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## **CALIBRE MINING CORP.**

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# **TECHNICAL REPORT ON THE LA LIBERTAD MINE, CHONTALES DEPARTMENT, NICARAGUA**

**NI 43-101 Report**

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# 1 SUMMARY

## EXECUTIVE SUMMARY

Roscoe Postle Associates Inc. (RPA) was retained by Calibre Mining Corp. (Calibre) to prepare an independent Technical Report on the La Libertad Mine (the Project or La Libertad), located in Chontales Department, Nicaragua. The purpose of the Technical Report was to document updated Mineral Resource estimates and provide a summary of the current status of the mine. Subsequently, RPA has identified a typographical error on the effective date of Tables 1-1 and 14-1 and has revised these from June 30, 2019 to December 31, 2018, and prepared this Amended Technical Report dated January 31, 2020. In addition, RPA has included some operating information in Section 16 Mining Methods and Section 21 Capital and Operating Costs. This Technical Report conforms to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). The effective date of this Amended Technical Report is June 30, 2019, and information in this Technical Report is current as of that date unless otherwise specified. RPA visited the Project on April 30, 2019.

Calibre is a Vancouver-based company formed in January 1969. It is a reporting issuer in British Columbia and Alberta and is under the jurisdiction of the British Columbia Securities Commission. Its shares trade on the Toronto Venture Exchange under the symbol CXB.V.

Calibre is focussed on the exploration, development, and operation of gold-silver-copper deposits in Nicaragua. Calibre has extensive land holdings at various stages of exploration in the Borosi area and a number of other exploration projects in Nicaragua.

On July 2, 2019, Calibre announced that it had entered into a transaction with B2Gold Corp. (B2Gold) whereby it would acquire the producing La Libertad and El Limón gold mines as well as the Pavon gold project and other mineral concessions in Nicaragua held by B2Gold for an aggregate consideration of \$100 million, to be paid with a combination of cash, common shares, and a convertible debenture. Following completion of the transaction, B2Gold will own an approximate 31% direct equity interest in Calibre.

The La Libertad exploitation concession covers an area of 10,937.08 ha and was granted by Ministerial Decree for a 40-year term in 1994. The Project also comprises the Buenaventura

and Cerro Quiroz exploration concessions, which are contiguous with the La Libertad exploitation concession and cover a total area of 4,600 ha. The Project is located approximately 110 km east of the capital of Managua and is accessible by road.

The La Libertad Mine is an open pit and underground operation using conventional open pit methods at the San Juan and Tope (San Diego) pits and a bottom-up sequenced long hole stoping mining method with unconsolidated backfill in the Jabalí underground mine. The La Libertad processing plant can treat approximately 2.25 million tonnes per annum (tpa), and current gold recoveries are approximately 94% to 95% for a blend of spent ore and run of mine (ROM) ore.

The current La Libertad Life of Mine plan (LOM) includes the mining of surface and underground Mineral Resources and processing of historically placed heap leach material as well as Mineral Resources produced by surface and underground mining operations. This plant feed does not satisfy the requirements to be classified as a Mineral Reserve.

Calibre's exploration strategy for the Project starting in October 2019 will be to infill drill Inferred Mineral Resources, concurrently with exploration programs that target Mineral Resource expansions at existing and new deposits. A care and maintenance (C&M) option to support exploration activities, maintain site facilities, and defer site closure has been developed. Following the completion of the current LOM, Calibre plans to continue exploration activities with C&M costs included in the overall exploration budget. In general, the C&M scenario will minimize costs and activities while options are evaluated for continued operations.

In October 2006, Scott Wilson Roscoe Postle Associates Inc. (Scott Wilson RPA), a predecessor company to RPA, completed a technical report on the La Libertad Mine on behalf of Glencairn Gold Corporation (Glencairn) to document a Mineral Resource estimate and report on the status of the mine at that time. In June 2008, Scott Wilson RPA completed a technical report on the La Libertad Mine on behalf of Central Sun Mining Inc. (Central Sun) to summarize and document the results of a definitive feasibility study, including Mineral Resource and Mineral Reserve estimates, and a change from heap leaching to conventional milling.

The Mineral Resources for La Libertad, effective December 31, 2018, are summarized in Table 1-1. Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for

Mineral Resources and Mineral Reserves (CIM (2014) definitions) were used for Mineral Resource classification.

**TABLE 1-1 MINERAL RESOURCES - DECEMBER 31, 2018**  
**Calibre Mining Corp. – La Libertad Mine**

Area	Tonnes (kt)	Grade (g/t Au)	Contained Au (koz)
<b>Indicated</b>			
Jabalí Central OP	381	2.22	27
Jabalí Antena OP	457	4.90	72
San Juan OP	124	7.19	29
Mojón UG	68	4.52	10
Tope OP	48	4.25	7
Spent H/L Ore	902	0.77	22
Stockpile	8	0.75	0.2
<b>Total Indicated</b>	<b>1,987</b>	<b>2.61</b>	<b>167</b>
<b>Inferred</b>			
Jabalí Central OP	185	2.26	13
Jabalí UG	1,135	7.81	285
Tope OP	214	2.50	17
Spent H/L Ore	206	0.76	5
Mojón UG	300	4.14	40
San Juan UG	326	2.88	30
Socorro (formerly Chamarro) OP	217	1.56	11
Rosario OP	260	2.08	17
San Antonio OP	374	2.75	33
<b>Total Inferred</b>	<b>3,216</b>	<b>4.37</b>	<b>452</b>

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are based on 100% ownership.
3. Mineral Resources are estimated at cut-off grades ranging from 0.62 g/t Au to 0.68 g/t Au for open pits and 2.80 g/t Au to 2.85 g/t Au for underground.
4. Mineral Resources are estimated using a long-term gold price of US\$1,400 per ounce.
5. Bulk density is 1.70 t/m<sup>3</sup> to 2.65 t/m<sup>3</sup>.
6. Numbers may not add due to rounding.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

All currency in this report is US dollars (US\$) unless otherwise noted.

## CONCLUSIONS

RPA has the following conclusions.

### **GEOLOGY AND MINERAL RESOURCES**

- The La Libertad deposits are low-sulphidation epithermal deposits hosted by volcanic lithologies.
- The sampling, sample preparation, analyses, security, and data verification meet industry standards and are appropriate for Mineral Resource estimation.
- The composite lengths are reasonable.
- The interpretation of the mineralization, wireframes, and block sizes are appropriate.
- Capping restrictions are reasonable, however, a distance restriction should be considered to control the smearing of high grade in some deposits.
- The grade interpolation strategies are appropriate for the style of mineralization.
- The parameters, assumptions, and methodology used for Mineral Resource estimation are appropriate for the style of mineralization.
- Total Mineral Resources at La Libertad are:
  - Indicated – 2.0 million tonnes, grading 2.61 g/t Au, containing 167,000 oz Au
  - Inferred – 3.2 million tonnes, grading 4.37 g/t Au, containing 452,000 oz Au
- The overall Mineral Resource classification is reasonable and conforms to CIM (2014) definitions.
- There is potential to outline additional Mineral Resources with an exploration program.

### **MINING**

- There are no Mineral Reserves on the Project, however, there is a two-year production schedule to mine much of the remaining Mineral Resources in 2019 and 2020 totalling 2.4 million tonnes grading 1.45 g/t Au resulting in a total of 115,000 contained gold ounces.
- Most of the planned ounces in the remaining two years of production come from the San Juan and Tope open pits, Jabalí open pit and underground mines, and spent heap leach ore stockpile.

### **PROCESS**

- The La Libertad processing plant can treat approximately 2.25 million tpa, and current gold recoveries are approximately 94% to 95% for a blend of spent ore and ROM ore.
- Feed grades to the processing plant were significantly below budget in 2017 and 2018, a trend which has continued into 2019. In RPA's opinion, this trend is likely to continue unless mitigating strategies are implemented.

### **ENVIRONMENTAL CONSIDERATIONS**

- La Libertad has adopted an Environmental Policy (2018) and a Biodiversity Policy (2018) designed to ensure that environmental risks continue to be identified and are

adequately addressed while committing to environmental protection for all its activities. In addition, La Libertad has established an Occupational, Health and Safety Policy (2018) aimed at minimizing risks to its workers and a Corporate Social Responsibility policy to openly and respectfully engage with community stakeholders. These policies are, in part, implemented through the site Health, Safety and Environment Management System and Social Management System. These systems provide La Libertad staff with a clear understanding of the company's expectations regarding how to effectively manage the key risks associated with La Libertad, which leads to positive environmental and social outcomes.

- This management system is based on international standards including compliance with in-country regulations, relevant International Organization for Standardization (ISO) and Occupational Health, Safety and Security standards, and reliance on the International Finance Corporation (IFC) Performance Standards and international best practices in cases where national regulatory systems are not sufficiently stringent.
- According to the monthly environmental reports, there were no water contamination incidents and no erosion/subsidence incidents during the reviewed period.
- The Esperanza tailings storage facility (TSF) at La Libertad is nearly at the design capacity of its current raise, stage 7, and has a large pond with little freeboard to the crest. For future tailings management, Calibre is looking into in-pit tailings deposition, which is a good opportunity for the Project due to the numerous completed pits and the typically low risk posed by in-pit tailings deposition.
- A care and maintenance (C&M) strategy has been developed to minimize closure cost activities while options for continued operation, full closure, or suitable alternatives are developed. The C&M strategy carries a \$4.5 million annual cost. The total estimated cost to complete La Libertad and Santo Domingo Mines Closure and Transition Plan by 2028 is \$30.5 million, inclusive of five-year post-closure monitoring (2023-2028) and factors indirect costs. It accounts for social closure costs, severance, closure monitoring, and additional studies.

## RECOMMENDATIONS

RPA has the following recommendations.

### **GEOLOGY AND MINERAL RESOURCES**

- Complete additional drilling of mined out areas in open pit resources that were not surveyed and host backfill that is classified as Inferred Mineral Resources to determine the true extent of the openings and grade of the material contained therein.
- Complete further review of the methodology for estimation of tonnage and grade in grade material backfill classified as Inferred Mineral Resources.
- Conduct a study on reconciliation of grade material backfill.
- Apply minimum thickness constraints to narrow areas of selected wireframes in the La Libertad deposit.
- In addition to capping high grade outliers, consider using a distance restriction to control the smearing of high grade in some deposits.



- Conduct a two-phase exploration program with Phase 2 contingent on the results of Phase 1.
- Phase 1 – 30,000 m diamond drilling and related studies - C\$10 million.
- Phase 2 - 40,000 m diamond drilling and related studies – C\$14 million.

#### **MINING**

- Account for multiple sources of dilution, including internal dilution due to grade variability within the selective mining unit (SMU), external dilution resulting from geological/geometric contacts, and operational dilution that accounts for production errors, pressures, and schedule demands. Therefore, adherence to a strict grade control program will be essential to achieve good control of dilution.

#### **PROCESS**

- Analyze the strategic and financial benefits of reduced plant throughput to accommodate reduced ROM ore production, or the exhaustion or exclusion of spent ore from the processing plant. This can be achieved by the implementation of various grinding circuit configurations.

#### **ENVIRONMENTAL CONSIDERATIONS**

- Discuss, with regulators, the opportunity of providing an Umbrella Semi-detailed Environmental Impact Assessment (EIAsd) that covers all foreseeable exploration activities for any given calendar year, in order to minimize permitting activities.
- Continue to evaluate noise and vibration impacts resulting from the Project to ensure operations are within International Best Practices.
- Continue to evaluate noise and vibration impacts resulting from the Project and include limits in all monitoring with corrective actions for compliance.
- Continue to implement the site Environmental Management Plan which monitors and manages potential environmental impacts resulting from the Project to inform permit applications and the closure plan.
- Air quality monitoring indicates consistent particulate matter exceedances. Review management and mitigation corrective actions for compliance.
- Review existing flora and fauna studies within the Project footprint and the area of influence, with the aim of informing the closure plan and siting studies for future operations and site infrastructure development.
- Continue to ensure all necessary permits are obtained for operating the site in the medium and long term.
- Carry out studies regarding the presence of known or registered archaeological sites or other cultural heritage features on the La Libertad property.
- Implement a water balance for ongoing operations (if a water balance is not already in place) by mine operations personnel using meteorological and water monitoring data on a regular basis. The water balance is an important tool to track trends and conduct short-term predictions through simulation of variable operating and/or climatic scenarios to support decision making associated with pond operation (e.g., maintaining adequate freeboard at all times) and water discharge.



- The Esperanza TSF closure costs require additional consideration and review. The existing tailings deposition plan up to closure may have significant fill volume requirements for regrading and potential construction challenges associated with placing fill over soft wet tailings.
- To improve dam safety and to simplify closure cover requirements, deposition planning in the Esperanza TSF should be revised to displace the pond away from the dam using tailings and to promote drainage towards the spillway. Additional capacity at the Esperanza TSF should be considered if beneficial for reducing the facility closure costs and risk.
- Opportunities for in-pit tailings depositions should be investigated for future tailings management strategies.

## TECHNICAL SUMMARY

### PROPERTY DESCRIPTION AND LOCATION

The La Libertad site is located in the municipal area of La Libertad, Chontales Department, Republic of Nicaragua, approximately 110 km due east of Managua, the capital city of Nicaragua. Access to the Project site from Managua is via a well-maintained paved highway to Juigalpa (201 km), and subsequently via a gravel road (30 km) travelling eastward to the village of La Libertad.

### LAND TENURE

The Project consists of a contiguous block comprising one exploitation concession and two exploration concessions totalling 15,550 ha. On July 2, 2019, Calibre announced that it had entered into a transaction with B2Gold Corp. (B2Gold) whereby it would acquire the producing La Libertad and El Limón gold mines as well as the Pavon gold project and other mineral concessions in Nicaragua held by B2Gold for an aggregate consideration of \$100 million, to be paid with a combination of cash, common shares, and a convertible debenture.

### EXISTING INFRASTRUCTURE

Since La Libertad has been in operation for many years, the infrastructure is well developed.

- A processing plant consisting of comminution, agitated cyanide leaching, and carbon adsorption, followed by carbon elution, electrowinning, and doré production, with an annual throughput of approximately 2.25 million tonnes of ore per year.
- Power to the mine via a dedicated 138 kVA line which is fed from a substation near Juigalpa.
- Well established transportation network.

- A conventional TSF located near the plant and office area, expected to provide capacity until end of 2020.
- A number of waste disposal areas around the open pits.

## **HISTORY**

The district has been explored by prospectors, small scale miners, and mining companies for the last 150 years.

Mining operations at La Libertad were sporadic until the mine was privatized in 1994. Effective August 26, 1994, Greenstone Resources Canada Ltd. (Greenstone) purchased an interest in the mine, and formed a new company called Minera Nicaragüense S.A. (MINISA). The new company was formed with the purpose of developing a large-scale gold mining operation out of the small La Libertad operation.

Greenstone completed a feasibility study in 1995, acquired the remaining interest in the mine in 1996, and resumed operation in 1997, using heap leach processing to recover gold. Greenstone operated the mine from 1997 to mid-1999, mining 3.1 million tonnes, at a grade of 1.9 g/t Au, and producing 103,000 ounces of gold.

By 1999, Greenstone was suffering financial difficulties, and Leslie Coe, an individual investor, acquired the mine by repaying Greenstone's debt to vendors. The name of the new company was Desarrollo Minero de Nicaragua S.A. (DESMINIC). In early 2001, DESMINIC rehabilitated the heap leach operation at La Libertad, and resumed operations.

Operations from 2001 to 2007 were mostly continuous, with some temporary shutdowns reported as being for maintenance purposes. Mine production has been largely from a series of pits along the main Mojón-Crimea structure. Significant production was also achieved from the Esmeralda structure located parallel to and immediately south of the Mojón pits. Mine production for 2001 to March 2007 totalled 6.7 million tonnes, at a grade of 1.66 g/t Au, producing 207,000 ounces of gold.

Ownership of DESMINIC passed through several companies via merger and acquisition, until July 6, 2006, when Glencairn purchased a 100% interest in La Libertad Mine.

AMEC conducted test work and studied the potential for conversion of the heap leach process to conventional milling for Glencairn, completing a scoping study in May 2007. Results were positive, and open pit mining was halted in March 2007 in order to proceed with the process upgrade. Glencairn commissioned a feasibility study and investigated sources of mill equipment.

Glencairn underwent a name change to Central Sun on November 29, 2007. Along with the corporate name change, the La Libertad operation was renamed Orosi.

B2Gold acquired Central Sun on March 26, 2009 and completed the construction of the mill in the fourth quarter of 2009 and commenced ore processing at the La Libertad Mine on December 15, 2009.

## **GEOLOGY AND MINERALIZATION**

La Libertad gold district covers an area of approximately 150 km<sup>2</sup> and lies within a broad belt of Tertiary volcanic rocks that have been differentiated into two major units called the Matagalpa and the Coyol Groups. The Oligocene to Miocene age Matagalpa Group consists of intermediate to felsic pyroclastic rocks. Unconformably overlying the Matagalpa Group are Miocene-aged mafic to intermediate lavas of the Lower Coyol unit.

The rocks of the Lower Coyol unit host the gold-bearing low-sulphidation epithermal quartz veins in the La Libertad gold district. Gold mineralization at La Libertad is contained within vein sets along two parallel trends separated by approximately 500 m. The Mojón-Crimea Trend is nearly four kilometres long, strikes 065°, and dips on average 80° to the southeast. The down-dip dimension is commonly in the order of 200 m to 250 m. The massive quartz veins and adjacent stockwork/stringer zones range in width from 2.0 m to 70 m for an average of 15 m, often narrowing at depth. The Santa Mariá-Esmeralda Trend is discontinuous, with the Santa Mariá and Esmeralda veins separated by approximately 1,000 m. The Santa Mariá vein averages 10 m wide and is approximately 450 m long. The Esmeralda Vein has been mined out. Additional mineralization is contained within previously mined material that has been crushed and partly processed by heap leach methods.

## EXPLORATION STATUS

Exploration at La Libertad mostly comprises drilling. Other exploration methods include prospecting, geological mapping, geophysical and geochemical surveys, and trenching.

In RPA's opinion, there is potential to outline additional resources in the following areas:

- Extension to currently producing areas:
  - Mojón
  - San Juan
  - Tope (San Diego)
  - Jabalí Central/West
  - Jabalí Antena UG
  
- Existing resource areas not currently producing:
  - Soccoro (formerly Chamarro)
  - Rosario
  - San Antonio
  
- Advanced Targets:
  - Buenos Aires (including Nancite and Tranca)
  - Esmeralda North
  - Cosmatillo
  - Volcan
  - Morales
  - Santa Julia
  - Amalia (regional)
  - Quintana
  
- Conceptual Targets

Calibre has planned a two-phase exploration program to explore for and potentially outline additional Mineral Resources at La Libertad. The Phase 1 program would cost C\$10 million and would require 12 months to complete. The Phase 2 program, C\$14 million over 12 months, would be contingent on the results of Phase 1. Diamond drilling and assaying accounts for approximately 70% of the total cost while the remainder is for salaries and support, and technical studies. RPA concurs with the recommended program and budget.

## MINERAL RESOURCES

The La Libertad Mineral Resources, effective December 31, 2018, are summarized in Table 1-1.

Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves (CIM (2014) definitions) were used for Mineral Resource classification.

The Mineral Resources at La Libertad Mine were estimated by B2Gold and reviewed and accepted by RPA. The Mineral Resources are contained in nine proposed open pit and underground mining scenarios as well as spent ore from a previous heap leach operation and surface stockpiles.

To fulfill the CIM requirement of “reasonable prospects for eventual economic extraction” of open pit scenarios, RPA prepared a preliminary open pit shell for each mineralized zone to constrain the block model for resource reporting purposes. Each preliminary pit shell was generated using Whittle software. For deposits designated as underground scenarios, a range of cut-off grades from 2.80 g/t Au to 2.85 g/t Au was developed that reflects the mining costs based on the likely mining method, processing costs, and gold price.

La Libertad Mineral Resources are based on approximately 92,039 assays from 124,929 m of diamond drilling, RC drilling, and channel samples in 1,364 holes. The drilling was conducted almost exclusively from surface, with the exception of a small number of diamond drill holes completed from underground.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

## **MINING AND MINERAL RESERVES**

There are no Mineral Reserves on the Project.

There is currently a two-year production schedule to mine much of the remaining Mineral Resources in 2019 and 2020. This schedule totals 2.4 million tonnes grading 1.45 g/t Au resulting in a total of 115,000 contained gold ounces.

The remaining two-year production schedule features higher than usual average open pit stripping ratio of 7.7:1 with a maximum of 37.1:1.

The operation also has multiple sources of dilution including:

- Internal dilution due to grade variability within the SMU,
- External dilution resulting from geological/geometric contacts,

- Operational dilution that accounts for production errors, pressures, and schedule demands.

Mining operations use conventional open pit mining methods and a bottom-up sequenced long hole stoping mining method with unconsolidated backfill at the Jabalí underground mine.

Open pit drilling, blasting, and ore control are performed by Calibre personnel. Loading and haulage of both ore and waste are performed by a contractor.

Underground mining has been performed in the past by a contractor but is planned to transition to an in-house team starting in 2020.

## **MINERAL PROCESSING**

Mill feed is processed through a grinding circuit consisting of a semi-autogenous grinding (SAG) mill, pebble crusher, and two ball mills, then classified by cyclones, thickened, and passed to a series of leach tanks. The leached slurry is processed in a carbon-in-pulp (CIP) circuit; then loaded carbon is delivered to the absorption, desorption, and refining (ADR) plant for stripping, electrowinning, and production of gold and silver doré bars. The annual throughput is approximately 2.25 million tpa and current gold recoveries are approximately 94% to 95%.

## **ENVIRONMENTAL, PERMITTING AND SOCIAL CONSIDERATIONS**

Permits to operate the site appear to be in place. Discussions with regulators should be held to find ways to more efficiently approve exploration EIAs.

Social issues and stakeholder consultation are carried out in line with international best practice.

According to the monthly environmental reports, there were no water contamination incidents and no erosion/subsidence incidents during the reviewed period.

The Esperanza TSF has been used since 2008 and the mined out Crimea pit has also been used for tailings storage. The proposed TSF facility raise (stage 7a) would provide capacity until end of 2020. The Esperanza TSF is nearly at the design capacity of its current raise,

stage 7, and has a large pond with little freeboard to the crest. The final tailings deposition plan snapshots indicate that the plan places the pond against the dam, which does not mitigate dam safety risks. The proposed closure plan calls for a soil cover over the interior of the TSF, including through the current pond area, however, this involves schedule and cost risks due to material sourcing and construction on wet tailings. Closure planning documents indicate that a three metre Stage 7a raise of the TSF is being considered or is in use.

The mine waste rock on the Project is non-acid generating and has been stored in a number of waste rock dumps around the open pits.

The total estimated cost to complete La Libertad and Santo Domingo Mines Closure and Transition Plan by 2028 is \$30.5 million, inclusive of five-year post-closure monitoring (2023-2028) and factors indirect costs.

## CAPITAL AND OPERATING COSTS

A summary of the LOM capital costs for the remaining two years of the production schedule in 2019 and 2020 is provided in Table 1-2.

**TABLE 1-2 LIFE OF MINE CAPITAL COSTS**  
**Calibre Mining Corp. – La Libertad Mine**

Item	Total (\$000)
Mining*	8,864
Process	11,054
Site General	143
Distributable	-
General and Administrative (G&A)	-
<b>Total Sustaining Capital</b>	<b>20,062</b>
<b>Total Closure/Reclamation Capital</b>	<b>28,249</b>
<b>Total Capital</b>	<b>48,310</b>

The sustaining capital costs for La Libertad mainly consist of a TSF dam raise in 2019 and equipment purchase for mining the Jabalí underground mine. Note that capitalized waste costs were included as expensed operating cost for simplicity since the operation only has a two-year production window.

