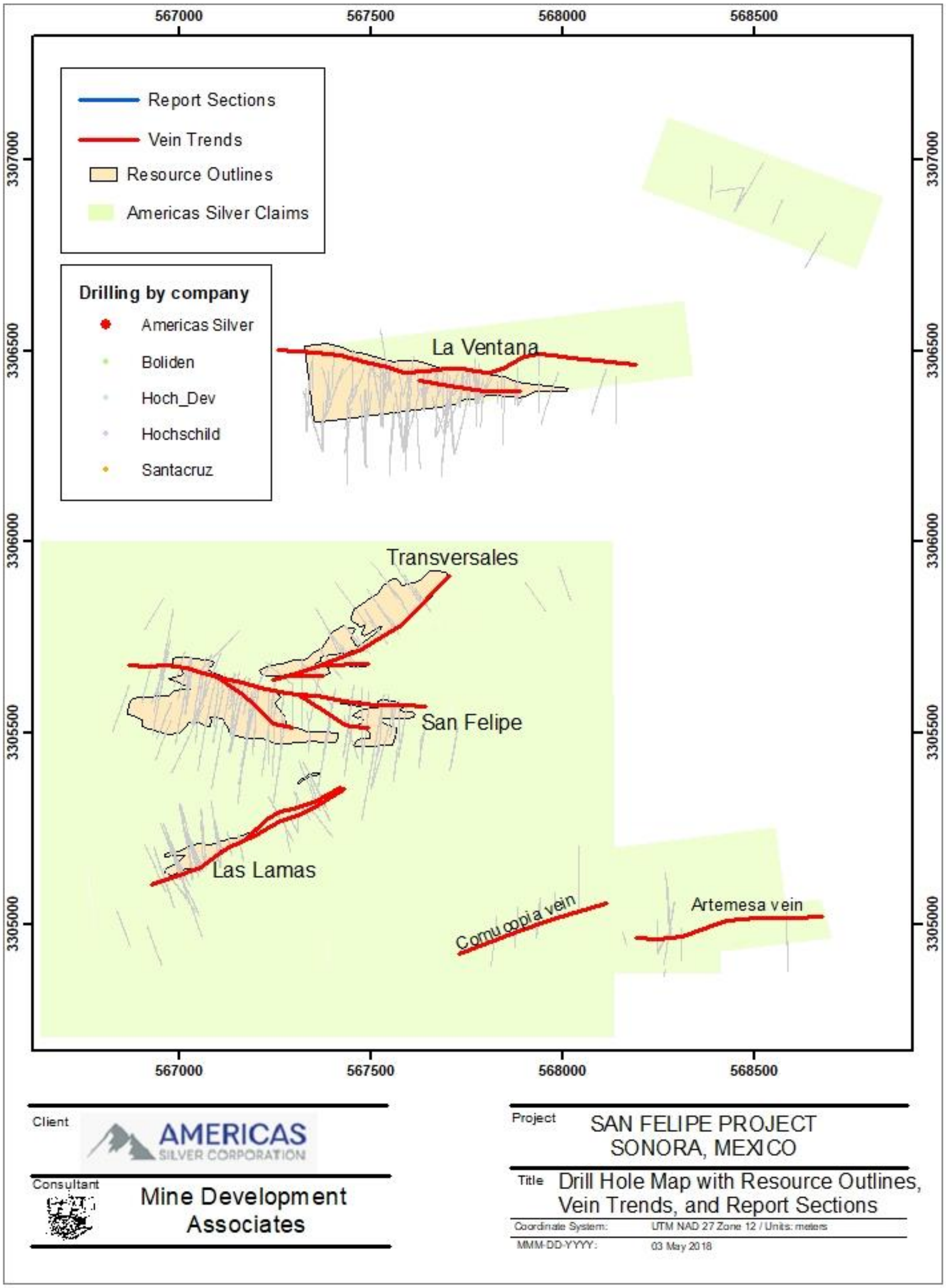
Americas Silver drilled six core holes in 2017. All other project drilling was completed by historical operators from the late 1990s through 2014. Except for 21 vertical development holes drilled by Hochschild, the drilling was inclined to best penetrate the near-vertical mineralized structures.

Figure 10.1 shows the locations of all known drill-hole collars within the San Felipe property along with the location of the La Ventana, San Felipe, Las Lamas, and Transversales deposits, and the secondary vein targets at Artemisa and Cornucopia.

Of the project-wide drill total within the current database, 293 holes (275 core and 18 RC) for a total of 60,682 m are within or directly adjacent to the four San Felipe project resource areas and contribute data used in the current resource models. Drilling for the La Ventana deposit totals 129 holes though about two/thirds of these holes are north-directed angle holes collared on Peñoles ground to the immediate south of Americas' La Ventana concession. All of the project drill data, including drill data from Peñoles ground, were used in the grade estimate, though all portions of the model outside the concession boundary were excluded from the current mineral resources.

Representative drilling cross-sections through the La Ventana, San Felipe, Las Lamas, and Transversales zones are shown in Figure 14.1, Figure 14.2, Figure 14.3, and Figure 14.4, respectively. Locations of the cross-sections are shown in blue on Figure 10.1.

**Figure 10.1 Location of San Felipe Project Drill Holes and Mineral Zones**



## 10.2 Drilling by Boliden (1998 – 2000)

Boliden drilled 27 core holes within the San Felipe project area. Of this total, 20 holes (17 in La Ventana, 2 in San Felipe, and one in Las Lamas) are within the resource areas. Total meterage in the current project database is 4,945m, though the 2014 technical report (Smit et al, 2014) states a total for the 27 Boliden holes of 5,187.24 m. The author cannot determine the reason for this discrepancy.

Britton Bothers of Hermosillo, Mexico was the drilling contractor and the drilling was completed using NQ-size core. MDA has no information on the type of core rig and drilling procedures used.

Copies of the geologic drill logs, which contain original collar coordinates in a local grid and drill set-up orientations, along with assay certificates are available for the La Ventana drill holes, though not for the San Felipe or Las Lamas drilling. There are no original collar surveys in the project data. Collar locations were later re-surveyed for Hochschild by Precision GPS. There are no downhole survey data available for the Boliden drilling. The collar set-up data are used to determine hole orientations. The lack of original collar surveys and no downhole surveys creates some uncertainty in the Boliden hole locations, but the significant amount of later drilling has validated, in a general sense, the Boliden drill results. Any risk to the resource estimate is considered low.

The Boliden drill results indicated that the La Ventana mineralization had the potential for both continuity along strike and also down-dip. The limited San Felipe results indicated that the mineral system weakened directly down-dip from the historical underground mine production areas on the east end of the deposit.

## 10.3 Drilling by Hochschild (2006 – 2008)

The drill database contains 165 core holes and 18 RC holes drilled by Hochschild for a total of 40,120m within the San Felipe project area. Drilling was concentrated within the La Ventana (73 core holes), San Felipe (47 core and 14 RC holes), and Las Lamas (17 core and 4 RC holes) zones. One core hole was drilled in each of the Artemisa and Cornucopia zones. The total includes 26 core holes drilled for development purposes (mill site condemnation, geotechnical, hydrological, etc.). Twelve of the development holes within the database were collared on Peñoles ground outside of Americas' concessions.

The drilling contractors were Major Drilling Group International Inc., Perforservice S.A. de C.V., GeoDrill, Landdrill International Mexico, S.A. de C.V., and Globexplore Drilling S.A. de C.V. The majority of core drilling was completed using HQ-size core. MDA has no information on the type of core rig and drilling procedures used. Downhole surveys were collected by the drilling contractors approximately every 50 m using a REFLEX instrument.

The collar locations were surveyed for Hochschild by Precision GPS (Hermosillo), though the project data available to the author includes just one original 2006 survey file with collar coordinates for six drill holes. In 2014, Santacruz located and re-surveyed 51 Hochschild drill collars. This resulted in a shift in many of the Hochschild collar locations of up to 10 m. See Section 12.1.1 for greater detail on the project collar surveys and final coordinates.

The Hochschild drilling confirmed the continuity and potentially economic metal grades within the La Ventana structure. The San Felipe drilling extended mineralization about 600 m to the west from the historical workings and the initial drilling at Las Lamas indicated mineralization down dip and along trend from the historical workings. The Artemisa and Cornucopia drilling did not intersect significant mineralization beneath the historically mined areas.

## 10.4 Drilling by Santacruz (2013-2014)

Santacruz drilled 126 core holes for a total of 22, 533m within the San Felipe project area. Infill and expansion drilling was completed at La Ventana (27 holes), San Felipe (21 holes), and Las Lamas (32 holes). First-time drilling was completed at Transversales (32 holes). An additional 14 holes targeted the vein systems at Artemisa (4 holes), Cornucopia (6 holes), and Santa Rosa (4 holes).

The drilling contractor was AP Explore Drilling S.A. de C.V. of Oaxaca, Mexico. The type of drill rig is not known. The majority of core drilling was completed using HQ-size core. Downhole surveys were collected by the drilling contractors approximately every 50 m using a REFLEX instrument.

The Santacruz collar locations were surveyed in 2014 and 2017. The initial survey in early 2014 was completed by a Santacruz surveyor. After a problem was detected – caused by the use of an incorrect survey base station – an independent surveyor re-surveyed the Santacruz drilling and 51 Hochschild hole collars, in May 2014. The 2017 surveys provided collar locations for the 27 infill holes drilled at La Ventana in late 2014. See Section 12.1.1 for greater detail on the project collar surveys and final coordinates.

Only limited mineralization was encountered in the vein targets at Artemisa, Cornucopia, and Santa Rosa. Positive results at the four principal deposits resulted in an updated resource estimate and a PEA.

## 10.5 Drilling by Americas Silver (2017)

Americas Silver drilled six core holes for 1,331m within the San Felipe project area in 2017. Three holes were drilled at La Ventana and three holes were drilled at San Felipe. The core holes were angled “twin” holes drilled primarily to confirm historical drill results and were also used to collect geotechnical data. The results of the twin comparison are in Section 12.3.

The drilling contractor was Maza Drilling, based out of Sinaloa, Mexico, and the drilling was completed using HQ-size core and a triple-tube core barrel to provide increased core recovery. Downhole surveys were collected by the drilling contractors approximately every 50 m using a REFLEX instrument.

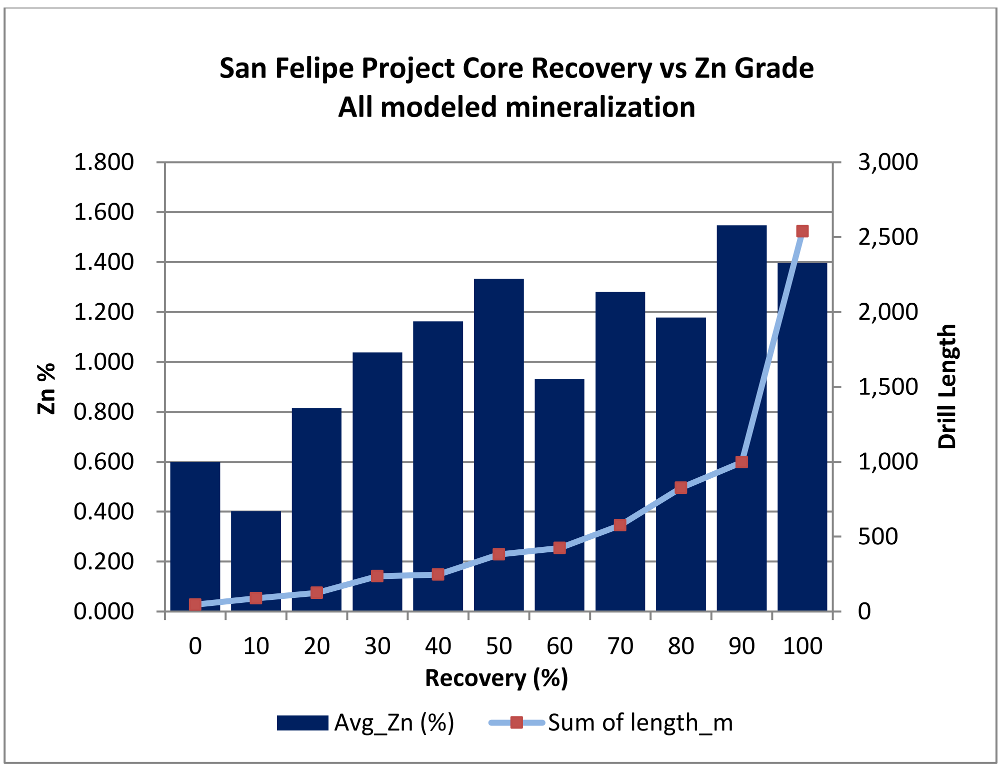
The collar locations were surveyed by Lopez Olivas Y Asociados, and independent surveyor based out of Hermosillo.

## 10.6 Core Recovery and RQD

Average core recovery for all San Felipe core holes is 81%, while average core recovery for those intervals contributing to the current mineral estimate (i.e., are within the modeled mineral domains as described in Section 14.0) is 82%. The core is generally highly fractured both within and adjacent to the mineralized intervals, and rock quality designation ("RQD") measurements are typically low, averaging about 10-15%.

Poor core recovery may have an impact on grade assessment. The drill data was analyzed to determine if there was a deposit-wide relationship between poor recovery intervals and zinc grades. Figure 10.2 shows the mean zinc grade (blue vertical bars) and the drill footage (light blue line with orange data points) plotted in the vertical axes, while core recovery is plotted along the horizontal axis. The figure includes all mineralized intervals within the San Felipe models, with the very high-grade (>20% Zn) intercepts excluded due to their tendency to skew the statistics. The core recovery data have been separated into distinct bins for each 10% increase in recovery. As an example, the "70" value in the horizontal axis contains all data points which have core recovery values between 70 and 79%. The "100%" core recovery bin includes all drill intercepts with 100% or greater core recovery. Approximately 2% of these drill intercepts have calculated core recovery values greater than 100%. These infrequent intercepts are the result of core re-drill or minor footage measurement errors.

**Figure 10.2 Core Recovery versus Zinc Grade – All Modeled Mineralization**




There is an increase in zinc grade of about 10% associated with core recoveries in the 90% range, but with further decreases in recovery, zinc grades also begin to decrease. For those intervals with core recoveries between 30 and 90%, zinc grades average about 20 to 25% lower than intervals with 100% recovery. The drill intervals below 30% core recovery average less than half the zinc grade compared to intervals with 100% core recovery. The less than 30% intervals make up less than 5% of the total drill intervals, so the potential strong negative bias from these intervals has a limited effect on the global resource. It is likely true that the generally lower zinc grades associated with intervals of less than 90% core recovery lend a conservative aspect to the current resource estimate.

Further analyses of the core recovery data were competed by parsing the data into deposit and/or grade-range specific sub-sets to see if there are unique differences in the core recovery versus zinc grade relationship. As an example, Figure 10.3 shows the data set for the La Ventana deposit mid- and high-grade zinc domains (domains 200 and 300). Average core recovery is 82%, the same as the full set of mineralized intervals. There is not the small increase in grade in the 90% recovery bin, as seen for the full set of data, but at lower core recoveries the zinc grade shows the same 20% decrease in grades compared to intervals of 100% recovery.

**Figure 10.3 Core Recovery versus Zinc Grade – La Ventana Deposit**
(Mid- and High-Grade Mineralization)

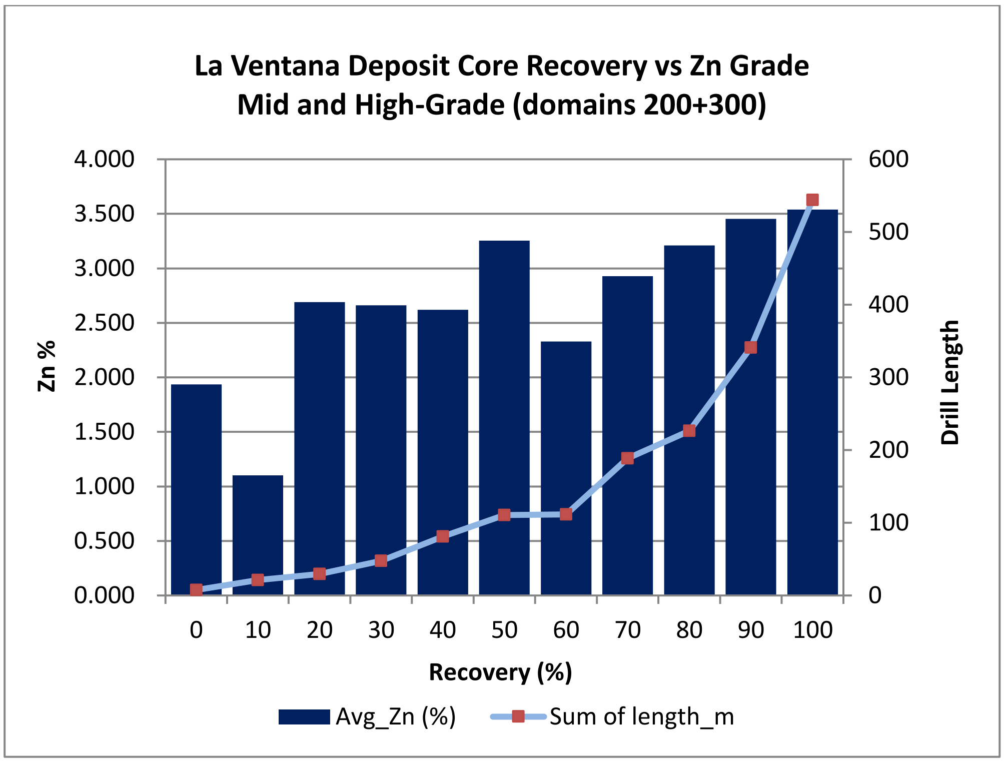
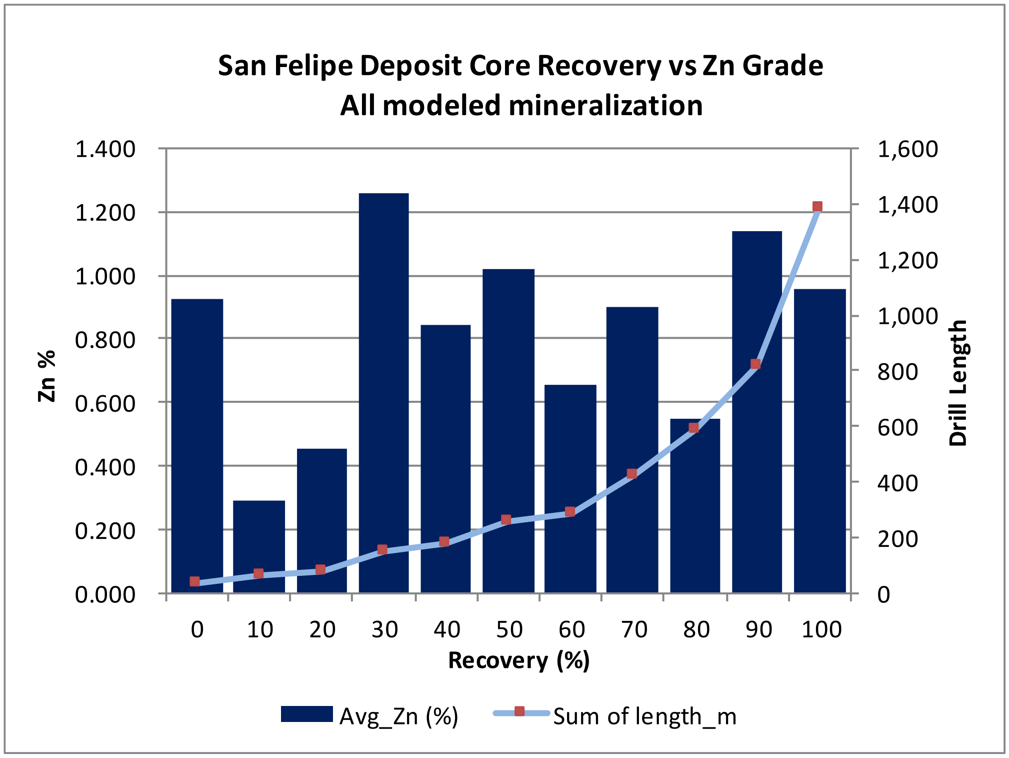



Figure 10.4 shows the core recovery vs. zinc grade relationship for the San Felipe deposit. In this case, there is the increase in grade for intervals in the 90% recovery range, but at lower recoveries the average zinc grades become erratic. In general, at lower core recoveries the zinc grades are 10 to 15% lower than in the 100% core recovery intervals. The overall effect on the San Felipe resource is likely a small negative bias and a likely small conservative bias to the deposit resource estimate.

**Figure 10.4 Core Recovery versus Zinc Grade – San Felipe Deposit**
(All Modeled Mineralization)




## 10.7 Summary Statement

The author believes that the drilling procedures used by all previous operators and Americas Silver provided samples that are representative and of sufficient quality for use in the mineral resource estimations discussed in Section 14.0. Mr. Tietz is unaware of any drilling, sampling or recovery factors that materially impact the mineral resources discussed in Section 14.0.

# 11.0 SAMPLE PREPARATION, ANALYSIS, AND SECURITY

## 11.1 Sample Preparation and Analysis

For all drill campaigns, holes were drilled with HQ- and NQ-sized core, with only select intervals sampled. Core was sawn in half at site and one half sent to ALS (formerly Chemex and ALS Chemex). ALS and its predecessors Chemex and ALS Chemex were independent of Boliden, Hochschild, Santacruz, and Americas Silver. ALS is presently accredited by the International Organization for Standardization (ISO). Samples were prepared at the ALS facility in Hermosillo, Mexico, where they were crushed to 70% less than 2mm, then a 250g sample was split by riffle splitter and pulverized to better than 85% passing 75 microns. The pulps were then shipped by commercial air freight to Canada and analyzed at the ALS laboratory in North Vancouver.

The Boliden samples were analyzed for 23 elements using an unnamed inductively-coupled plasma atomic-emission ("ICP" or "ICPAES") procedure, plus Au using a fire assay with an atomic absorption ("AAS") finish (ALS code Au-AA23). Samples with high-grade Ag, Cu, Pb, or Zn were re-analysed with an aqua regia digestion and AAS finish.