Total mine closure costs are estimated to be \$28.2 million spent over 10 years, with \$20 million of direct closure/reclamation costs over the first five years and \$8.2 million over the remaining five years of post closure monitoring.

The unit operating costs for the Project are listed in Table 1-3.

**TABLE 1-3 LIFE OF MINE OPERATING COSTS  
Calibre Mining Corp. – La Libertad Mine**

Item	Units	Total \$
Surface Mining <sup>1</sup>	\$/t mined	2.98
Surface Mining <sup>1</sup>	\$/t milled	16.78
Underground Mining <sup>1</sup>	\$/t milled	52.42
Processing	\$/t milled	14.37
Site General	\$/t milled	4.21
Annual License	\$/t milled	0.05
Corporate G&A	\$/t milled	1.66
CSR Projects	\$/t milled	0.37
<b>Total Unit Operating Cost</b>	<b>\$/t milled</b>	<b>89.85</b>

Note:

1. Includes capitalized waste costs.

The operating cost estimates are prepared based on recent operating performance and the current operating budget. RPA considers these operating cost estimates to be reasonable, as long as the production targets are realized.

It should be noted that the costs of open pit pre-stripping and underground development are considered expensed in Table 1-3 whereas usually they would be considered capitalized waste costs and not included in operating cost unit rates. This was done for simplicity since the operation has only a two-year production window.

Corporate G&A costs include the Managua regional office and Vancouver head office operations costs.



## 2 INTRODUCTION

Roscoe Postle Associates Inc. (RPA) was retained by Calibre Mining Corp. (Calibre) to prepare an independent Technical Report on the La Libertad Mine (the Project or La Libertad), located in Chontales Department, Nicaragua. The purpose of the Technical Report was to document updated Mineral Resource estimates and provide a summary of the current status of the mine. Subsequently, RPA has identified a typographical error on the effective date of Tables 1-1 and 14-1 and has revised these from June 30, 2019 to December 31, 2018, and prepared this Amended Technical Report dated January 31, 2020. In addition, RPA has included some operating information in Section 16 Mining Methods and Section 21 Capital and Operating Costs. This Technical Report conforms to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). The effective date of this Amended Technical Report is June 30, 2019, and information in this Technical Report is current as of that date unless otherwise specified.

Calibre is a Vancouver-based company formed in January 1969. It is a reporting issuer in British Columbia and Alberta and is under the jurisdiction of the British Columbia Securities Commission. Its shares trade on the Toronto Venture Exchange under the symbol CXB.V.

Calibre is focussed on the exploration, development, and operation of gold-silver-copper deposits in Nicaragua. Calibre has extensive land holdings at various stages of exploration in the Borosi area and a number of other exploration projects in Nicaragua.

On July 2, 2019, Calibre announced that it had entered into a transaction with B2Gold Corp. (B2Gold) whereby it would acquire the producing La Libertad and El Limón gold mines as well as the Pavon gold project and other mineral concessions in Nicaragua held by B2Gold for an aggregate consideration of \$100 million, to be paid with a combination of cash, common shares, and a convertible debenture. Following completion of the transaction, B2Gold will own an approximate 31% direct equity interest in Calibre.

The La Libertad Mine consists of one exploitation concession and two contiguous exploration concessions covering an aggregate area of approximately 15,537 ha located in the La Libertad municipality, Chontales Department, approximately 110 km east of the capital of Managua. The Project is accessible by road.

The La Libertad Mine is an open pit and underground operation using conventional open pit methods at the San Juan and Tope (San Diego) pits and a bottom-up sequenced long hole stoping mining method with unconsolidated backfill in the Jabalí underground mine. The La Libertad processing plant can treat approximately 2.25 million tonnes per annum (tpa), and current gold recoveries are approximately 94% to 95% for a blend of spent ore and run of mine (ROM) ore. La Libertad is currently operating, with process plant feed consisting of Mineral Resources. The majority of the Mineral Resources are classified as Inferred, and as such do not satisfy the requirements to be classified as a Mineral Reserve.

## SOURCES OF INFORMATION

A site visit to La Libertad was carried out by Scott C. Ladd, P.Eng., formerly RPA Principal Mining Engineer, Lance Engelbrecht, RPA Principal Metallurgist, and Stephan Theben, Dipl-Ing., SLR Consulting (Canada) Ltd. (SLR), Mining Sector Lead and Managing Principal on April 30, 2019.

During the visit, discussions were held with personnel from B2Gold:

- Dale Craig, Vice President Operation
- Omar Vega, Country Manager
- Jorge Marin, Country Operations Manager
- Carlos Barberena, General Manager
- Cesar Rivera, Operations Mine Manager
- Roberto Soto, Mine Superintendent
- Jorge Camacho, Process Plant Superintendent
- Carlos Perez, Maintenance Superintendent
- Hector Kaufmann, Environmental Superintendent
- William Ramirez, Health and Safety Superintendent
- Raul Novoa, Corporate Social Responsibility Superintendent
- Thomas Lee, Corporate Affairs Manager

José M. Texidor Carlsson, M.Sc., P.Geo., RPA Senior Geologist, and Wayne W. Valliant, P.Geo., RPA Principal Geologist, visited the B2Gold Vancouver office on April 29 and 30, 2019 and held discussions relating to the geology and resource estimation of the Mine. During the visit, discussions were held with the following personnel from B2Gold:

- Brian Scott, Vice-President, Geology and Technical Services
- Tyler McKinnon, Senior Resource Geologist
- Susan Meister, Manager, Technical Services
- Maggie Harder, Resource Modeller
- Kevin Pemberton, Chief Engineer

This report was prepared by Grant A. Malensek, P.Eng./P.Geo., RPA Managing Principal Mining Engineer, Mr. Valliant., Brenna J.Y. Scholey, P.Eng., RPA Principal Metallurgist, Mr. Texidor Carlsson, and Luis Vasquez, M.Sc., P.Eng, SLR Senior Environmental Consultant and Hydrotechnical Engineer. Mr. Malensek is responsible for overall preparation of the report and specifically for Sections 15, 16, 18, 19, 21, 22, and 24. Mr. Valliant prepared Sections 4 to 12 and 23. Mr. Texidor Carlsson prepared Section 14. Ms. Scholey prepared Sections 13 and 17 and was assisted by Mr. Engelbrecht. Mr. Vasquez prepared Section 20, with the assistance of Mr. Theben. All authors share responsibility for Sections 1, 2, 3, 25, 26, and 27.

The documentation reviewed, and other sources of information, are listed at the end of this report in Section 27 References.

## LIST OF ABBREVIATIONS

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

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

### 3 RELIANCE ON OTHER EXPERTS

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

- Information available to RPA at the time of preparation of this report, and
- Assumptions, conditions, and qualifications as set forth in this report.

For the purpose of this report, RPA has relied on ownership information provided by Calibre. This opinion is relied on in Section 4 and the Summary of this report. RPA has not researched property title or mineral rights for the La Libertad Mine and expresses no opinion as to the ownership status of the property.

RPA has relied on Calibre for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from the La Libertad Mine.

Except for the purposes legislated under provincial securities laws, any use of this report by any third party is at that party's sole risk.

## 4 PROPERTY DESCRIPTION AND LOCATION

The La Libertad Mine site is located in the municipal area of La Libertad, Chontales Department, Republic of Nicaragua, approximately 110 km due east of Managua, the capital city of Nicaragua. The geographic coordinates of the Project are approximately 12°13' N latitude, 85°10' W longitude. The datum survey point for the property group is pegged at 135,277.57 mN and 704,476.63 mE (UTM NAD 27, Zone 16). A map showing the property location is presented in Figure 4-1.

### LAND TENURE

The Project consists of a contiguous, irregularly shaped block of concessions extending for approximately 25 km in an east-west direction and approximately 12 km in a north-south direction. It consists of one exploitation concession and two exploration concessions totalling 15,550 ha (Figure 4-2).

Table 4-1 lists the Project Concessions and their relevant tenure information.

**TABLE 4-1 TENURE DATA**  
**Calibre Mining Corp. – La Libertad Mine**

<b>Concession</b>	<b>Certified and Applicable Ministerial Agreement</b>	<b>Title Holder</b>	<b>Effective Tax Date</b>	<b>Area (ha)</b>	<b>Tax Year</b>
La Libertad	032-RN-MC/1994	DESMINIC	26-Sep-94	10,937	25
Buenaventura	200-RN-MC/2002	DESMINIC	03-Jul-02	2,350	17
Cerro Quiroz	07-DM-268-2011	Quiroz	18-Feb-11	2,250	8
Kinuma	065-DM-005-2017	Glencairn	12-Oct-17	2,889	2
San Marcos	083-DM-647-2015	Glencairn	30-Sep-15	3,037	4
<b>Total</b>				<b>21,463</b>	

Notes:

1. DESMINIC: Desarrollo Minero de Nicaragua, S. A.
2. Quiroz: Cerro Quiroz Gold, S. A.
3. Glencairn: Minera Glencairn, S. A.



August 2019 Source: Map No. 3932 Rev. 5, United Nations, 2011.



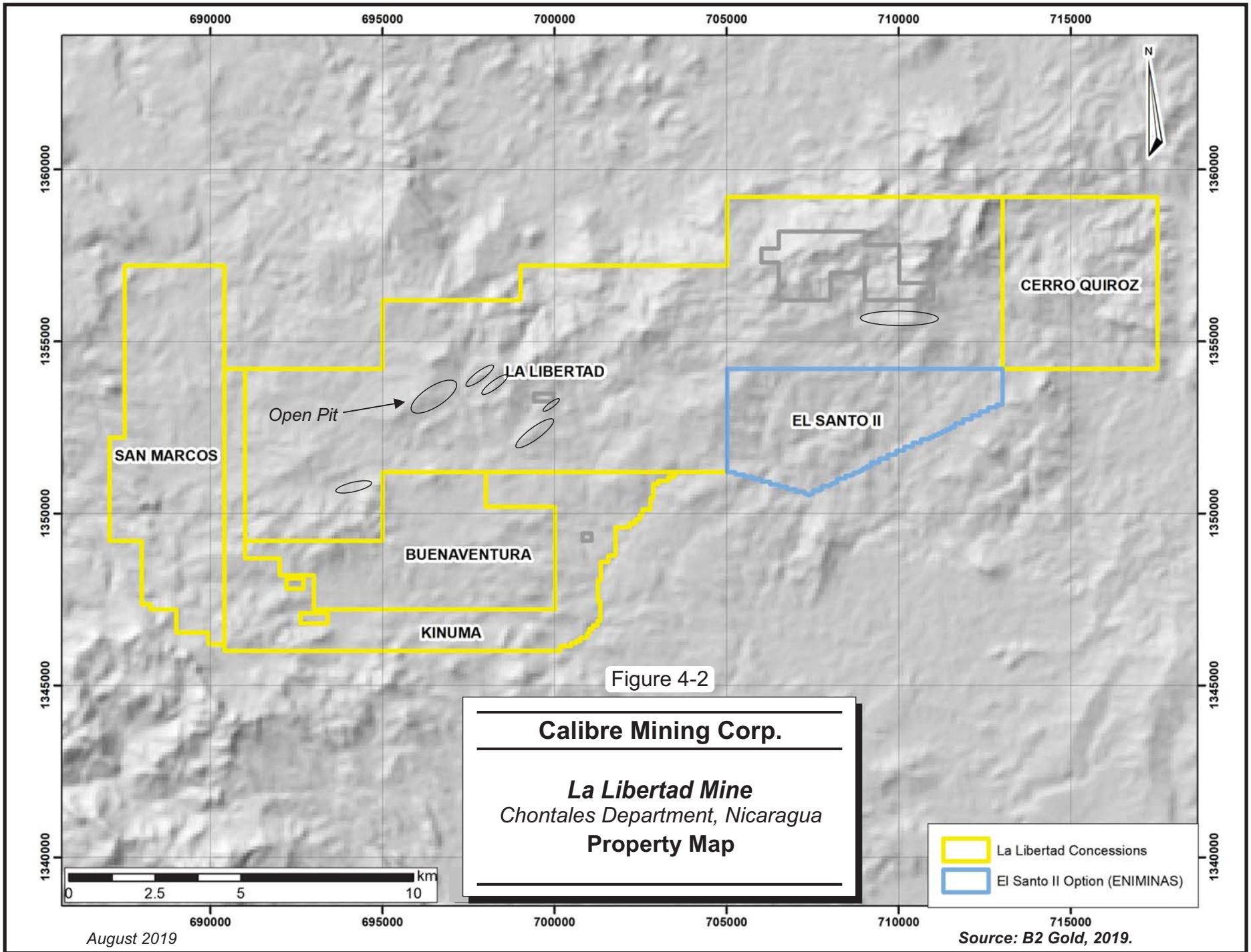


Figure 4-2

**Calibre Mining Corp.**

**La Libertad Mine**  
Chontales Department, Nicaragua  
**Property Map**

- La Libertad Concessions
- El Santo II Option (ENIMINAS)



On July 2, 2019, Calibre announced that it had entered into a transaction with B2Gold whereby it would acquire the producing La Libertad and El Limón gold mines as well as the Pavon gold project and other mineral concessions in Nicaragua held by B2Gold for an aggregate consideration of \$100 million, to be paid with a combination of cash, common shares, and a convertible debenture. Following completion of the transaction, B2Gold will own an approximate 31% direct equity interest in Calibre.

The La Libertad exploitation concession was granted in August 31, 1994 for the term of 40 years pursuant to Ministerial Decree No. 032-RN-MC/94. This concession was granted and is regulated under the old, pre-2001 mining law. The principal obligations under the Ministerial Accord include the payment of surface taxes on an annual basis, and a net 3.0% royalty on gross production revenues.

Another royalty interest was granted to a corporation formed by La Libertad workers (IMISA). The Royalty Contract dated September 25, 1996 (Public Deed No. 23) grants a royalty on Net Smelter Returns (NSR) equal to 2.0% of the total production of gold and silver from La Libertad.

The Buenaventura I exploration concession was granted in July 2002 for a period of 25 years pursuant to Ministerial Decree No. 200-RN-MC/2002.

B2Gold acquired an 80% interest in the Cerro Quiroz exploration concession, located east of the La Libertad concession, in 2010 from Condor Resources PLC (Condor), a company listed on the Alternative Investment Market of the London Stock Exchange, via a claim swap. Condor and B2Gold agreed to incorporate two new companies in Nicaragua, La India Gold SA and Cerro Quiroz Gold SA, and transfer the Cerro Quiroz, Espinito-San Pablo, and La India concessions to the new companies. The principal terms of the transaction are:

1. La India Gold SA will be 80% directly owned by Condor and 20% indirectly by B2Gold.
2. Cerro Quiroz Gold SA will be 80% indirectly owned by B2Gold and 20% directly by Condor.
3. B2Gold will transfer La India and Espinito-San Pablo concessions (both in La India District) to La India Gold SA and Condor will transfer the Cerro Quiroz concession to Cerro Quiroz Gold SA. The transfer of the concessions was approved by the Ministry of Energy and Mines.
4. The 80% shareholder of each new company shall complete at their own cost, not less than 2,000 m of drilling on the concession under their 80% ownership within two years of receiving all permits required to drill, including land access rights.

## MINING RIGHTS

Exploration and exploitation of mineral deposits in Nicaragua are defined and regulated in the 2001 Mining Code (the Mining Code) and overseen by the Ministry of Development, Industry, and Trade (*Ministerio de Fomento, Industria y Comercio*, or MIFIC) of the government of Nicaragua.

Under the Mining Code and regulations, the new mineral concessions have a term of 25 years. Each concession is subject to an agreement (Acuerdo Ministerial) issued by the government of Nicaragua. The Mining Code allows for amalgamation, division, and reduction of the concessions. Mineral concessions are subject to surface taxes *cánon* payments due as two advanced instalments in January and July of each year, and adjusted for any reductions in concession area, according to the rates shown on Table 4-2.

**TABLE 4-2 NICARAGUA EXPLORATION/MINING CONCESSION CANON  
PAYMENT SCHEDULE  
Calibre Mining Corp. – La Libertad Mine**

Tax Year	Fee (\$/ha)
1	0.25
2	0.75
3 & 4	1.50
5 & 6	3.00
7 & 8	4.00
9 & 10	8.00
11 to 25	12.00

The total payment required to renew all of the Project concessions upon their respective anniversary dates is \$176,000

Under the Mining Code all mineral concessions include the rights to explore, develop, mine, extract, export, and sell the mineral commodities found and produced from the concession. Concession holders are required to submit annual reports of its activities and production statistics to the government, as well as quarterly reports on its exploration activities.

## **SURFACE RIGHTS**

The surface rights in the Mojón, Los Angeles, and San Juan area are held via fee ownership and are sufficient for the current project

In the Jabalí area, surface land rights are presently owned by private parties and the mayoralty of the town of Santo Domingo. Negotiations with the landowners to obtain surface access to conduct exploration were carried out in the area in 2009 and 2010. B2Gold has purchased the surface rights over approximately 50% of the area of the current Jabalí Inferred Mineral Resource and is currently negotiating the purchase of the remainder.

There is a person with no title currently occupying the remaining Jabalí property although DESMINIC has obtained two court orders concerning the property. The first confirms the location with the office of the cadaster, and the second grants the right of forced sale of the property to DESMINIC. This grants adequate surface rights for operations of the entire LOM plan.

## **ROYALTIES AND OTHER ENCUMBRANCES**

La Libertad is subject to a royalty interest granted to Inversiones Mineras S.A. (IMISA), a holding company formed to represent unionized mine workers in Nicaragua, equal to 2.0% of the value of total production of gold and silver from the La Libertad exploitation concession. In Nicaragua, the government is entitled to an ad valorem tax over the substances extracted from a mineral concession. The amount of ad valorem tax is 3% for minerals. Under Nicaraguan law, the ad valorem tax paid is considered a deductible expense for purposes of computing corporate income tax, however, when this law was enacted, it included a grandfathering rule which allowed concessions granted prior to this law to continue operating under its existing regime. Under the mining law applicable at the time, the amount paid as ad valorem tax is applied as a direct credit against corporate income tax. The total royalty payable on La Libertad production is 5.0%. In addition, under Nicaraguan law, small scale or artisanal miners have the right to exploit secondary veins up to a total surface area that may not exceed 1% of the total area granted under a concession. Artisanal mining activities continue on the concession.

## **ENVIRONMENTAL LIABILITIES**

Due to historic mining and processing, there is the possibility of historic mercury contamination. From 1900 to 1935, British companies processed mineralized rock using stamp mills and mercury amalgamation.

Prior to 1988, tailings from the later flotation/cyanidation processing were dumped directly into the Rio El Tigre. Construction of a tailings dam was completed in 1988, and the tailings were stored there on site.

## **REQUIRED PERMITS AND STATUS**

To carry out exploration activities such as geophysics, geo-chemistry, trenching, and drilling, permits are required in Nicaragua from the Ministry of Natural Resources and Environment (MARENA). Following the submission of a plan of work report and an Environmental Impact Study to MARENA, exploration work including diamond drilling, trenching, soil sampling, and geological mapping was permitted under Administrative Resolution No. 08-2008, dated May 12, 2008, and issued to DESMINIC by MARENA. B2Gold is operating under that Permit issued on May 12, 2008 with new exploration programs added to the existing permit as addendums.

RPA is not aware of any environmental liabilities on the property. B2Gold has all required permits to conduct the proposed work on the property. RPA is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the property.

## **5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY**

### **ACCESSIBILITY**

Managua is the capital city of Nicaragua and daily flights to international destinations are available. Access to the La Libertad property is via paved roads from Managua to Juigalpa, the capital city of the Department of Chontales, a distance of approximately 201 km. From Juigalpa, a cobble road heads northeastwards for approximately 30 km to the town of La Libertad. Access to the mine site from the community of La Libertad is along a five-kilometre long, unpaved secondary road. Total driving distance from Managua is approximately 236 km and takes approximately three hours.

A private haul road has been constructed between the Jabalí mining area and the plant site. Upgrades were also completed to the public road between the town of La Libertad and Santo Domingo. The mine improved the public road including the installation of bridges and the government surfaced the road with paving stones.

### **CLIMATE**

The most salient climatic characteristic of the region is a pronounced wet and dry season. The wet season occurs in May through to November, with the highest precipitation occurring usually in September and October. Average monthly rainfall during these months is approximately 270 mm. The driest months are generally in February and March, with average monthly rainfalls of approximately 23 mm. According to government statistical records, the Department of Chontales has an average annual rainfall of 1,695 mm. At the La Libertad weather station, the average annual precipitation recorded over a 16-year period (1972 to 1987) was 1,687 mm.

Temperature variation in Nicaragua is mainly a function of altitude. Nationally, temperature varies between 21°C in the upper parts of the central mountain ranges to 29°C in the Pacific coastal regions. Average temperatures recorded in Chontales region range from 24°C in

December to 27°C in May. The average daily temperature is fairly constant at 25°C during the rest of the year.

Statistical records indicate an annual average rate of evaporation of approximately 2,050 mm, higher than the average annual precipitation of approximately 1,695 mm. The highest monthly evaporation rates of approximately 235 mm coincide with the driest and hottest months (March and April). The La Libertad Mine can operate year-round and is not normally affected by the typical seasonal climatic variations.

## LOCAL RESOURCES

Most of the non-professional staff at the Project come from the surrounding towns in the area. The town of La Libertad, approximately six kilometres by an unsurfaced secondary road, has a local population just over 11,000. Several other small towns are located within close proximity of the mine. The area has a long history of mining and ranching, and a local labour force skilled in small-scale mining is available. Many of the higher-skilled jobs, such as supervisory and professional designations, are filled by expatriates. Most machinery and equipment required at the mine is imported. The transportation network is well established.

## INFRASTRUCTURE

The La Libertad Mine is an active mining operation located in the municipal area of La Libertad, Chontales Department, Republic of Nicaragua. Access to the La Libertad property is via paved roads from Managua to Juigalpa, the capital city of the Department of Chontales. From Juigalpa, a cobble road heads northeastwards for approximately 30 km to the town of La Libertad. Access to the mine site from the community of La Libertad is along a five-kilometre long, unpaved secondary road. Road access allows for overland movement of all required supplies and materials.

Nicaragua in general has a moderately developed infrastructure of telecommunications, roads, airports, and seaports and there is a fairly high literacy rate among the population with an ample supply of skilled and unskilled labour.

Project infrastructure is described in Section 18 of this Technical Report.

## PHYSIOGRAPHY

The area is characterized by hilly terrain ranging in elevation from 400 MASL to 835 MASL. Many of the old workings in the region are located on hills and ridges. Gold mineralization is associated with quartz veins that support these topographic highs. Cerro El Chamarro, located five kilometres northeast of the town of La Libertad, is the highest point on the concession at 835.2 MASL.

The La Libertad Mine is situated in the western end of the exploitation concession, approximately four kilometres northwest of the town of La Libertad. Prior to open pit mining, a mineralized vein outcropped along the Cerro Mojón ridge. It was the highest point in the immediate area at approximately 630 MASL but has since been removed by mining. The surrounding topography is characterized by gently sloping terrain, reaching a low of approximately 500 MASL. Vegetative cover is primarily second growth shrubs, small trees, and grasses.

## 6 HISTORY

### PRIOR OWNERSHIP AND OWNERSHIP CHANGES

This section is compiled from Hulse, Crowl, and Malhotra (2015), Scott (2011), Cox et al. (2008), and Lacroix (2006).

Underground mining operations in the Santo Domingo area first began in 1862 at the El Jabalí Mine and continued until the mid-1970s. Important mines developed during this period include: El Jabalí, which belonged to Compañía Anónima de El Jabalí; Monte Carmelo, owned by Victoria Salinas; and La Tranca, owned by the Pellas and Company. No larger-scale mining operations have been in production in the Santo Domingo area for the last 20 years; however, small miner activity and “arrastra” (local artisanal milling) operations have continued.

Larger scale mining operations at La Libertad started in the middle of the last century at the San Juan and Babilonia areas. From 1900 to 1935, British companies extracted mineralized rock from the Santa Elena, Crimea, Santa María, San Juan, Tres Amigos, Zopilote, and Azul areas. Approximately 200,000 tonnes of ore, with an average grade of 15 g/t Au, was mined during this time. The ore was processed at a rate of 20 tpd to 40 tpd using a stamp mill. Gold was recovered by mercury amalgamation techniques.

From 1943 to 1945, the Neptune Mining Company conducted geological exploration in the Santa Elena and Santa María areas, however, no mining took place. From 1956 to 1979, an American company, Lemans Resource, mined the Santa Elena-Crimea deposit. The ore was processed in a mill at a rate of 40 short tons per day (stpd). Gold was recovered through flotation and cyanidation of the concentrate.

Prior to the Sandinista period, Nicaragua was an important contributor in the Central American gold market. In November 1979, the Sandinista government nullified all mining concessions issued by the previous administration and nationalized all mining companies operating in the country. As a result, average annual gold production for the period 1975 through 1979 dropped to an estimated 69,400 troy ounces.



Throughout the 1980s, the Sandinista government sought assistance for the mining sector in both Western and Eastern Europe. The United Kingdom, the Soviet Union, Sweden, and Bulgaria all provided institutional support to the Nicaraguan mining industry, however, due to low availability of capital most facilities had to make do with old and substandard equipment.

Large-scale mining operations at La Libertad were suspended in November 1979. In 1982, mining of the Santa Elena deposit resumed under the Instituto Nicaragüense de la Minería (INMINE). From 1984 to 1989, a crushing and grinding facility was installed and the capacity of the mill increased from 40 stpd to 120 stpd, using the same flotation/cyanidation technology for gold recovery. Tailings were being dumped directly into the Río El Tigre until a tailings dam was constructed northeast of the mill in 1988.

Mining operations at Santa Elena were suspended in 1991 and the San Juan vein became the main source of ore.

In 1991, the Chamorro Administration began its efforts to privatize Nicaraguan mining enterprises as part of an overall plan for economic stabilization and structural reform. It was hoped that foreign investment would boost mining production and provide employment and stability in regions dependent on mining. The Chamorro Administration agreed to privatize 25% of the national mineral resources to the Nicaraguan mine workers. This resulted in the formation of IMISA, a profit-oriented company privately held by the Nicaraguan mine workers. Technical and administrative assistance for IMISA was contracted from former INMINE officials. The remaining interest in select facilities was put out to international tender.

La Libertad went out to tender in 1992. On April 11, 1994, a Presidential Decree was issued authorizing the privatization of La Libertad mining assets. Effective August 26, 1994, an agreement between Greenstone de Nicaragua S.A. (GRENICA), a wholly owned subsidiary of Greenstone Resources Canada Ltd. (Greenstone), and IMISA resulted in the formation of a new company called Minera Nicaragüense S.A. (MINISA). The new company was formed with the purpose of developing a large-scale gold mining operation out of the La Libertad operation. At this time, small miners were active on site, processing their gold using stamp mills, grinding, and mercury amalgamation.

MINISA was originally owned 75% (51,450 shares) by GRENICA and 25% (17,150 shares) by IMISA (68,600 total shares). IMISA vested in its 25% of MINISA by virtue of contributing the

existing assets at La Libertad, including the exploitation and exploration concessions (which included a 3% royalty payable to the Nicaraguan government). These assets were conveyed to IMISA by the Nicaraguan government and the IMISA shares were pledged to the Nicaraguan government, until such time as IMISA paid \$1,715,000 to the government. GRENICA became vested once it had contributed a total of \$5.325 million to the project and issued 468,100 Greenstone Common Shares.

As a requirement of privatization, MINISA had to complete a feasibility study for an operation producing greater than 50,000 ounces of gold per year. Compliance was met with the submittal of a feasibility study in October 1995. GRENICA was required to fund the feasibility as well as any cash losses from the existing operation. It was also required to fund a limited rehabilitation program of the existing operation. At December 31, 1995, GRENICA had met all vesting conditions for the 75% interest in MINISA. In September 1996, GRENICA acquired the remaining 25% minority interest from IMISA through the acquisition of all the shares of MINISA held by IMISA. The purchase price consisted of:

- a cash payment of \$13,125,000, directed by IMISA to be paid to shareholders;
- a cash payment of approximately \$350,000 in satisfaction of existing obligations to IMISA in connection with GRENICA's and IMISA's shareholdings in MINISA; and
- a 2% NSR in favour of IMISA on future production from areas within the La Libertad mining area.

Under MINISA, the La Libertad Mine site was rehabilitated, and operations continued from mid-1994 until October 1996, when MINISA shut down the operation to prepare for the heap leach operation.

GRENICA, through MINISA, operated the mine from 1997 to mid-1999, as a heap leach operation, mining 3.1 million tonnes at a grade of 1.9 g/t Au and producing 103,000 ounces of gold.

By 1999, GRENICA was suffering financial difficulties, and all mining and exploration activities at La Libertad ceased in August of that year. Leslie Coe (Coe), an individual investor acquired MINISA by repaying GRENICA's debt to vendors. The name of the new company was DESMINIC. In February 2001, Coe sold 50% of DESMINIC to RNC Resources Limited (RNC), a private international business incorporated in Belize in March 2001, and 40% to Auric Resources Corp. (Auric). Coe retained a 10% interest in DESMINIC.

In early 2001, DESMINIC rehabilitated the heap leach operation at La Libertad, and resumed operations.

In July 2003, RNC acquired Auric's interest in DESMINIC and, in September 2003, Coe's remaining 10% interest, thereby obtaining 100% ownership. RNC Gold Inc. (RNC Gold), a publicly traded Canadian company, became the owner of all the assets of RNC, including DESMINIC, in December 2003 as a result of a reverse take-over of Tango Mineral Resources Inc. (Tango) by RNC and a name change of Tango to RNC Gold. In February 2006, Yamana Gold Inc. (Yamana) acquired DESMINIC along with all the other assets of RNC Gold as a result of a merger between the two companies.

Operations from 2001 to 2007 were continuous, with some temporary shutdowns reported as being for maintenance purposes. Mine production has been largely from a series of pits along the main Mojón-Crimea structure. Significant production was also achieved from the Esmeralda structure located parallel to and immediately south of the Mojón pits. Mine production for 2001 to March 2007 totalled 6.7 million tonnes, at a grade of 1.66 g/t Au, producing 207,000 ounces of gold. During this time, the size of crushed material on the heap leach pad varied and resulted in low gold recoveries; as a result, the spent leach material is being reprocessed through the current mill facility.

On July 6, 2006, Glencairn Gold Corporation (Glencairn) purchased a 100% interest in La Libertad from Yamana, along with a 60% interest in the Cerro Quema Gold Project in Panama. The total consideration for these two acquisitions was 32 million Glencairn common shares.

AMEC conducted test work and studied the potential for conversion of the heap leach process to conventional milling for Glencairn, completing a scoping study in May 2007. Results were positive, and open pit mining was halted in March 2007 in order to proceed with the process upgrade. Glencairn commissioned a feasibility study and investigated sources of mill equipment.

Glencairn underwent a name change to Central Sun Mining Inc. (Central Sun) on November 29, 2007. Along with the corporate name change, the La Libertad operation was renamed Orosi.

Ownership of DESMINIC, B2Gold's subsidiary that holds the mineral title, passed through several companies as a result of mergers and acquisitions, until July 6, 2006, when Central Sun purchased a 100% interest in La Libertad Mine. B2Gold acquired Central Sun on March 26, 2009 and completed the construction of the mill in the fourth quarter of 2009 and commenced ore processing at the La Libertad Mine on December 15, 2009.

Extensive exploration has been completed at La Libertad including work completed by previous owners and successive exploration programs by B2Gold every year since acquisition in 2009. Exploration mostly comprises drilling as described in Section 10, Drilling. Other exploration methods include prospecting, geological mapping, geophysical and geochemical surveys, and trenching.

## **HISTORICAL EXPLORATION**

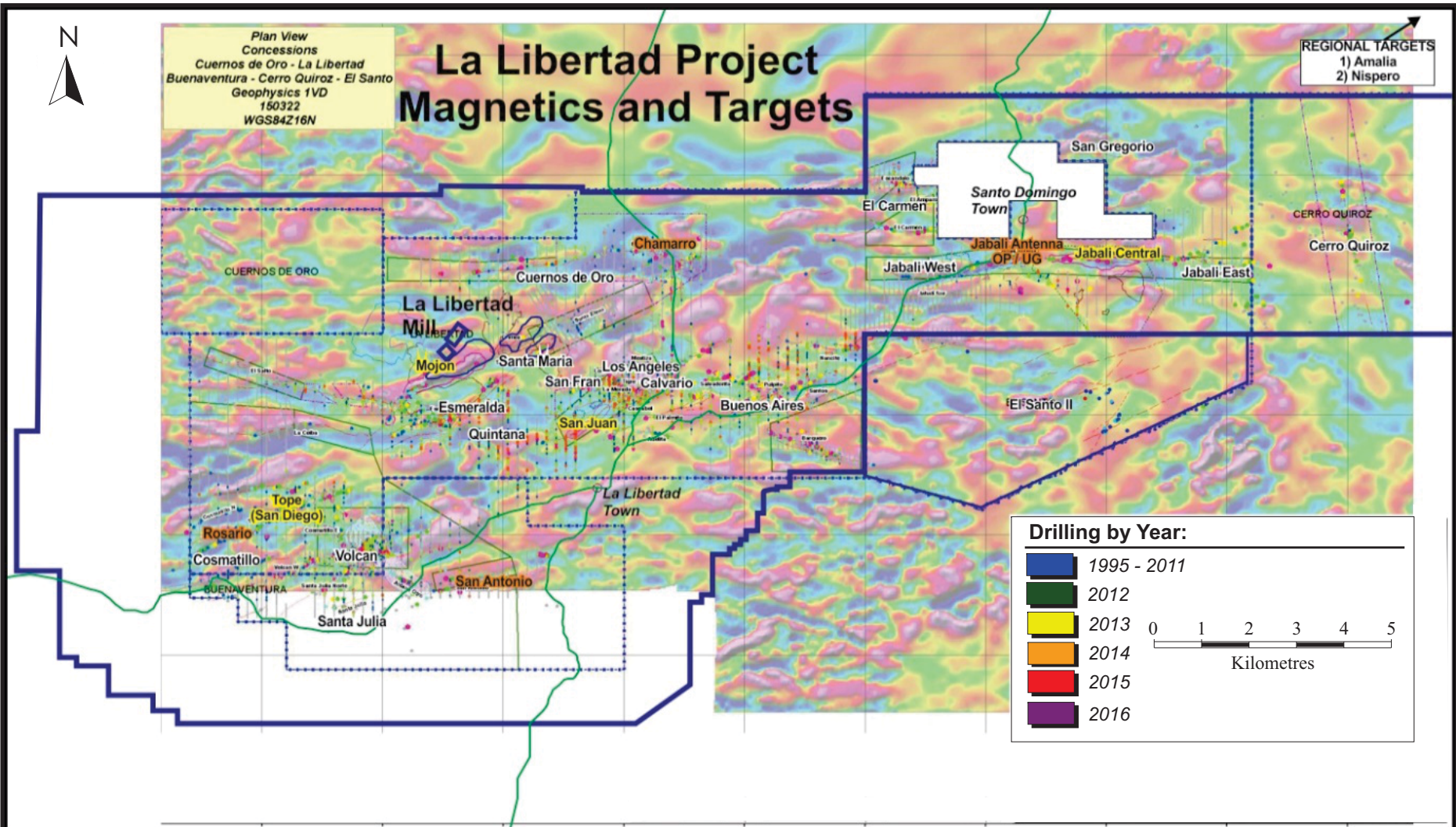
### **GEOLOGICAL MAPPING**

B2Gold has completed extensive geological mapping covering much of the La Libertad Project. Surface mapping is severely constrained by the limited natural outcrop in the area. Topography is gentle to moderate and oxidation has resulted in the formation of saprolite and thin to moderate but extensive soil coverage. While natural outcrops are rare, exposures can be found in drainages as well as in workings associated with artisanal miner activity. Rock float including quartz blocks and lag associated with veins and silicified structures is typical and provides a useful tool for mapping. Additional exposures are created by trenching.

### **GEOPHYSICAL SURVEYS**

Magnetic surveys have been completed over the entire main concession block. Veins and silicified structures are often associated with magnetic low interpreted to be related to destruction of magnetic minerals in the host rocks surrounding the mineralized structures. Figure 6-1 illustrates the results of the compilation of the magnetic surveys.





6-6

Figure 6-1

**Calibre Mining Corp.**

**La Libertad Mine**  
 Chontales Department, Nicaragua  
**Magnetic Surveys**

## **SOIL SAMPLING**

Soil sampling and geochemical analyses is one of the best exploration methods for the identification of gold-bearing veins and structures in the La Libertad area. Moderate topography and moderate oxidation with a well-developed but shallow soil horizon results in conditions where most near surface gold bearing veins and structures are identifiable using moderately spaced soil sampling programs and gold analyses. Dispersion away from the veins and structures is moderate but sufficient to generate anomalies with appropriately spaced surveys. The current database contains 12,950 soil samples and results greater than 100 ppb gold have outlined all of the known deposits as well as numerous additional targets. Figure 6-2 illustrates the results of the soil sampling surveys.



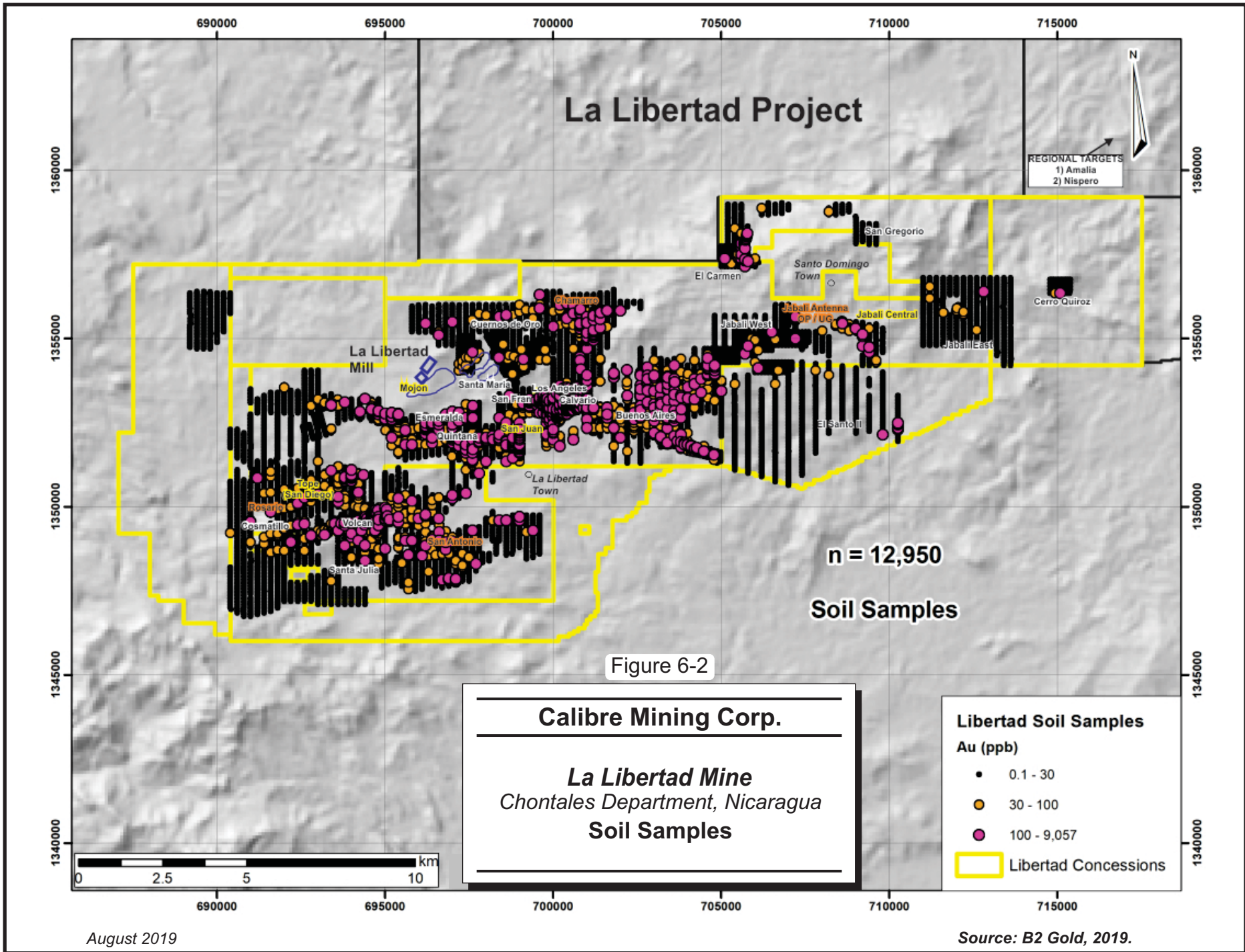


Figure 6-2

**Calibre Mining Corp.**

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*La Libertad Mine*  
Chontales Department, Nicaragua

**Soil Samples**

**Libertad Soil Samples**  
Au (ppb)

- 0.1 - 30
- 30 - 100
- 100 - 9,057

▭ Libertad Concessions

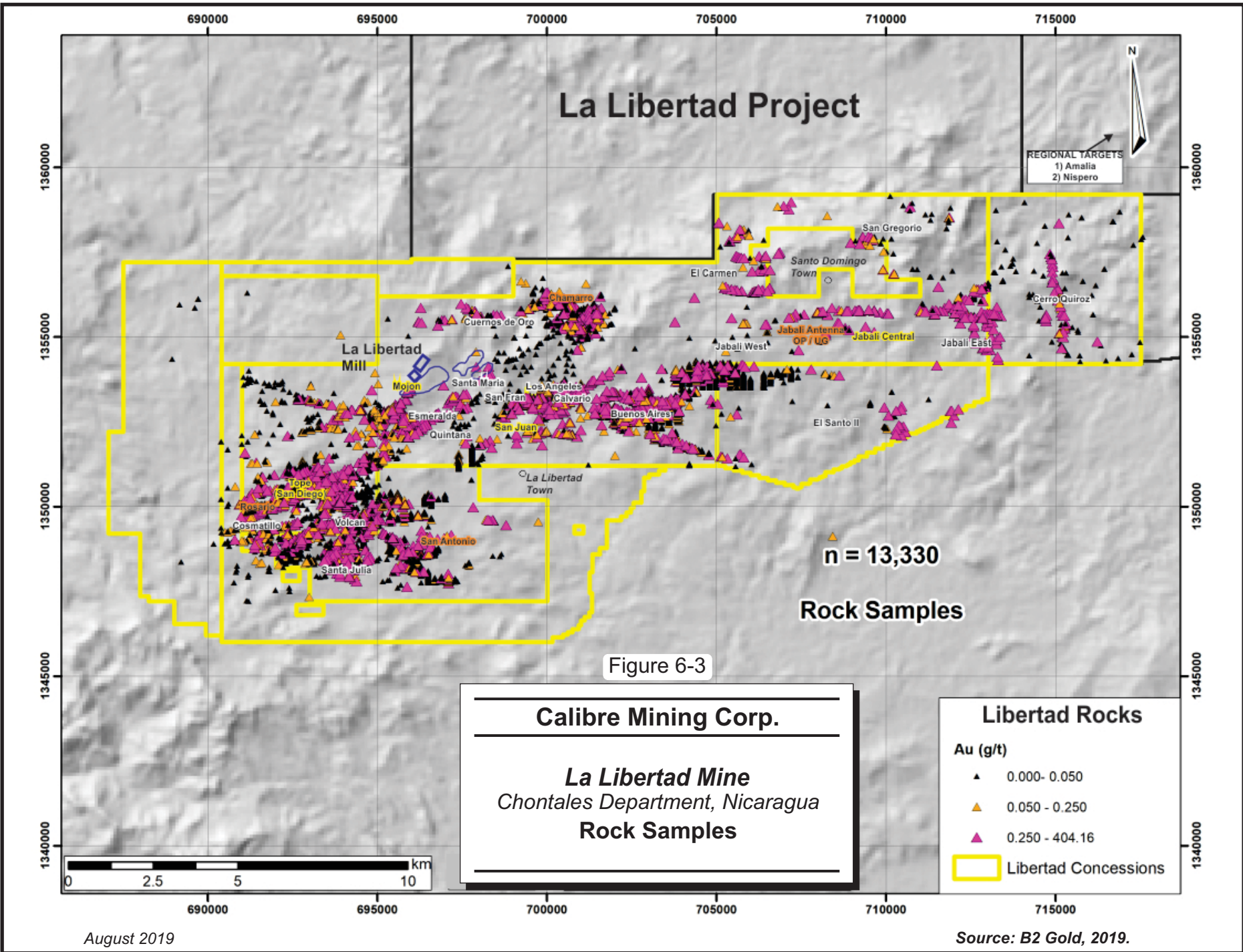
## **ROCK SAMPLING**

Outcrop is rare, however, quartz veins and breccias are often demonstrated by float and lag on surface. Extensive sampling programs have been completed often following up on geochemical anomalies generated by soil sampling.

Additionally, augers have been used to penetrate the near surface cover, extending two to eight metres with the collection of a sample at the bottom of the hole. This type of sample provides accurate geochemical results for the exact position of the auger drill hole with limited to no effect of dispersion. The current database contains 13,330 rock samples and results greater than 250 ppb gold have outlined all of the known deposits as well as numerous additional targets. Figure 6-3 illustrates the results of the rock sampling.