The Hochschild samples were analyzed for 34 elements using an aqua regia ICP-AES procedure (ALS code ME-ICP41) and Au using a fire assay with an AAS finish (Au-AA23). Samples with high grade Ag, Cu, Pb, or Zn were re-analysed using aqua regia digestion and an ICP-AES (OG46) or AAS (AA46) finish.

The Santacruz samples were analyzed for 34 elements, using a four acid ICP-mass spectrometry ("ICP-MS") procedure (ME-MS61), or an aqua regia ICP-AES procedure (ME-ICP41), and Au using a fire assay with an AAS finish (Au-AA23). Samples with high grade Ag, Cu, Pb, or Zn were re-analysed by either a four-acid digestion and ICP-AES finish (OG62), or an aqua regia digestion and ICP-AES (OG46) finish.

The Americas Silver samples were analyzed for 33 elements using a four acid ICP-MS procedure (ME-MS61) and Au using a fire assay with an AAS finish (Au-AA23). Samples with high-grade Ag, Cu, Pb, or Zn were re-analysed by a four-acid digestion and ICP-AES finish (OG62). Very high-grade Ag was re-run by fire assay with gravimetric finish (GRA21).

## 11.2 Sample Security

The following information on Boliden, Hochschild, and Santacruz sample security is taken from Smit et al. (2014). The author has visited the site and confirmed the current storage of all project core within the San Felipe core shed located just east of the property.

### 11.2.1 Boliden

The Boliden core was cut on site by Boliden geologists and the core was stored at the property caretaker's house located at the old San Felipe mill site. The core from Boliden is now kept in the San Felipe core shed. Details on sample security during Boliden's work are not known.

### 11.2.2 Hochschild

Core was delivered from the drill rigs to the San Felipe core shed by Hochschild staff where it was logged and cut. Samples were delivered to the ALS laboratory in Hermosillo. The remaining core was stored in the San Felipe core shed. Details on sample security during Hochschild's work are not known.

### 11.2.3 Santacruz

After logging, selected core for sampling was delivered directly to the core-cutting area or secure storage area before cutting. Unauthorized personnel were not allowed in the core storage, logging or cutting facilities during the core logging and sampling process.

Once cut, the samples were bagged and labeled and assembled into batch shipments. These were stored in sealed sacks. The batches were delivered by Santacruz staff to the ALS facility in Hermosillo along with sample submission forms. The remaining core was kept in locked storage under supervision of a caretaker.

### 11.2.4 Americas Silver

Core selected for sampling was delivered directly to the core-cutting area within the San Felipe core shed. Unauthorized personnel were not allowed in the core storage, logging or cutting facilities during the core logging and sampling process.

The samples were bagged and labeled and assembled into batch shipments that were delivered to the ALS lab in Hermosillo along with sample submission forms by Americas Silver staff. The remaining core is kept in locked storage within the San Felipe core shed.

## 11.3 Quality Assurance/Quality Control

Smit, et al. (2014) stated that no quality assurance / quality control ("QA/QC") samples were inserted by Boliden and the author is not aware of any Boliden QA/QC samples.

QA/QC samples were inserted into the sample stream sent to ALS by Hochschild, Santacruz, and Americas Silver. The QA/QC samples consisted of reference standards, pulp and coarse blanks, and duplicate samples. The duplicates samples consisted of field duplicates (quarter-core splits), preparation duplicates (second splits from coarse reject material) and pulp duplicates or re-assays (second splits from the original pulps). The QA/QC samples make up about 12% of the total core samples analyzed. A listing of QA/QC samples available for review are shown in Table 12.1 and a description of the QA/QC analyses is presented in Section 12.2.

## 11.4 Summary Statement

Mr. Tietz believes that the sampling, assaying, security, and QA/QC procedures provided samples that are representative and of sufficient quality for use in the mineral resource estimations discussed in Section 14.0. The author is unaware of any sampling or analytical factors that materially impact the mineral resources discussed in Section 14.0.

# 12.0 DATA VERIFICATION

Data verification, as defined in NI 43-101, is the process of confirming that data has been generated with proper procedures, has been accurately transcribed from the original source and is suitable to be used. There were no limitations on, or failure to conduct, the data verification for this report.

Mr. Tietz visited the San Felipe project office and field site on April 12 through 14, 2017. During the site visit, the project geology was reviewed, which included: a) a field tour of the deposit area; b) visual inspection of core; and c) discussion with project personnel of the current geologic interpretations. Drill site verification procedures were conducted, and core drilling and sampling procedures were appraised. The result of the site visits and communications is that Mr. Tietz has no significant concerns with the project procedures.

Mr. Tietz has also verified the project database and compiled and analyzed available QA/QC data collected by Hochschild, Santacruz, and Americas Silver. No QA/QC data from Boliden are available, if it was collected.

## 12.1 Database Audit

### 12.1.1 Drill-Collar Audit

There are no original collar survey data for the Boliden holes. For the Hochschild drilling, there is a single 2006 survey file with collar coordinates for six drill holes, while an additional 51 Hochschild drill collars were located and surveyed in 2014. The Santacruz drilling was surveyed in 2014 and 2017. The 2017 work provided collar surveys for the 27 infill holes drilled at La Ventana in late 2014.

MDA's primary source for use in the collar audit was a May 2014 report from a professional surveyor which provided surveyed collar locations for the Santacruz drilling and an additional 51 Hochschild holes which were able to be located. The surveying was completed using a Trimble survey instrument with sub-centimeter accuracy. This work was completed after the 2014 technical report (Smit et al., 2014), was published and appears to have addressed the concerns noted in the 2014 technical report about the lack and/or uncertainty with collar locations at Las Lamas. For this current audit, MDA compared these survey data against the original Santacruz database. MDA found differences in drill hole locations for all of the surveyed Hochschild and Santacruz drill holes which ranged from <1 m to 10 m. MDA has now updated the Santacruz and the surveyed Hochschild hole locations to reflect the 2014 survey results. In reviewing the differences between the 2014 survey data and the original Hochschild coordinates, it was noted that the differences in collar data were fairly consistent within each of the four deposit areas. MDA has used these average differences to create x,y,z factors, which have been used to convert the Hochschild hole locations not surveyed in 2014 so that their coordinates are spatially consistent with the surveyed holes.

### 12.1.2 Down-Hole Survey Audit

There are Reflex downhole survey data for 250 holes in the deposit areas with readings about every 50 m. Where there are no actual survey data the collar set-up is used. For the current audit, there are very limited original Reflex survey data and so the 2014 compilation from Santacruz and the set-up data from drill logs were used as a check on the database. No errors were found, but the lack of original survey data adds some uncertainty to the models.

### 12.1.3 Geological Data Audit

There were no geology data in the original database, though this was rectified by the compilation work completed by Americas Silver in the spring of 2017. Except for a handful of drill holes, geology data has been provided to MDA for all holes within the four deposits.

### 12.1.4 Assay Database Audit

The database contains 15,382 assay intervals. About 90% of the data were checked against original ALS Chemex assay certificates. No significant errors were found. There were some rounding inconsistencies, which were corrected, but these would not have been considered material if left uncorrected. The remaining data set was checked against the assay file used in the resource estimate reported in 2014; no material errors or deficiencies were noted. The assay database is considered very clean for use in future resource studies.

## 12.2 Quality Assurance/Quality Control

Mr. Tietz has reviewed the analytical data for several types of QA/QC samples, including standards, duplicates and blanks, obtained from drilling campaigns during the periods 2006 – 2008 (Hochschild), 2013 – 2014 (Santacruz) and 2017 (Americas Silver). The types and qualities of the QA/QC materials vary from operator to operator, and even among different campaigns by the same operator.

Table 12.1 lists the QA/QC data that are available. The analyses for the Santacruz 2013-2014 drilling campaign is presented in Section 12.2.1 as an example of the analyses completed on all drilling campaigns and QA/QC sample types. A discussion of the QA/QC results highlighting issues noted within the San Felipe project data is presented in Section 12.2.2.

**Table 12.1 Available QA/QC Data**

| Year(s) | Operator | Standards | Pulp Blanks | Coarse Blanks | Field Duplicates | Coarse Duplicates | Analytical Duplicates |
|---|---|---|---|---|---|---|---|
| 2006-7 | Hochschild | 175* | | | | | |
| *2006-7* | *Hochschild* | | *217* | *217* | *183* | *191* | *188* |
| 2008 | Hochschild | 14 | 38 | 37 | 109 | 119 | 117 |
| *2013-14* | *Santacruz* | *223** (Au, Ag)* | | | | | |
| 2013-14 | Santacruz | 65 | 349 | | 345 | | |
| 2017 | Americas Silver | 25 | | 20 | 4 | | |

Notes: * standards are not certified
** count may be slightly lower
*italic text and shaded background indicates that MDA did not do independent evaluations of these data, instead accepting the evaluations described in Smit et al., 2014.*

### 12.2.1 Santacruz 2013-2014 QA/QC Analyses

#### 12.2.1.1 Standards used by Santacruz

Smit et al. (2014) described 223 analyses of standards in the Santacruz data set. Six certified reference materials were used, two certified only for gold, two certified for gold and silver, and two certified for gold, silver, copper, lead and zinc. However, at that time, very few analyses of the latter two multi-metal standards had been done. There were six assays of one of them, and only one assay of the other.

Smit et al. (2014) evaluated results for the two gold standards and the two gold-silver standards. They concluded that "*Overall, the performance of the Santacruz standards performed well, with only 3 failures (1% of the total) and the standards show no bias in the lab results.*" The author accepts the assessment of Smit et al. (2014). However, in the data available to MDA there are many more analyses of the two multi-metal standards than were known to Smit et al. (2014), in addition to which there are analyses for a third multi-metal standard. These are more relevant to the current San Felipe project than are the gold and gold-silver standards evaluated by Smit et al. (2014). Mr. Tietz has evaluated the results for the three multi-metal standards, using control charts similar to the commonly-used Shewhart type. The results are summarized in Table 12.2.

For the most part, the failure counts and biases listed in Table 12.2 are typical of those MDA observes when doing after-the-fact evaluations of QA/QC data. However, copper is a special case, exhibiting higher than expected biases and failure counts. The biases and failure counts are not as extreme as those seen for copper in the Hochschild 2008 data set, but it is notable that copper is an issue in both data sets.

**Table 12.2 Standards Results, Santacruz Multi-Metal**

| Metal | Standard ID | Target | Average | Maximum | Minimum | Units | Count | Failure Count | | Bias (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | High | Low | |
| zinc | CDN-ME-1301 | 0.797 | 0.812 | 0.866 | 0.767 | percent | 17 | 2 | 0 | 1.88 |
| zinc | CDN-ME-1302 | 1.2 | 1.222 | 1.28 | 0.977 | percent | 24 | 1 | 1 | 1.83 |
| zinc | CDN-ME-1303 | 0.931 | 0.935 | 0.988 | 0.855 | percent | 24 | 0 | 1 | 0.43 |
| lead | CDN-ME-1301 | 0.188 | 0.187 | 0.198 | 0.1785 | percent | 17 | 0 | 0 | -0.53 |
| lead | CDN-ME-1302 | 4.68 | 4.67 | 4.81 | 1.21 | percent | 24 | 0 | 1 | -0.21 |
| lead | CDN-ME-1303 | 1.22 | 1.22 | 1.25 | 1.19 | percent | 24 | 0 | 0 | 0 |
| silver | CDN-ME-1301 | 26.1 | 26.8 | 28.2 | 25.9 | g/t | 17 | 0 | 0 | 2.68 |
| silver | CDN-ME-1302 | 418.9 | 432 | 451 | 154 | g/t | 24 | 3 | 1 | 3.13 |
| silver | CDN-ME-1303 | 152 | 153 | 158 | 145 | g/t | 24 | 0 | 0 | 0.66 |
| copper | CDN-ME-1301 | 0.299 | 0.312 | 0.332 | 0.294 | percent | 17 | 2 | 0 | 4.35 |
| copper | CDN-ME-1302 | 0.579 | 0.604 | 0.633 | 0.383 | percent | 24 | 5 | 1 | 4.32 |
| copper | CDN-ME-1303 | 0.344 | 0.358 | 0.388 | 0.334 | percent | 24 | 5 | 0 | 4.07 |
| **Total** | **12 standards** | | | | | | **260** | **18** | **5** | |

Table 12.3 lists some details of the failures in the Santacruz multi-metal standards. Background colors are used to make it visually easy to identify instances of the same reference sample having failed for two or more metals. MDA suspects, but cannot prove, that the four failures of sample 15760 are due to a sample numbering mix-up.

**Table 12.3 Details of Standards Failures, Santacruz Multi-Metal**

| Standard ID | Metal | Sample ID | Failure Value | Target for Std | Units | Comment |
|---|---|---|---|---|---|---|
| CDN-ME-1301 | zinc | 16642 | 0.855 | 0.797 | pct | |
| CDN-ME-1301 | zinc | 17203 | 0.866 | 0.797 | pct | |
| CDN-ME-1302 | zinc | 15524 | 1.28 | 1.2 | pct | |
| CDN-ME-1302 | zinc | 15760 | 0.977 | 1.2 | pct | sample mix-up? |
| CDN-ME-1303 | zinc | 16176 | 0.855 | 0.931 | pct | |
| CDN-ME-1302 | lead | 15760 | 1.21 | 4.68 | pct | sample mix-up? |
| CDN-ME-1302 | silver | 15524 | 445 | 418.9 | g/t | |
| CDN-ME-1302 | silver | 15760 | 154 | 418.9 | g/t | sample mix-up? |
| CDN-ME-1302 | silver | 15898 | 444 | 418.9 | g/t | |
| CDN-ME-1302 | silver | 15913 | 451 | 418.9 | g/t | |
| CDN-ME-1301 | copper | 16642 | 0.328 | 0.299 | pct | |
| CDN-ME-1301 | copper | 17203 | 0.332 | 0.299 | pct | |
| CDN-ME-1302 | copper | 15698 | 0.619 | 0.579 | pct | |
| CDN-ME-1302 | copper | 15760 | 0.383 | 0.579 | pct | sample mix-up? |
| CDN-ME-1302 | copper | 15898 | 0.633 | 0.579 | pct | |
| CDN-ME-1302 | copper | 16896 | 0.615 | 0.579 | pct | |
| CDN-ME-1302 | copper | 17177 | 0.624 | 0.579 | pct | |
| CDN-ME-1302 | copper | 17317 | 0.617 | 0.579 | pct | |
| CDN-ME-1303 | copper | 15727 | 0.374 | 0.344 | pct | |
| CDN-ME-1303 | copper | 15798 | 0.371 | 0.344 | pct | |
| CDN-ME-1303 | copper | 15998 | 0.378 | 0.344 | pct | |
| CDN-ME-1303 | copper | 16084 | 0.388 | 0.344 | pct | |
| CDN-ME-1303 | copper | 17145 | 0.371 | 0.344 | pct | |

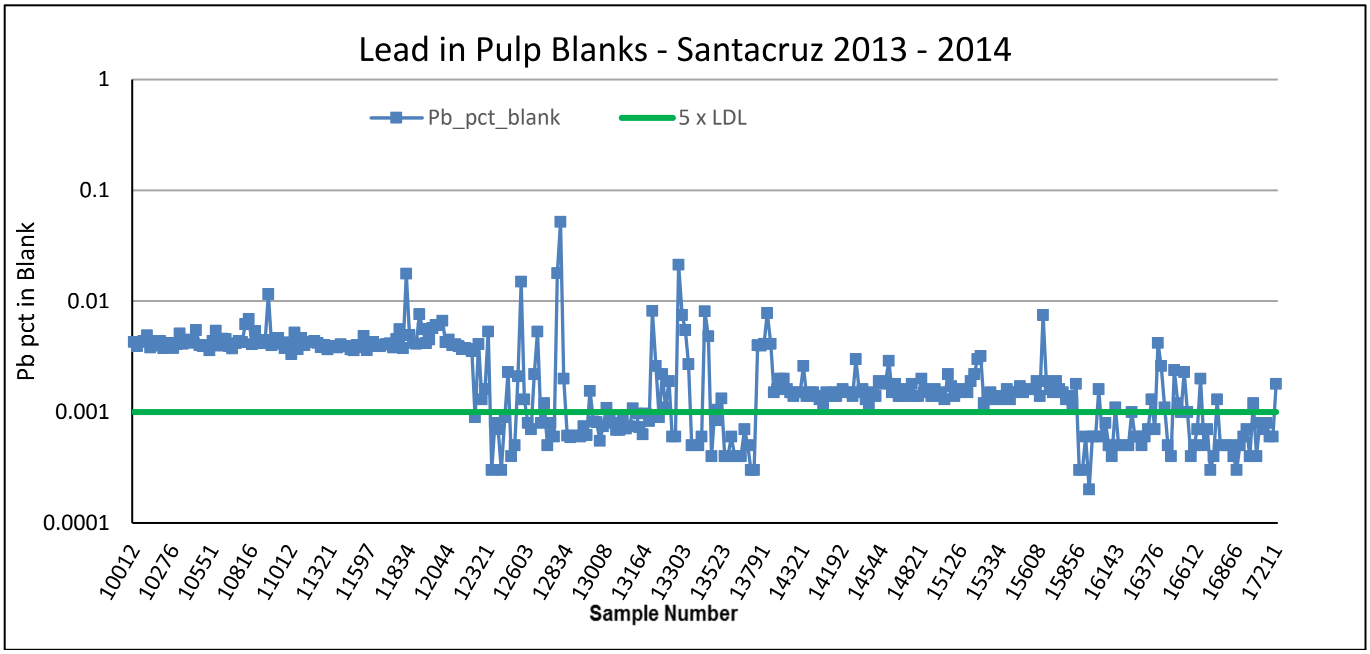
### 12.2.1.2 Santacruz Blanks 2013 – 2014

Smit et al. (2014) described 254 pulp blanks used by Santacruz. They were certified for gold, but not for other metals. Smit et al. did evaluate the blanks for silver and stated that "*All Ag values for the blanks are below acceptable limits …*", although it isn't clear how such limits were defined. They noted, correctly, that "*… pulp blanks are not useful for monitoring contamination within the sample preparation area …*".

In the data set available to MDA there are 349 instances of analyses assigned to the pulp blanks. With more data in hand than Smit et al. (2014) had, MDA undertook to evaluate the blanks for silver, lead, zinc and copper. While the blank material is not certified for any of these metals, the author thought it likely that the contents of other metals in the blanks would be relatively uniform, and of low grades, if not truly devoid of mineralization.

Mr. Tietz found that the data set for pulp blanks used by Santa Cruz exhibits some characteristics that must be taken into account when attempting to use the data for evaluating possible contamination or high bias in the laboratory procedures. Figure 12.1, shows the results for lead and illustrates these characteristics. Within Figure 12.1, the blank lead value is shown in blue while the "failure" limit of five times the lower detection limit for the analytical method is shown in green.

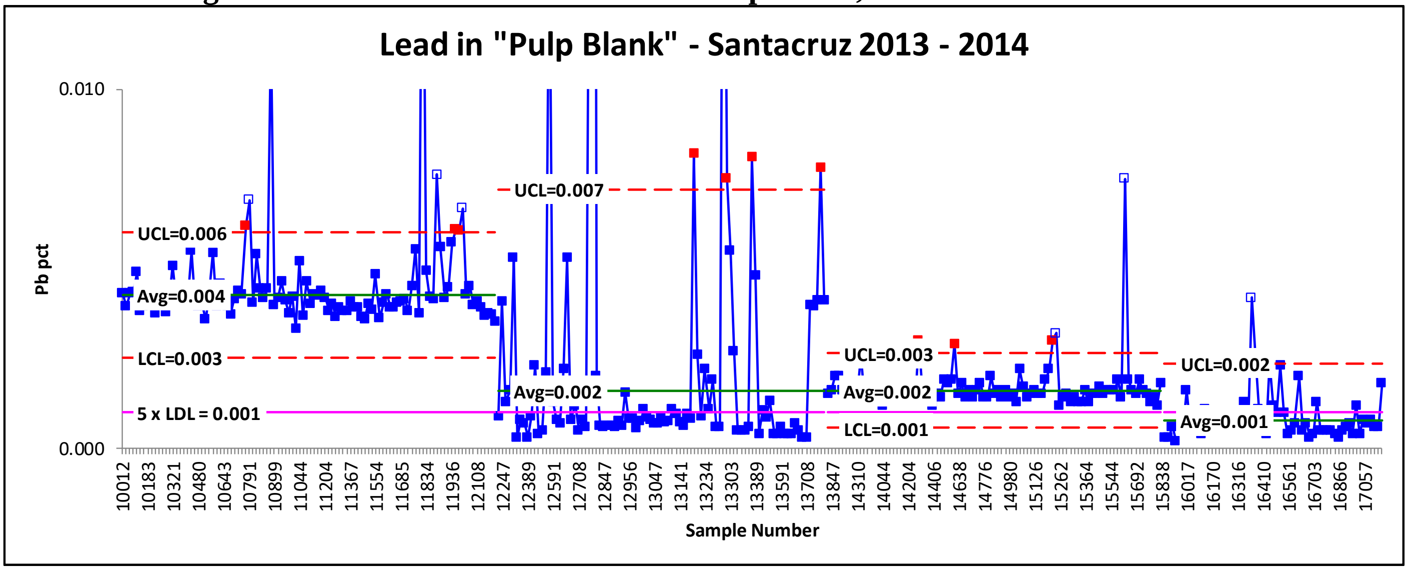
**Figure 12.1 Lead in Pulp Blanks - Santacruz 2013 - 2014**




Two items to note in Figure 12.1 are:

- A large number (71%) of the lead assays are well above the commonly-used, if arbitrary, "failure" limit. For zinc and copper (graphs not shown), essentially all the analyses are above that limit. For silver 75% are above that limit. Since the blank material is not certified for any of these elements, so many values above the arbitrary failure limit do not indicate a problem. This does suggest, however, that the material should be thought of more as a very low-grade reference material for the metals of interest, rather than a blank.
- Assuming that sample numbers can be used as rough proxies for time, it is evident in Figure 12.1 that the statistical characteristics of the results can be divided, on visual inspection alone, into about four time-blocks or populations, each having its own characteristic central tendency and degree of dispersion. This pattern is very evident in the zinc, lead and copper data, and less so in the silver data. To further investigate these populations in the case of lead, MDA used a control chart similar to those used for evaluating standards. This is shown below in Figure 12.2.