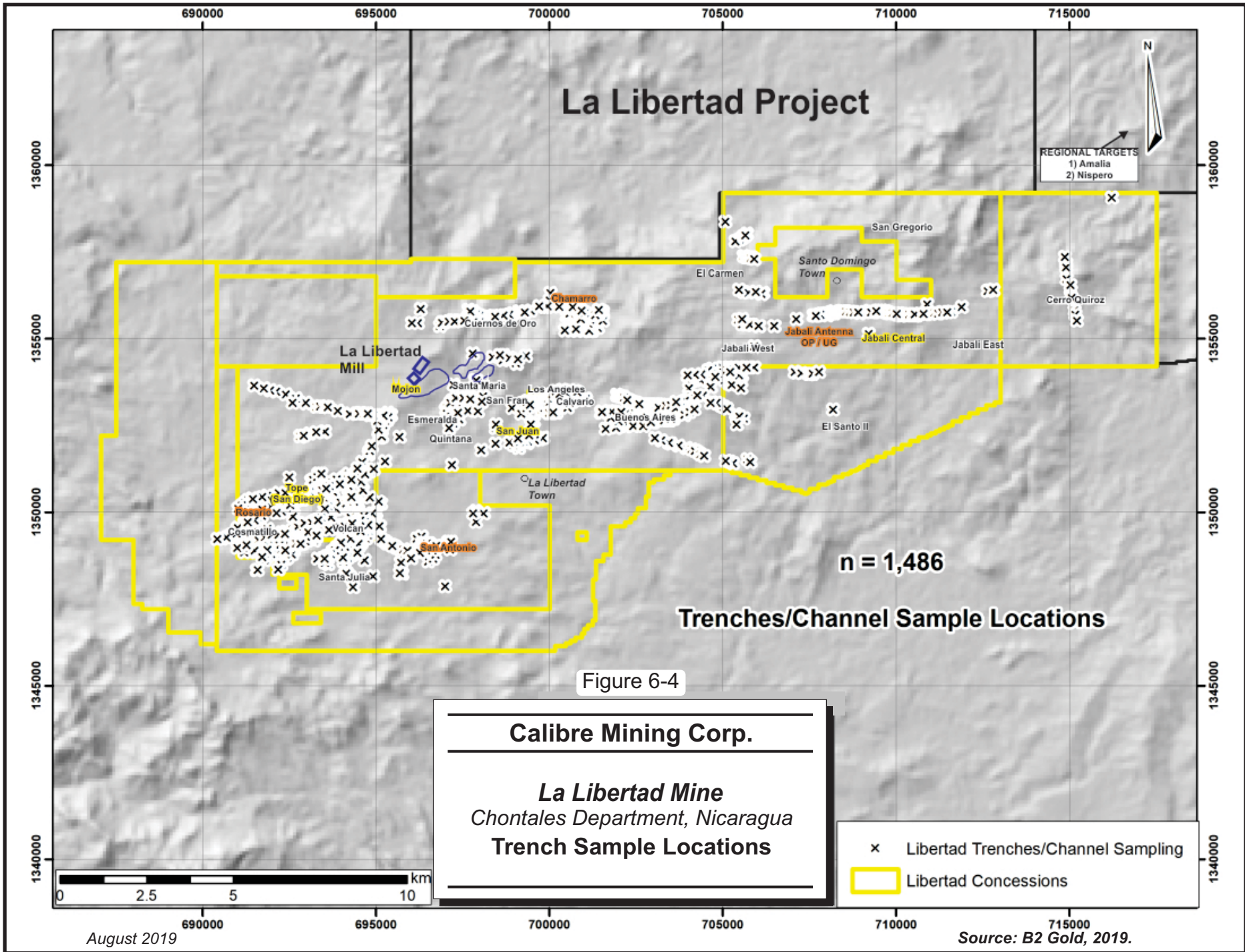
6-10



## **TRENCHING**

Geochemical anomalies generated by soil and rock sampling are often followed up by trenching. Trenching is completed by hand to a depth of two to three metres below surface depending on the local soil and weather provide. Material sampled is often oxidized except in the cases of veins and silicified vein breccias which often extend to surface or close to surface. Continuous chip samples of vein and wall rock material are collected with the aid of a rock saw where required. Figure 6-4 illustrates the location of the trenches.





6-12

Figure 6-4

**Calibre Mining Corp.**

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**La Libertad Mine**  
*Chontales Department, Nicaragua*  
**Trench Sample Locations**

- x Libertad Trenches/Channel Sampling
- ▭ Libertad Concessions

## HISTORICAL RESOURCE ESTIMATES

There have been several historical Mineral Resource and Mineral Reserve estimates prepared by previous operators. These estimates are historical in nature and should not be relied upon.

## PAST PRODUCTION

Historical production from La Libertad is summarized in Table 6-1.

**TABLE 6-1 HISTORICAL PRODUCTION**  
**Calibre Mining Corp. – La Libertad Mine**

<b>Period</b>	<b>Ore Processed (kt)</b>	<b>Mill Head Grade (g/t Au)</b>	<b>Production (koz)</b>
1900 to 1935	200	15.00	96.5 (est.)
1975 to 1979	N/A	N/A	347 (est.)
1997 to 1999	3,100	1.90	103
2001 to 2007	6,700	1.66	207
2010 to 2014	9,737	1.96	559.1
2015 to 2018	8,998	1.52	415.8

## **7 GEOLOGICAL SETTING AND MINERALIZATION**

### **REGIONAL GEOLOGY**

Nicaragua is located in the southern part of the Chortis Block, one of the several major structural units forming the Caribbean Plate.

McBirney and Williams (1965) divided Nicaragua into four physiographical provinces that closely correspond to geological provinces. From west to east these are the Pacific Coastal Plain, the Nicaraguan Depression, the Interior Highlands, and the Atlantic Coastal Plain. La Libertad gold district covers an area of approximately 150 km<sup>2</sup> within the Interior Highlands.

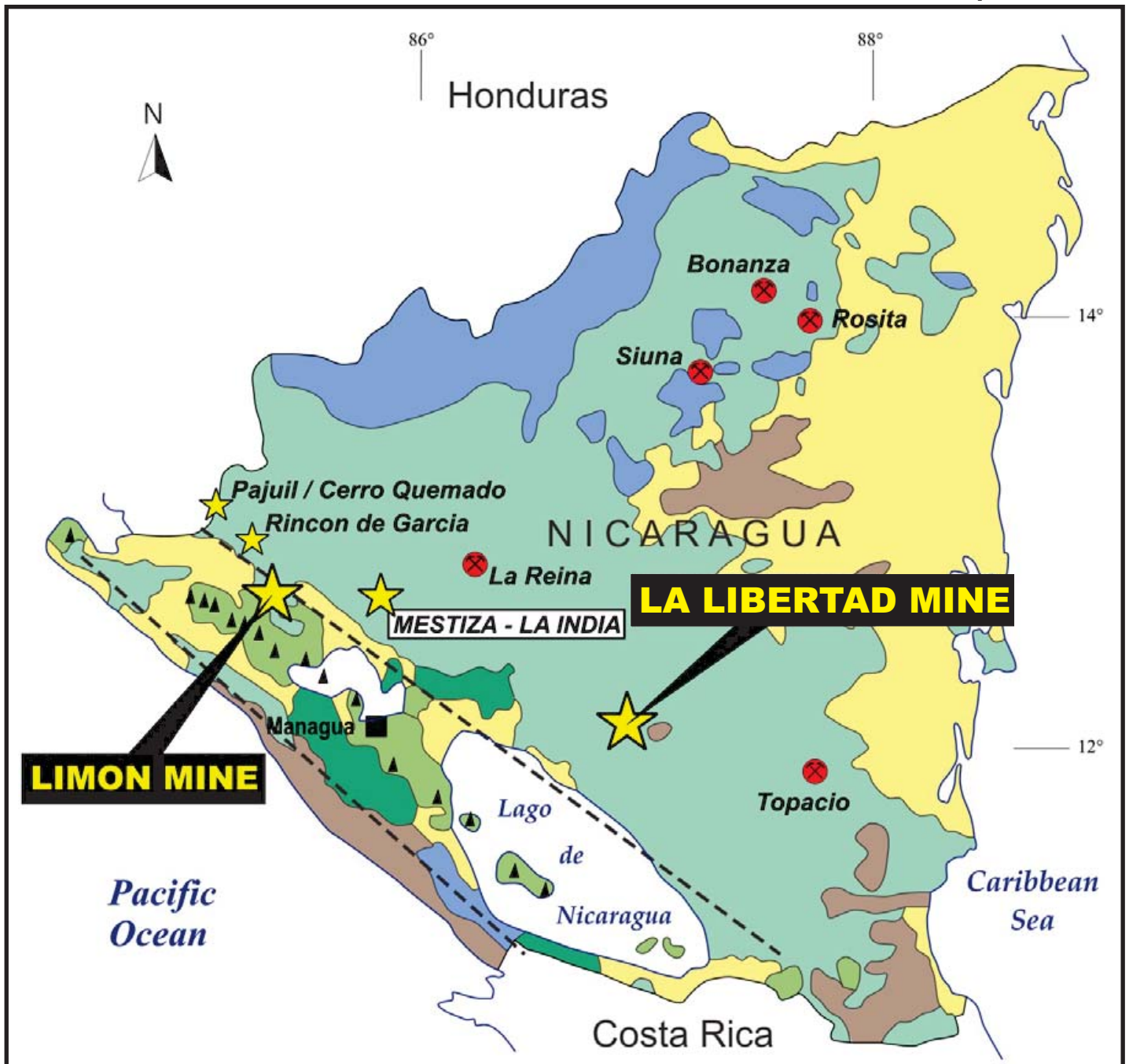
The Interior Highlands consist of the Oligocene Matagalpa and Miocene-Pliocene Coyol Groups. The Matagalpa Group comprises an approximately 2,500 m thick sequence of pyroclastic flows, mainly ignimbrites whereas the Coyol Group consists mainly of basaltic through rhyolitic lavas, breccias, lahars, and pyroclastic flows (Ehrenborg and Alvarez, 1988). These two groups are separated by an angular discordance a tribute to faulting and doming above Coyol related intrusions.

The property lies within a broad belt of Tertiary volcanic rocks that have been differentiated into two major units called the Matagalpa and the Coyol Groups (McBirney and Williams, 1965; Parsons Corporation, 1972). The Oligocene to Miocene age Matagalpa Group consists of intermediate to felsic pyroclastic rocks. Unconformably overlying the Matagalpa Group are Miocene-aged mafic to intermediate lavas of the Lower Coyol unit. The rocks of the Lower Coyol unit host the gold-bearing quartz veins in the Libertad gold district. Pliocene-age mafic lavas and ignimbrites, belonging to the 400 m to 600 m thick Upper Coyol unit, form mesa-like erosional remnants in the region (Darce, 1990). Several small felsic to mafic intrusive bodies of similar Tertiary age are distributed along northeast-southwest structural trends.

The rocks of the Lower Coyol unit host the gold-bearing quartz veins in La Libertad gold district.

Figure 7-1 illustrates the Regional Geology of the La Libertad area. Figure 7-2 illustrates the Regional Stratigraphic Column.





**Legend:**

- Alluvium
- Recent Volcanic Rocks
- Pliocene - Pleistocene Volcanic Rocks
- Tertiary Volcanic Rocks
- Tertiary Marine Sedimentary Rocks
- Paleozoic - Mesozoic Rocks
- Volcanoes
- Central Sun Mining District
- Other Mining District
- Nicaragua Depression

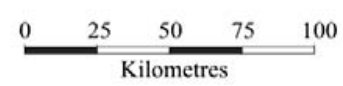


Figure 7-1

**Calibre Mining Corp.**

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**La Libertad Mine**  
Chontales Department, Nicaragua  
**Regional Geology**

Age		Thickness (m)	Unit		Lithology
<b>TERTIARY</b>	Pliocene	300	Coyol Group	Upper	Rhyolitic Ignimbrites and Tuffs
		100			Basaltic Flows
	Miocene	300		Lower	Basaltic and Andesitic Flows
		110			Matagalpa Group
	Oligocene	120			
	Eocene	>20	Pre-Matagalpa Group El Caracol Fm.	Upper	Cherts and Shales

Figure 7-2

**Calibre Mining Corp.**

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**La Libertad Mine**  
Chontales Department, Nicaragua

**Regional Stratigraphic Column**

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## LOCAL AND PROPERTY GEOLOGY

The following is taken largely from Pearson and Speirs (2009).

### LITHOLOGY

The epithermal gold-silver system at La Libertad is hosted in a thick sequence of andesitic lava flows believed to be part of the Lower Coyol Group. The group consists of individual flows ranging in thickness from two metres to five metres to much larger flows 22 m to 50 m in thickness. Flow breccias and conglomerate debris flows, ranging from 3.0 m to 40 m thick, commonly separate the coherent flows.

The andesitic rocks are locally intruded by fine-grained variably altered andesitic dikes. Crosscutting relationships suggest the dikes predate the epithermal gold mineralization. The dikes probably intruded along pre-existing fault structures similar in manner to the mineralized quartz veins.

A younger sequence of basaltic-andesite rocks locally intrude and overlie the older mineralized andesitic package. These rocks are commonly fresh, dense rocks that are locally weathered but not hydrothermally altered. The basaltic-andesite flow rocks were apparently deposited on an erosional surface having a paleo-topography similar to that of the present-day relief.

### STRUCTURE

The overall strike length of the quartz veins in La Libertad gold district suggests emplacement along a regionally extensive fault system, however, it is difficult to recognize individual pre-mineral structures that have not been filled by quartz veins. The only clearly demonstrable fault planes in the district have been observed in the Mojón, Crimea, and Esmeralda pits. These faults appear to be pre-mineral structures occupied by quartz veins that have since experienced post-mineral movement.

In La Libertad gold district, individual northeast trending fracture-controlled ridges can be traced for more than five kilometres and host a number of targets including: Mojón SW, Mojón, Zopilote, Babilonia, Crimea, Santa Elena, Esmeralda, Santa María, and Socorro (formerly Chamarro). Five parallel and similar structures occur within La Libertad district. These structures from northwest to southeast are: Mojón SW to Chamarro; Esmeralda to Santa María to Santa Evangelina; San Francisco to Los Angeles; San Juan to Calvario; and El Pulpito.



The analyses of the lineaments evident on RADARSAT-1 imagery and aerial photographs show a dominance of northeast and northwest trending fractures. Northwest trending faults may be related to the subduction zone along the Pacific Coast of Nicaragua. The northeast trending vein structures form ridges throughout La Libertad district and are thought to represent extensional fractures parallel to the principal northeast stress direction. These fractures have acted as the major fluid conduits for both magmatic and hydrothermal activity.

East-northeast and north-northeast trending conjugate fractures are thought to be related to strike-slip movement. Some of these conjugate fractures were dilatant and acted as fluid pathways during mineralization while others remained closed. It is thought that during the mineralizing event, these conjugate fractures were open to gold-bearing fluids and formed an en-echelon series of dilatational zones within the main northeast trending fracture/vein zones.

The andesite flows host the epithermal quartz veins, quartz stockworks, sheeted veining, and massive banded quartz veins along the northeast trending fracture zones. Minor stockwork zones and quartz veins one metre to two metres in width are found within the hanging wall of the main vein structures. Hanging wall veins appear to occupy fractures that are conjugate to the main vein.

## **ALTERATION AND GANGUE MINERALOGY**

Alteration associated with the deposits is typical of a low sulphidation epithermal gold-silver deposit. Fracture-controlled quartz veining and silicification is haloed by argillic and propylitic alteration zones within the andesite host rock.

Alteration aureoles around the individual veins extend for two to ten times the width of the respective veins (Darce, 1990). Alteration mineralogy gradually changes with distance from the veins as follows:

*Quartz vein->adularia/quartz/illite->kaolinite/illite/qtz->kaolinite/quartz->chlorite/carbonate*

Quartz veins consist of milky white, sugary textured quartz, with varying amounts of chalcedonic, banded, cock's comb, and vuggy quartz. Vuggy quartz appears to be pseudo-morphing platy calcite in places, which may be indicative of boiling of the hydrothermal fluid (Corbett and Leach, 1998).

Manganiferous oxides are ubiquitous and observed to be very strong throughout the vuggy textured quartz, as linings and coatings on open spaces. Goethite, limonite, and jarosite are invariably present as coatings and linings to open spaces and fractures. Minor “massive” goethite-limonite occurs within the massive vein zone, usually as thin (one centimetre to five centimetres thick) veinlets. These presumably represent the oxidation product of sulphide-rich veinlets.

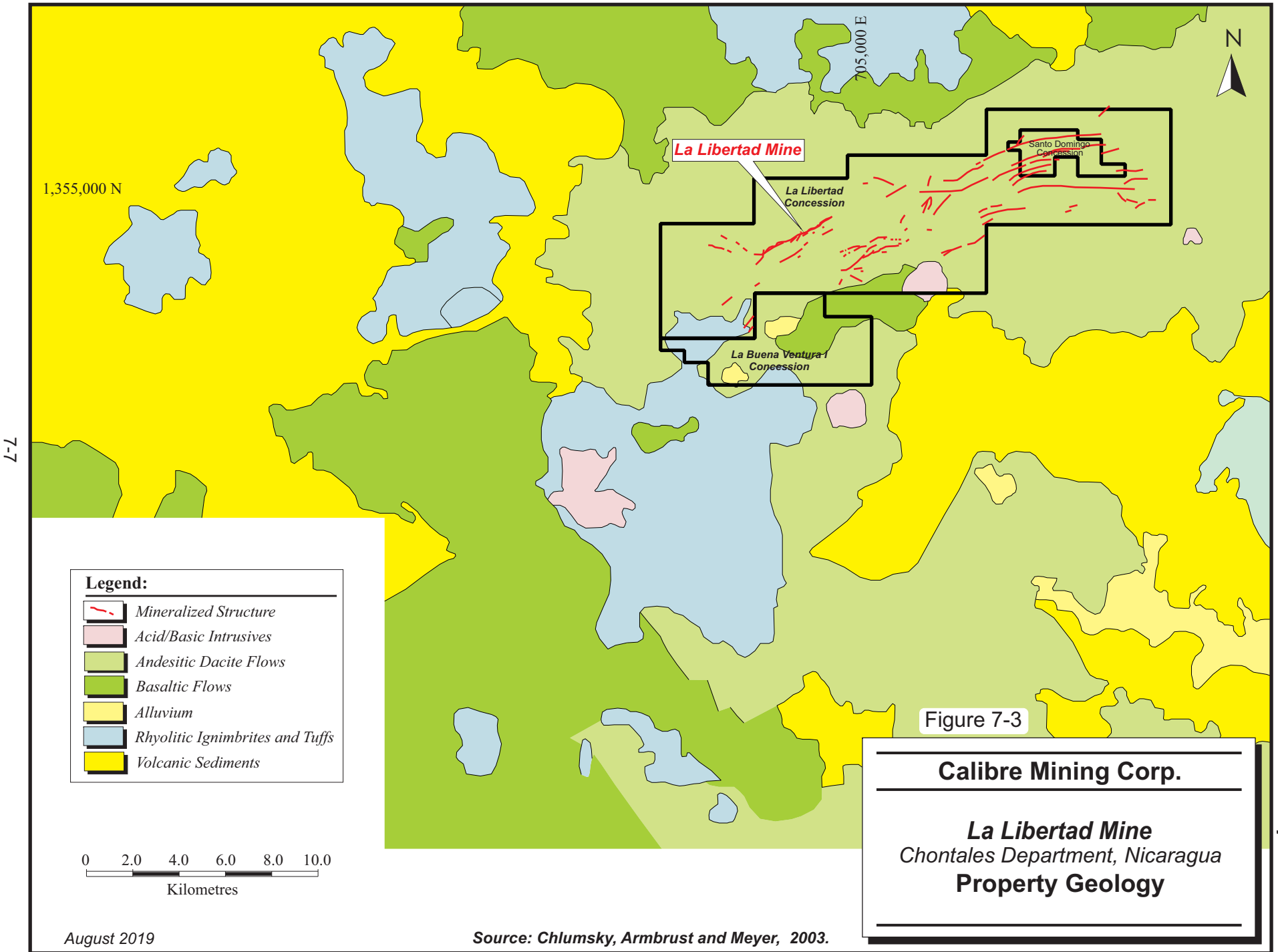
Silicification is often intense within the vein zones. Partial silica replacement/rimming of breccia clasts is widespread throughout the veins and can extend into both the hanging wall and footwall. A zone of intense silica replacement and brecciation up to several metres in width is often observed within the zone immediately footwall to the main vein structure.

Darce (1990) describes an illite-kaolinite cap in the near surface levels of quartz veins and proposes that this alteration zone was formed during the waning stages of the geothermal field. The illite-kaolinite “cap” is observed by Darce to progress to chlorite-adularia-illite at depth, reflecting palaeo-temperature and chemical gradients in the hydrothermal system. This kaolinite/illite cap can be observed in the Mojón open pit and has been noted from deep drilling to become very narrow or absent with depth.

Meteoric weathering and alteration formed a clay rich “blanket” throughout La Libertad district. Weathering profiles tend to mimic topography and have been observed to extend from surface to depths of 50 m. The distinction between hypogene and supergene clay alteration at or near surface can be difficult to distinguish. The presence of finely disseminated, cubic pyrite is generally accepted as indicative of hypogene alteration.

The boundary between oxidized and unoxidized rock is very sharp along the footwall contact of the Mojón mineralized zone. Goethite and jarosite, which were derived from the oxidization of pyrite, are present in various ratios throughout the mineralized structural zone and are seen as brown, brownish yellow, yellowish brown to yellow colours in clay-altered hanging wall rock and fracture coatings within the quartz veins.

The property geology is illustrated in Figure 7-3.



7-7

1,355,000 N

705,000 E



**La Libertad Mine**

La Libertad Concession

Santo Domingo Concession

La Buena Ventura Concession

**Legend:**

- Mineralized Structure
- Acid/Basic Intrusives
- Andesitic Dacite Flows
- Basaltic Flows
- Alluvium
- Rhyolitic Ignimbrites and Tuffs
- Volcanic Sediments

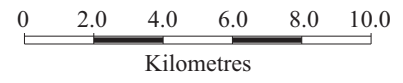


Figure 7-3

**Calibre Mining Corp.**

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**La Libertad Mine**  
 Chontales Department, Nicaragua  
**Property Geology**

## MINERALIZATION

Gold mineralization at La Libertad is contained within vein sets along the parallel Mojón-Crimea and Santa Mariá-Esmeralda trends, which are separated by approximately 500 m. The Mojón-Crimea Trend is nearly four kilometres long, strikes 065°, and dips on average 80° to the southeast. The down-dip dimension is commonly in the order of 200 m to 250 m. The massive quartz veins and adjacent stockwork/stringer zones range in width from 2.0 m to 70 m for an average of 15 m, often narrowing at depth. The Santa Mariá-Esmeralda Trend is discontinuous, with the Santa Mariá and Esmeralda veins separated by approximately 1,000 m. The Santa Mariá vein averages 10 m wide and is approximately 450 m long. The Esmeralda Vein has been mined out. Additional mineralization is contained within previously mined material that has been crushed and partly processed by heap leach methods.

The following descriptions of mineralization at La Libertad is taken from Hulse, Crowl, and Malhotra (2015). Figure 7-4 illustrates the locations of the various mineralized zones mentioned below.

### MOJÓN

The Mojón trend forms a braided stockwork system trending 063° and dipping sub-vertically 75° to 90° to the south-southeast. Stockwork/vein zones average 22 m in width, with a range from five metres to 40 m. Numerous hanging wall splays are present that are generally narrower and less continuous than the main zone. They are oriented at 075° and have vertical to slightly north-northwest dips. Gold grades in the stockwork zones are generally 0.1 g/t Au to 0.5 g/t Au with occasional spikey values.

Massive veins/vein breccias within the stockwork envelopes have an average true width of about nine metres with a range of one metre to 20 m. Higher gold grades are associated with vuggy, drusy, and banded quartz veins. Pyrite (and its oxidized products) is closely related to gold mineralization but is present in small volumes, generally less than 1%.

Host rocks are moderately altered immediately adjacent to the stockwork and veining zones. Alteration types are typically silica and argillic with minor amounts of propylitic. Surface saprolite alteration is developed to a depth of approximately 15 m to 20 m.

## **JABALÍ AREA**

The Jabalí low sulphidation epithermal quartz adularia vein system is hosted in a thick sequence of andesitic flows believed to be part of the Lower Coyal Group. The group consists of individual, feldspar porphyritic andesitic flows ranging in thickness from two metres to five metres to much larger flows 22 m to 50 m in thickness. Lapilli-tuff and occasionally ash tuff beds of variable thickness separate the flows.

The east-west trending Jabalí vein system has been traced on surface over a distance of more than six kilometres. To date, ongoing diamond drilling has tested more than 3,950 m of the Jabalí vein system. The vein system dips to the north, varying from 60° to 80° north.

The andesite flows host the epithermal quartz veins, quartz stockworks, quartz breccia, and massive to banded quartz veins along the east-west trending mineralized structure.

Alteration associated with the deposits is typical of a low sulphidation epithermal quartz adularia vein system. Fracture-controlled quartz veining and silicification is surrounded by argillic and propylitic alteration zones within the andesite host rock.

Quartz veins consist of milky white to light grey quartz with minor amounts of adularia. Epithermal textures comprise crustiform and colloform banding, vuggy and drusy quartz, cockscomb, and bladed silica pseudomorphs after low temperature calcite.

Manganese oxides are ubiquitous and observed to be very strong throughout the vuggy textured quartz, as linings and coatings on open spaces. Goethite, limonite, and jarosite are invariably present as coatings and linings to open spaces and fractures.

Silicification is often intense within the vein zones. Partial silica replacement and rimming of breccia clasts is widespread throughout the veins and can extend into both the hanging wall and footwall.

## **SAN JUAN**

The San Juan zone is a low sulphidation epithermal vein and stockwork system hosted by sub-horizontal andesitic volcanic and volcanoclastic rocks.

The San Juan trend forms a vein and stockwork system trending at 140° and dipping sub-vertically 80° to 90° to the north-northwest. Stockwork zones average 12 m wide, with a range from 10 m to 20 m. Gold grades in the stockwork zones are generally from 0.1 g/t Au to 0.5 g/t Au with occasional spikey values.

Massive veins/vein breccias within the stockwork envelopes have an average true width of approximately three metres with a range of one metre to 11 m. Higher gold grades are associated with vuggy, drusy, and banded quartz veins.

Host rocks are moderately altered immediately adjacent to the stockwork and veining zones. Alteration types are typically silica and argillic with minor amounts of propylitic.

Surface saprolite alteration is developed to a depth of approximately 15 m to 20 m.

## **LOS ANGELES**

The Los Angeles vein is a low-sulphidation epithermal breccia and stockwork system.

The mineralized structure strikes at 240° and dips steeply to the north at approximately 75° to 85°. The ore grade portion is confirmed over at least 400 m and is open along strike. The zones are also open down dip. The deepest current intersection is well mineralized at 120 m vertical from surface. The stockwork zone varies from three metres to 12 m thick, while the higher-grade breccias are 1.5 m to 3.5 m thick.

The best gold grades are associated with hydrothermal breccia, quartz breccia, and wall rock breccia with >25% veins and veinlets and banded texture with fine black sulphides.

The volcanic host rocks are moderately altered immediately adjacent to the stockwork and veining zones. In these areas, silicic and argillic alteration is present.

Surface saprolite alteration is developed to a depth of approximately 25 m from surface.

The Los Angeles vein was previously mined and, although the highest-grade portions of the vein are likely mined out, significant remnants in the hanging wall and footwall still contain mineralization. Drilling and long sections of historic mining confirm that there is no previous mining greater than 40 m to 50 m from surface.

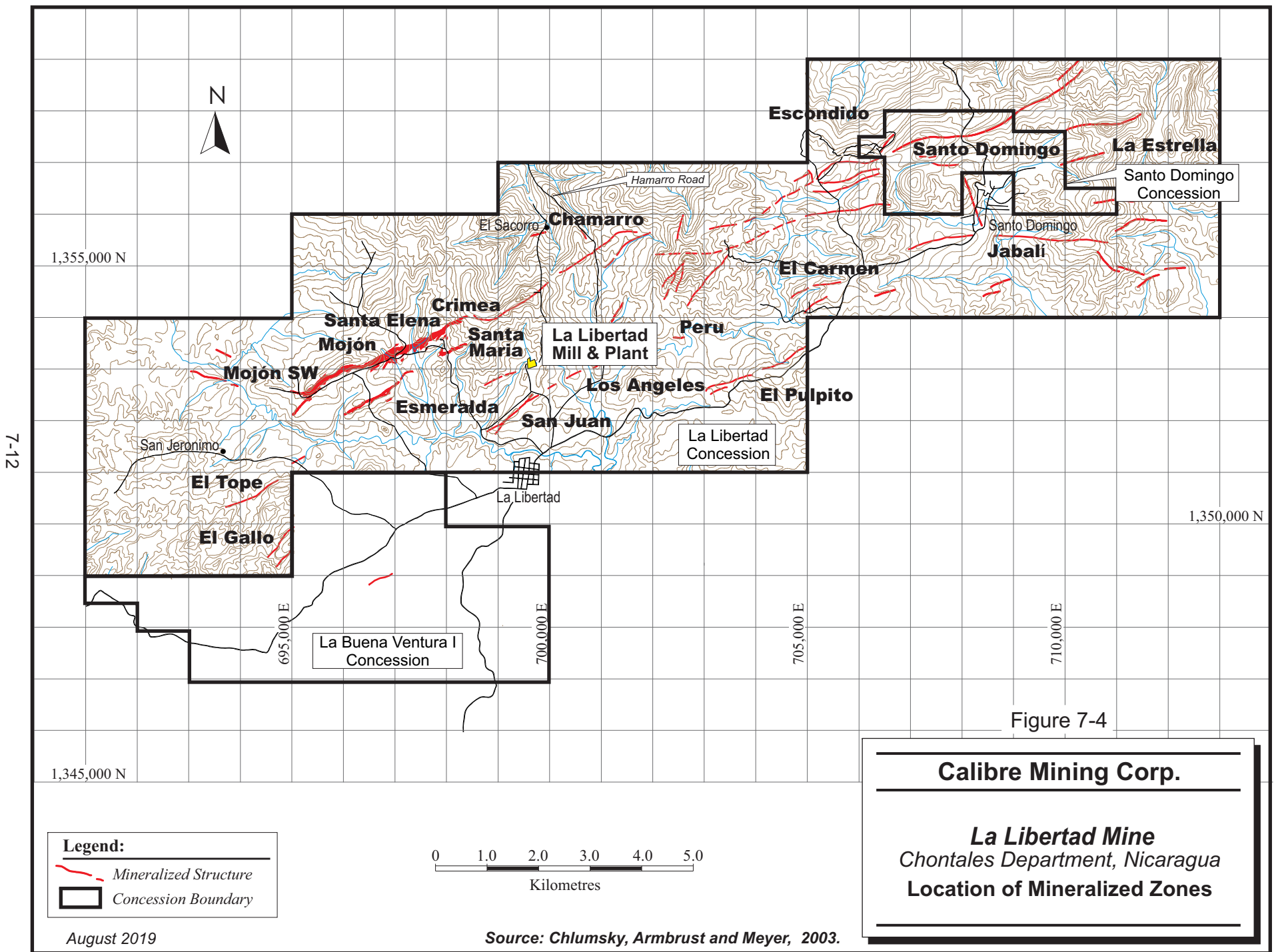
## **JABALÍ CENTRAL AND JABALÍ ANTENA**

The Jabalí vein system is geologically similar to other known veins within the La Libertad Concession. Gold mineralization at Jabalí is hosted in the east-west striking, northerly dipping quartz vein, quartz breccia, and quartz stockwork system. The 6.2 km long vein system has been divided into two zones: Jabalí Antena to the west of the Rio Sucio and Jabalí Central to the east. Preliminary multi-element geochemical data in conjunction with drill core logging suggests gold values are associated with the presence of gold-silver sulphosalt mineralization and locally with zinc and possibly lead sulphides. The vein structure is commonly oxidized up to 60 m below surface. Gold values within this oxidized portion of the vein are commonly associated with increased limonite, jarosite, and manganese oxides within vuggy textured quartz breccia veins.

Sulphides are rare near surface due to moderate to strong oxidation within the structure. Jabalí Antena has been drill tested over a strike length of 1,300 m. The vein system ranges in width from five metres to 29 m, dips 60° to 70° to the north, and has vertical extent that ranges from 150 m to 250 m.

Jabalí Central has been drill tested over a strike length of 2,650 m. The vein system ranges in width from five metres to 13 m, dips 80° to the north, and has a vertical extent of 50 m to 150 m as presently drilled.





7-12

Figure 7-4

**Calibre Mining Corp.**

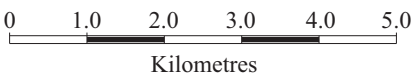
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**La Libertad Mine**  
Chontales Department, Nicaragua  
**Location of Mineralized Zones**

---

**Legend:**

- Mineralized Structure
- Concession Boundary



August 2019

Source: Chlumsky, Armbrust and Meyer, 2003.



## 8 DEPOSIT TYPES

According to Hulse, Crowl, and Malhotra (2015), the La Libertad vein system is classified as a low sulphidation epithermal system. The following is a description of this type of mineralization.

Low sulphidation epithermal gold-silver + copper deposits develop from near neutral dilute fluids, which are dominated by meteoric waters within cells of circulating hydrothermal fluids, commonly driven by the intrusive source rocks for metals, at considerable depth. Low sulphidation deposits therefore tend to dominate in reactivated dilational structural settings, and so are commonly characterized by banded veins comprising many individual events of hydrothermal mineral deposition. Some events of mineral deposition will be dominated by Au-bearing fluids derived from the magmatic source, deep circulating meteoric waters will entrain a magmatic component and so may exhibit lower grade gold mineralization, while shallow circulating meteoric waters are sometimes barren. Ground waters may collapse into the hydrothermal system or otherwise interact with the hydrothermal cells as an important feature of the mineral deposition process.

Varying mechanisms of mineral deposition are apparent within multi-generational veins. While boiling or phase separation by rapid pressure drop has long been proposed as a possible mechanism of mineral deposition, detailed character sampling has often failed to identify the bulk of gold-silver mineralization in the minerals deposited at this stage – adularia, bladed calcite, quartz pseudo-morphing calcite and to a certain extent chalcedony. Rather, these minerals constitute much of the gangue mineralogy. Some workers (Corbett and Leach, 1998) have proposed that Au deposition may be promoted by rapid cooling of the mineralizing fluid, enhanced by wall rock reaction, or mixing with varying ground waters. Rapid cooling of a mineralizing fluid, which promotes high-grade gold deposition, is often evidenced by the presence of gold within chalcedony, while fluid mixing is apparent from the presence of kaolin for low pH acid sulphate waters, manganese oxide for bicarbonate waters, and hypogene hematite and jarosite for oxygenated ground waters.

Varying styles of low sulphidation epithermal gold deposits, which commonly form in different geological environments, are distinguished on the basis of vein mineralogy. The group of low sulphidation gold-silver deposits with higher sulphide contents, although in many instances only in the order of 1% to 2%, display a closer association with intrusive source rocks. These

display transitional relationships and vary spatially and temporally from early to later in a vein paragenetic sequence, and generally from deeper to shallower levels from: quartz-sulphide gold + copper to carbonate-base metal Au, and epithermal quartz gold-silver deposits.

Corbett (2004) further sub-divides the low-sulphidation epithermal gold deposits into the following sub-types:

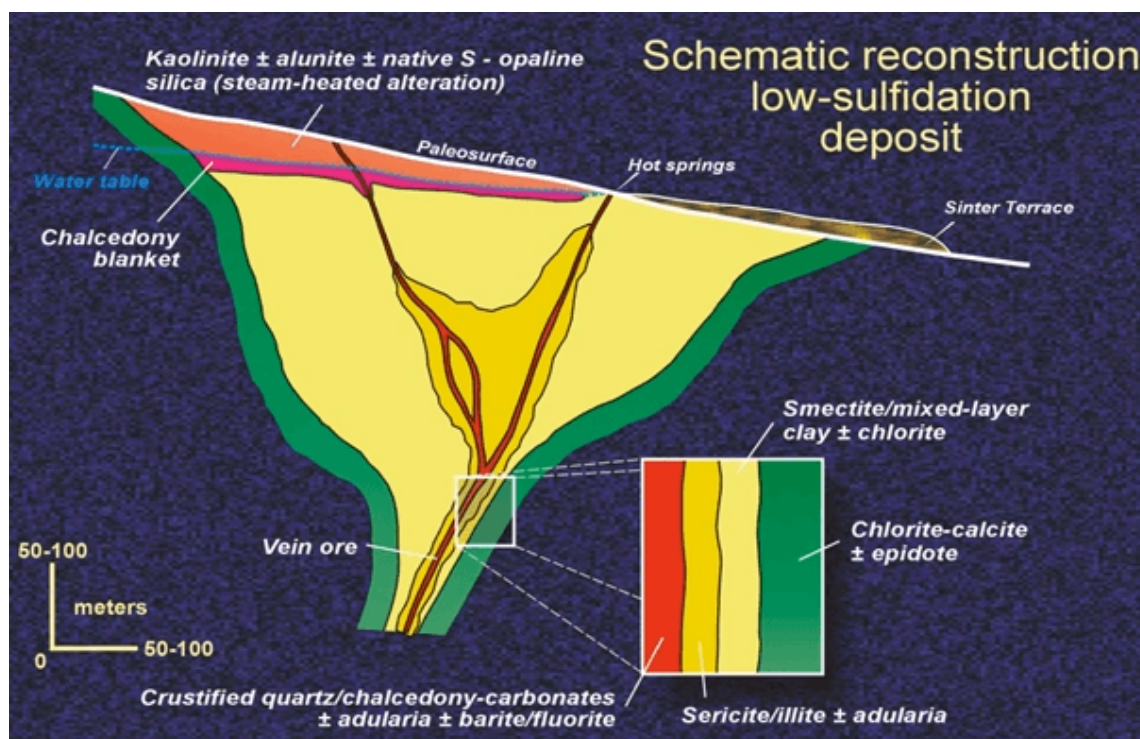
- Quartz-sulphide gold + copper deposits
- Carbonate – base metal-gold
- Epithermal quartz gold-silver
- Sediment-hosted replacement gold
- Adularia-sericite banded epithermal gold-silver quartz vein deposits

The reader is referred to Corbett (2004) for a description of these sub-types.

Examples of low sulphidation gold deposits include Hishikari (Japan), Sleeper (Nevada), and Round Mountain (Nevada).

A schematic of low sulphidation gold deposition is illustrated in Figure 8-1.

**FIGURE 8-1 LOW SULPHIDATION DEPOSIT**



## 9 EXPLORATION

### HISTORICAL EXPLORATION

All exploration work to date was performed by previous owners. The work is described in Section 6, History.

### EXPLORATION POTENTIAL

Exploration completed on the La Libertad Project has identified a series of targets at various stages of advancement with positive results which warrant further work. In RPA's opinion, there is potential to outline additional resources in the following areas:

- Extension to currently producing areas:
  - Mojón
  - San Juan
  - Tope (San Diego)
  - Jabalí Central/West
  - Jabalí Antena UG
  
- Existing resource areas not currently producing:
  - Soccoro (formerly Chamarro)
  - Rosario
  - San Antonio
  
- Advanced Targets:
  - Buenos Aires (including Nancite and Tranca)
  - Esmeralda North
  - Cosmatillo
  - Volcan
  - Morales
  - Santa Julia
  - Quintana
  
- Conceptual Targets

The exploration targets are illustrated in Figure 9-1.

Calibre has planned a two-phase exploration program to explore for and potentially outline additional Mineral Resources at La Libertad. The Phase 1 program would cost C\$10 million and would require 12 months to complete. The Phase 2 program, C\$14 million over 12 months, would be contingent on the results of Phase 1. Diamond drilling and assaying

accounts for approximately 70% of the total cost while the remainder is for salaries and support, and technical studies. RPA concurs with the recommended program and budget.

**TABLE 9-1 EXPLORATION BUDGET  
Calibre Mining Corp. – La Libertad Mine**

<b>Phase 1 (12 months)</b>		
<b>Item</b>	<b>Work Program</b>	<b>Cost (C\$)</b>
Diamond Drilling	30,000 m @ \$200/m	6,000,000
Assays	25,000 samples @ \$40/sample	1,000,000
Salaries / Technical Support	-	1,000,000
Other Exploration	Soils, rock, trenching	1,000,000
Permitting	-	250,000
Metallurgical Testing	-	100,000
Additional Technical Studies	Geotechnical, hydrogeological, etc.	100,000
Surveying	-	50,000
Resource Update / Technical Report	-	100,000
Consumable Supplies and Camp Costs	-	400,000
<b>Total</b>	-	<b>\$10,000,000</b>

<b>Phase 2 (12 months)</b>		
<b>Item</b>	<b>Work Program</b>	<b>Cost (C\$)</b>
Diamond Drilling	40,000 m @ \$200/m	8,000,000
Assays	30,000 samples @ \$40/sample	1,200,000
Salaries / Technical Support	-	1,500,000
Other Exploration	Soils, rock, trenching	1,500,000
Permitting	-	400,000
Metallurgical Testing	-	200,000
Additional Technical Studies	Geotechnical, hydrogeological, etc.	500,000
Surveying	-	100,000
Economic Study / Technical Report	-	200,000
Consumable Supplies and Camp Costs	-	400,000
<b>Total</b>	-	<b>\$14,000,000</b>



# La Libertad Targets

9-3

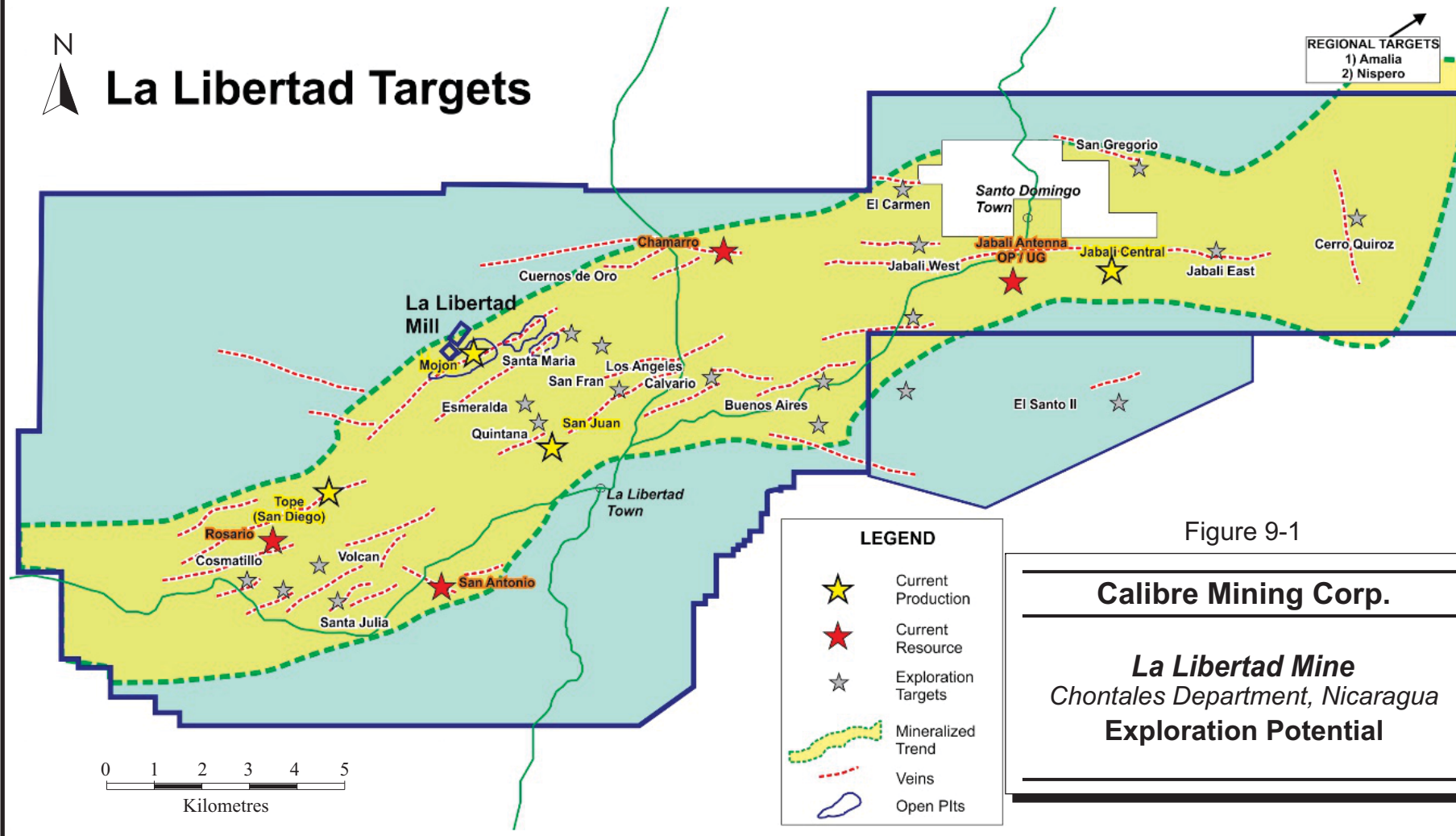


Figure 9-1

**Calibre Mining Corp.**

*La Libertad Mine*  
Chontales Department, Nicaragua

**Exploration Potential**

Highlights of some of the exploration targets follow:

### **JABALÍ ANTENA UNDERGROUND**

The Jabalí Antena underground target includes potential extensions along strike and down dip of the area currently being developed as the Jabalí Antena Underground operation. Only limited exploration drilling has been completed below the planned development and once underground development has been advanced, access to drilling sites will be competed for further exploration. A total of 1,214.65 metres was drilled in 12 diamond drill holes during 2019. Results received include 4.01 g/t Au over 5.1 m, 6.57 g/t Au over 7.5 m, 8.30 g/t Au over 4.6 m, 4.89 g/t Au over 8.1 m, and 2.25 g/t Au over 5.0 m at Zone 2.

### **ROSARIO OPEN PIT**

Assay results were received during April, 2019 for six infill drill holes completed in the Rosario target. These holes targeted the main Rosario structure within and below the current Inferred Mineral Resources in the Rosario open pit. Highlights of drilling include, 2.71 g/t Au over 4.3 m, 1.97 g/t Au over 3.5 m, and 2.54 g/t Au over 6.75 m.

### **ESMERALDA NORTH**

The Esmeralda target is located along one of the principal mineralized trends in the centre of the La Libertad Project. The main structure is a mineralized zone comprising vuggy quartz and associated quartz stockwork contained within an envelope of sericitized rocks cut by comb-textured quartz veinlets. The quartz-bearing structures show a moderate to a high presence of limonite plus goethite, locally accompanied by manganese oxides.

Recent positive results were returned from trenches and chip samples of surface exposures along a distance of approximately 400 m located between the two past-producing Esmeralda and Santa Mariá open pits. Results from channel samples include 2.38 g/t Au over 11.35 m, 15.70 g/t Au over 2.35 m, 0.60 g/t Au over 4.35 m, 1.23 g/t Au over 12.7 m (including 2.09 g/t Au over 5.44 m), and 4.16 g/t Au over 3.95 m.

### **BUENOS AIRES**

The Buenos Aires target which includes the subparallel structures of Nancite and Tranca is located in the south central portion of the main La Libertad concession group. The target has



been defined by extensive soil and rock sampling with follow-up trenching. The surface work has defined an anomalous trend extending over three kilometres with several sub-parallel structures. A moderate amount of artisanal miner activity has occurred in the area and has provided additional exposures for sampling. To date no drilling has been completed but drilling is planned for the second half of 2019.

## 10 DRILLING

Drilling has tested numerous priority targets defined by the exploration and has resulted in a series of discoveries including several deposits which are being mined or have been mined over the last number of years and others which are host to existing Inferred Resources.

La Libertad Mineral Resources are based on approximately 38,447 assays from 100,999 m of diamond drilling, reverse circulation (RC) drilling, and channel samples in 856 holes. The drilling was conducted almost exclusively from surface, with the exception of a small number of diamond drill holes completed from underground.