**Figure 12.2 Control Chart for Lead in Pulp Blank, - Santacruz 2013 - 2014**




In Figure 12.2 the red dashed lines labelled "UCL" and "LCL" represent the average grades obtained ± three times the standard deviations of the grades. In this case "UCL" and "LCL" have no meanings as control limits, but they represent a convenient way of comparing the different dispersions of the four populations. The four populations are summarized in Table 12.4.

**Table 12.4 Statistical Populations in Figure 12.2**

| Population | Average (pct Pb) | 3 x Std Deviation (pct Pb) |
|---|---|---|
| first | 0.004 | 0.002 |
| second | 0.002 | 0.005 |
| third | 0.002 | 0.001 |
| fourth | 0.001 | 0.001 |

To varying degrees, the analyses of the blank material for silver, lead and copper exhibit similar issues to those observed for zinc.

Mr. Tietz suspects, but cannot prove, that the four distinct populations evident in the data for the blanks are consequences of different batches of the blank material having different grades for these metals, not just for the case of lead as illustrated here, but also in the cases of zinc and copper. An alternative explanation could be periodic changes in conditions at the laboratory.

Another approach to evaluating the data for the blanks during the 2013 – 2014 period is to look for correlations between the blanks and the samples that are assumed to have immediately preceded them through the analytical steps at the lab. There are significant correlations, as summarized in Table 12.5.

**Table 12.5 Correlation Coefficients Between Blanks and Preceding Samples**

| Metal | Correlation Coefficient | Max Grade in Blank |
|---|---|---|
| zinc | 0.398 | 0.077% Zn |
| lead | 0.400 | 0.052% Pb |
| copper | 0.170 | 0.006% Cu |
| silver | 0.417 | 2.3 ppm Ag |

The significant correlations between the metal grades in the blanks and those in the preceding samples suggests that some contamination may occur during the sample preparation procedures in the laboratory. However, the maximum grades obtained from the blanks suggest that such contamination as may have occurred was not great enough to be material to the grades of samples included in the resource estimate.

### 12.2.1.3 Santacruz Duplicates, 2013-2014

Smit et al. (2014) described 319 core duplicates from drilling by Santacruz. MDA used an assay table named "Assays_all_SC_2017.xlsx" to identify the sample numbers of the duplicates. It contains records of 345 duplicate samples which MDA presumes to be core duplicates. Accompanying the 345 core duplicates are 339 samples labelled "ORI", which always have a sample number immediately preceding the number of the duplicate. MDA assumed that in the six cases in which the duplicates do not have immediately adjacent samples labelled "ORI", the sample with the immediately preceding number is the original sample.

MDA evaluated the results of duplicate comparisons using scatterplots, relative difference plots, QQ plots and to a lesser degree, histograms. MDA routinely uses two methods of calculating relative differences. The first method uses:

$$100\ x\ \frac{(Duplicate - Original)}{Lesser\ of\ (Duplicate, Original)}$$

The calculation shown above accentuates differences, making it easy to spot extreme cases. An alternative method of calculating relative differences is:

$$100\ x\ \frac{(Duplicate - Original)}{Mean\ of\ (Duplicate, Original)}$$

The calculation shown above yields results that can be used in further statistical calculations but does not highlight extreme differences in the same way as the first. MDA uses charts based on both methods in comparisons of duplicate data sets.

MDA's evaluation of the Santacruz field duplicates is summarized in Table 12.6. Similar sets of charts were created for the duplicate data from the other drill campaigns as well.

**Table 12.6 Results for Analyses of Field Duplicates, Santacruz 2013-2014**

| Duplicate Type | Counts | | Averages of Grades | | Averages of Relative Differences as Percent | | | | RMA Regression Equation | Correlation Coefficient |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Based on Lesser of Pair | | Based on Mean of Pair | | | |
| | All Pairs | Pairs Used | Mean of Pair | Difference (Dup – Orig) | Relative Difference | Absolute Rel Diff | Relative Difference | Absolute Rel Diff | | |
| **Silver** | | | | | | | | | | |
| Field | 345 | 338 | 12.3 | -0.1 | 2.2 | 59.8 | -0.7 | 33.5 | y = 1.059x - 0.832 | 0.770 |
| **Zinc** | | | | | | | | | | |
| Field | 345 | 335 | 0.779 | -0.008 | -0.9 | 52.3 | -0.2 | 30.5 | y = 0.955x + 0.027 | 0.972 |
| **Lead** | | | | | | | | | | |
| Field | 345 | 339 | 0.515 | -0.023 | -4.8 | 74.8 | -2.2 | 37.2 | y = 0.971x - 0.008 | 0.961 |
| **Copper** | | | | | | | | | | |
| Field | 344 | 338 | 0.058 | 0 | 4.9 | 50.1 | 1.5 | 30.6 | y = 0.973x + 0.003 | 0.964 |

The Santacruz field duplicates have low relative differences with the original sample indicating no material bias in the samples. The Santacruz field duplicates do show higher absolute relative differences, compared to the absolute differences observed in the Hochschild field duplicates from Las Lamas and San Felipe. MDA has not identified a cause for the higher absolute relative differences in the Santacruz field duplicates, but one possibility could be differences in sampling procedures.

### 12.2.2 Discussion of QA/QC Results

Issues noted in the San Felipe project QA/QC data are:

- In the limited Hochschild 2008 data set (three certified reference standards and a total of 40 analyses), copper analyses of two of the three standards average more than 12% higher than the expected values. Analyses of silver in one standard average almost 15% higher than the expected value while analyses of lead in the three standards average from 5% to 10% lower than the expected values. The drilling done in 2008, and the assays produced in that year, represents a relatively small subset of the total Hochschild drilling. However, the question does arise as to whether similar biases might have been present in the 2006-2007 period, for which certified values are not available for the standards then in use.
- In the Santacruz data set of 2013 – 2014, the copper analyses for all three standards are biased more than 4% higher than the expected values, and for two of the standards five of 24 analyses were high-side failures.
- In the data sets for the blanks in the years 2008, 2013-14 and 2017, there is statistical evidence for cross-contamination in the laboratory, with blanks that numerically follow high-grade samples through the laboratory processes tending to have higher grades than blanks following lower-grade samples.
- Though no material biases are observed, the Santacruz field duplicates show high absolute relative differences, compared to the absolute differences observed in the Hochschild Las Lamas and San Felipe field duplicates.
- MDA has not seen any records indicating that any corrective actions were taken as a result of any of the QA/QC failures described.

Factors that mitigate the issues described above are:

- The most severe issues revealed by the standards involve copper, whose contribution to the economics of the San Felipe project is negligible.
- Such cross-contamination as may take place in the lab does not produce grade increases of such magnitudes as to be material.

On balance, the QA/QC data available to the author do not reveal any issues that preclude the use of the sample analyses in the resource estimate.

## 12.3 Drill Hole Twin Analyses

Americas Silver drilled six core holes in 2017 that served as "twin" holes of two Hochschild and five Santacruz drill holes. Three of the twin holes (MPLV-01, 02, and 03) were in the La Ventana deposit while the other three (MPSF-01, 02, and 03) are in the San Felipe deposit. Drill hole MPLV-01 is a twin to both a Hochschild drill hole (HFLV-01) and a Santacruz (SCLV-01) drill hole. Due to minor differences in sample depths, sample lengths, and also incomplete downhole sampling (most holes are sampled only where there is visual evidence of significant alteration/mineralization), the author standardized the data sets by compositing the drill data into even 1.5 m downhole composite intervals, and then compared average zinc grades for correlative intervals each coded as being within the same mineralized interval.

The twin data for hole MPSF-03, whose twin was supposed to be hole HFSF23, is not included in the analyses because the holes deviated away from each other and encountered different geology and very different mineralized intervals. This made using the pair as twins problematic from a sample data standpoint, but the differences between drill holes did indicate the likely spatial variability within the San Felipe deposit due to the erratic presence of pre-mineral intrusive rocks and strong pre- and post-mineral faulting.

The results of the twin analyses are shown in Table 12.7. Americas Silver's drilling confirmed the presence of significant mineralization within the historical drill intervals, though there can be differences in average zinc grades of over 100%. There is not an apparent bias by company because the Americas Silver's drill interval has the higher average zinc grade in exactly half of the 10 twin pairs. The higher zinc grade in each pair is highlighted in Table 12.7.

Core recovery data was analyzed and the average core recovery was determined for each twin pair interval (shown in the "core_rec_pct" column in Table 12.7). The highest core recovery value in each pair is again highlighted. Interestingly, in nine out of the ten twin comparisons, the twin pair that has the highest core recovery value also has the highest average zinc grade. This finding coincides with the earlier core recovery versus metal grade study shown in Section 10.6, in which there is a strong indication of loss of metal grade within moderate to poor core recovery intervals.

**Table 12.7 Twin Hole Comparison – Americas Silver vs. Historical Mineralized Intervals**

| Hole_ID | from | to | Length m | Zn % | Core_rec_pct |
|---|---|---|---|---|---|
| MPLV-01 | 138 | 154.5 | 16.5 | 2.8 | 90 |
| HFLV-01 | 151.9 | 168.4 | 16.5 | 1.48 | 59.7 |
| | | | | | |
| MPLV-01 | 138 | 154.5 | 16.5 | 2.8 | 90 |
| SCLV-01 | 149 | 165.5 | 16.5 | 1.42 | 69.4 |
| | | | | | |
| MPLV-01 | 238.6 | 258.1 | 19.5 | 7.74 | 98.1 |
| HFLV-01 | 238.9 | 258.4 | 19.5 | 11.55 | 59.1 |
| | | | | | |
| MPLV-01 | 238.6 | 258.1 | 19.5 | 7.74 | 98.1 |
| SCLV-01 | 240.8 | 260.3 | 19.5 | 5.1 | 58.8 |
| | | | | | |
| MPLV-02 | 19.15 | 41.65 | 22.5 | 0.61 | 78.5 |
| SCLV-05 | 18.4 | 40.9 | 22.5 | 0.77 | 80.5 |
| | | | | | |
| MPLV-02 | 110.4 | 171.5 | 61.1 | 5.55 | 92.1 |
| SCLV-05 | 111.1 | 172.6 | 61.5 | 3.5 | 63.7 |
| | | | | | |
| MPLV-03 | 93 | 114 | 21 | 1.79 | 79.9 |
| VT14-22 | 92.55 | 113.05 | 20.5 | 5.75 | 90.1 |
| | | | | | |
| MPSF-01 | 133.5 | 150.95 | 17.45 | 2.33 | 95 |
| SCSF-06 | 137.85 | 155.85 | 18 | 1.09 | 66.4 |
| | | | | | |
| MPSF-01 | 223 | 232 | 9 | 0.67 | 96.8 |
| SCSF-06 | 223.7 | 232.35 | 8.65 | 0.87 | 100 |
| | | | | | |
| MPSF-02 | 128.7 | 177.9 | 49.2 | 1.52 | 94.2 |
| SCSF-09 | 125.95 | 175.45 | 49.5 | 1.83 | 98.6 |

## 12.4 MDA Independent Verification of Mineralization

### 12.4.1 Site Visit

Mr. Tietz visited the San Felipe project on April 12-14, 2017. The site visit included a brief update on the project status in the San Felipe office and a field tour focused on the geology and drilling results within the various vein systems on the property. Field verification of a dozen historical drill collars at La Ventana, San Felipe and Transversales was also conducted. No material issues were noted with the hole locations. Various database deficiencies, including missing assay data, a lack of digital geologic information, and a general lack of original data for use in auditing the drill data were noted during the site visit. The majority of these issues were corrected before MDA started work on the block models and grade estimates.

## 12.5 Summary Statement on Data Verification

The following issues have resulted from the data verification procedures:

- There are some minor uncertainties as to drill hole locations due to a lack of original collar surveys and no downhole surveys for the Boliden drilling, but the risk to the resource estimate is considered low;
- The assay database is clean, with only minor errors that have been corrected before use in the resource estimate;
- There are minor biases, primarily in the copper standard QA/QC analyses, and some low-grade contamination in the blanks, but these are not considered material to the estimate;
- Americas Silver's twin analyses confirmed the historical drill intervals, though there can be significant grade variability between drill hole twins. Evidence presented in Section 10.6 and Section 12.3 both indicate that reduced core recovery correlates with lower metal grades and the core recovery differences observed between drill hole twins could account for some of the observed twin hole grade differences. The inclusion of moderate to poor core recovery intervals within the resource model and estimate likely lends a conservative bias to the estimate; and
- The author believes the project data is adequate for use in mineral resource estimation and can support the classification assigned to the resource estimate as reported in Section 14.0.

# 13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

## 13.1 Summary

The following metallurgical information presented in Section 13.0 is taken from the 2014 technical report of Smit et al. (2014). The author has reviewed the information and, although the author is not an expert with respect to metallurgy, the author believes the information to be sound and appropriate for the purposes for which it has been used in this report. The data from these studies are used by the author in this technical report solely for the purposes of deriving appropriate metal equivalencies, and reasonable and appropriate cutoffs for mineral resource reporting as stated in Section 14.0.

**Review of Metallurgical Testwork**

The information summarized below is based on the work presented in the following reports:

1. Final Report on Test Work on Samples from the San Felipe Project in Mexico, Dawson Metallurgical Laboratories, Inc. October 8, 2008.

2. Optical Microscopy Scanning Electron Microscopic Analysis, DCM Sciences Laboratories, Inc. June 27, 2008.

3. Petrographic/X-Ray Diffraction Scanning Electron Microscopy Analysis, DCM Sciences Laboratories, Inc. September 29, 2008.

4. San Felipe Project Appendix 7.3.2 Process Flow Diagrams, Civil Drawings and General Arrangements, Samuel Engineering Inc.

5. Proyecto San Felipe Informe General, Santacruz Silver Mining Ltd.

6. Calculo De Equipos Para Planta De Beneficio, Proyecto San Felipe Capacidad De 750TMPD, Santacruz Silver Mining Ltd.

## 13.2 Dawson Metallurgical Laboratory 2008 Report

Hochschild contracted Dawson Metallurgical Laboratories in 2008 to undertake metallurgical testwork. The primary objective of this phase of testwork was to determine lead and zinc flotation response on different mineralization type composites. Seventeen composites, representing oxide, mixed and sulfide mineralization types were prepared from 51 individual samples and scoping level flotation tests were performed. Material for the tests was obtained from core assay rejects. It was noted in the report that some of the samples showed signs of secondary copper mineralization on particle surfaces. Following several series of tests to optimize the type and dosage of collectors and depressants, kinetic variability open-circuit rougher-scavenger lead and zinc flotation tests were performed on the seventeen composite samples. The test results indicated the following:

- Lead flotation showed excellent lead recovery (> 90% in most cases) and concentrate grade (± 30% Pb). Silver recovery into lead concentrate ranged from 50% to 87%, while zinc recovery into the lead concentrate ranged from 13% to 40%. The lower recovery of silver was for oxide mineralization. However, a significant amount of silver reported to the lead scavenger concentrate (± 20%)

- Zinc flotation was robust for all tests with 45% to 82% of zinc reporting to zinc concentrate. The concentrate grades ranged from 34% to 54% Zn.

## 13.3 DCM Sciences Laboratories, Inc.

Bulk mineralogy was determined for the seventeen Hochschild composite samples. The study indicated that sphalerite was present as coarse to fine particles with inclusions of chalcopyrite and galena. Some coarse galena and arsenopyrite was also seen in the samples. There was no mention of silver minerals in the study.

## 13.4 Santacruz Silver Mining Ltd. Documents

Santacruz personnel completed additional testwork on four composites, one from La Ventana, two from Las Lamas and one from the San Felipe vein. Results were given in a report dated April 4, 2014 titled Investigacion Metalurgical Proyecto San Felipe, Sonora. Composites were made from drill core assay rejects. All were of sulfide material. Results for the open-circuit flotation test results for the various composites are summarized in a Santacruz report. A locked-cycle test for La Ventana mineralization was performed by Minera Hochschild and was also reported in the Santacruz document.

## 13.5 Process Flowsheet

As part of the PEA included within the 2014 technical report, a process flowsheet for the proposed process plant was reported. A PEA is not included within this current report and the mineral resources reported in Section 14.0 supersede the mineral resource reported within the 2014 technical report. As such, the 2014 PEA can no longer be considered current. The author is providing the following flowsheet and plant information, as reported in 2014, to give the reader a more comprehensive and complete depiction of the metallurgical testing and processing evaluations conducted on the project. As stated by Smit, et al. (2014):

"*The run-of-mine (ROM) mineralized material will be trucked and dumped into the hopper which will have a grizzly. The mineralized material will be crushed in a three-stage crushing system and stored in a fine mineralized material bin. The mineralized material will be fed from the fine mineralized material bin to a ball mill in closed circuit with cyclones. The cyclone overflow will be pumped to the lead rougher and scavenger flotation circuit. The scavenger concentrate will be recycled back to the rougher flotation feed. The rougher concentrate will be subjected to counter-current two stage cleaner flotation. The lead concentrate will be thickened and filtered and stored for shipment.*

*The lead rougher flotation tailing will be sent to the zinc rougher/ scavenger flotation circuit. The zinc scavenger flotation tailing will be sent to the conventional tailing pond. The rougher zinc concentrate will be subjected to two stages of counter-current cleaner flotation and the final concentrate will be thickened and filtered.*"

## 13.6 Projected Metallurgical Recoveries (from the 2014 Technical Report)

Additional testwork completed by Santacruz Silver indicated an average silver recovery of 80% based on recent open-circuit tests and the same methodology applied to the open-circuit tests discussed Section 13.2. Review of the limited oxide testwork using the same methodology for metal recovery estimation indicated 70% silver, 70% lead and 68% zinc recovery. Most of the material in the resource is sulfide, but the relative amount of oxide, mixed and sulfide material in the upper part of the veins is not well known at this time.

Estimated metallurgical recoveries used to determine appropriate cutoffs for mineral resource reporting are summarized in Table 13.1.

**Table 13.1 Estimated Metallurgical Recoveries**

| | Oxide | Sulfide |
|---|---|---|
| **Ag** | 70% | 80% |
| **Pb** | 70% | 86% |
| **Zn** | 68% | 87% |

To date, testing has not been able to produce a viable copper concentrate. Further testwork to evaluate the potential for copper recovery is recommended.

# 14.0 MINERAL RESOURCE ESTIMATES

## 14.1 Introduction

Mineral resource estimation described in this section follows CIM standards and was completed in accordance with the guidelines of Canadian National Instrument 43-101 ("NI 43-101"). The modeling and estimation of the mineral resources were done under the supervision of Paul G. Tietz, a qualified person with respect to mineral resource estimations under NI 43-101. Mr. Tietz is independent of Americas Silver by the definitions and criteria set forth in NI 43-101; there is no affiliation between Mr. Tietz and Americas Silver, or any of the prior operators of the project, except that of an independent consultant/client relationship.

Mr. Tietz is not aware of any unusual environmental, permitting, legal, title, taxation, socio-economic, marketing, or political factors that may materially affect the San Felipe mineral resources as of the date of this report.

The effective date of the mineral resource estimate is March 15, 2018.

The San Felipe mineral resources are classified in order of increasing geological and quantitative confidence into Inferred, Indicated, and Measured categories to be in accordance with the "CIM Definition Standards - For Mineral Resources and Mineral Reserves" (2014) and therefore Canadian National Instrument 43-101. CIM mineral resource definitions are given below, with CIM's explanatory material shown in italics:

**Mineral Resource**

*Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories. An Inferred Mineral Resource has a lower level of confidence than that applied to an Indicated Mineral Resource. An Indicated Mineral Resource has a higher level of confidence than an Inferred Mineral Resource but has a lower level of confidence than a Measured Mineral Resource.*

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.

*Material of economic interest refers to diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals.*

*The term Mineral Resource covers mineralization and natural material of intrinsic economic interest which has been identified and estimated through exploration and sampling and within which Mineral Reserves may subsequently be defined by the* *consideration and application of Modifying Factors. The phrase 'reasonable prospects for eventual economic extraction' implies a judgment by the Qualified Person in respect of the technical and economic factors likely to influence the prospect of economic extraction. The Qualified Person should consider and clearly state the basis for determining that the material has reasonable prospects for eventual economic extraction. Assumptions should include estimates of cutoff grade and geological continuity at the selected cut-off, metallurgical recovery, smelter payments, commodity price or product value, mining and processing method and mining, processing and general and administrative costs. The Qualified Person should state if the assessment is based on any direct evidence and testing.*

*Interpretation of the word 'eventual' in this context may vary depending on the commodity or mineral involved. For example, for some coal, iron, potash deposits and other bulk minerals or commodities, it may be reasonable to envisage 'eventual economic extraction' as covering time periods in excess of 50 years. However, for many gold deposits, application of the concept would normally be restricted to perhaps 10 to 15 years, and frequently to much shorter periods of time.*

**Inferred Mineral Resource**

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 Inferred Mineral Resource is based on limited information and sampling gathered through appropriate sampling techniques from locations such as outcrops, trenches, pits, workings and drill holes. Inferred Mineral Resources must not be included in the economic analysis, production schedules, or estimated mine life in publicly disclosed Pre-Feasibility or Feasibility Studies, or in the Life of Mine plans and cash flow models of developed mines. Inferred Mineral Resources can only be used in economic studies as provided under NI 43-101.*

*There may be circumstances, where appropriate sampling, testing, and other measurements are sufficient to demonstrate data integrity, geological and grade/quality continuity of a Measured or Indicated Mineral Resource, however, quality assurance and quality control, or other information may not meet all industry norms for the disclosure of an Indicated or Measured Mineral Resource. Under these circumstances, it may be reasonable for the Qualified Person to report an Inferred Mineral Resource if the Qualified Person has taken steps to verify the information meets the requirements of an Inferred Mineral Resource.*

**Indicated Mineral Resource**

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.

*Mineralization may be classified as an Indicated Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such as to allow confident interpretation of the geological framework and to reasonably assume the continuity of mineralization. The Qualified Person must recognize the importance of the Indicated Mineral Resource category to the advancement of the feasibility of the project. An Indicated Mineral Resource estimate is of sufficient quality to support a Pre-Feasibility Study which can serve as the basis for major development decisions.*

**Measured Mineral Resource**

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.

*Mineralization or other natural material of economic interest may be classified as a Measured Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such that the tonnage and grade or quality of the mineralization can be estimated to within close limits and that variation from the estimate would not significantly affect potential economic viability of the deposit. This category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit.*

**Modifying Factors**

Modifying Factors are considerations used to convert Mineral Resources to Mineral Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.

Mr. Tietz reports resources at cutoffs that are reasonable for deposits of this nature given anticipated mining methods and plant processing costs, while also considering economic conditions, because of the regulatory requirements that a resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction."

## 14.2 Database

The San Felipe database contains records for a total of 68,929 m of drilling in 342 holes in the San Felipe property. Of this total, 293 drill holes are within the four deposit areas and contribute to the geologic models and grade estimates. Core drilling accounts for approximately 95% of the meters drilled and reverse circulation ("RC") drilling accounts for the balance.

The lack of ability to verify the Boliden and a portion of the Hochschild drill collar locations, along with the limited amount of original down hole survey data for use in the data audit, creates some uncertainty in drill hole and drill sample locations for these drill holes.

The project database contains 15,782 sample intervals containing Au, Ag, Cu, Pb, and Zn data. Of this total, 14,732 are within the four resource areas and 7,771 are within the modeled domains and contribute data to the resource estimate.

Drilling for the La Ventana deposit totals 129 holes, though about two thirds of these holes are north-directed angle holes collared on Peñoles ground to the immediate south of Americas Silver's La Ventana concession. All of the project drill data, including drill data from Peñoles ground, were used in the grade estimate, though the portions of the model outside the concession boundary were excluded from the current mineral resources.

The San Felipe project data is in UTM NAD27 Zone 12 coordinates.

## 14.3 Geology Pertinent to Resource Modeling

Zn-Pb-Ag-Cu mineralization occurs as skarn-related, massive sulfide replacement and veins, which are often cut by late quartz veins. There is some zoning in the district with Pb increasing in grade from south (Las Lamas) to north (La Ventana), and it appears that the late quartz is associated with increased Ag, Cu and Au, though Au remains rather low throughout the district.

The potentially economic (>2.5% ZnEq) sulfide veins are usually 2 to 10m wide and occur within the much wider, near-vertical, structural zones marked by strongly silicified, weakly brecciated, meta-andesite country rock that form the large distinctive outcrops. Fault off-sets of the structures are mapped on the surface and have also been modeled on cross-section. There was also significant faulting that occurred within and appears to be sub-parallel to the structural/mineral zones.

A granitic batholith borders the south side of property and cuts off the southwestern extension of the Las Lamas zone. Granodiorite is encountered at depth within the San Felipe, Transversales, and La Ventana deposits, and in the latter deposit appears to form the footwall boundary to the mineralized structural zone. The granodiorite is likely pre-mineral, or possibly contemporaneous with the early massive sulfide and skarn. Rhyolite intrusive bodies, often significantly faulted and dismembered, occur within the andesite and, though often forming footwall or hanging wall boundaries to the mineralized structures, can also be caught up within the primary structural zones that host mineralization. The granodiorite and rhyolite intrusives are not as amenable to skarn alteration as the andesite, and mineralization within the intrusive rock types occurs primarily within narrow fractures and thin veins.

## 14.4 Mineral Domains

The drill-hole information, including geology, metal grades, and the topographic surface were plotted on sets of cross-sections aligned to be perpendicular to the trend of each particular structural/mineral zone. These were oriented N90E at La Ventana, S100E at San Felipe, N70E at Las Lamas, and N55E at Transversales. Cross-sections were spaced at 50 m intervals, except for the central portion of La Ventana where the cross-sections were spaced at 25 m intervals to accommodate the increased drilling density.

Geologic interpretations for the La Ventana deposit were provided by Cath Pitman (Adiuvare Geologic and Engineering Services) and these were plotted on the La Ventana sections. The apparent importance of the granodiorite and rhyolite intrusives to the emplacement and style of mineralization led to the addition of these geologic features to the other resource area geologic cross-sections.

The assay statistics were analyzed for the La Ventana deposit and then also with all four deposits together. Quantile plots of the four metals were made to help define the natural populations of metal grades. Due to the good to excellent correlation, both statistically and spatially, seen between zinc and the other three metals (lead, silver and copper), the zinc assay values were used to create distinct mineral domains, which in turn were used to control grade estimation for all four metals. These mineral domains were also used to assign density within the models.

The zinc mineral domains were based on three assay populations, each of which represents a distinct style of mineralization with unique statistical characteristics. The low-grade population ranges from 0.05% to 0.5% Zn and occurs primarily as thin quartz-sulfide fractures and weakly sulfidic skarn within the andesite country rock adjacent to the primary mineralized structures. The mid-grade population is from 0.5% Zn to 3.0% Zn and represents skarn alteration and mineralization, with increased late-stage quartz-sulfide veining, within or immediately peripheral to the primary mineral zones. The high-grade population, with assay grades >3.0% Zn, is the massive sulfide and strongly sulfidic quartz veins that delineate the favorable economic portions of the mineral zones.

Though the database contains gold values, the gold mineralization is generally very low-grade and shows less correlation with the other metals. It is possible that the gold represents another, minor mineralizing event. Accordingly, gold was not included in the data evaluation or in the grade estimate.

Representative geologic cross-sections showing zinc mineral-domain interpretations for the La Ventana, San Felipe, Las Lamas, and Transversales zones are shown in Figure 14.1, Figure 14.2, Figure 14.3, and Figure 14.4.

The cross sections were sliced to levels on 3 m intervals to coincide with the center of each row of blocks in the model. The sliced sections were reinterpreted on those 3 m intervals, and these interpretations were used to code the block models with the percent of block in each mineral domain.

### 14.4.1 Underground Workings Exclusions

Approximate locations of the historical San Felipe and Las Lamas workings were noted on the cross-sections and the mineral domain interpretations were excluded from these general areas. It is likely that the exclusion zones over-state the past historical production and that there is the potential for additional in-place mineralization directly adjacent to the workings.

A wireframe solid of the Hochschild La Ventana decline was used to code the block model. If 10% or more of the block was inside the wireframe, the block was coded as "workings" and any mineral domain percentage within the block was "zeroed out" and therefore excluded from grade estimation.

# Figure 14.1 Section 567540E – La Ventana Zinc Mineral Domains

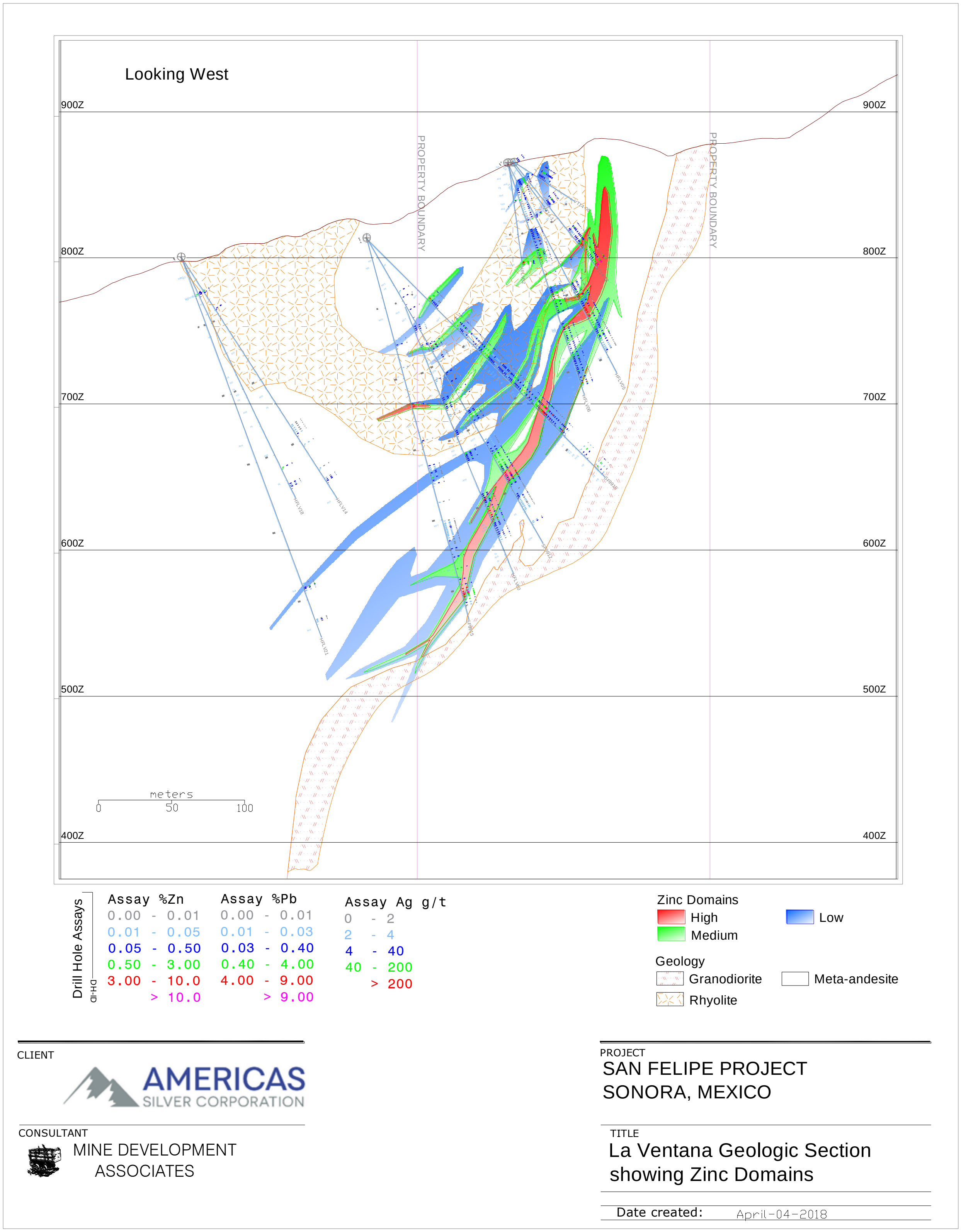


**Figure 14.2 Section 650 – San Felipe Zinc Mineral Domains**

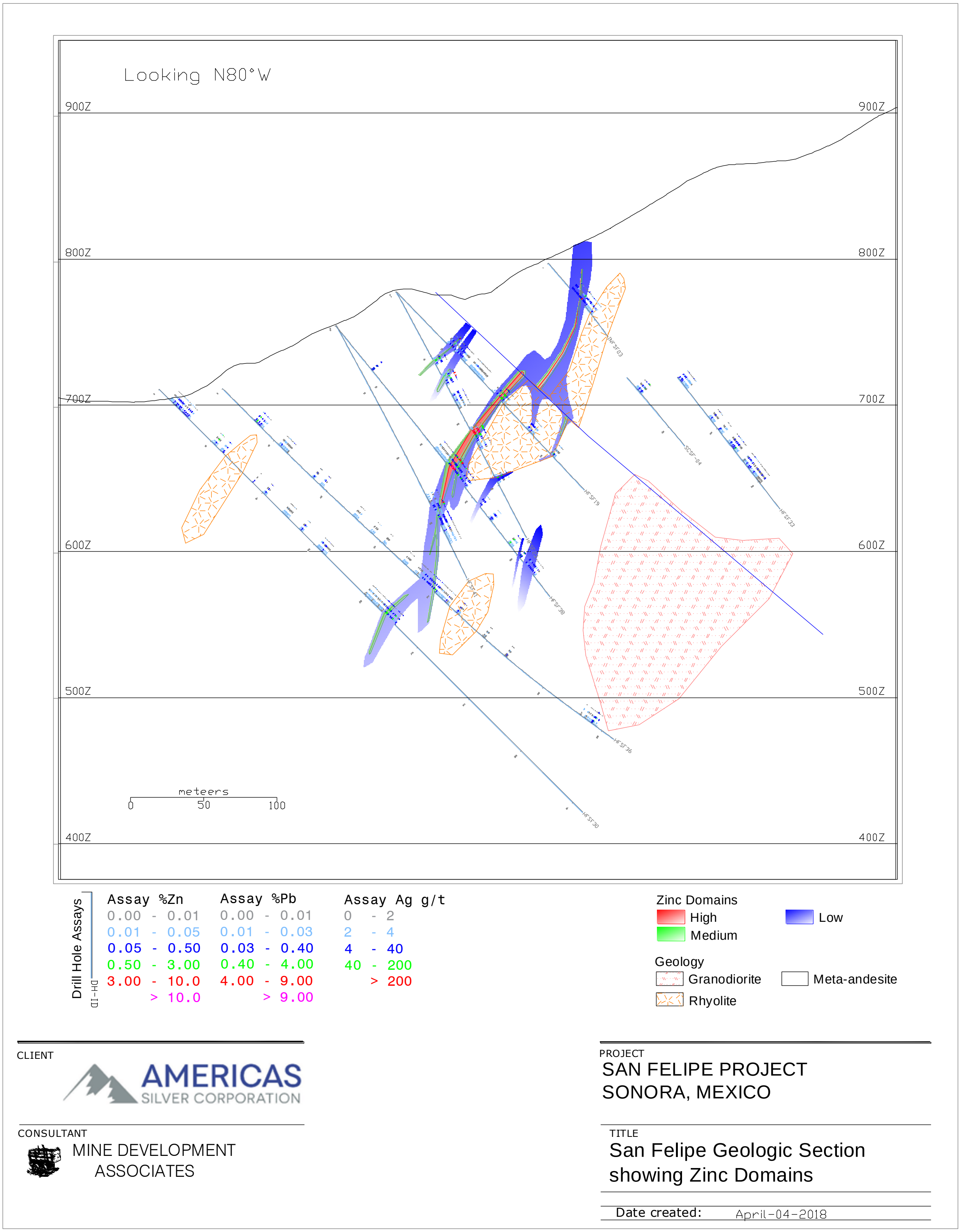
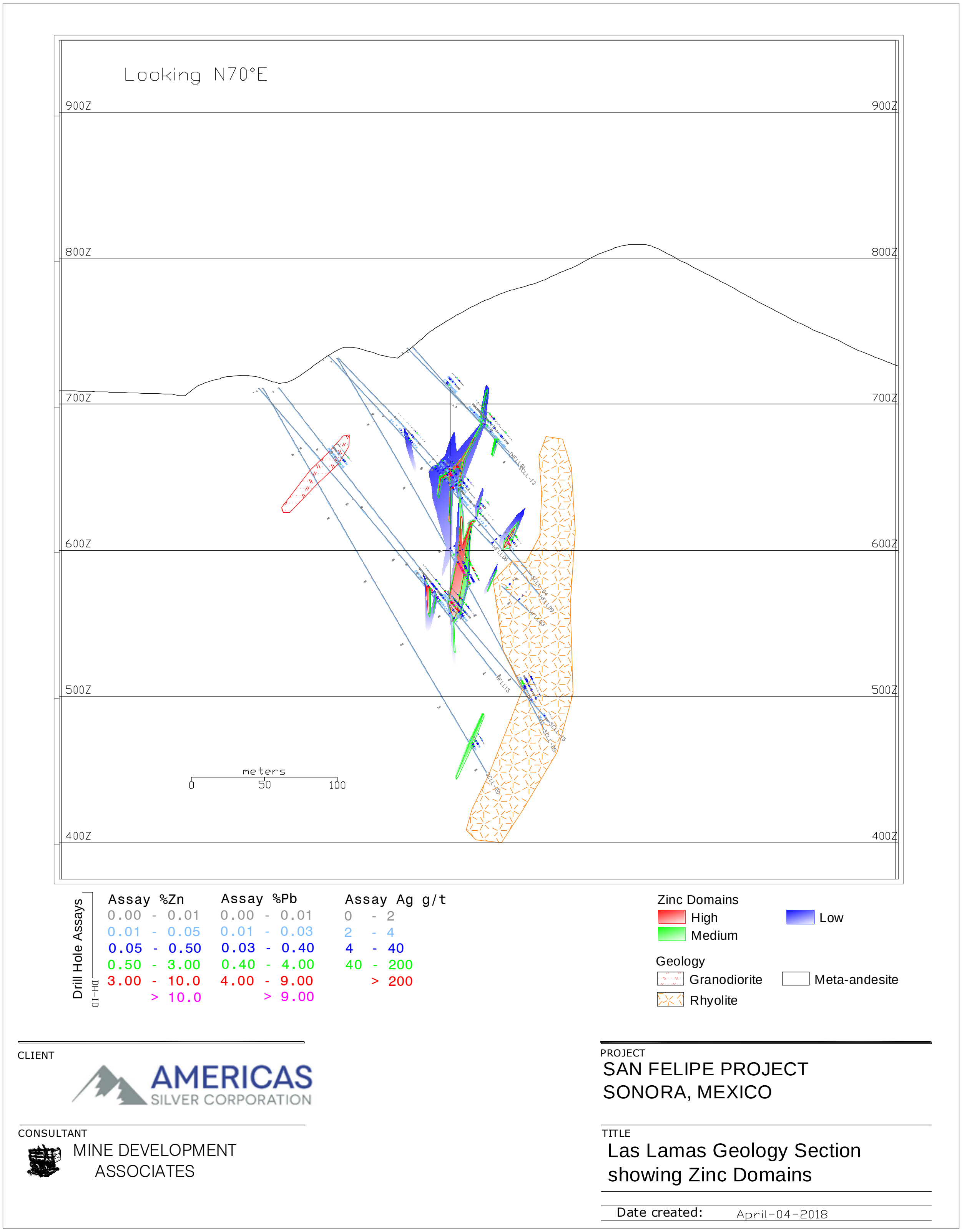
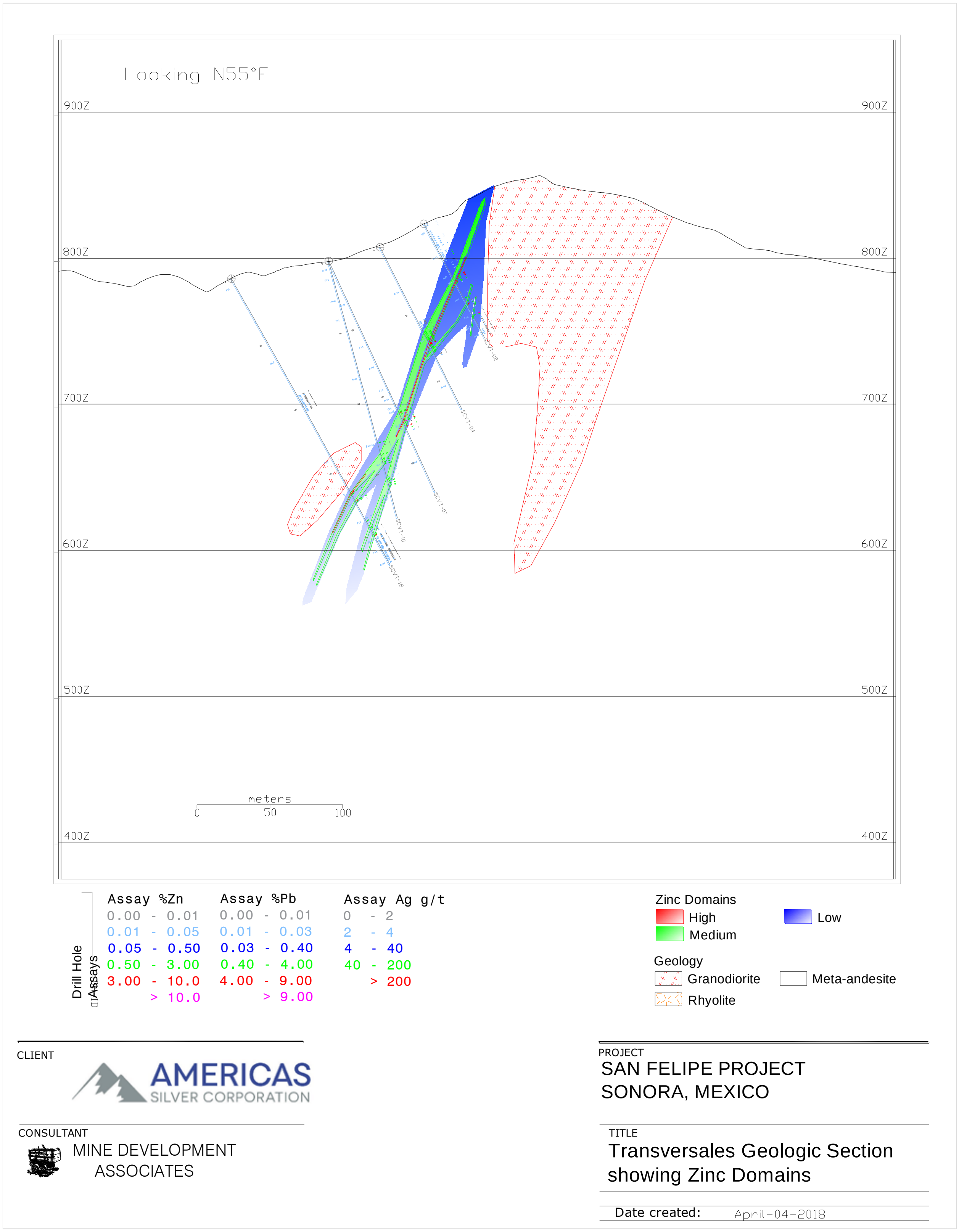


**Figure 14.3 Section 150 – Las Lamas Zinc Mineral Domains**



# Figure 14.4 Section 400 – Transversales Zinc Mineral Domains



## 14.5 Assay and Composite Statistics

The zinc mineral-domain polygons were used to code drill samples. Quantile plots, along with domain statistics and spatial location of higher-grade samples, were made to assess validity of these domains and to determine capping levels for the individual mineral domain metal populations. After these analyses, Mr. Tietz chose to cap 40 of the La Ventana assays (7 zinc, 13 lead, 10 silver, and 10 copper), 46 of the San Felipe assays (3 zinc, 11 lead, 10 silver, and 17 copper), 41 of the Las Lamas assays (11 zinc, 12 lead, and 18 silver), and 41 of the Transversales assays (5 zinc, 8 lead, 14 silver, and 14 copper). The author believes these assays are not representative of their domain populations and if left uncapped would have a high probability of over-estimating local grades. The capped assays represent about 0.5% of the assays used in the resource estimation and are primarily isolated, high-grade intervals within the low- and mid-grade mineral domains. Assay descriptive statistics for each deposit, including the capping levels and effects of capping on the assay statistics, are presented in Appendix A.