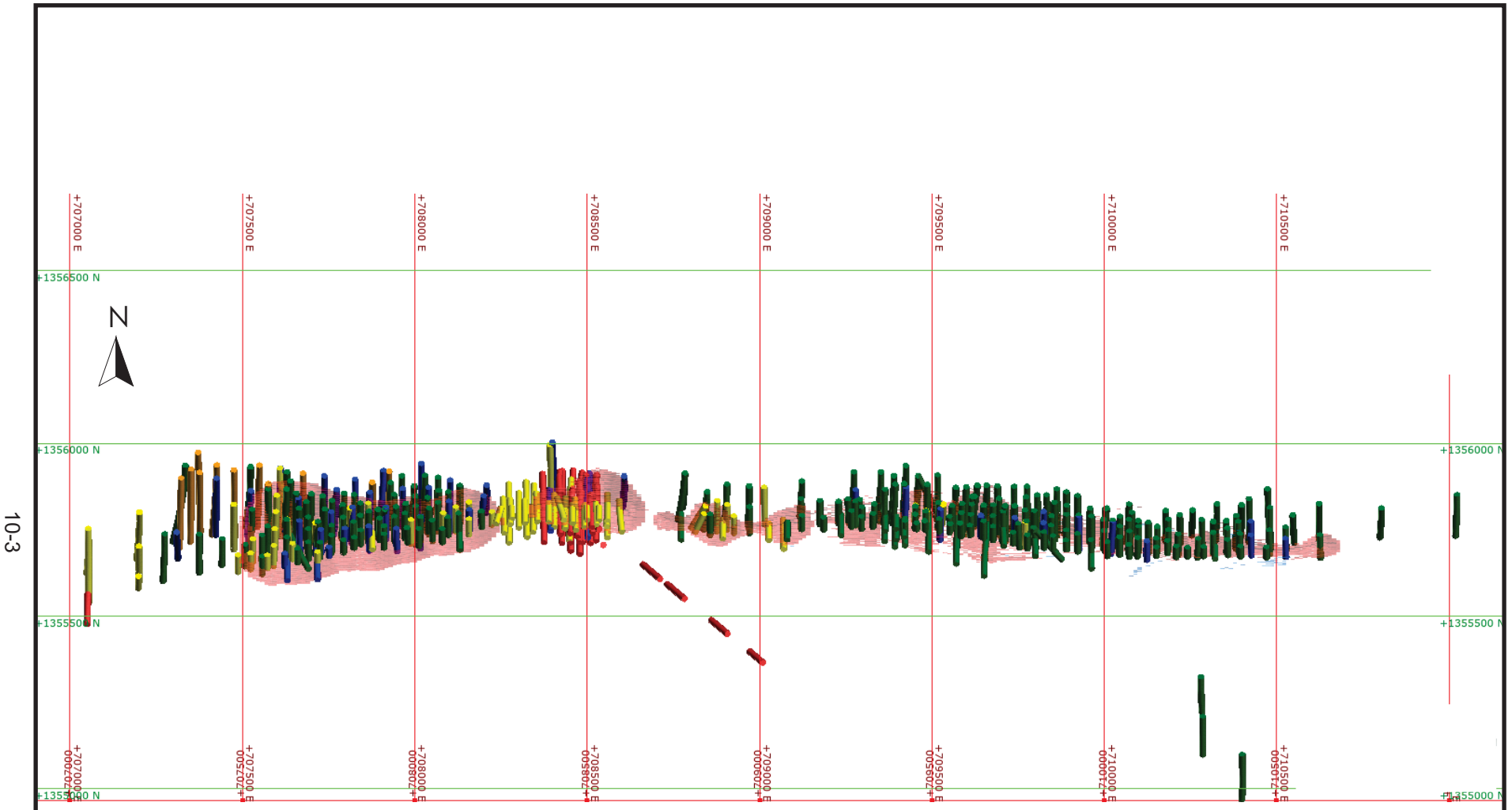
RC drilling and diamond drilling was conducted on 30 m to 40 m spacing for the Jabalí deposit and on 40 m to 60 m spacing for the Mojón, San Juan, and Tope deposits.

The drilling for 1984 through 2017 is summarized in Table 10-1 and illustrated in Figures 10-1 through 10-5.








**TABLE 10-1 DRILLING SUMMARY**  
**Calibre Mining Corp. - La Libertad Mine**

Year	Jabali (Antena)		San Juan				Tope		Mojon				Spent Ore		Total	
	DDH		DDH		RC		DDH		DDH		RC		Holes	Metres (m)	Holes	Metres (m)
	Holes	Metres (m)	Holes	Metres (m)	Holes	Metres (m)	Holes	Metres (m)	Holes	Metres (m)	Holes	Metres (m)				
1984			18	2,353					18						36	2,353
1995					5	485			5		27	3,010			37	3,495
1996											39	6,907			39	6,907
1997									9	1,819	75	17,218			84	19,037
1998									10	1,786	25	4,130			35	5,916
2006									14	2,137					14	2,137
2007									8	1,227			71	1,136	79	2,363
2008			30	4,166					3	662					33	4,828
2010	41	7,928	32	4,618					3	646					76	13,192
2011	81	11,611	3	593											84	12,204
2012	56	7,715	15	2,217									173	3,155	244	13,087
2013	11	3,395													11	3,395
2014															0	0
2015	23	4,845					13	1,208							36	6,053
2016							19	2,145							19	2,145
2017							29	3,887							29	3,887
<b>TOTAL</b>	<b>212</b>	<b>35,494</b>	<b>98</b>	<b>13,947</b>	<b>5</b>	<b>485</b>	<b>61</b>	<b>7,240</b>	<b>70</b>	<b>8,277</b>	<b>166</b>	<b>31,265</b>	<b>244</b>	<b>4,291</b>	<b>856</b>	<b>100,999</b>



10-3

**Drilling by Year:**

	2010
	2011
	2012
	2013
	2015

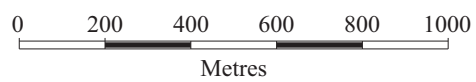
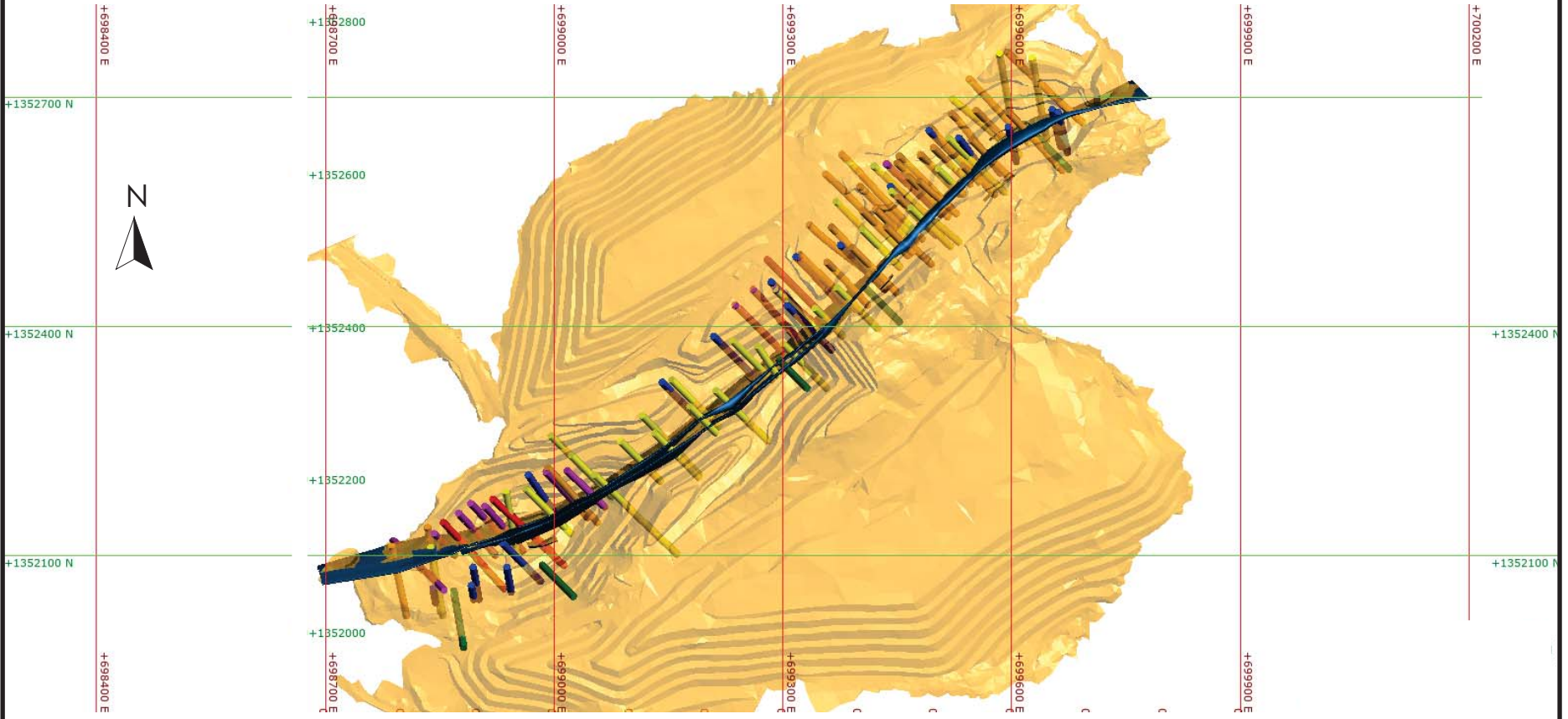


Figure 10-1







**Calibre Mining Corp.**

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*La Libertad Mine*  
Chontales Department, Nicaragua  
**Jabalí Drill Holes**



**Drilling by Year:**

	1984
	1995
	2008
	2010
	2011
	2012

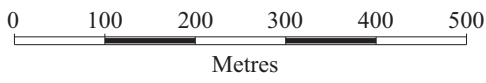


Figure 10-2

**Calibre Mining Corp.**

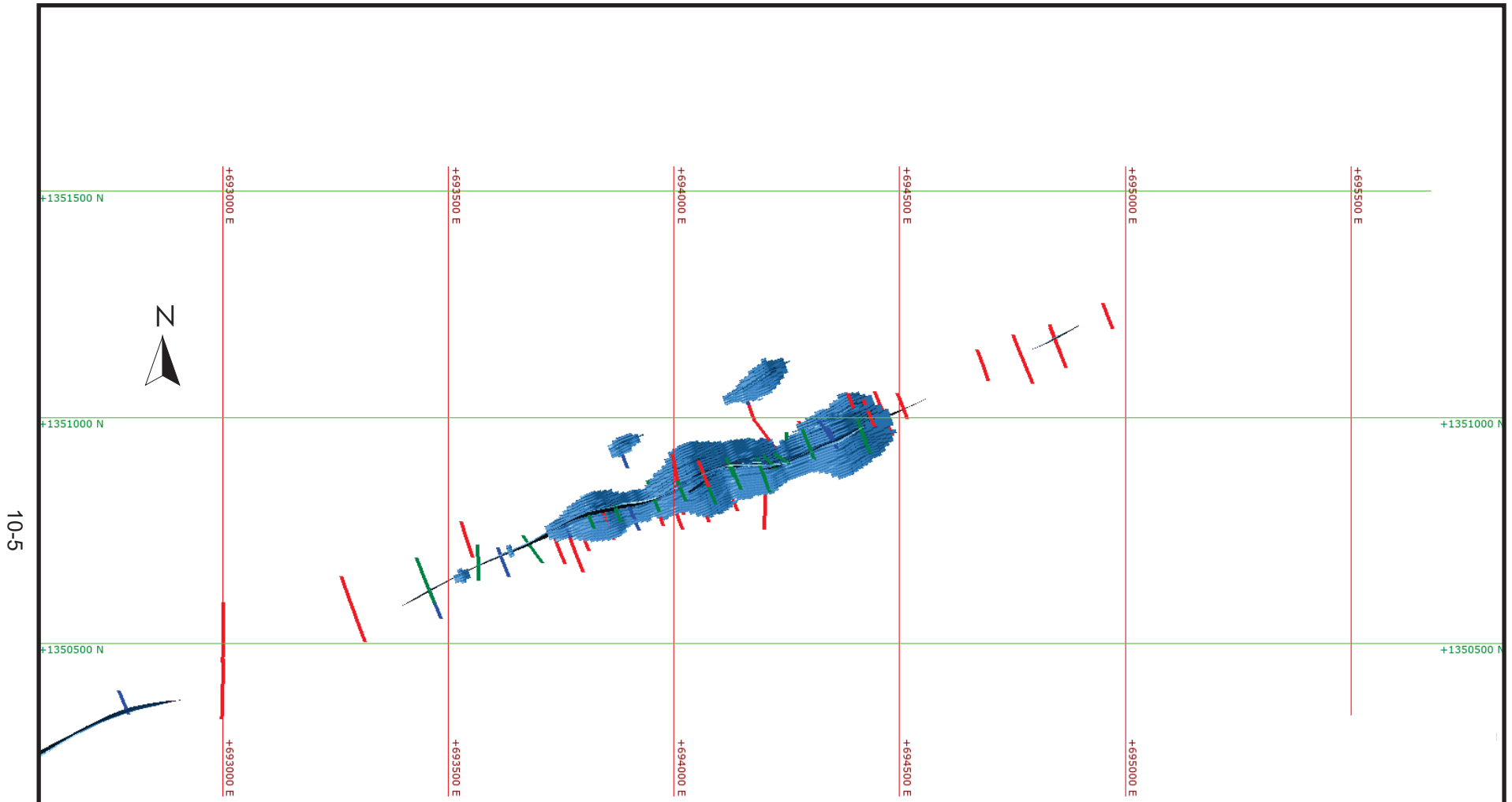
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*La Libertad Mine*  
Chontales Department, Nicaragua

**San Juan Drill Holes**

August 2019

Source: RPA, 2019.



**Drilling by Year:**

- 2015
- 2016
- 2017

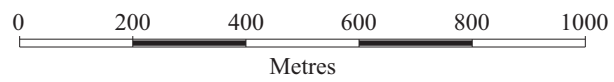
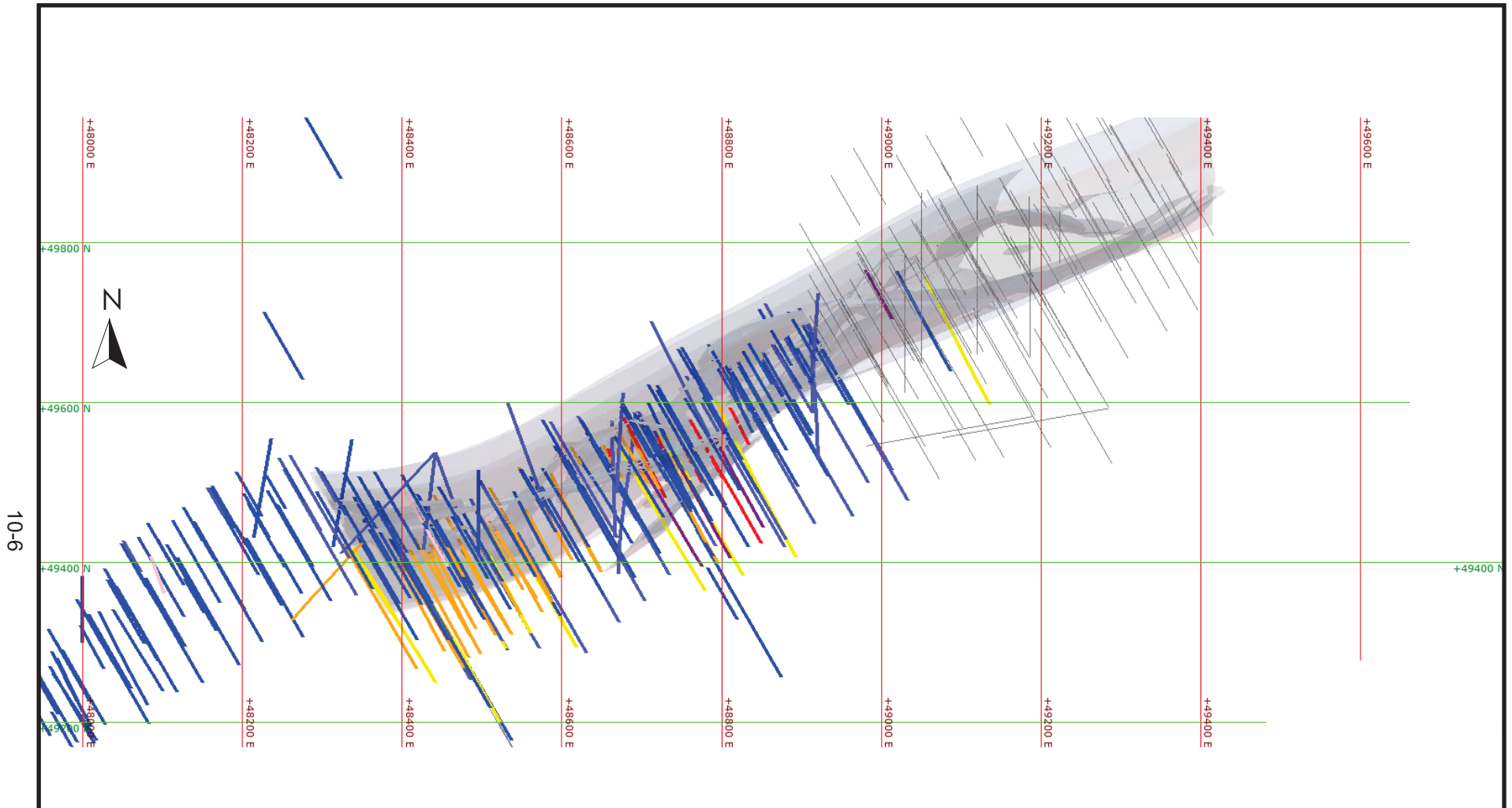


Figure 10-3

**Calibre Mining Corp.**

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***La Libertad Mine***  
*Chontales Department, Nicaragua*  
**Topo Drill Holes**

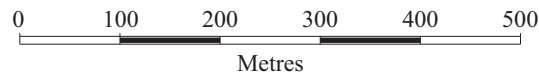


10-6

**Drilling by Year:**

- 1995 - 2011
- 2012
- 2013
- 2014
- 2015
- 2016

August 2019



Source: RPA, 2019.

Figure 10-4

**Calibre Mining Corp.**

***La Libertad Mine***  
*Chontales Department, Nicaragua*  
**Mojón Drill Holes**



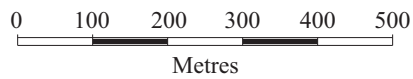
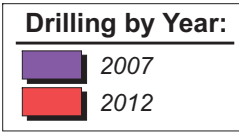
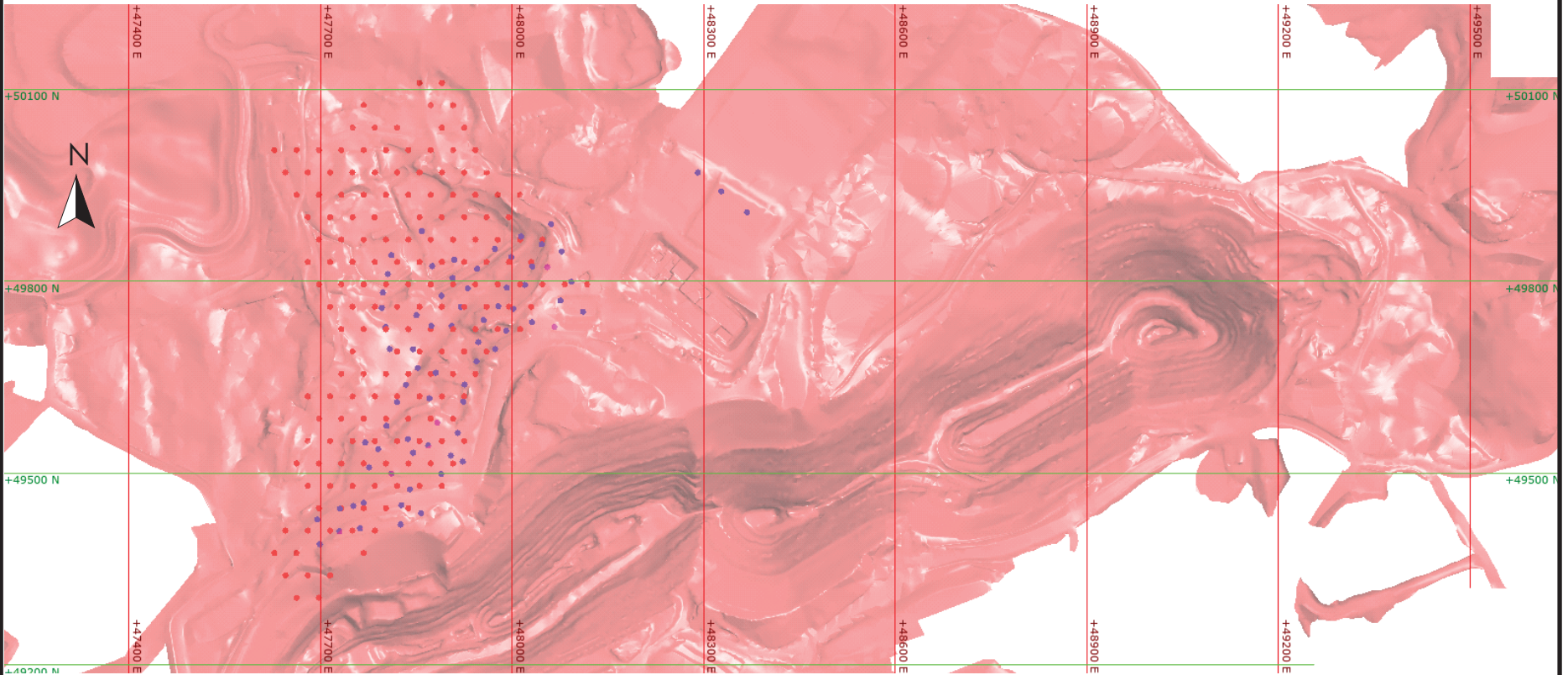


Figure 10-5

**Calibre Mining Corp.**

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***La Libertad Mine***  
*Chontales Department, Nicaragua*  
**Spent Ore Drill Holes**



Drill hole collars are surveyed using Sokia Total Station and Trimble Pro XRT-2 GPS instruments. Downhole surveys are completed at 50 m downhole intervals using a multi- or single-shot Reflex EZ-Shot or Reflex EZ-Trac instrument.

Drill core is logged by a geologist noting lithology, alteration, weathering/oxidation, mineralization, structure, core recovery, and rock quality designation (RQD). Logging is completed on paper, dual entered into MS Excel, then imported to an MS Access database and verified with a 100% check by the logging geologist. Drill core is photographed, both wet and dry, and the electronic photos are stored on site and on the Vancouver server.

Sample lengths range from 0.25 m to 2.00 m and respect lithological and mineralization contacts. Core is sawn in half with a diamond saw; half is sent to the laboratory for sample preparation and analysis and the remaining core is stored on site under cover.

There is a written protocol for logging and sampling to ensure consistency in the database.

Density measurements are collected on core samples every 20 m down hole. Samples are weighed, coated with wax, weighed in air, then suspended in water and weighed again. Average densities by domain code and oxidation are used for tonnage calculations. Densities range from 1.70 t/m<sup>3</sup> to 2.24 t/m<sup>3</sup> in saprolite and saprock and 2.40 t/m<sup>3</sup> to 2.65 t/m<sup>3</sup> in fresh rock. In RPA's opinion, these are reasonable densities for this type of mineralization.