Compositing was done to 1.5 m down-hole lengths (half the block model's vertical block size), using the capped assays and honoring all mineral-domain boundaries. The volume inside each mineral domain was estimated using only composites from inside that domain. The final block-diluted metal grade assigned to each model block is a volume-weighted average based on the proportion of each domain within the block. Composite descriptive statistics for each deposit are presented in Appendix B.

## 14.6 Density

The density values used in the current resource model and estimate are based on 875 density measurements collected by Santacruz from drill core in the San Felipe project area. Of the total, 797 are measurements from the four deposit areas, with 206 specifically from the La Ventana zone.

MDA grouped the density samples by zinc mineral domains and analyzed the data for each deposit and then in total for all deposits. There is a minimal difference (<5%) in density for each mineral domain between deposits so the same value was used for each domain. Due to potential sample collection bias (the use of whole solid core versus fractured, possibly less-dense core), MDA reduced the mean values of each group by about 1.5% for use in the current model. The density values used in the model are 2.65g/cm$^3$ for background and domain 100, 2.9 g/cm$^3$ for domain 200, and 3.25 g/cm$^3$ for domain 300. The density assigned to each model block is a volume-weighted average based on the proportion of each domain within the block.

## 14.7 Estimation

Separate orthogonal block models were created for each deposit. All have a 2 m by 2 m by 3 m block size that is appropriate for the application of underground mining methods.

Mineral domains aid in controlling the grade distribution, and the estimation used inverse distance to the third power ("ID$^3$") to interpolate grades into the domains, as this technique was judged to provide results superior to those obtained by ordinary kriging. Ordinary kriging and nearest neighbor estimates were also made as checks on the ID$^3$ estimate. To aid in determining search distances, variograms for zinc were made in numerous orientations and at various lag lengths. The La Ventana deposit provided the most useful variograms and these distances were used in all four deposits. More detailed variogram analyses could be conducted at San Felipe, and possibly Las Lamas, resulting in deposit-specific search distances, but it is not likely to result in material changes to the estimates or reported resources.

The mineralization within each deposit has a unique orientation and the search ellipsoids reflect these different orientations. Two search orientations are used in the La Ventana deposit to indicate the change from a near-vertical structure/vein orientation in the upper and eastern portions of the deposit, to a south-dipping orientation in the lower and western portions of the deposit. The estimation parameters for the San Felipe project are shown in Table 14.1.

**Table 14.1 San Felipe Project Estimation Parameters**

| Description | Parameter |
|---|---|
| **SEARCH ELLIPSOID PARAMETERS: All Metals** | |
| Search Bearing/Plunge/Tilt (Upper La Ventana) | 270° / 0° / 90° |
| Search Bearing/Plunge/Tilt (Lower La Ventana) | 270° / 0° / 65° |
| Search Bearing/Plunge/Tilt (San Felipe) | 290° / 0° / 60° |
| Search Bearing/Plunge/Tilt (Las Lamas) | 55° / 0° / 70° |
| Search Bearing/Plunge/Tilt (Transversales) | 70° / 0° / 85° |
| | |
| First Pass Search (m): major/semimajor/minor | 75/ 75 /37.5 |
| First Pass Samples: minimum/maximum/maximum per hole | 2/ 12 / 4 |
| Second Pass Search (m): major/semimajor/minor | 150/ 150/ 75 |
| Second Pass Samples: minimum/maximum/maximum per hole | 2/ 12 / 4 |
| Third Pass Search (m): major/semimajor/minor | 300/ 300 / 300 |
| Third Pass Samples: minimum/maximum/maximum per hole | 1 / 16 / 4 |

All of the San Felipe drill data, including drill data from Peñoles ground outside the current La Ventana concession, were used in the grade estimate. However, those portions of the block model outside the concession boundary were not included in the current mineral resources.

## 14.8 Mineral Resources

Las Lamas and Transversales resources are restricted to the Inferred classification due to the relatively widely spaced drilling and uncertain continuity. The criteria for assigning the Indicated classification to a La Ventana or San Felipe mineralized block are that the average distance to the nearest two drill holes, with at least one composite sample per drill hole, is 35 m or less. The samples used for the classification criteria stated above are independent of the modeled domains.

Table 14.2 shows the project total reported mineral resources along with the reported mineral resources for the four deposits, all reported at a 2.5% zinc equivalent ("ZnEq") grade. A tabulation of mineral inventory for each deposit at various ZnEq cut-offs is provided in Appendix C. Copper has been excluded from the reported mineral resources due to its generally low-grade, uncertain metallurgy, and erratic QA/QC data.

**Table 14.2 San Felipe Project Reported Mineral Resources (based on a 2.5% ZnEq cutoff)**

| MINERAL RESOURCE ESTIMATE AS OF MARCH 15, 2018<br>Americas Silver Corporation - San Felipe Project | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Tonnes | Grades | | | Contained Metal | | |
| Classification | (000) | Zn (%) | Ag (g/t) | Pb (%) | Zn lbs (000) | Ag oz (000) | Pb lbs (000) |
| Indicated | 4,685 | 5.42 | 60.6 | 2.48 | 559,714 | 9,125 | 255,899 |
| Inferred | 2,008 | 3.57 | 48.2 | 1.43 | 157,845 | 3,110 | 63,166 |

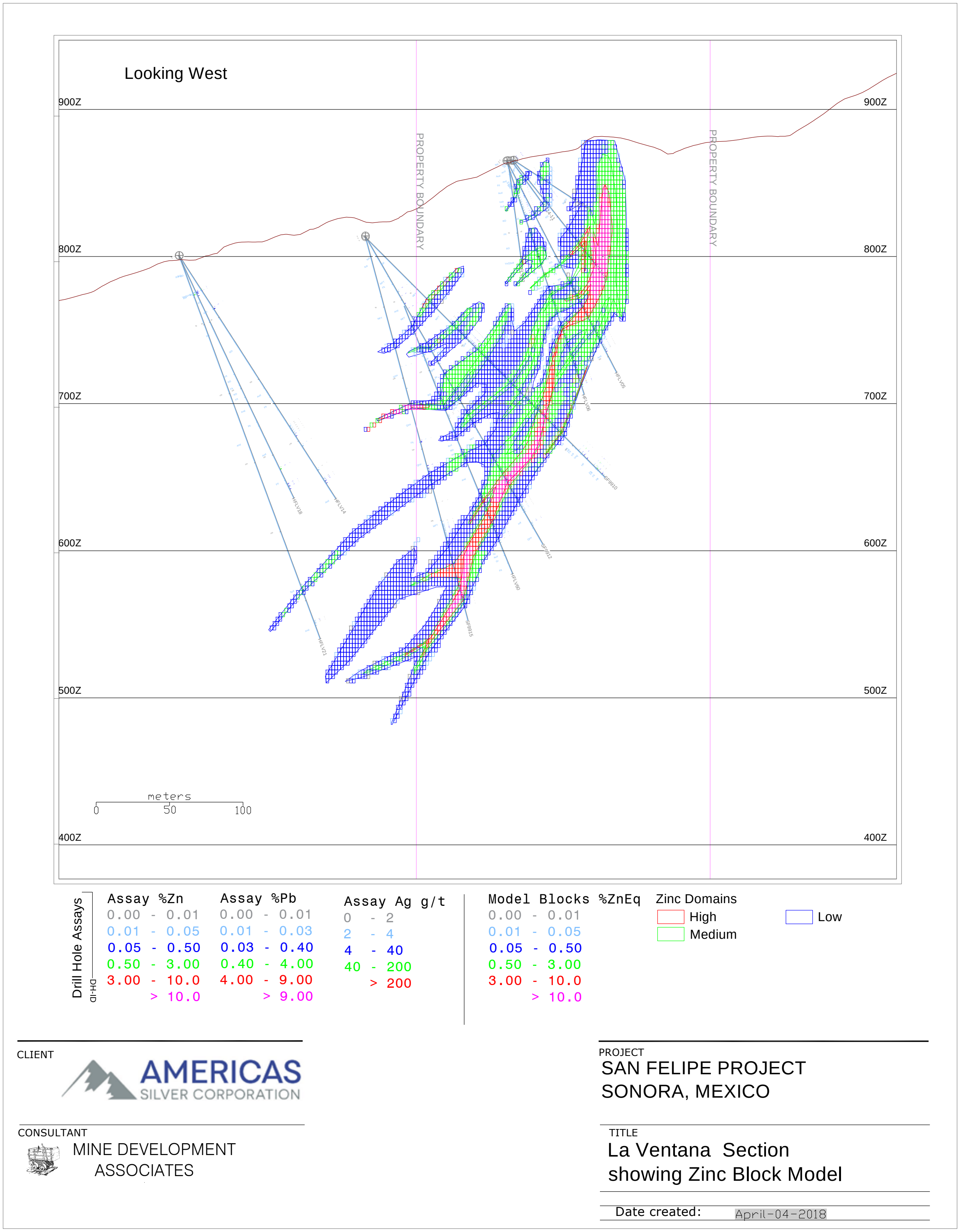
| INDICATED MINERAL RESOURCE ESTIMATE AS OF MARCH 15, 2018<br>Americas Silver Corporation - San Felipe Project | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Tonnes | Grades | | | Contained Metal | | |
| Zone | (000) | Zn (%) | Ag (g/t) | Pb (%) | Zn lbs (000) | Ag oz (000) | Pb lbs (000) |
| La Ventana | 3,846 | 5.44 | 55.0 | 2.62 | 461,589 | 6,802 | 222,038 |
| San Felipe | 839 | 5.30 | 86.1 | 1.83 | 98,125 | 2,323 | 33,861 |
| **Total** | **4,685** | **5.42** | **60.6** | **2.48** | **559,714** | **9,125** | **255,899** |

| INFERRED MINERAL RESOURCE ESTIMATE AS OF MARCH 15, 2018<br>Americas Silver Corporation - San Felipe Project | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Tonnes | Grades | | | Contained Metal | | |
| Zone | (000) | Zn (%) | Ag (g/t) | Pb (%) | Zn lbs (000) | Ag oz (000) | Pb lbs (000) |
| La Ventana | 675 | 2.95 | 29.8 | 1.99 | 43,912 | 646 | 29,658 |
| San Felipe | 398 | 4.53 | 67.7 | 1.46 | 39,753 | 866 | 12,814 |
| Las Lamas | 351 | 5.75 | 82.6 | 0.25 | 44,478 | 932 | 1,935 |
| Transversales | 584 | 2.31 | 35.5 | 1.46 | 29,702 | 666 | 18,759 |
| **Total** | **2,008** | **3.57** | **48.2** | **1.43** | **157,845** | **3,110** | **63,166** |

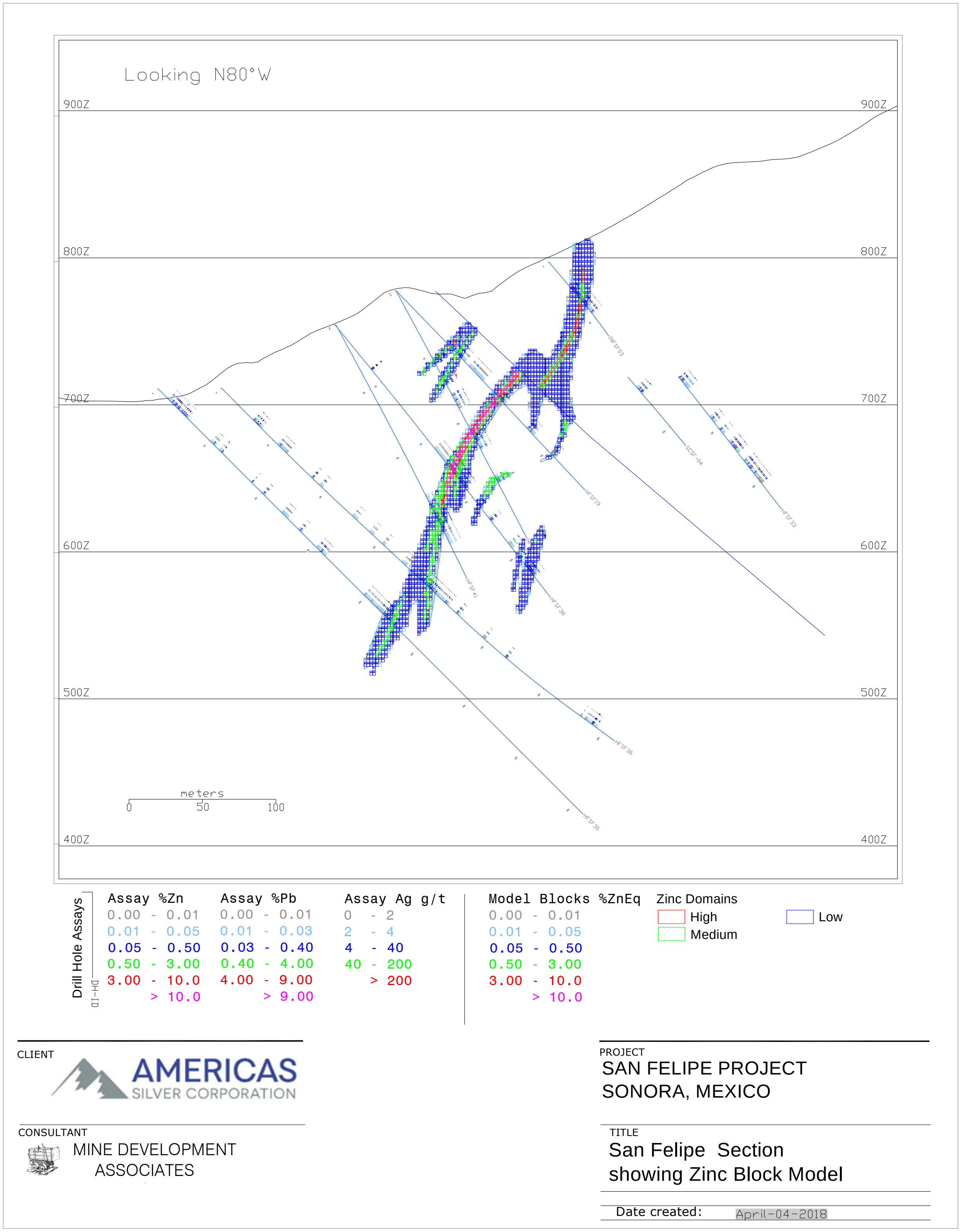
1. CIM Definition Standards were followed for mineral resource estimates.
2. Mineral resources are fully diluted to the 2mx3mx2m block size and estimated at a cut-off grade of 2.5% zinc equivalent (“ZnEq”).
3. ZnEq is calculated using the formula: %ZnEq = %Zn + (1.054 * %Pb) + (0.017 * g Ag/t). This formula uses metal prices of US$18.00/oz Ag, US$1.05/lb Pb, and US$1.05/lb Zn, along with expected metal recoveries.
4. Numbers may not add due to rounding.

Figure 14.5 through Figure 14.8 show cross sections of the block models that correspond to the mineral-domain cross-sections in Figure 14.1 through Figure 14.4, respectively.

**Figure 14.5 Section 567540E– La Ventana Block Model**



## Figure 14.6 Section 650 – San Felipe Block Model



# Figure 14.7 Section 150 – Las Lamas Block Model

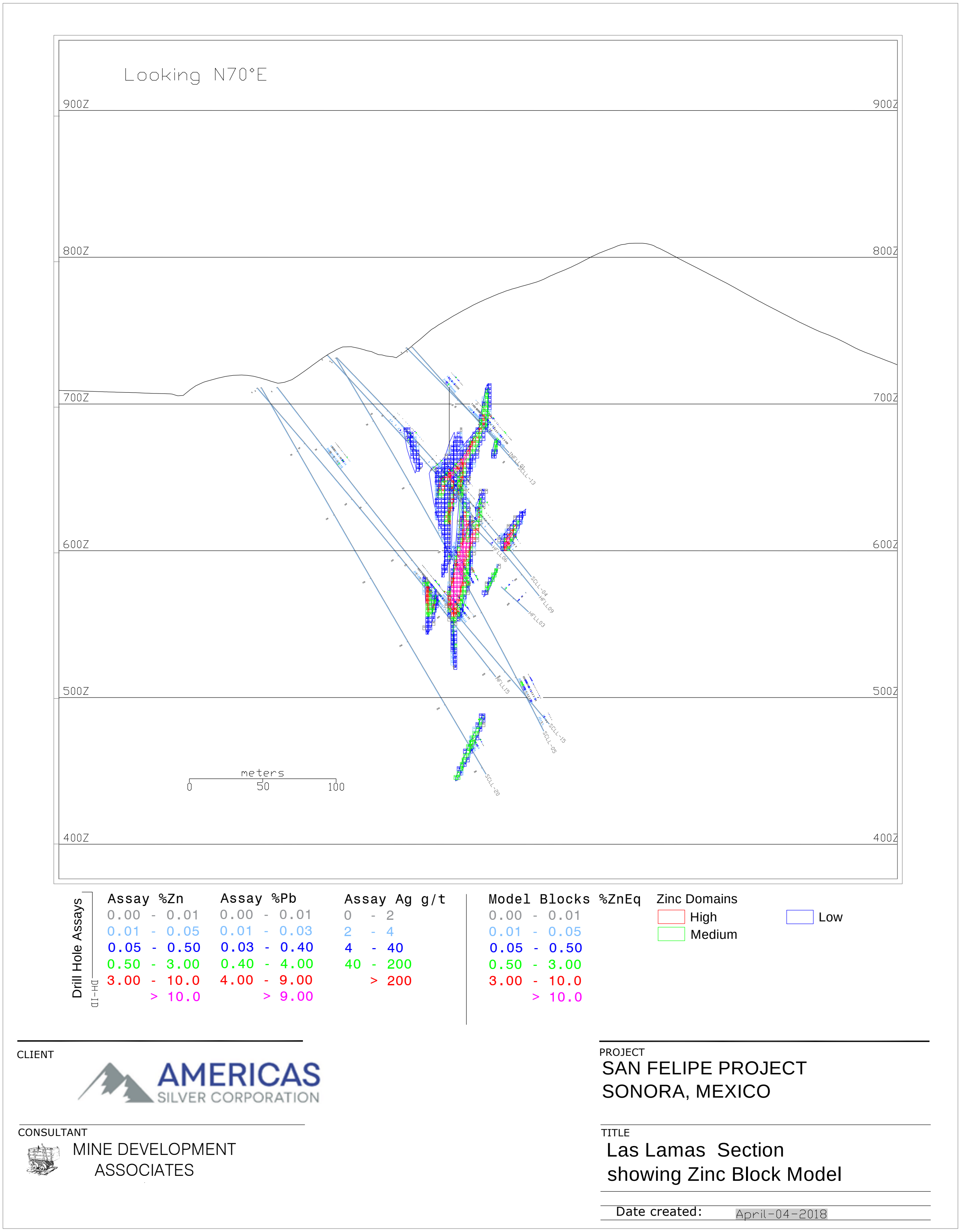
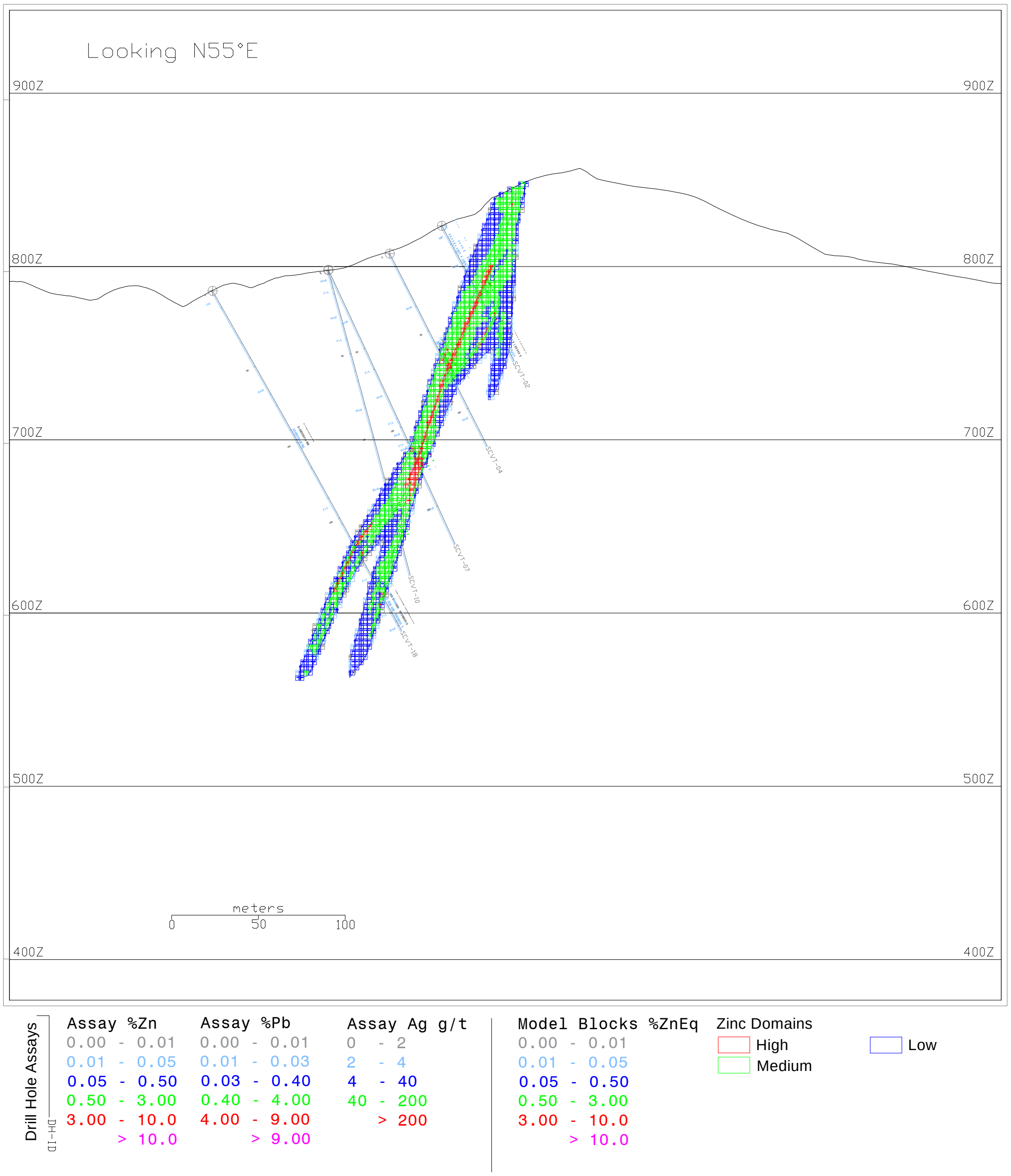


**Figure 14.8 Section 400 – Transversales Block Model**




CLIENT

AMERICAS SILVER CORPORATION

CONSULTANT

MINE DEVELOPMENT ASSOCIATES

PROJECT

SAN FELIPE PROJECT
SONORA, MEXICO

TITLE

Transversales Section showing Zinc Block Model

Date created: April-04-2018

## 14.9 Model Checks

Volumes indicated by level plan interpretations were compared to the cross-section volumes and those coded to the block model to assure close agreement, and all block-model coding was checked visually on the computer. Nearest-neighbor and ordinary-kriging estimates of the project resources were undertaken as a check on the $ID^3$ resource model. Grade-distribution plots of assays and composites versus the nearest-neighbor, krige, and $ID^3$ block grades were also evaluated as a check on the estimation. Finally, the $ID^3$ grades were visually compared to the drill-hole assay data to assure that reasonable results were obtained.