The exploration drilling database is maintained in MS Access, underground sampling data is stored in MS Excel, and underground mapping lines are maintained in AutoCAD.

## 11 SAMPLE PREPARATION, ANALYSES, AND SECURITY

Sample preparation is carried out at the site assay laboratory and comprises the following steps:

- Dry at 100°C
- Crush to 85% minus 2 mm
- Riffle split 800 g
- Pulverize to 85% minus 74 microns

Prior to January 2013, the primary laboratory for analyses of La Libertad sample pulps used for Mineral Resource estimation was ALS Chemex in North Vancouver, B.C., Canada. Since January 2013, sample pulps used for Mineral Resource estimation are shipped to Bureau Veritas Minerals, previously Acme Labs, in Vancouver, B.C., Canada for analysis. Core samples are analyzed for gold using protocol FA430. Samples returning values greater than 10 g/t Au are re-assayed using protocol FA530.

In RPA's opinion, the sample preparation, analysis, and security procedures at La Libertad are adequate for use in the estimation of Mineral Resources.

### QUALITY ASSURANCE/QUALITY CONTROL

Exploration geological staff use an industry standard system for quality assurance/quality control (QA/QC) including the insertion of standard reference materials (SRM), blanks, and duplicates. La Libertad employs a database manager whose responsibilities include the monitoring of the QA/QC programs. The results are forwarded to a corporate database manager for review and corporate reporting. RPA reviewed the QA/QC results for 2017 and 2018 as a test of the recent additions to the database.

Each batch of 39 samples included a standard sample, a blank sample, a field duplicate (split core), a reject duplicate, and a pulp duplicate. In the event of a failed QA/QC sample, the entire batch was re-assayed.

**BLANK SAMPLES**

Blank samples are sourced from a basalt quarry. A failure was declared if the assay was greater than 10 times the detection limit of 0.05 g/t Au. During 2017-2018, there was one failure returned from 889 samples submitted.

**STANDARD REFERENCE SAMPLES**

SRMs were purchased from CDN Resource Laboratories in Vancouver, BC. During 2017-2018, La Libertad used seven different SRM samples with expected values ranging from 0.71 g/t Au to 7.93 g/t Au representing the range of probable grades expected at La Libertad. An SRM was considered a failure if it returned a value greater than three times the expected standard deviation (SD) or greater than twice the expected SD in two consecutive batches. During 2017-2018, the exploration department submitted 854 SRMs with batches of diamond drill core and had nine, or 1.1%, failures.

**FIELD DUPLICATES**

Field duplicates are made of split core. A total of 1,029 samples were submitted and compared with the original using scatter plots. The results show a reasonable comparison with an R<sup>2</sup> regression of approximately 96%.

In RPA's opinion, the QA/QC program as designed and implemented by La Libertad is adequate and the assay results within the database are suitable for use in a Mineral Resource estimate.

## 12 DATA VERIFICATION

### SOFTWARE VALIDATION AND AUDIT OF DRILL HOLE DATABASE

RPA conducted a number of digital and visual queries on the resource database. RPA inspected the drill hole traces, reviewed the drill hole traces in 3D, level plan, and vertical sections and found no unreasonable geometries. RPA also confirmed that there are no duplicate sample numbers and that sample numbers are available for every assayed interval.

RPA compared two drill holes from the Jabalí vein and two drill holes from the San Juan vein to Assay Certificates from ALS. No discrepancies were found.

In addition, a number of standard data integrity checks were performed within the software programs on the La Libertad drill hole database such as:

- Property boundary limits for each deposit.
- Intervals exceeding the total hole length (from-to issue).
- Negative length intervals (from-to issue).
- Out-of-sequence and overlapping intervals (from-to issue; additional sampling/QA/QC/check sampling included in table).
- No interval defined within analyzed sequences (not sampled or missing samples/results).
- Inconsistent drill hole labelling between tables and duplicate drill hole numbers.
- Invalid data formats and out-of-range values.
- Unusual assay results, including excessively long high grade assay intervals.

RPA reviewed the error reports generated by GEOVIA's Surpac and imported the drill hole database into Leapfrog Geo version 4.5. RPA identified a limited number of holes missing lithological information. No discrepancies were found.

### QUALITY ASSURANCE/QUALITY CONTROL

B2Gold conducts an industry standard QA/QC program. RPA reviewed the protocols and QA/QC results for 2017 and 2018. The results of the review are described in Section 11, Sample Preparation, Analyses, and Security.

## **RPA OPINION ON DATABASE**

In RPA's opinion the database is adequate for Mineral Resource estimation.

## 13 MINERAL PROCESSING AND METALLURGICAL TESTING

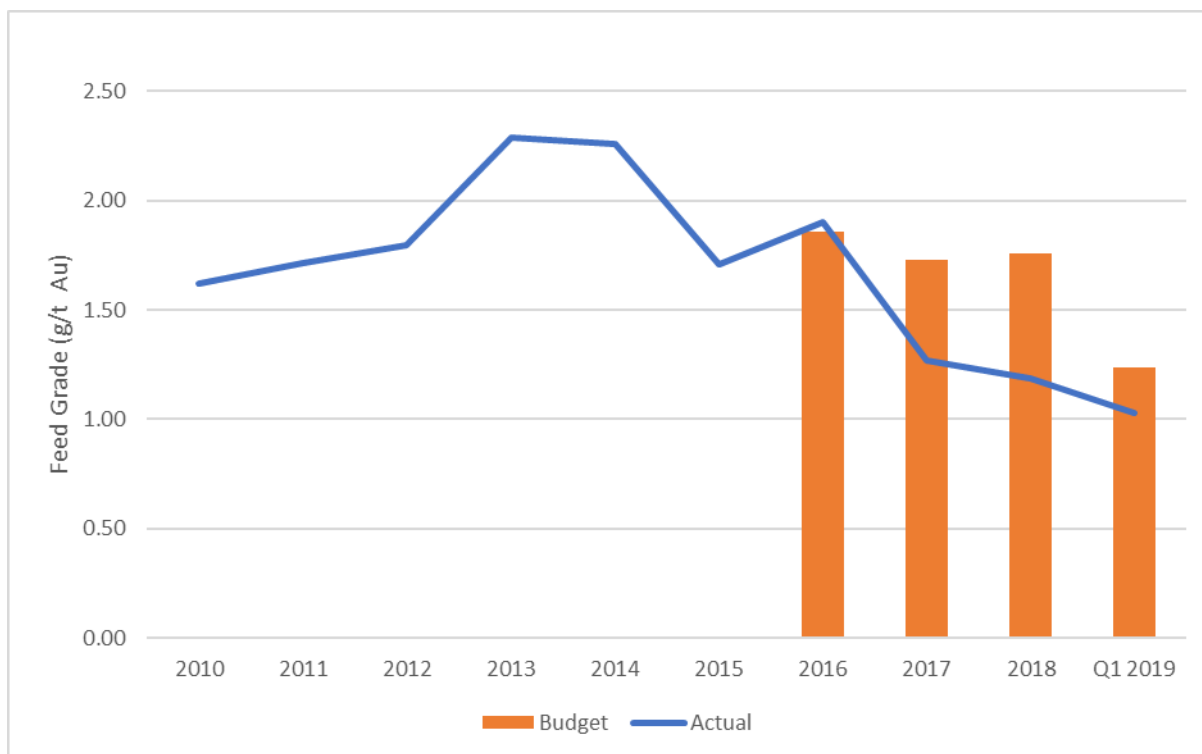
The La Libertad processing plant is a conventional processing plant consisting of agitated cyanide leaching and carbon adsorption, followed by carbon elution, electrowinning, and doré production. It has been in operation since 2009 and has undergone some upgrades to allow for increased throughput. Prior to 2009, La Libertad operated as an on-off heap leach and adsorption, desorption, and refining (ADR) operation from 1994 to 1996, and again from 2001 until 2007. Historical gold recovery from the heap leach operation averaged approximately 45%, as reported in the 2008 Scott Wilson RPA Technical Report (Scott Wilson RPA, 2008). The plant can treat approximately 2.25 million tpa, and current gold recoveries are approximately 94% to 95%.

Ore processed in 2018 had an average grade of 1.19 g/t Au, and originated from the San Juan and Tope open pits, Mojón and Jabalí underground mines, and the spent-ore stockpile. The plan for 2019 is to process a total of 2,273,736 t of ore at an average grade of 1.41 g/t Au and budgeted gold recovery of 94%, with the majority of the planned gold ounces coming from the San Juan and Tope open pits, Jabalí underground mine, and the spent-ore stockpile.

Feed grades to the processing plant have decreased in recent years as the operation approaches the end of the Life of Mine (LOM). Feed grades to the processing plant did not meet budget in 2017 and 2018, a trend which has continued into 2019 (Figure 13-1). In RPA's opinion, this trend is likely to continue in the absence of mitigating strategies. RPA recommends that the plan for 2019 be revised to take this into account.



**FIGURE 13-1 PROCESSING PLANT FEED GRADES**



## TEST WORK

Recent test work focussed mainly on cyanidation amenability of potential future feed material for the La Libertad processing plant. In general, the test work indicated that material tested could be successfully processed through the plant while achieving recoveries similar to historical recoveries. Carbon-in-pulp (CIP) modelling was conducted by SGS Canada Inc. (SGS) in 2015 using two samples, one of current plant cyclone overflow, and one composite sample made up of a blend of future ores including Jabalí-Central, spent ore, Mojón surface, Jabalí Antena, Mojón underground, and Jabalí underground ore. SGS also evaluated one composite sample and four variability samples from the Jabalí Antena deposit for amenability to whole ore cyanidation in 2015.

Sample representativity for the samples used in the various test campaigns was not available, however, the small degree of variability between the results for the samples (with the exception of the High-ox Jabalí Antena sample) indicate that, in general, recoveries similar to historical recoveries are possible when treating ores from these deposits. No deleterious elements were detected in significant amounts.

## CIP MODELLING – SGS, 2015

Two samples, one of current processing plant cyclone overflow and one of a future ore blend were submitted for test work. The first phase of the test work focussed on the amenability of the samples to whole-ore cyanidation, while the second phase focussed on carbon circuit modelling. A sample of La Libertad regenerated plant carbon was also used for the test work. The make-up of the future ore blend sample is provided in Table 13-1.

**TABLE 13-1 FUTURE ORE BLEND**  
**Calibre Mining Corp. – La Libertad Mine**

Ore Source	SGS Sample	Distribution (%)	Amount of Sample (kg)
Jabalí-Central	La Libertad Jabalí Central	11.9	2.4
Spent Ore	Spent Ore	48.1	9.6
Mojón Surface	La Libertad Mojón OP	6.9	1.4
Jabalí-Antena	Avg. Grade Mix	8.6	1.7
Mojón Underground	Mojón Master Comp	10.1	2.0
Jabalí Underground	50% Low-mix Sulphide	14.4	1.4
	50% High-mix Sulphide		1.4
<b>Total</b>		<b>100.0</b>	<b>20.0</b>

While the cyclone overflow sample assayed 1.41 g/t Au and 9.7 g/t Ag, the future blend sample assayed 2.70 g/t Au and 22.4 g/t Ag. The CIP modelling program included leach kinetics, adsorption kinetics, and equilibrium isotherm test work. The results from the tests were used to develop a mathematical leach and adsorption model that reproduced key plant operating parameters. The future blend modelling results illustrated that a carbon transfer rate of 12 tpd (current plant condition) would need to be used for the higher grade sample in order to maximize both gold and silver recovery.

## JABALÍ ANTENA CYANIDATION AMENABILITY – SGS, 2015

One average grade mixed sample and four variability samples were used for a metallurgical program to evaluate amenability of the samples to whole-ore cyanidation using optimized leach conditions established by a third party (BBA Engineering), with adjustments to the dissolved oxygen profile and leach temperature to simulate the current La Libertad plant operating conditions. The tests were completed using the Libertad target grind size of 80% passing ( $P_{80}$ ) 100  $\mu$ m. The leach tests were conducted using stirred reactors, as opposed to standard bottle roll tests, at the request of the client. The head grades for the average grade mix sample were 4.17 g/t Au and 35.6 g/t Ag. The head grades of the variability samples ranged from 2.38 g/t

Au to 11.1 g/t Au and from 12.8 g/t Ag to 85.2 g/t Ag. Head assays for the samples are shown in Table 13-2.

**TABLE 13-2 JABALÍ ANTENA SAMPLE HEAD ASSAYS**  
**Calibre Mining Corp. – La Libertad Mine**

Element	Unit	Samples				
		Average Grade Mix	Low-Mix (Sulphide)	High-Mix (Sulphide)	Low-Ox	High-Ox
Au Cut A	g/t	3.66	2.43	9.60	2.44	11.2
Au Cut B	g/t	4.67	2.32	7.40	2.53	11.0
<b>Au Avg.</b>	<b>g/t</b>	<b>4.17</b>	<b>2.38</b>	<b>8.50</b>	<b>2.49</b>	<b>11.1</b>
Ag Cut A	g/t	35.5	14.5	62.2	13.2	85.7
Ag Cut B	g/t	35.7	15.5	65.2	12.4	84.7
<b>Ag Avg.</b>	<b>g/t</b>	<b>35.6</b>	<b>15.0</b>	<b>63.7</b>	<b>12.8</b>	<b>85.2</b>
Cu	%	0.079	...	...	...	...
Pb	%	0.69	...	...	...	...
Zn	%	0.59	...	...	...	...
S <sub>T</sub>	%	0.52	0.36	0.70	0.16	0.71
S <sup>=</sup>	%	0.46	0.29	0.59	0.15	0.62
SO <sub>4</sub>	%	<0.1	<0.1	<0.1	<0.1	<0.1
S <sup>o</sup>	%	<0.05	<0.05	<0.05	<0.05	<0.05
Hg	g/t	<0.3	<0.3	<0.3	<0.3	<0.3

The average grade mix sample, low-mix sulphide, and low-ox samples all responded well to the optimized test conditions and gold extractions were approximately 96% or higher after 32 hours of leaching. Silver extractions were approximately 73-74%.

The high-mix sulphide and high-ox variability samples did not respond well to the optimized leach conditions, and gold extractions were 44.1% and 47.7%, respectively. Silver extractions were 47.1% (high-mix sulphide) and 7.9% (high-ox). Repeat tests were completed and the cyanide (NaCN) concentration was increased to 0.5 g/L from 0.3 g/L. The increased cyanide concentration had a positive impact on both samples. The high-mix sulphide sample gold and silver extractions increased to 93.8% and 80.2%, respectively. The high-ox sample gold and silver extractions increased to 61.8% and 64.3%, respectively, but were still lower than all the other samples tested.

The cyanide and lime consumptions for the optimized leach tests ranged from 0.48 kg/t to 1.57 kg/t and 1.48 kg/t to 2.06 kg/t, respectively. The cyanide consumption was directly related to the sulphide, copper, and zinc head grades.

A three-stage diagnostic leach test was completed using the repeat high-ox cyanidation residue sample. The results indicated that the majority of the gold in the sample (approximately 99%) was readily available and could be extracted with additional leach time and more cyanide. The silver extraction was approximately 81% after the additional leach stages and the remaining silver was mostly associated with sulphide minerals.

## SAN ANTONIO CYANIDATION AMENABILITY – LA LIBERTAD, 2018

Samples from the San Antonio deposit were tested in the La Libertad metallurgical laboratory. Results are presented in Figure 13-2.

**FIGURE 13-2 SUMMARY OF CYANIDATION TEST WORK ON SAMPLES FROM THE SAN ANTONIO DEPOSIT**

Sample N°	Granulometry	Target NaCN	Calculated Head	Extracted	Average tails	Au extracted	Leach time	Consumption	Addition	Addition
	-200 meshes	ppm	g Au/t	g Au/t	g Au/t	%	h	NaCN Kg/t	CaO Kg/t	Pb(NO <sub>3</sub> ) <sub>2</sub> g/t
SA18-011	72.0	350	1.844	1.772	0.072	96.1	31	0.192	1.900	100
SA18-015	72.0	350	1.750	1.678	0.071	95.9	31	0.220	1.940	100
SA18-016	70.0	350	1.247	1.169	0.078	93.8	31	0.192	1.540	100
SA18-017	70.0	350	4.432	4.260	0.172	96.1	31	0.148	2.300	100
SA18-020	71.5	350	1.754	1.660	0.094	94.6	31	0.167	1.453	100
SA18-021	70.7	350	1.386	1.186	0.102	92.1	31	0.178	2.560	100
SA18-023	69.0	350	1.714	1.625	0.089	94.8	31	0.250	2.120	100
SA18-024	70.0	350	1.318	1.236	0.078	94.1	31	0.178	1.700	100
SA18-025	73.0	350	0.888	0.834	0.054	93.9	31	0.206	1.320	100
SA18-012/013	70.5	350	1.158	1.079	0.079	93.2	31	0.188	1.728	100

Sample N°	Granulometry	Target NaCN	Calculated Head	Extracted	Average tails	Au extracted	Leach time	Consumption	Addition	Addition
	-200 meshes	ppm	g Au/t	g Au/t	g Au/t	%	h	NaCN Kg/t	CaO Kg/t	Pb(NO <sub>3</sub> ) <sub>2</sub> g/t
Composite 021 and 024	72.0	350	1.289	1.200	0.089	93.11%	31	0.220	1.420	100
Composite 021 and 024	72.0	500	1.335	1.268	0.066	95.04%	31	0.343	1.460	100

Sample N°	Granulometry	Target NaCN	Calculated Head	Extracted	Average tails	Au extracted	Leach time	Consumption	Addition	Addition
	-200 meshes	ppm	g Au/t	g Au/t	g Au/t	%	h	NaCN Kg/t	CaO Kg/t	Pb(NO <sub>3</sub> ) <sub>2</sub> g/t
Composite all samples	71.0	350	1.732	1.654	0.078	95.50%	31	0.240	1.600	100
Composite all samples	71.0	500	1.658	1.604	0.054	96.74%	31	0.370	1.600	100

Source: B2Gold, 2019

## EL TOPE CYANIDATION AMENABILITY – LA LIBERTAD, 2017

Three samples from the Tope deposit were tested in duplicate in the La Libertad metallurgical laboratory. Gold extraction results are presented in Figure 13-3. The results indicated that this material would be suitable as a portion of the feed to the La Libertad processing plant.

**FIGURE 13-3 SUMMARY OF CYANIDATION TEST WORK ON SAMPLES FROM THE TOPE DEPOSIT**

Resumen Au											
Descripcion	Prueba No.	Fecha realizacion de prueba	NaCN ppm inicio	Pb(NO <sub>3</sub> ) <sub>2</sub> g/ton mineral	Fineza (-200), 0.075 mm	Cabeza analizada promedio g Au/t	Cabeza calculada, (g Au/t)	Extraido (g Au/t)	Promedio cola, (g Au/t)	Au extraido	Tiempo Lixivacion, horas
El tope LP	PB-1207	08-feb-17	320.0	100.0	65.60	2.311	2.216	2.137	0.079	96.45%	32
El tope HP	PB-1208	08-feb-17	320.0	100.0	70.60	4.500	4.875	4.715	0.160	96.72%	32
El tope MIX	PB-1209	08-feb-17	320.0	100.0	66.60	4.178	3.706	3.596	0.110	97.03%	32
El tope LP	PB-1210	14-feb-17	320.0	100.0	73.20	2.311	2.403	2.311	0.093	96.15%	32
El tope HP	PB-1211	14-feb-17	320.0	100.0	71.40	4.500	4.588	4.435	0.153	96.67%	32
El tope MIX	PB-1212	14-feb-17	320.0	100.0	69.20	4.178	4.276	4.163	0.113	97.36%	32

Source: B2Gold, 2017

### SAN JUAN CYANIDATION AMENABILITY – LA LIBERTAD, 2016

Four samples from the San Juan deposit were tested in the La Libertad metallurgical laboratory. Gold extraction results are presented in Figure 13-4. The results indicated that this material could be successfully treated as a portion of the feed to the La Libertad processing plant.

**FIGURE 13-4 SUMMARY OF CYANIDATION TEST WORK ON SAMPLES FROM THE SAN JUAN DEPOSIT**

Resumen Au											
Prueba No.	Descripcion	Fecha realizacion de prueba	NaCN ppm inicio	Pb(NO <sub>3</sub> ) <sub>2</sub> g/ton mineral	Fineza (-200), 0.075 mm	Cabeza analizada promedio g Au/t	Cabeza calculada, (g Au/t)	Extraido (g Au/t)	Promedio cola, (g Au/t)	Au extraido	Tiempo Lixivacion, horas
PB-1194	SAN JUAN-051216-MET01	08-dic-16	350.0	100.0	70.05	5.333	4.894	4.749	0.145	97.04%	32
PB-1195	SAN JUAN-051216-MET01	14-dic-16	350.0	100.0	75.55	5.333	5.035	4.904	0.109	97.83%	32
PB-1196	SAN JUAN-051216-MET01	19-dic-16	350.0	100.0	72.00	5.333	4.987	4.847	0.140	97.20%	32
PB-1197	SAN JUAN-051216-MET01	21-dic-16	350.0	100.0	77.00	5.333	5.102	4.923	0.180	96.48%	32

Source: B2Gold, 2016

### EL ROSARIO CYANIDATION AMENABILITY – LA LIBERTAD, 2018

Eight samples from the Rosario deposit were tested in the La Libertad metallurgical laboratory. Gold extraction results are presented in Figure 13-5.

**FIGURE 13-5 SUMMARY OF CYANIDATION TEST WORK ON SAMPLES FROM THE ROSARIO DEPOSIT**

Sample N°	Granulometry	Target NaCN	Head Average	Calculated Head	Extracted	Average tails	Au extracted	Leach time	Consumption	Addition	Addition
	-200 meshes	ppm	g Au/t	g Au/t	g Au/t	g Au/t	%	h	NaCN Kg/t	CaO Kg/t	Pb(NO <sub>3</sub> ) <sub>2</sub> g/t
RS18-001	69.70%	350	2.952	3.306	2.988	0.318	90.4	31	0.191	2.492	100
RS18-002	71.00%	350	0.680	0.664	0.614	0.049	92.6	31	0.176	2.330	100
RS18-003	70.00%	350	1.359	1.338	1.221	0.116	91.3	31	0.197	1.880	100
RS18-004	70.33%	350	5.832	5.741	5.314	0.427	92.6	31	0.214	1.639	100
RS18-005	70.00%	350	0.983	0.966	0.887	0.079	91.8	31	0.264	1.780	100
RS18-007	71.00%	350	1.497	1.596	1.445	0.151	90.5	31	0.264	2.040	100
RS18-008/09	72.00%	350	0.897	0.941	0.847	0.094	90.0	31	0.350	2.280	100

Source: B2Gold, 2018

## COMMINUTION TEST WORK

In 2015, two samples from the Mojón deposit underwent comminution characterization test work at SGS and the results are presented in Table 13-3.

**TABLE 13-3 COMMINUTION TEST WORK SUMMARY – SGS 2015**  
**Calibre Mining Corp. – La Libertad Mine**

	<b>Relative Density</b>	<b>JK Parameters A x b</b>	<b>t<sub>a</sub></b>	<b>RWi kWh/t</b>	<b>BWi kWh/t</b>	<b>Ai g</b>
Sample 1	2.53	43.7	0.44	16.3	17.2	0.742
Sample 2	2.54	45.0	0.46	16.2	17.1	0.748



## 14 MINERAL RESOURCE ESTIMATE

Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves (CIM (2014) definitions) were used for Mineral Resource classification.

The Mineral Resources at La Libertad Mine were estimated by B2Gold and reviewed and accepted by RPA. The Mineral Resources are contained in nine proposed open pit and underground mining scenarios as well as spent ore from a previous heap leach operation and surface stockpiles.