The author believes that the current mineral resource block model and estimate is a reasonable portrayal of the San Felipe structure/vein deposits and can be used in future economic analyses.

## 14.10 Discussion of Resources

The San Felipe resource models reflect the structurally-related massive sulfide replacement/vein mineralization as interpreted for the four deposits. The potentially economic (>2.5% ZnEq) sulfide veins are usually 2 to 10 m wide and occur within the much wider, near-vertical structural zones marked by strongly silicified, weakly brecciated, andesite country rock. There has been significant pre- and post-mineral faulting that occurred within, and appears to be sub-parallel to, the structural/mineral zones and often displaced the mineralized veins.

The San Felipe resources are based on potential exploitation by underground mining methods. If further work indicates the potential for open-pit mining of the near-surface portions of the vein deposits, the resources would likely grow due to lower economic cut-offs. However, the current land position at La Ventana is likely too restricted for any appreciable surface mining.

The primary risk with the resource model is continuity of mineralization within the structural zones. Multiple vein intervals can be encountered in a single drill hole and correlating individual vein or massive sulfide intervals between drill holes involves some uncertainty. Moderate to poor core recovery is common, though analyses presented in Section 10.6 indicate that metal grades decrease with lower core recovery, so the resource estimate is potentially conservative. There is minor uncertainty in hole locations due to a lack of original collar and downhole surveys. None of these risks are high enough to preclude classifying portions of the San Felipe and La Ventana deposits as Indicated mineral resources.

The resource is open at depth at San Felipe and Transversales, though the highest-grade portions of the deposits encountered to date have been within the upper levels of the deposits. The La Ventana deposit is limited in growth due to current land constraints from concession boundaries.

Additional core drilling at Las Lamas and Transversales would likely allow for classifying Indicated resources within these deposits. Further drilling at San Felipe would result in the conversion of Inferred resources to Indicated resources, while also assist in expanding the current resources.

## 14.11 Previous Resource Comparison

The current estimate is based on an updated interpretation of 336 drill holes completed by previous operators on the project since 1998, including 21 holes that were completed after the last mineral resource estimate was published in 2014, and 6 new drill holes completed by Americas Silver in 2017. When compared to the 2014 mineral resource estimate, the contained metal in the Indicated zinc, silver and lead resources increased by 258%, 236%, and 320%, respectively, while the contained metal in the Inferred zinc, silver, and lead resources each decreased by 52%.

Some of the differences between the current estimate and the previous 2014 estimate are a result of the reinterpretation of the project as a zinc deposit instead of a silver deposit. The current cut-off value of 2.5% zinc equivalent brought in additional material into both the Indicated and Inferred categories, as compared to the 75g/t and 150 g/t silver equivalent cut-off values used in the 2014 resource estimate.

The 2014 resources were undiluted and constrained within narrow wireframe solids meant to mimic the high-grade silver portions of the veins within the mineralized structures. In comparison, the current model, which reports block-diluted metal grades, does not constrain the modeled mineralization to a discrete narrow vein, but represents the mineralization as occurring within a larger structural envelope. The 2014 model did not account for multiple, stacked high-grade intervals that often occur within a single hole. The best interval was assigned to the vein model while the adjacent mineral intervals were not modeled and essentially disregarded from resource consideration. Within the current model, the high-grade intervals are each explicitly modeled, and while there is often a primary mineralized structure with excellent continuity, the model also includes the many wallrock mineral intervals that can show variable continuity between drill holes. It is reasonable to expect that any future development would target some of these intervals and therefore should be included within the resource base. The result of these modeling differences are greater tonnes and a lower diluted grade in the 2018 resource estimate.

The use of more liberal zinc variogram distances in determining the classification criteria, versus the more restrictive silver variogram distances used in 2014, also resulted in a larger proportion of resource classified as Indicated within the current mineral resources.

## 23.0 ADJACENT PROPERTIES

The author has no information regarding adjacent properties that is relevant to the resource estimate described in this report.

## 24.0 OTHER RELEVANT DATA AND INFORMATION

The author is unaware of any other data or information relevant to the resource estimate described in this report.

# 25.0 INTERPRETATION AND CONCLUSIONS

Mr. Tietz has reviewed the project data, including the San Felipe drill-hole database, and visited the project site. The author believes that the data provided by Americas Silver, as well as the geological interpretations Americas Silver and the author have derived from the data, are generally an accurate and reasonable representation of the San Felipe project.

The San Felipe district represents a cluster of deeply-eroded, distal Pb-Zn-Ag skarn vein deposits hosted within meta-andesites and felsic intrusives within the upper plate of the El Amol detachment fault. The current San Felipe resource model includes mineralization within four structural/vein zones: La Ventana, San Felipe, Las Lamas, and Transversales. Other structural targets within the district include Cornucopia- Artemisa.

The San Felipe resources are based on the drill data from 293 drill holes within the four deposit areas. Core drilling accounts for approximately 95% of the meters drilled and reverse circulation (“RC”) drilling accounts for the balance. All of the project drill data, including drill data from holes collared on the adjacent Peñoles ground, were used in the grade estimate. However, those portions of the block model outside the concession boundary were not included in the current mineral resources.

The San Felipe resource block models reflect the structurally-related, massive-textured sulfide replacement and vein mineralization as interpreted for the four deposits. The potentially economic (>2.5% ZnEq) sulfide veins are usually 2 to 10 m wide and occur within much wider, steeply dipping structural zones marked by strongly silicified, weakly brecciated, andesite country rock. There has been significant pre- and post-mineral faulting that occurred within, and appears to be sub-parallel to, the structural/mineralized zones which often displaced the mineralized veins.

The current San Felipe mineral resources are based on potential exploitation by underground mining methods. If further work indicates the potential for open-pit mining of the near-surface portions of the vein deposits, the resources would likely increase, due to the lower economic cut-offs. The current land position at La Ventana likely excludes this deposit from any appreciable surface mining.

The principal risk with the resource model is continuity of mineralization within the structural zones. Multiple vein intervals can be encountered in one hole. Correlating individual vein or massive sulfide intervals between drill holes carries some uncertainty. Moderate to poor core recovery is common, but core recovery versus zinc grade analyses indicate that metal grades decrease with lower core recovery; indicating the resource estimate is potentially conservative. There is minor uncertainty in hole locations due to a lack of original collar and downhole surveys. None of these risks are sufficient to preclude classifying portions of the San Felipe and La Ventana deposits as Indicated mineral resources.

The resources are open at depth at San Felipe and Transversales, while the La Ventana deposit is limited in growth due to current land constraints from concession boundaries. Additional infill core drilling at Las Lamas and Transversales would likely allow for the assigning of Indicated resources within these deposits. Further drilling at San Felipe would result in the conversion of Inferred to Indicated resources, and also assist in expanding the current resources.

## 26.0 RECOMMENDATIONS

MDA believes that the San Felipe project is a project of merit and warrants additional exploration and development work. The recommended work would include core drilling, along with geochemical and geophysical analyses to assist in target generation, plus additional metallurgical testing. The recommended work totals approximately $2.0 million.

Continued core drilling is recommended in order to:

- upgrade and expand the resources at San Felipe, Las Lamas, and Transversales;
- provide material for additional metallurgical and geotechnical testing at Las Lamas and Transversales; and
- increase the project-wide resources by targeting additional vein systems such as at Artemisa-Cornucopia.

A flexible drill program of approximately 10,000 meters of drilling is recommended to complete the above tasks. Total costs for the drill program would be approximately $1,500,000.

Additional metallurgical testing is recommended at La Ventana and San Felipe along with initial testing of Las Lamas and Transversales mineralization. The drill plan would allow for the infill and expansion drilling to also provide samples for the proposed metallurgical testing. Costs for the metallurgical testing would be approximately $300,000.

Upon drilling completion, and positive drill and metallurgical results, an updated mineral resource estimate and a preliminary economic assessment ("PEA") is recommended. The estimated cost, including the accompanying technical reports, is approximately $150,000.

# 27.0 REFERENCES

Anderson, T. H., Rodriguez-Castaneda, J. L., & Silver, L. T. (2005). Jurassic rocks in Sonora, Mexico: Relations to the Mojave-Sonora megashear and its inferred northwestward extension: *Geological Society of America Special Papers*, v. 393, p. 51-95.

Barra, F., Ruiz, J., Valencia, V. A., Ochoa-Landin, L., Chesley, J. T., & Zurcher, L. (2005). Laramide Porphyry Cu-Mo Mineralization in Northern Mexico: Age Constraints from Re-Os Geochronology in Molybdenite: *Economic Geology*, v. 10, p. 1605-1616.

Bartolini, C., Damon, P. E., Shafiqullah, M., & Morales, M. (1994). Geochronologic contributions to the Tertiary sedimentary-volcanic sequences ("Baucarit Formation") in Sonora, Mexico. *Geofisica International*, v.33, p. 67-77.

Bussell, M. A., Alpers, C. N., Petersen, U., Shepherd, T. J., Bermudez, C., & Baxter, A. N. (1990). The Ag-Mn-Pb-Zn vein, replacement, and skarn deposits of Uchucchacua, Peru; studies of structure, mineralogy, metal zoning, Sr isotopes, and fluid inclusions: *Economic Geology*, v. *85*, p. 1348– 1383.

Calmus, T., Perez-Segura, E., & Roldan-Quintana, J. (1996). The Pb-Zn ore deposits of San Felipe, Sonora, Mexico: "Detached" mineralization in the basin and Range Province: *Geofisica International*, v. 35, p. 115-124.

Einaudi, M., Meinert, L. D., & Newberry, R. (1981). Skarn Deposits: *Economic Geology*, v. *75* (Anniversary Volume), p. 317–391.

Gray, G.G., Lawton, T.F., and Murphy, J.J., (2008). Looking for the Mohave-Sonora megashear in northeastern Mexico: *Geological Society of America Field Trip Guide 14*, p. 1-25.

Hochschild Mining plc. (2008). Reporte interno – recursos minerales proyecto San Felipe, San Felipe – Hermosillo, Sonora – Mexico: Hochschild Mining, PLC. In-house report, p49.

Hulse, D.E. (2012). Updated NI 43-101 technical report on resources San Felipe project Sonora, Mexico: SEDAR, p86.

King, R. E. (1939). Geological reconnaissance in northern Sierra Madre Occidental of Mexico: *Geol. Soc. Am. Bull.*, v50, p.1625-1722.

Longo, A. (2014). Geology of San Felipe Project. *Santacruz Silver Mining Ltd. In-house report.*

Meinert, L. D. (1982). Skarn, manto, and breccia pipe formation in sedimentary rocks of the Cananea mining district, Sonora, Mexico: *Economic Geology*, v. 77, p. 919–949.

Meinert, L. D., (2007). Exploration review of San Felipe district: *Hochschild Mining, PLC. In-house report*.

M3 Engineering & Technology Corporation. (2008). San Felipe project scoping study: *Hochschild Mining, PLC. In-house report*.

MTB Project Management Professionals, Inc. (2009). Prefeasibility study close out report for San Felipe Project Hochschild Mining, Lima, Peru: *Hochschild Mining, PLC. In-house report*.

Molina-Garza, R.S., and Iriondo, A., (2007). The Mojave-Sonora megashear: The hypothesis, the controversy, and the current state of knowledge, in Alaniz-Alvarez, S.A., and Nieto Samaniego, A.F., eds., Geology of Mexico: Celebrating the Centenary of the Geological Society of Mexico: *Geological Society of America Special paper 422*, p. 233-259.

Nelson, E.P., (2007). Structural geological analysis of the San Felipe district, Sonora, Mexico: *Hochschild Mining, PLC. In-house report*, p. 14.

Newberry, R.J., Einaudi, M.T., and Eastman, H.S., (1991). Zoning and genesis of the Darwin Pb-Zn-Ag Skarn deposit, a reinterpretation based on new data: *Economic Geology*, v. 86, p. 960-982.

Rodriguez-Castaneda, J.L., (1999). Cretaceous-Tertiary detachment surface- Cerro El Vigia structural block in the Banamichi-San Antonio region, central Sonora, Mexico: *Revista Mexicana de Ciencias Geologicas*, v. 16, no.1, p. 63-72.

Roldan-Quintana, J., (1979). Geologia y yacimientos minerales del distrito de San Felipe, Sonora: *Uni.Nal. Auton. Mexico, Inst. Geologia*, v. 3, p. 97-115.

Roldan-Quintana, J., (1991). Geology and chemical composition of the Jaralito and Aconchi batholiths in east-central Sonora, Mexico. *Geological Society of America, SP 254.* p. 69-80.

Shewhart, W., A., (1929). Economic quality control of manufactured product: A.A.A.S., p. 364-389.

Smit, H., et al, (2014), 2014 Resource Estimate and Preliminary Economic Assessment San Felipe Project, Sonora, Mexico; technical report prepared for Santacruz Silver Mining, 331 p.

Turner, A. T., (1999). 1999 summary report on geological mapping, soil and stream sediment geochemical surveys, airborne and ground geophysical surveys, and diamond drilling programs at the San Felipe Project, Sonora, Mexico: *Unpublished Boliden Report*, p. 58.

Valencia-Moreno, M., Ruiz, J., Barton, M.D., Patchett, P.J., Zurcher, L., Hodkinson, D.G., Roldan- Quintana, J., (2001). A chemical and isotopic study of the Laramide granitic belt of northwestern Mexico: Identification of the southern edge of the North American Precambrian basement: *Geological Society of America Bulletin*, v. 113, no. 11, p. 1409-1422.

## 28.0 DATE AND SIGNATURE PAGE

Effective Date of report: March 15, 2018

The data on which the contained resource estimates are based was current as of the Effective Date.

Completion Date of report: May 3, 2018

***"Paul Tietz"***
Paul Tietz C.P.G.

Date Signed:
May 3, 2018

## 29.0 CERTIFICATE OF QUALIFIED PERSONS

**Paul Tietz, C.P.G.**

I, Paul Tietz, C.P.G., do hereby certify here that I am currently employed as Senior Geologist by Mine Development Associates, Inc., 210 South Rock Blvd., Reno, Nevada 89502.

1. I graduated with a Bachelor of Science degree in Biology/Geology from the University of Rochester in 1977 and a Master of Science degree in Geology from the University of North Carolina, Chapel Hill in 1981. I also received a Master of Science degree in Geological Engineering from the University of Nevada, Reno in 2004. I have worked as a geologist for a total of 37 years since receiving my Master of Science degree in Geology.

2. I am a Certified Professional Geologist (#11004) with the American Institute of Professional Geologists. I have drilling, exploration, and resource modeling experience in similar base-metal deposits throughout the western U.S. and Mexico.

3. 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. I am independent of Americas Silver and its subsidiaries, as well as all previous operators, applying all of the tests in section 1.5 of National Instrument 43-101.

4. I am responsible for all Sections of this technical report titled *Technical Report and Estimated Resources for the San Felipe Project, Sonora, Mexico"* for Americas Silver Corporation ("Technical Report"), and with an effective date of March 15, 2018.

5. I have had no previous involvement with this project. I visited the San Felipe project on April 12-14, 2017.

6. As of the effective date of this Technical Report, to the best of my knowledge, information, and belief, those parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

7. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

Dated May 3, 2018

***"Paul Tietz"***
Paul Tietz

# APPENDIX A

Assay Statistics - San Felipe Deposits

## Ag Coded Assays - Las Lamas

| Domain | Assays | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV | Min. (g Ag/t) | Max. (g Ag/t) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Ag | 414 | 8.3 | 2.1 | 23.70 | 2.86 | 0.1 | 246.0 | 11 |
| | Ag Cap | 414 | 6.8 | 2.1 | 14.30 | 2.10 | 0.1 | 80.0 | |
| 200 | Ag | 107 | 35.0 | 18.0 | 54.50 | 1.55 | 0.8 | 442.0 | 5 |
| | Ag Cap | 107 | 31.1 | 18.0 | 36.00 | 1.16 | 0.8 | 150.0 | |
| 300 | Ag | 105 | 147.3 | 124.0 | 116.90 | 0.79 | 4.4 | 1052.0 | 2 |
| | Ag Cap | 105 | 143.7 | 124.0 | 96.70 | 0.67 | 4.4 | 500.0 | |
| *All* | *Ag* | 626 | 29.6 | 3.7 | 67.80 | 2.29 | 0.1 | 1052.0 | *18* |
| | *Ag Cap* | 626 | 27.5 | 3.7 | 59.00 | 2.14 | 0.1 | 500.0 | |

## Cu Coded Assays - Las Lamas

| Domain | Assays | Count | Mean (% Cu) | Median (% Cu) | Std. Dev. | CV | Min. (% Cu) | Max. (% Cu) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Cu | 414 | 0.01 | 0.00 | 0.02 | 2.14 | 0.00 | 0.19 | 0 |
| | Cu Cap | 414 | 0.01 | 0.00 | 0.02 | 2.14 | 0.00 | 0.19 | |
| 200 | Cu | 107 | 0.07 | 0.03 | 0.13 | 1.91 | 0.00 | 1.52 | 0 |
| | Cu Cap | 107 | 0.07 | 0.03 | 0.13 | 1.91 | 0.00 | 1.52 | |
| 300 | Cu | 105 | 0.34 | 0.28 | 0.25 | 0.73 | 0.02 | 1.98 | 0 |
| | Cu Cap | 105 | 0.34 | 0.28 | 0.25 | 0.73 | 0.02 | 1.98 | |
| *All* | *Cu* | 626 | 0.06 | 0.01 | 0.15 | 2.47 | 0.00 | 1.98 | 0 |
| | *Cu Cap* | 626 | 0.06 | 0.01 | 0.15 | 2.47 | 0.00 | 1.98 | |

## Pb Coded Assays - Las Lamas

| Domain | Assays | Count | Mean (% Pb) | Median (% Pb) | Std. Dev. | CV | Min. (% Pb) | Max. (% Pb) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Pb | 414 | 0.06 | 0.02 | 0.10 | 1.79 | 0.00 | 0.77 | 8 |
| | Pb Cap | 414 | 0.05 | 0.02 | 0.09 | 1.68 | 0.00 | 0.50 | |
| 200 | Pb | 107 | 0.19 | 0.09 | 0.32 | 1.67 | 0.00 | 2.32 | 3 |
| | Pb Cap | 107 | 0.17 | 0.09 | 0.22 | 1.29 | 0.00 | 1.00 | |
| 300 | Pb | 105 | 0.58 | 0.31 | 1.49 | 2.55 | 0.01 | 16.00 | 1 |
| | Pb Cap | 105 | 0.47 | 0.31 | 0.48 | 1.02 | 0.01 | 3.00 | |
| *All* | *Pb* | 626 | 0.14 | 0.03 | 0.57 | 4.04 | 0.00 | 16.00 | 12 |
| | *Pb Cap* | 626 | 0.12 | 0.03 | 0.25 | 2.00 | 0.00 | 3.00 | |

## Zn Coded Assays - Las Lamas

| Domain | Assays | Count | Mean (% Zn) | Median (% Zn) | Std. Dev. | CV | Min. (% Zn) | Max. (% Zn) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Zn | 414 | 0.15 | 0.06 | 0.29 | 1.99 | 0.00 | 4.32 | 8 |
| | Zn Cap | 414 | 0.13 | 0.06 | 0.18 | 1.40 | 0.00 | 1.00 | |
| 200 | Zn | 107 | 1.56 | 1.05 | 1.76 | 1.13 | 0.02 | 15.15 | 3 |
| | Zn Cap | 107 | 1.46 | 1.05 | 1.21 | 0.83 | 0.02 | 6.00 | |
| 300 | Zn | 105 | 10.75 | 9.21 | 6.96 | 0.65 | 0.11 | 30.00 | 0 |
| | Zn Cap | 105 | 10.75 | 9.21 | 6.96 | 0.65 | 0.11 | 30.00 | |
| *All* | *Zn* | 626 | 1.67 | 0.11 | 4.29 | 2.56 | 0.00 | 30.00 | 11 |
| | *Zn Cap* | 626 | 1.65 | 0.11 | 4.26 | 2.58 | 0.00 | 30.00 | |

## Ag Coded Assays - San Felipe

| Domain | Assays | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV | Min. (g Ag/t) | Max. (g Ag/t) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Ag | 902 | 6.2 | 1.8 | 18.60 | 3.01 | 0.1 | 276.0 | 6 |
| | Ag Cap | 902 | 5.7 | 1.8 | 13.70 | 2.38 | 0.1 | 125.0 | |
| 200 | Ag | 374 | 31.0 | 11.3 | 77.70 | 2.50 | 0.1 | 844.0 | 10 |
| | Ag Cap | 374 | 24.6 | 11.3 | 36.00 | 1.47 | 0.1 | 175.0 | |
| 300 | Ag | 172 | 119.4 | 53.6 | 153.70 | 1.29 | 0.7 | 892.0 | 0 |
| | Ag Cap | 172 | 119.4 | 53.6 | 153.70 | 1.29 | 0.7 | 892.0 | |
| *All* | *Ag* | 1448 | 23.5 | 3.3 | 72.00 | 3.06 | 0.1 | 892.0 | *16* |
| | *Ag Cap* | 1448 | 21.7 | 3.3 | 62.70 | 2.89 | 0.1 | 892.0 | |

## Cu Coded Assays - San Felipe

| Domain | Assays | Count | Mean (% Cu) | Median (% Cu) | Std. Dev. | CV | Min. (% Cu) | Max. (% Cu) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Cu | 902 | 0.01 | 0.00 | 0.05 | 3.42 | 0.00 | 0.86 | 7 |
| | Cu Cap | 902 | 0.01 | 0.00 | 0.03 | 2.36 | 0.00 | 0.25 | |
| 200 | Cu | 374 | 0.05 | 0.01 | 0.14 | 2.82 | 0.00 | 2.57 | 6 |
| | Cu Cap | 374 | 0.04 | 0.01 | 0.08 | 1.83 | 0.00 | 0.50 | |
| 300 | Cu | 172 | 0.20 | 0.14 | 0.23 | 1.15 | 0.00 | 1.57 | 4 |
| | Cu Cap | 172 | 0.19 | 0.14 | 0.20 | 1.03 | 0.00 | 1.00 | |
| *All* | *Cu* | 1448 | 0.04 | 0.01 | 0.12 | 2.94 | 0.00 | 2.57 | 17 |
| | *Cu Cap* | 1448 | 0.04 | 0.01 | 0.09 | 2.48 | 0.00 | 1.00 | |

## Pb Coded Assays - San Felipe

| Domain | Assays | Count | Mean (% Pb) | Median (% Pb) | Std. Dev. | CV | Min. (% Pb) | Max. (% Pb) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Pb | 902 | 0.11 | 0.03 | 0.28 | 2.54 | 0.00 | 8.04 | 2 |
| | Pb Cap | 902 | 0.11 | 0.03 | 0.25 | 2.33 | 0.00 | 2.80 | |
| 200 | Pb | 374 | 0.74 | 0.26 | 1.47 | 1.98 | 0.00 | 17.65 | 5 |
| | Pb Cap | 374 | 0.70 | 0.26 | 1.12 | 1.60 | 0.00 | 7.00 | |
| 300 | Pb | 172 | 3.24 | 1.78 | 3.83 | 1.18 | 0.02 | 20.00 | 4 |
| | Pb Cap | 172 | 3.16 | 1.78 | 3.50 | 1.11 | 0.02 | 15.00 | |
| *All* | *Pb* | 1448 | 0.58 | 0.07 | 1.70 | 2.96 | 0.00 | 20.00 | 11 |
| | *Pb Cap* | 1448 | 0.56 | 0.07 | 1.55 | 2.78 | 0.00 | 15.00 | |

## Zn Coded Assays - San Felipe

| Domain | Assays | Count | Mean (% Zn) | Median (% Zn) | Std. Dev. | CV | Min. (% Zn) | Max. (% Zn) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Zn | 902 | 0.19 | 0.10 | 0.30 | 1.63 | 0.00 | 9.04 | 2 |
| | Zn Cap | 902 | 0.19 | 0.10 | 0.28 | 1.50 | 0.00 | 3.20 | |
| 200 | Zn | 374 | 1.29 | 0.90 | 1.39 | 1.08 | 0.01 | 23.10 | 1 |
| | Zn Cap | 374 | 1.28 | 0.90 | 1.29 | 1.01 | 0.01 | 12.00 | |
| 300 | Zn | 172 | 8.35 | 6.03 | 6.99 | 0.84 | 0.02 | 38.20 | 0 |
| | Zn Cap | 172 | 8.35 | 6.03 | 6.99 | 0.84 | 0.02 | 38.20 | |
| *All* | *Zn* | 1448 | 1.27 | 0.20 | 3.35 | 2.64 | 0.00 | 38.20 | 3 |
| | *Zn Cap* | 1448 | 1.27 | 0.20 | 3.34 | 2.63 | 0.00 | 38.20 | |

## Ag Coded Assays - Transversales

| Domain | Assays | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV | Min. (g Ag/t) | Max. (g Ag/t) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Ag | 340 | 4.7 | 1.8 | 10.90 | 2.30 | 0.1 | 125.0 | 4 |
| | Ag Cap | 340 | 4.3 | 1.8 | 7.70 | 1.77 | 0.1 | 50.0 | |
| 200 | Ag | 225 | 23.0 | 13.1 | 43.80 | 1.91 | 0.1 | 485.0 | 10 |
| | Ag Cap | 225 | 19.3 | 13.1 | 21.30 | 1.10 | 0.1 | 100.0 | |
| 300 | Ag | 23 | 93.9 | 61.2 | 86.70 | 0.92 | 5.6 | 331.0 | 0 |
| | Ag Cap | 23 | 93.9 | 61.2 | 86.70 | 0.92 | 5.6 | 331.0 | |
| *All* | *Ag* | 588 | 13.7 | 3.8 | 34.80 | 2.55 | 0.1 | 485.0 | *14* |
| | *Ag Cap* | 588 | 12.1 | 3.8 | 25.20 | 2.08 | 0.1 | 331.0 | |

## Cu Coded Assays - Transversales

| Domain | Assays | Count | Mean (% Cu) | Median (% Cu) | Std. Dev. | CV | Min. (% Cu) | Max. (% Cu) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Cu | 340 | 0.02 | 0.00 | 0.10 | 4.90 | 0.00 | 2.02 | 5 |
| | Cu Cap | 340 | 0.02 | 0.00 | 0.03 | 2.18 | 0.00 | 0.20 | |
| 200 | Cu | 225 | 0.06 | 0.02 | 0.17 | 2.63 | 0.00 | 1.36 | 7 |
| | Cu Cap | 225 | 0.05 | 0.02 | 0.10 | 1.96 | 0.00 | 0.50 | |
| 300 | Cu | 23 | 0.30 | 0.16 | 0.49 | 1.64 | 0.00 | 2.92 | 2 |
| | Cu Cap | 23 | 0.23 | 0.16 | 0.19 | 0.81 | 0.00 | 0.70 | |
| *All* | *Cu* | 588 | 0.04 | 0.01 | 0.16 | 3.62 | 0.00 | 2.92 | 14 |
| | *Cu Cap* | 588 | 0.03 | 0.01 | 0.08 | 2.40 | 0.00 | 0.70 | |

## Pb Coded Assays - Transversales

| Domain | Assays | Count | Mean (% Pb) | Median (% Pb) | Std. Dev. | CV | Min. (% Pb) | Max. (% Pb) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Pb | 340 | 0.13 | 0.06 | 0.22 | 1.64 | 0.00 | 1.94 | 7 |
| | Pb Cap | 340 | 0.12 | 0.06 | 0.17 | 1.35 | 0.00 | 0.80 | |
| 200 | Pb | 225 | 0.87 | 0.50 | 1.24 | 1.43 | 0.00 | 13.25 | 1 |
| | Pb Cap | 225 | 0.84 | 0.50 | 1.03 | 1.23 | 0.00 | 7.00 | |
| 300 | Pb | 23 | 5.30 | 3.36 | 5.00 | 0.94 | 0.23 | 20.00 | 0 |
| | Pb Cap | 23 | 5.30 | 3.36 | 5.00 | 0.94 | 0.23 | 20.00 | |
| *All* | *Pb* | 588 | 0.53 | 0.13 | 1.41 | 2.64 | 0.00 | 20.00 | 8 |
| | *Pb Cap* | 588 | 0.52 | 0.13 | 1.35 | 2.59 | 0.00 | 20.00 | |

## Zn Coded Assays - Transversales

| Domain | Assays | Count | Mean (% Zn) | Median (% Zn) | Std. Dev. | CV | Min. (% Zn) | Max. (% Zn) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Zn | 340 | 0.21 | 0.15 | 0.20 | 0.92 | 0.01 | 1.58 | 5 |
| | Zn Cap | 340 | 0.21 | 0.15 | 0.18 | 0.87 | 0.01 | 1.00 | |
| 200 | Zn | 225 | 1.21 | 0.88 | 1.25 | 1.04 | 0.01 | 9.04 | 0 |
| | Zn Cap | 225 | 1.21 | 0.88 | 1.25 | 1.04 | 0.01 | 9.04 | |
| 300 | Zn | 23 | 9.36 | 7.11 | 7.08 | 0.76 | 0.78 | 27.20 | 0 |
| | Zn Cap | 23 | 9.36 | 7.11 | 7.08 | 0.76 | 0.78 | 27.20 | |
| *All* | *Zn* | 588 | 0.81 | 0.28 | 2.04 | 2.50 | 0.01 | 27.20 | 5 |
| | *Zn Cap* | 588 | 0.81 | 0.28 | 2.04 | 2.51 | 0.01 | 27.20 | |

## Ag Coded Assays - La Ventana

| Domain | Assays | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV | Min. (g Ag/t) | Max. (g Ag/t) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Ag | 3034 | 4.0 | 1.4 | 18.40 | 4.63 | 0.1 | 984.0 | 7 |
| | Ag Cap | 3034 | 3.7 | 1.4 | 8.00 | 2.17 | 0.1 | 100.0 | |
| 200 | Ag | 1370 | 13.4 | 6.9 | 23.50 | 1.75 | 0.1 | 495.0 | 2 |
| | Ag Cap | 1370 | 13.2 | 6.9 | 20.10 | 1.52 | 0.1 | 200.0 | |
| 300 | Ag | 705 | 86.7 | 52.4 | 121.20 | 1.40 | 0.1 | 2570.0 | 1 |
| | Ag Cap | 705 | 85.7 | 52.4 | 107.00 | 1.25 | 0.1 | 1000.0 | |
| *All* | *Ag* | *5109* | *16.0* | *2.6* | *52.20* | *3.27* | *0.1* | *2570.0* | *10* |
| | *Ag Cap* | *5109* | *15.6* | *2.6* | *46.20* | *2.95* | *0.1* | *1000.0* | |

## Cu Coded Assays - La Ventana

| Domain | Assays | Count | Mean (% Cu) | Median (% Cu) | Std. Dev. | CV | Min. (% Cu) | Max. (% Cu) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Cu | 3034 | 0.02 | 0.01 | 0.04 | 2.57 | 0.00 | 1.20 | 3 |
| | Cu Cap | 3034 | 0.02 | 0.01 | 0.04 | 2.36 | 0.00 | 0.50 | |
| 200 | Cu | 1370 | 0.07 | 0.02 | 0.16 | 2.18 | 0.00 | 2.38 | 7 |
| | Cu Cap | 1370 | 0.07 | 0.02 | 0.13 | 1.91 | 0.00 | 1.00 | |
| 300 | Cu | 705 | 0.49 | 0.22 | 0.70 | 1.43 | 0.00 | 4.72 | 0 |
| | Cu Cap | 705 | 0.49 | 0.22 | 0.70 | 1.43 | 0.00 | 4.72 | |
| *All* | *Cu* | *5109* | *0.09* | *0.01* | *0.30* | *3.45* | *0.00* | *4.72* | *10* |
| | *Cu Cap* | *5109* | *0.09* | *0.01* | *0.29* | *3.44* | *0.00* | *4.72* | |

## Pb Coded Assays - La Ventana

| Domain | Assays | Count | Mean (% Pb) | Median (% Pb) | Std. Dev. | CV | Min. (% Pb) | Max. (% Pb) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Pb | 3034 | 0.18 | 0.05 | 0.44 | 2.50 | 0.00 | 21.50 | 11 |
| | Pb Cap | 3034 | 0.17 | 0.05 | 0.36 | 2.10 | 0.00 | 4.00 | |
| 200 | Pb | 1370 | 0.76 | 0.37 | 1.15 | 1.52 | 0.00 | 16.75 | 2 |
| | Pb Cap | 1370 | 0.76 | 0.37 | 1.12 | 1.49 | 0.00 | 12.00 | |
| 300 | Pb | 705 | 4.08 | 2.36 | 4.61 | 1.13 | 0.00 | 24.60 | 0 |
| | Pb Cap | 705 | 4.08 | 2.36 | 4.61 | 1.13 | 0.00 | 24.60 | |
| *All* | *Pb* | *5109* | *0.78* | *0.10* | *2.10* | *2.71* | *0.00* | *24.60* | *13* |
| | *Pb Cap* | *5109* | *0.77* | *0.10* | *2.09* | *2.70* | *0.00* | *24.60* | |

## Zn Coded Assays - La Ventana

| Domain | Assays | Count | Mean (% Zn) | Median (% Zn) | Std. Dev. | CV | Min. (% Zn) | Max. (% Zn) | # Capped |
|---|---|---|---|---|---|---|---|---|---|
| 100 | Zn | 3034 | 0.22 | 0.12 | 0.36 | 1.64 | 0.00 | 12.70 | 4 |
| | Zn Cap | 3034 | 0.22 | 0.12 | 0.34 | 1.56 | 0.00 | 5.00 | |
| 200 | Zn | 1370 | 1.30 | 0.90 | 1.41 | 1.08 | 0.01 | 18.70 | 3 |
| | Zn Cap | 1370 | 1.30 | 0.90 | 1.37 | 1.05 | 0.01 | 15.00 | |
| 300 | Zn | 705 | 8.87 | 6.18 | 7.58 | 0.86 | 0.01 | 39.20 | 0 |
| | Zn Cap | 705 | 8.87 | 6.18 | 7.58 | 0.86 | 0.01 | 39.20 | |
| *All* | *Zn* | *5109* | *1.50* | *0.26* | *3.82* | *2.55* | *0.00* | *39.20* | *7* |
| | *Zn Cap* | *5109* | *1.50* | *0.26* | *3.82* | *2.55* | *0.00* | *39.20* | |

# APPENDIX B

Composite Statistics - San Felipe Deposits

**Ag Composites - Las Lamas**

| Silver Domain | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV | Min. (g Ag/t) | Max. (g Ag/t) |
|---|---|---|---|---|---|---|---|
| 100 | 351 | 6.8 | 2.4 | 12.40 | 1.81 | 0.1 | 80.0 |
| 200 | 84 | 31.1 | 18.8 | 31.30 | 1.01 | 1.0 | 150.0 |
| 300 | 71 | 143.7 | 130.4 | 78.00 | 0.54 | 30.1 | 500.0 |
| All | *506* | *27.5* | *4.4* | *54.70* | *1.99* | *0.1* | *500.0* |

**Cu Composites - Las Lamas**

| Copper Domain | Count | Mean (% Cu) | Median (% Cu) | Std. Dev. | CV | Min. (% Cu) | Max. (% Cu) |
|---|---|---|---|---|---|---|---|
| 100 | 351 | 0.01 | 0.00 | 0.02 | 1.86 | 0.00 | 0.11 |
| 200 | 84 | 0.07 | 0.04 | 0.09 | 1.39 | 0.00 | 0.51 |
| 300 | 71 | 0.34 | 0.31 | 0.20 | 0.61 | 0.06 | 1.22 |
| All | 506 | 0.06 | 0.01 | 0.13 | 2.26 | 0.00 | 1.22 |

**Pb Composites - Las Lamas**

| Lead Domain | Count | Mean (% Pb) | Median (% Pb) | Std. Dev. | CV | Min. (% Pb) | Max. (% Pb) |
|---|---|---|---|---|---|---|---|
| 100 | 351 | 0.05 | 0.02 | 0.08 | 1.46 | 0.00 | 0.50 |
| 200 | 84 | 0.17 | 0.09 | 0.20 | 1.14 | 0.01 | 0.89 |
| 300 | 71 | 0.47 | 0.34 | 0.41 | 0.87 | 0.11 | 2.22 |
| All | 506 | 0.12 | 0.04 | 0.22 | 1.81 | 0.00 | 2.22 |

**Zn Composites - Las Lamas**

| Zinc Domain | Count | Mean (% Zn) | Median (% Zn) | Std. Dev. | CV | Min. (% Zn) | Max. (% Zn) |
|---|---|---|---|---|---|---|---|
| 100 | 351 | 0.13 | 0.07 | 0.15 | 1.15 | 0.01 | 1.00 |
| 200 | 84 | 1.46 | 1.22 | 0.98 | 0.67 | 0.02 | 4.88 |
| 300 | 71 | 10.75 | 10.61 | 5.33 | 0.50 | 1.58 | 28.00 |
| All | 506 | 1.65 | 0.13 | 3.94 | 2.39 | 0.01 | 28.00 |

**Ag Composites - San Felipe**

| Silver Domain | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV | Min. (g Ag/t) | Max. (g Ag/t) |
|---|---|---|---|---|---|---|---|
| 100 | 737 | 5.7 | 2.2 | 12.10 | 2.11 | 0.1 | 125.0 |
| 200 | 295 | 24.6 | 14.2 | 31.70 | 1.29 | 0.1 | 175.0 |
| 300 | 119 | 119.4 | 60.5 | 134.80 | 1.13 | 1.7 | 792.8 |
| All | *1151* | *21.7* | *3.7* | *57.30* | *2.65* | *0.1* | *792.8* |

**Cu Composites - San Felipe**

| Copper Domain | Count | Mean (% Cu) | Median (% Cu) | Std. Dev. | CV | Min. (% Cu) | Max. (% Cu) |
|---|---|---|---|---|---|---|---|
| 100 | 737 | 0.01 | 0.01 | 0.03 | 2.08 | 0.00 | 0.25 |
| 200 | 295 | 0.04 | 0.02 | 0.07 | 1.66 | 0.00 | 0.50 |
| 300 | 119 | 0.19 | 0.14 | 0.17 | 0.89 | 0.00 | 1.00 |
| All | 1151 | 0.04 | 0.01 | 0.09 | 2.28 | 0.00 | 1.00 |

**Pb Composites - San Felipe**

| Lead Domain | Count | Mean (% Pb) | Median (% Pb) | Std. Dev. | CV | Min. (% Pb) | Max. (% Pb) |
|---|---|---|---|---|---|---|---|
| 100 | 737 | 0.11 | 0.05 | 0.20 | 1.91 | 0.00 | 2.60 |
| 200 | 295 | 0.70 | 0.30 | 0.92 | 1.32 | 0.00 | 7.00 |
| 300 | 119 | 3.16 | 2.12 | 3.07 | 0.97 | 0.07 | 15.00 |
| All | 1151 | 0.56 | 0.08 | 1.41 | 2.54 | 0.00 | 15.00 |

**Zn Composites - San Felipe**

| Zinc Domain | Count | Mean (% Zn) | Median (% Zn) | Std. Dev. | CV | Min. (% Zn) | Max. (% Zn) |
|---|---|---|---|---|---|---|---|
| 100 | 737 | 0.19 | 0.12 | 0.22 | 1.19 | 0.01 | 3.20 |
| 200 | 295 | 1.28 | 1.02 | 1.04 | 0.81 | 0.01 | 9.20 |
| 300 | 119 | 8.35 | 6.57 | 5.64 | 0.68 | 0.92 | 30.00 |
| All | 1151 | 1.27 | 0.22 | 3.05 | 2.40 | 0.01 | 30.00 |

**Ag Composites - Transversales**

| Silver Domain | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV | Min. (g Ag/t) | Max. (g Ag/t) |
|---|---|---|---|---|---|---|---|
| 100 | 275 | 4.3 | 2.2 | 7.00 | 1.61 | 0.1 | 50.0 |
| 200 | 168 | 19.3 | 14.3 | 18.70 | 0.97 | 0.1 | 100.0 |
| 300 | 17 | 93.9 | 61.5 | 85.10 | 0.91 | 12.3 | 331.0 |
| All | *460* | *12.1* | *4.3* | *24.10* | *2.00* | *0.1* | *331.0* |

**Cu Composites - Transversales**

| Copper Domain | Count | Mean (% Cu) | Median (% Cu) | Std. Dev. | CV | Min. (% Cu) | Max. (% Cu) |
|---|---|---|---|---|---|---|---|
| 100 | 275 | 0.02 | 0.01 | 0.03 | 2.04 | 0.00 | 0.20 |
| 200 | 168 | 0.05 | 0.02 | 0.09 | 1.75 | 0.00 | 0.50 |
| 300 | 17 | 0.23 | 0.16 | 0.18 | 0.77 | 0.00 | 0.70 |
| All | 460 | 0.03 | 0.01 | 0.08 | 2.23 | 0.00 | 0.70 |

**Pb Composites - Transversales**

| Lead Domain | Count | Mean (% Pb) | Median (% Pb) | Std. Dev. | CV | Min. (% Pb) | Max. (% Pb) |
|---|---|---|---|---|---|---|---|
| 100 | 275 | 0.13 | 0.07 | 0.15 | 1.16 | 0.00 | 0.80 |
| 200 | 168 | 0.84 | 0.62 | 0.85 | 1.00 | 0.00 | 6.21 |
| 300 | 17 | 5.30 | 4.26 | 4.42 | 0.83 | 0.31 | 20.00 |
| All | 460 | 0.52 | 0.16 | 1.24 | 2.38 | 0.00 | 20.00 |

**Zn Composites - Transversales**

| Zinc Domain | Count | Mean (% Zn) | Median (% Zn) | Std. Dev. | CV | Min. (% Zn) | Max. (% Zn) |
|---|---|---|---|---|---|---|---|
| 100 | 275 | 0.21 | 0.17 | 0.15 | 0.71 | 0.01 | 0.84 |
| 200 | 168 | 1.21 | 0.95 | 1.00 | 0.83 | 0.03 | 8.00 |
| 300 | 17 | 9.36 | 7.11 | 6.56 | 0.70 | 3.01 | 27.20 |
| All | 460 | 0.81 | 0.31 | 1.94 | 2.39 | 0.01 | 27.20 |

**Ag Composites - La Ventana**

| Silver Domain | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV | Min. (g Ag/t) | Max. (g Ag/t) |
|---|---|---|---|---|---|---|---|
| 100 | 2679 | 3.7 | 1.7 | 6.70 | 1.80 | 0.1 | 100.0 |
| 200 | 1150 | 13.2 | 7.7 | 17.50 | 1.33 | 0.1 | 200.0 |
| 300 | 534 | 85.7 | 56.2 | 92.50 | 1.08 | 0.5 | 1000.0 |
| All | *4363* | *15.6* | *3.1* | *41.90* | *2.68* | *0.1* | *1000.0* |

**Cu Composites - La Ventana**

| Copper Domain | Count | Mean (% Cu) | Median (% Cu) | Std. Dev. | CV | Min. (% Cu) | Max. (% Cu) |
|---|---|---|---|---|---|---|---|
| 100 | 2679 | 0.02 | 0.01 | 0.03 | 2.01 | 0.00 | 0.43 |
| 200 | 1150 | 0.07 | 0.03 | 0.12 | 1.71 | 0.00 | 1.00 |
| 300 | 534 | 0.49 | 0.27 | 0.62 | 1.26 | 0.00 | 4.49 |
| All | *4363* | *0.09* | *0.01* | *0.27* | *3.14* | *0.00* | *4.49* |

**Pb Composites - La Ventana**

| Lead Domain | Count | Mean (% Pb) | Median (% Pb) | Std. Dev. | CV | Min. (% Pb) | Max. (% Pb) |
|---|---|---|---|---|---|---|---|
| 100 | 2679 | 0.17 | 0.07 | 0.28 | 1.66 | 0.00 | 3.30 |
| 200 | 1150 | 0.76 | 0.45 | 0.93 | 1.23 | 0.00 | 12.00 |
| 300 | 534 | 4.08 | 2.87 | 3.91 | 0.96 | 0.02 | 21.90 |
| All | *4363* | *0.77* | *0.14* | *1.88* | *2.43* | *0.00* | *21.90* |

**Zn Composites - La Ventana**

| Zinc Domain | Count | Mean (% Zn) | Median (% Zn) | Std. Dev. | CV | Min. (% Zn) | Max. (% Zn) |
|---|---|---|---|---|---|---|---|
| 100 | 2679 | 0.22 | 0.14 | 0.25 | 1.16 | 0.00 | 3.46 |
| 200 | 1150 | 1.30 | 1.02 | 1.10 | 0.85 | 0.01 | 15.00 |
| 300 | 534 | 8.87 | 6.66 | 6.49 | 0.73 | 0.03 | 38.47 |
| All | *4363* | *1.50* | *0.30* | *3.55* | *2.37* | *0.00* | *38.47* |

# APPENDIX C

Tabulated Resources – San Felipe Deposits

**Indicated by ZnEq Inside Property Limits in La Ventana:**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 6,833,000 | 3.48 | 1.70 | 35.8 | 0.21 | 523,900,000 | 255,739,000 | 7,863,000 | 31,506,000 | 5.88 |
| 1.50 | 5,667,000 | 4.05 | 1.97 | 41.4 | 0.24 | 506,269,000 | 245,857,000 | 7,542,000 | 30,384,000 | 6.83 |
| 2.00 | 4,641,000 | 4.72 | 2.29 | 48.0 | 0.28 | 483,446,000 | 234,421,000 | 7,161,000 | 29,046,000 | 7.95 |
| 2.20 | 4,288,000 | 5.01 | 2.43 | 50.8 | 0.30 | 474,093,000 | 229,518,000 | 7,008,000 | 28,482,000 | 8.44 |
| 2.40 | 3,981,000 | 5.30 | 2.56 | 53.7 | 0.32 | 465,443,000 | 224,558,000 | 6,869,000 | 27,938,000 | 8.91 |
| **2.50** | **3,846,000** | **5.44** | **2.62** | **55.0** | **0.33** | **461,589,000** | **222,038,000** | **6,802,000** | **27,684,000** | **9.14** |
| 2.60 | 3,729,000 | 5.57 | 2.67 | 56.2 | 0.33 | 458,118,000 | 219,787,000 | 6,742,000 | 27,463,000 | 9.35 |
| 2.80 | 3,532,000 | 5.80 | 2.77 | 58.4 | 0.35 | 451,801,000 | 215,861,000 | 6,634,000 | 27,092,000 | 9.72 |
| 3.00 | 3,362,000 | 6.01 | 2.86 | 60.5 | 0.36 | 445,812,000 | 212,343,000 | 6,536,000 | 26,728,000 | 10.06 |
| 3.50 | 3,023,000 | 6.49 | 3.07 | 65.1 | 0.39 | 432,474,000 | 204,465,000 | 6,323,000 | 25,938,000 | 10.83 |
| 4.00 | 2,806,000 | 6.82 | 3.22 | 68.3 | 0.41 | 422,141,000 | 199,064,000 | 6,166,000 | 25,365,000 | 11.38 |
| 4.50 | 2,615,000 | 7.14 | 3.36 | 71.5 | 0.43 | 411,959,000 | 193,485,000 | 6,012,000 | 24,774,000 | 11.90 |
| 5.00 | 2,453,000 | 7.44 | 3.48 | 74.5 | 0.45 | 402,380,000 | 188,041,000 | 5,877,000 | 24,248,000 | 12.37 |
| 6.00 | 2,173,000 | 8.00 | 3.70 | 80.3 | 0.48 | 383,069,000 | 177,125,000 | 5,611,000 | 23,197,000 | 13.26 |
| 7.00 | 1,926,000 | 8.55 | 3.91 | 86.1 | 0.52 | 362,766,000 | 165,951,000 | 5,333,000 | 22,063,000 | 14.13 |
| 8.00 | 1,698,000 | 9.11 | 4.12 | 92.3 | 0.56 | 341,170,000 | 154,074,000 | 5,040,000 | 20,879,000 | 15.02 |
| 9.00 | 1,499,000 | 9.65 | 4.33 | 98.4 | 0.60 | 318,970,000 | 143,101,000 | 4,743,000 | 19,674,000 | 15.89 |
| 10.00 | 1,327,000 | 10.16 | 4.54 | 104.4 | 0.63 | 297,282,000 | 132,691,000 | 4,453,000 | 18,450,000 | 16.72 |

**Inferred by ZnEq Inside Property Limits in La Ventana:**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 2,049,000 | 1.61 | 0.99 | 15.4 | 0.07 | 72,717,000 | 44,662,000 | 1,016,000 | 3,103,000 | 2.91 |
| 1.50 | 1,432,000 | 2.01 | 1.24 | 19.1 | 0.09 | 63,504,000 | 39,155,000 | 880,000 | 2,743,000 | 3.64 |
| 2.00 | 989,000 | 2.45 | 1.56 | 23.7 | 0.11 | 53,332,000 | 34,117,000 | 753,000 | 2,373,000 | 4.50 |
| 2.20 | 836,000 | 2.66 | 1.74 | 26.2 | 0.12 | 49,032,000 | 32,045,000 | 703,000 | 2,218,000 | 4.94 |
| 2.40 | 721,000 | 2.86 | 1.91 | 28.6 | 0.13 | 45,408,000 | 30,417,000 | 664,000 | 2,091,000 | 5.36 |
| **2.50** | **675,000** | **2.95** | **1.99** | **29.8** | **0.14** | **43,912,000** | **29,658,000** | **646,000** | **2,034,000** | **5.56** |
| 2.60 | 632,000 | 3.05 | 2.08 | 31.0 | 0.14 | 42,480,000 | 28,920,000 | 629,000 | 1,986,000 | 5.76 |
| 2.80 | 555,000 | 3.26 | 2.24 | 33.4 | 0.16 | 39,841,000 | 27,440,000 | 595,000 | 1,897,000 | 6.19 |
| 3.00 | 490,000 | 3.48 | 2.41 | 35.8 | 0.17 | 37,604,000 | 26,017,000 | 565,000 | 1,820,000 | 6.62 |
| 3.50 | 382,000 | 3.98 | 2.76 | 41.2 | 0.19 | 33,532,000 | 23,211,000 | 505,000 | 1,639,000 | 7.59 |
| 4.00 | 313,000 | 4.44 | 3.06 | 45.5 | 0.22 | 30,640,000 | 21,090,000 | 458,000 | 1,486,000 | 8.44 |
| 4.50 | 231,000 | 5.38 | 3.45 | 53.8 | 0.26 | 27,422,000 | 17,572,000 | 399,000 | 1,345,000 | 9.94 |
| 5.00 | 191,000 | 6.04 | 3.76 | 59.8 | 0.30 | 25,435,000 | 15,838,000 | 367,000 | 1,264,000 | 11.03 |
| 6.00 | 156,000 | 6.69 | 4.21 | 66.2 | 0.33 | 23,070,000 | 14,520,000 | 333,000 | 1,147,000 | 12.25 |
| 7.00 | 128,000 | 7.35 | 4.70 | 73.0 | 0.36 | 20,707,000 | 13,242,000 | 300,000 | 1,020,000 | 13.54 |
| 8.00 | 105,000 | 8.03 | 5.21 | 80.4 | 0.39 | 18,514,000 | 12,024,000 | 270,000 | 902,000 | 14.89 |
| 9.00 | 87,000 | 8.61 | 5.78 | 86.5 | 0.42 | 16,549,000 | 11,110,000 | 243,000 | 807,000 | 16.17 |
| 10.00 | 74,000 | 9.13 | 6.29 | 91.5 | 0.44 | 14,988,000 | 10,325,000 | 219,000 | 730,000 | 17.31 |

**Indicated by ZnEq in San Felipe:**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 1,583,000 | 3.21 | 1.16 | 54.5 | 0.07 | 111,923,000 | 40,423,000 | 2,772,000 | 2,465,000 | 5.35 |
| 1.50 | 1,224,000 | 3.95 | 1.41 | 66.2 | 0.09 | 106,594,000 | 38,152,000 | 2,603,000 | 2,306,000 | 6.57 |
| 2.00 | 986,000 | 4.68 | 1.65 | 77.1 | 0.10 | 101,785,000 | 35,883,000 | 2,444,000 | 2,159,000 | 7.73 |
| 2.20 | 919,000 | 4.95 | 1.73 | 80.8 | 0.10 | 100,195,000 | 35,073,000 | 2,387,000 | 2,103,000 | 8.15 |
| 2.40 | 864,000 | 5.19 | 1.80 | 84.3 | 0.11 | 98,800,000 | 34,261,000 | 2,343,000 | 2,056,000 | 8.52 |
| **2.50** | **839,000** | **5.30** | **1.83** | **86.1** | **0.11** | **98,125,000** | **33,861,000** | **2,323,000** | **2,033,000** | **8.69** |
| 2.60 | 813,000 | 5.43 | 1.86 | 88.0 | 0.11 | 97,382,000 | 33,406,000 | 2,301,000 | 2,007,000 | 8.89 |
| 2.80 | 768,000 | 5.67 | 1.93 | 91.6 | 0.12 | 95,999,000 | 32,597,000 | 2,261,000 | 1,965,000 | 9.26 |
| 3.00 | 736,000 | 5.86 | 1.97 | 94.3 | 0.12 | 94,977,000 | 31,988,000 | 2,229,000 | 1,932,000 | 9.54 |
| 3.50 | 673,000 | 6.25 | 2.07 | 99.9 | 0.13 | 92,703,000 | 30,663,000 | 2,162,000 | 1,868,000 | 10.12 |
| 4.00 | 624,000 | 6.59 | 2.14 | 105.1 | 0.13 | 90,565,000 | 29,432,000 | 2,107,000 | 1,810,000 | 10.63 |
| 4.50 | 579,000 | 6.92 | 2.21 | 110.1 | 0.14 | 88,333,000 | 28,211,000 | 2,050,000 | 1,748,000 | 11.12 |
| 5.00 | 539,000 | 7.23 | 2.28 | 115.0 | 0.14 | 85,977,000 | 27,138,000 | 1,995,000 | 1,685,000 | 11.59 |
| 6.00 | 473,000 | 7.79 | 2.42 | 124.3 | 0.15 | 81,154,000 | 25,237,000 | 1,889,000 | 1,561,000 | 12.45 |
| 7.00 | 408,000 | 8.42 | 2.56 | 133.6 | 0.15 | 75,784,000 | 23,054,000 | 1,754,000 | 1,395,000 | 13.39 |
| 8.00 | 345,000 | 9.16 | 2.72 | 144.1 | 0.16 | 69,659,000 | 20,644,000 | 1,598,000 | 1,215,000 | 14.47 |
| 9.00 | 305,000 | 9.70 | 2.82 | 151.5 | 0.16 | 65,333,000 | 18,972,000 | 1,488,000 | 1,108,000 | 15.25 |
| 10.00 | 272,000 | 10.21 | 2.91 | 158.0 | 0.17 | 61,200,000 | 17,438,000 | 1,381,000 | 1,012,000 | 15.96 |

**Inferred by ZnEq in San Felipe:**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 1,003,000 | 2.34 | 0.83 | 35.4 | 0.08 | 51,731,000 | 18,463,000 | 1,141,000 | 1,830,000 | 3.82 |
| 1.50 | 715,000 | 3.00 | 1.04 | 45.2 | 0.10 | 47,331,000 | 16,335,000 | 1,040,000 | 1,654,000 | 4.87 |
| 2.00 | 518,000 | 3.78 | 1.25 | 56.5 | 0.13 | 43,149,000 | 14,268,000 | 940,000 | 1,482,000 | 6.05 |
| 2.20 | 450,000 | 4.15 | 1.37 | 62.6 | 0.14 | 41,158,000 | 13,593,000 | 906,000 | 1,418,000 | 6.65 |
| 2.40 | 413,000 | 4.42 | 1.43 | 66.2 | 0.15 | 40,172,000 | 13,036,000 | 878,000 | 1,358,000 | 7.05 |
| **2.50** | **398,000** | **4.53** | **1.46** | **67.7** | **0.15** | **39,753,000** | **12,814,000** | **866,000** | **1,329,000** | **7.22** |
| 2.60 | 385,000 | 4.63 | 1.49 | 69.0 | 0.15 | 39,389,000 | 12,621,000 | 855,000 | 1,304,000 | 7.37 |
| 2.80 | 361,000 | 4.86 | 1.54 | 71.8 | 0.16 | 38,593,000 | 12,229,000 | 832,000 | 1,249,000 | 7.70 |
| 3.00 | 336,000 | 5.09 | 1.59 | 74.7 | 0.16 | 37,779,000 | 11,808,000 | 808,000 | 1,188,000 | 8.04 |
| 3.50 | 291,000 | 5.62 | 1.71 | 80.8 | 0.17 | 36,046,000 | 10,974,000 | 756,000 | 1,063,000 | 8.79 |
| 4.00 | 260,000 | 6.03 | 1.79 | 87.0 | 0.18 | 34,590,000 | 10,234,000 | 727,000 | 1,006,000 | 9.39 |
| 4.50 | 233,000 | 6.45 | 1.86 | 93.0 | 0.18 | 33,154,000 | 9,549,000 | 696,000 | 946,000 | 9.99 |
| 5.00 | 211,000 | 6.85 | 1.92 | 99.0 | 0.20 | 31,820,000 | 8,904,000 | 671,000 | 907,000 | 10.55 |
| 6.00 | 184,000 | 7.33 | 2.05 | 105.3 | 0.21 | 29,780,000 | 8,327,000 | 624,000 | 844,000 | 11.28 |
| 7.00 | 162,000 | 7.77 | 2.17 | 111.3 | 0.22 | 27,682,000 | 7,736,000 | 578,000 | 777,000 | 11.96 |
| 8.00 | 142,000 | 8.18 | 2.29 | 116.7 | 0.23 | 25,568,000 | 7,172,000 | 532,000 | 709,000 | 12.58 |
| 9.00 | 122,000 | 8.61 | 2.42 | 122.2 | 0.23 | 23,178,000 | 6,524,000 | 480,000 | 632,000 | 13.24 |
| 10.00 | 105,000 | 9.01 | 2.56 | 126.5 | 0.24 | 20,787,000 | 5,909,000 | 426,000 | 552,000 | 13.86 |

**Inferred by ZnEq in Las Lamas:**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 590,000 | 3.84 | 0.20 | 58.4 | 0.12 | 49,947,000 | 2,643,000 | 1,108,000 | 1,613,000 | 5.04 |
| 1.50 | 470,000 | 4.63 | 0.22 | 68.5 | 0.15 | 47,933,000 | 2,305,000 | 1,034,000 | 1,530,000 | 6.03 |
| 2.00 | 396,000 | 5.27 | 0.24 | 76.7 | 0.17 | 46,021,000 | 2,076,000 | 977,000 | 1,459,000 | 6.82 |
| 2.20 | 375,000 | 5.49 | 0.24 | 79.4 | 0.17 | 45,346,000 | 2,002,000 | 957,000 | 1,434,000 | 7.10 |
| 2.40 | 358,000 | 5.66 | 0.25 | 81.6 | 0.18 | 44,770,000 | 1,957,000 | 940,000 | 1,412,000 | 7.31 |
| **2.50** | **351,000** | **5.75** | **0.25** | **82.6** | **0.18** | **44,478,000** | **1,935,000** | **932,000** | **1,401,000** | **7.42** |
| 2.60 | 343,000 | 5.85 | 0.25 | 83.7 | 0.18 | 44,155,000 | 1,913,000 | 922,000 | 1,389,000 | 7.54 |
| 2.80 | 329,000 | 6.01 | 0.26 | 85.6 | 0.19 | 43,585,000 | 1,876,000 | 906,000 | 1,368,000 | 7.73 |
| 3.00 | 318,000 | 6.15 | 0.26 | 87.4 | 0.19 | 43,048,000 | 1,843,000 | 892,000 | 1,349,000 | 7.91 |
| 3.50 | 291,000 | 6.49 | 0.27 | 91.7 | 0.20 | 41,642,000 | 1,759,000 | 858,000 | 1,298,000 | 8.33 |
| 4.00 | 267,000 | 6.82 | 0.28 | 95.8 | 0.21 | 40,146,000 | 1,675,000 | 822,000 | 1,245,000 | 8.75 |
| 4.50 | 245,000 | 7.15 | 0.29 | 100.0 | 0.22 | 38,588,000 | 1,588,000 | 787,000 | 1,191,000 | 9.16 |
| 5.00 | 224,000 | 7.48 | 0.30 | 103.9 | 0.23 | 36,969,000 | 1,496,000 | 748,000 | 1,136,000 | 9.57 |
| 6.00 | 183,000 | 8.22 | 0.32 | 112.6 | 0.25 | 33,238,000 | 1,304,000 | 664,000 | 1,011,000 | 10.47 |
| 7.00 | 153,000 | 8.87 | 0.34 | 120.6 | 0.27 | 29,841,000 | 1,151,000 | 592,000 | 900,000 | 11.28 |
| 8.00 | 126,000 | 9.52 | 0.36 | 128.7 | 0.28 | 26,437,000 | 1,002,000 | 521,000 | 787,000 | 12.09 |
| 9.00 | 104,000 | 10.13 | 0.38 | 136.7 | 0.30 | 23,226,000 | 866,000 | 457,000 | 684,000 | 12.85 |
| 10.00 | 84,000 | 10.76 | 0.40 | 145.4 | 0.31 | 19,943,000 | 734,000 | 393,000 | 579,000 | 13.65 |

**Inferred by ZnEq in Transversales:**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 2,136,000 | 1.26 | 0.84 | 20.1 | 0.05 | 59,130,000 | 39,665,000 | 1,381,000 | 2,322,000 | 2.49 |
| 1.50 | 1,612,000 | 1.46 | 0.98 | 23.3 | 0.06 | 51,983,000 | 34,872,000 | 1,206,000 | 1,973,000 | 2.89 |
| 2.00 | 1,130,000 | 1.71 | 1.15 | 27.0 | 0.07 | 42,512,000 | 28,621,000 | 981,000 | 1,631,000 | 3.38 |
| 2.20 | 902,000 | 1.88 | 1.25 | 29.6 | 0.07 | 37,407,000 | 24,869,000 | 857,000 | 1,467,000 | 3.70 |
| 2.40 | 671,000 | 2.15 | 1.39 | 33.6 | 0.09 | 31,878,000 | 20,515,000 | 724,000 | 1,298,000 | 4.19 |
| **2.50** | **584,000** | **2.31** | **1.46** | **35.5** | **0.09** | **29,702,000** | **18,759,000** | **666,000** | **1,219,000** | **4.45** |
| 2.60 | 520,000 | 2.45 | 1.52 | 37.2 | 0.10 | 28,042,000 | 17,430,000 | 621,000 | 1,155,000 | 4.68 |
| 2.80 | 401,000 | 2.81 | 1.68 | 40.5 | 0.11 | 24,880,000 | 14,825,000 | 522,000 | 1,009,000 | 5.27 |
| 3.00 | 330,000 | 3.15 | 1.81 | 43.2 | 0.12 | 22,864,000 | 13,156,000 | 457,000 | 897,000 | 5.79 |
| 3.50 | 230,000 | 3.88 | 2.06 | 49.6 | 0.13 | 19,696,000 | 10,477,000 | 367,000 | 655,000 | 6.90 |
| 4.00 | 187,000 | 4.32 | 2.25 | 54.4 | 0.14 | 17,870,000 | 9,303,000 | 328,000 | 581,000 | 7.62 |
| 4.50 | 158,000 | 4.72 | 2.41 | 58.8 | 0.15 | 16,428,000 | 8,367,000 | 298,000 | 524,000 | 8.26 |
| 5.00 | 136,000 | 5.08 | 2.53 | 63.1 | 0.16 | 15,239,000 | 7,596,000 | 276,000 | 482,000 | 8.82 |
| 6.00 | 103,000 | 5.78 | 2.75 | 71.5 | 0.18 | 13,128,000 | 6,255,000 | 237,000 | 410,000 | 9.90 |
| 7.00 | 80,000 | 6.41 | 2.99 | 78.8 | 0.20 | 11,296,000 | 5,265,000 | 203,000 | 346,000 | 10.89 |
| 8.00 | 63,000 | 6.94 | 3.27 | 85.3 | 0.21 | 9,583,000 | 4,521,000 | 172,000 | 296,000 | 11.84 |
| 9.00 | 49,000 | 7.53 | 3.50 | 93.1 | 0.23 | 8,096,000 | 3,760,000 | 146,000 | 248,000 | 12.79 |
| 10.00 | 37,000 | 8.28 | 3.59 | 103.6 | 0.25 | 6,797,000 | 2,950,000 | 124,000 | 204,000 | 13.83 |