To fulfill the CIM requirement of “reasonable prospects for eventual economic extraction” of open pit scenarios, RPA prepared a preliminary open pit shell for each mineralized zone to constrain the block model for resource reporting purposes. Each preliminary pit shell was generated using Whittle software. For deposits designated as underground scenarios a range of cut-off grades from 2.80 g/t Au to 2.85 g/t Au was developed that reflects the mining costs based on the likely mining method, processing costs, and gold price.

The Mineral Resources for La Libertad, effective December 31, 2018, are summarized in Table 14-1.

**TABLE 14-1 MINERAL RESOURCES – DECEMBER 31, 2018**  
**Calibre Mining Corp. - La Libertad Mine**

<b>Area</b>	<b>Tonnes (kt)</b>	<b>Grade (g/t Au)</b>	<b>Contained Au (koz)</b>
<b>Indicated</b>			
Jabalí Central OP	381	2.22	27
Jabalí Antena OP	457	4.90	72
San Juan OP	124	7.19	29
Mojón UG	68	4.52	10
Tope OP	48	4.25	7
Spent H/L Ore	902	0.77	22
Stockpile	8	0.75	0.2
<b>Total Indicated</b>	<b>1,987</b>	<b>2.61</b>	<b>167</b>
<b>Inferred</b>			
Jabalí Central OP	185	2.26	13

<b>Area</b>	<b>Tonnes (kt)</b>	<b>Grade (g/t Au)</b>	<b>Contained Au (koz)</b>
Jabalí UG	1,135	7.81	285
Tope OP	214	2.50	17
Spent H/L Ore	206	0.76	5
Mojón UG	300	4.14	40
San Juan UG	326	2.88	30
Soccoro (formerly Chamarro)	217	1.56	11
Rosario	260	2.08	17
San Antonio	374	2.75	33
<b>Total Inferred</b>	<b>3,216</b>	<b>4.37</b>	<b>452</b>

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are based on 100% ownership.
3. Mineral Resources are estimated at cut-off grades ranging from 0.62 g/t Au to 0.68 g/t Au for open pits and 2.80 g/t Au to 2.85 g/t Au for underground.
4. Mineral Resources are estimated using a long-term gold price of US\$1,400 per ounce.
5. Bulk density is 1.70 t/m<sup>3</sup> to 2.65 t/m<sup>3</sup>.
6. Numbers may not add due to rounding.

RPA notes that the La Libertad Mineral Resources are based on block models completed from February 2016 to November 2017 and the spent ore estimate is based on an April 2016 model.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

## RESOURCE DATABASE

The exploration drilling database is maintained in MS Access, underground sampling data is stored in MS Excel, and underground mapping lines are maintained in AutoCAD.

La Libertad Mineral Resources are based on approximately 92,039 assays from 124,929 m of diamond drilling, RC drilling, and channel samples in 1,364 holes. The drilling was conducted almost exclusively from surface, with the exception of a small number of diamond drill holes completed from underground.

The database for Mineral Resources consists primarily of RC drilling and diamond drilling on 30 m to 40 m spacing for the Jabalí deposit and on 40 m to 60 m spacing for the Mojón, San Juan, and Tope deposits. Trench samples are occasionally used, however, their influence is restricted.

The assay and geological database cut-off date is December 31, 2015 for the Jabalí, San Juan, and Mojón deposits and spent ore and December 31, 2016 for the Tope deposit. Some historical drill holes were not included in the models due to possible hole location issues. As well, suspect assay results were not included in the databases. RC drill holes and most of the underground exploration holes were also excluded from the Mineral Resource database.

## **CUT-OFF GRADE AND OPEN PIT OPTIMIZATION**

To fulfill the CIM requirement of “reasonable prospects for eventual economic extraction”, B2Gold prepared preliminary open pit shells for Jabalí and San Juan to constrain the block model for resource reporting purposes. Each preliminary pit shell was generated using Whittle software.

In the open pit scenarios, cut-off grades (COG) ranging from 0.62 g/t Au to 0.68 g/t Au were used in 2016 for reporting open pit Mineral Resources from optimized preliminary pit shells. In 2018, the optimization parameters were updated. Metal prices used for Mineral Reserves are based on consensus, long term forecasts from banks, financial institutions, and other sources. For Mineral Resources, metal prices used are slightly higher than those used for Mineral Reserves.

A range of COGs from 2.80 g/t Au to 2.85 g/t Au were developed for the underground scenarios that reflect the varying mining and processing costs and gold price.

## **GEOLOGICAL INTERPRETATION**

All La Libertad Mineral Resource estimates are based on interpretations of vein/quartz breccia, stockwork, and mined out openings. Solid models are built using a combination of Leapfrog and Datamine software, while the more recent models are built with Leapfrog with significant controls to the solids. Block model grade estimates are controlled by the geological/grade zone interpretations. RPA notes that there is good correspondence between diamond drill data, wireframes, and blocks.

Looking West

JB12-345

JB12-361

Stockwork

Vein

JB12-365

14-4

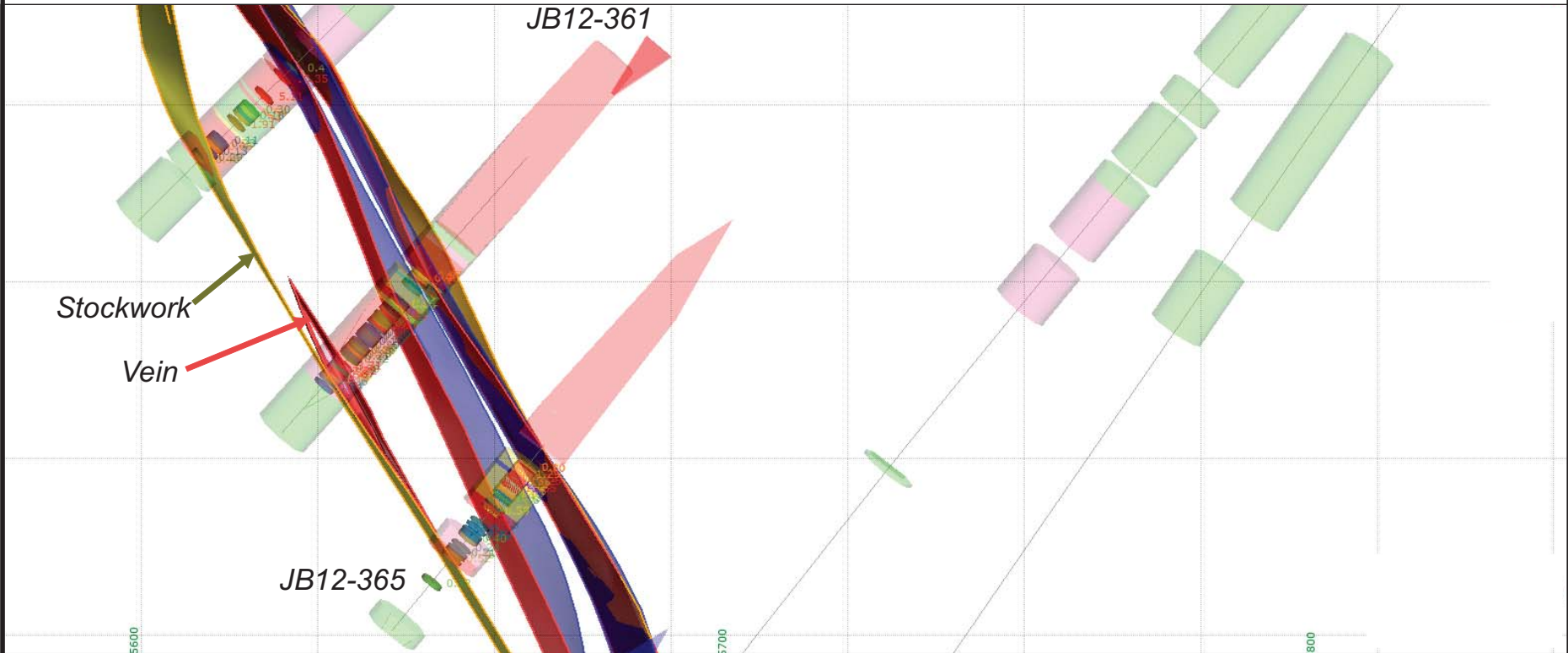
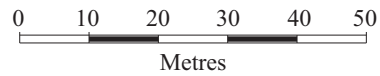


Figure 14-1

**Calibre Mining Corp.**

***La Libertad Mine***  
*Chontales Department, Nicaragua*  
**View of Mineralization Wireframe**



RPA reviewed the blocks related to the high grade veins and noticed that some areas close to the openings (galleries) have been extended more than half of the distance between holes. In general, the areas are very narrow from 0.5 m to 2.0 m, and in some cases their thickness is 4.0 m to 6.0 m. There is a risk that more openings could exist (as they were built based only on drill hole intercepts) in areas where there is no hole available to confirm what has been left. Overall, RPA is of the opinion that the mineralization and lithology wireframes are adequate for the style of mineralization and are suitable to constrain the block model.

## CAPPING OF HIGH GRADE ASSAYS

Capping of high grade gold assays was applied by resource area and domain; vein, quartz breccia, stockwork, high grade shoot, etc. If high grade shoots were apparent, assays within the shoot were treated as a separate capping domain. Capping levels for each domain were determined using decile analysis and lognormal probability plots. For the primary domains at Mojón, secondary capping using a distance restriction was used. Raw assays were capped prior to compositing. The capping levels are summarized in Table 14-2.

RPA performed an independent capping analysis on gold for the high grade vein, vein, stockwork, and gallery domains (1000, 2000, 3000, and 8000), where possible, in the Jabalí, San Juan, Tope and Mojón models, as well as visual validation of the block model in section and plan view. RPA notes that the high grade areas with more than 20 g/t Au are overpowering low grade areas, however, this occurs mostly in Inferred blocks. RPA suggests incorporating a distance restriction to control the smearing of the high grade zones.

In RPA's opinion, capping levels are reasonable, however, a distance restriction should be incorporated to control the smearing of the high grades. In Tope, the capping level should be slightly reduced.

**TABLE 14-2 CAPPING LEVELS**  
**Calibre Mining Corp. - La Libertad Mine**

Deposit	Capping Level (g/t Au)
<b>Jabalí Central</b>	
HG Vein-1	30
HG Vein-0	20

Deposit	Capping Level (g/t Au)
Breccia	9
Stockwork	8
Gallery (Fill)	11
<b>San Juan</b>	
HG Vein-1	20
HG Vein-2	50
Stockwork	2.5
Gallery (Fill)	3.5
<b>Tope</b>	
Vein (various)	2 - 25
Stockwork (various)	1.5 – 5.0
Gallery (Fill)	0.2
<b>Mojón</b>	
Vein (various)	5 - 25
Stockwork (various)	6
Gallery (Fill)	0.2
<b>Spent Ore</b>	
All	3.5

Table 14-3 summarizes uncapped assay statistics for gold.

**TABLE 14-3 UNCAPPED ASSAY STATISTICS – GOLD**  
**Calibre Mining Corp. - La Libertad Mine**

	Jabalí	San Juan	Tope	Mojón
No. of cases	14,911	2,555	4,667	16,314
Minimum	0.0030	0.0050	0.0025	0.0000
Maximum	2,010.00	184.56	58.10	292.00
Median	0.30	0.19	0.05	0.24
Arithmetic Mean	2.03	1.61	0.38	0.94
Weighted Mean	2.05	1.76	0.32	0.90
Standard Deviation	20.13	8.32	1.90	4.42
Coefficient of Variation	9.9	5.1	4.9	4.6



## COMPOSITING

In Jabalí, San Juan, Tope, and spent ore, samples were composited to 2.0 m beginning at each domain. In Mojón, the composites were created at 1.5 m. In RPA's opinion, the composite length is reasonable given that the dominant sample length is 0.6 m and the block height is 2.0 m (Figures 14-2 to 14-6).

**FIGURE 14-2 JABALÍ ASSAY LENGTH HISTOGRAM**

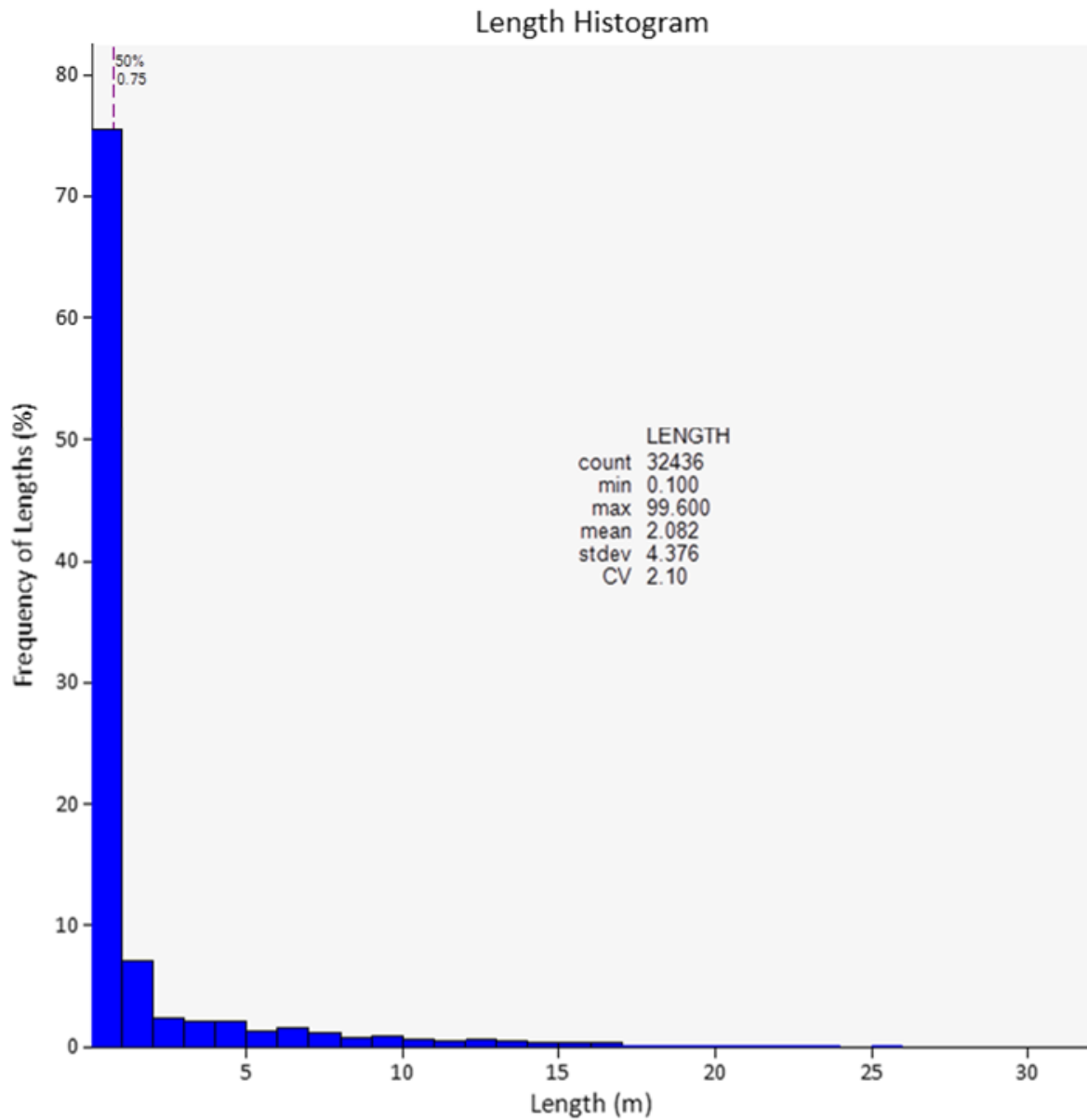


FIGURE 14-3 SAN JUAN ASSAY LENGTH HISTOGRAM

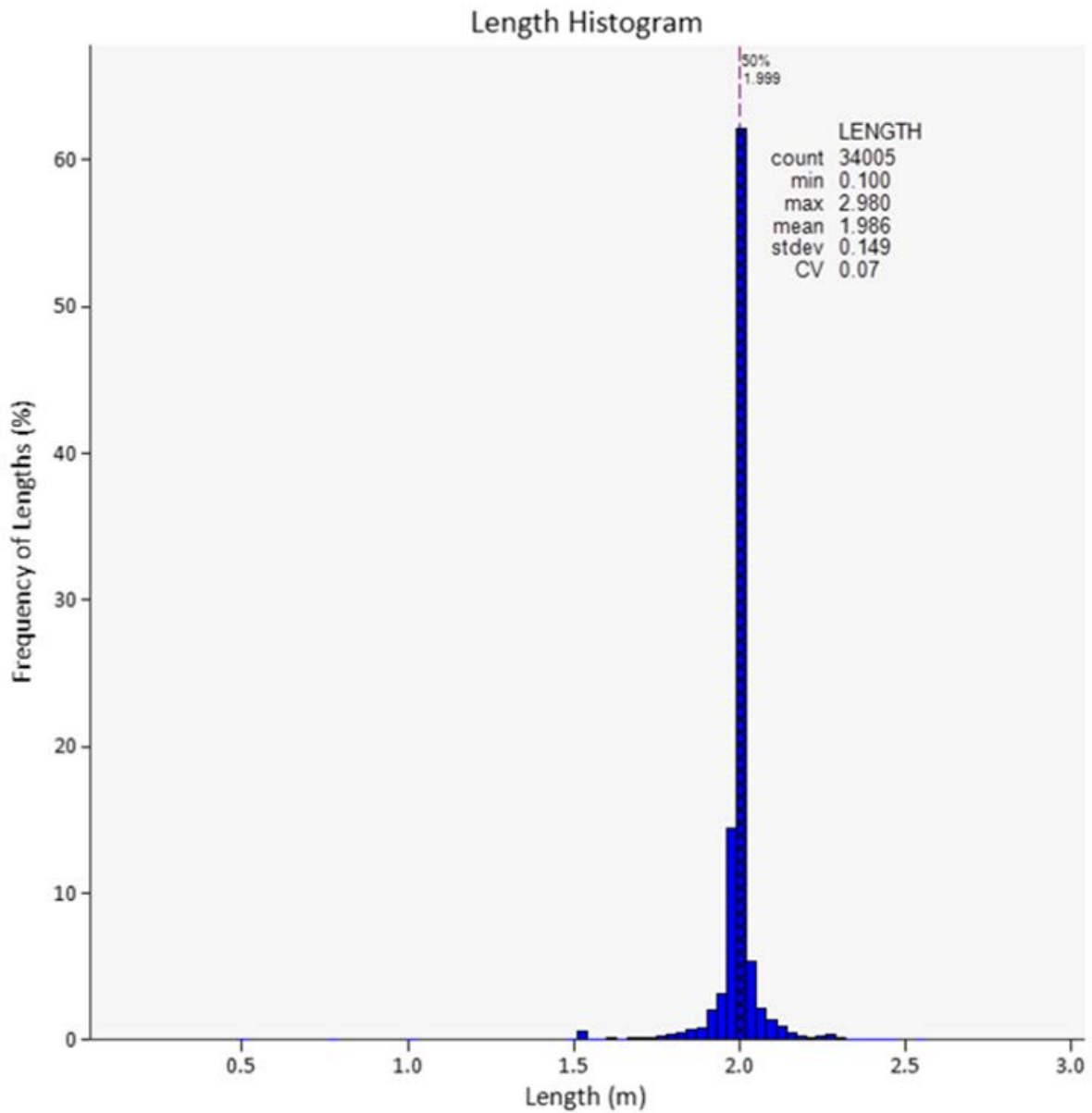


FIGURE 14-4 MOJÓN ASSAY LENGTH HISTOGRAM

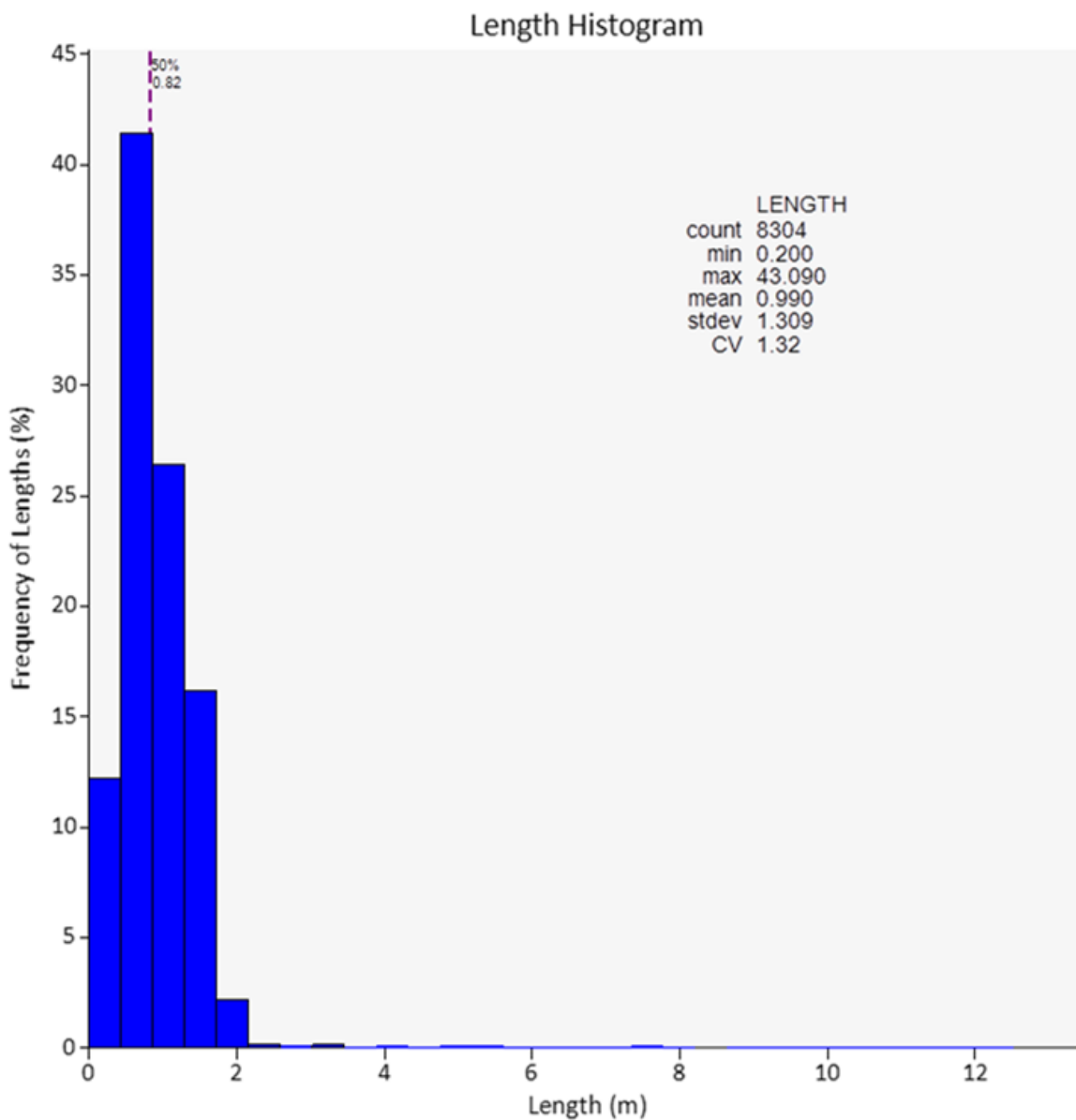


FIGURE 14-5 SPENT ORE ASSAY LENGTH HISTOGRAM

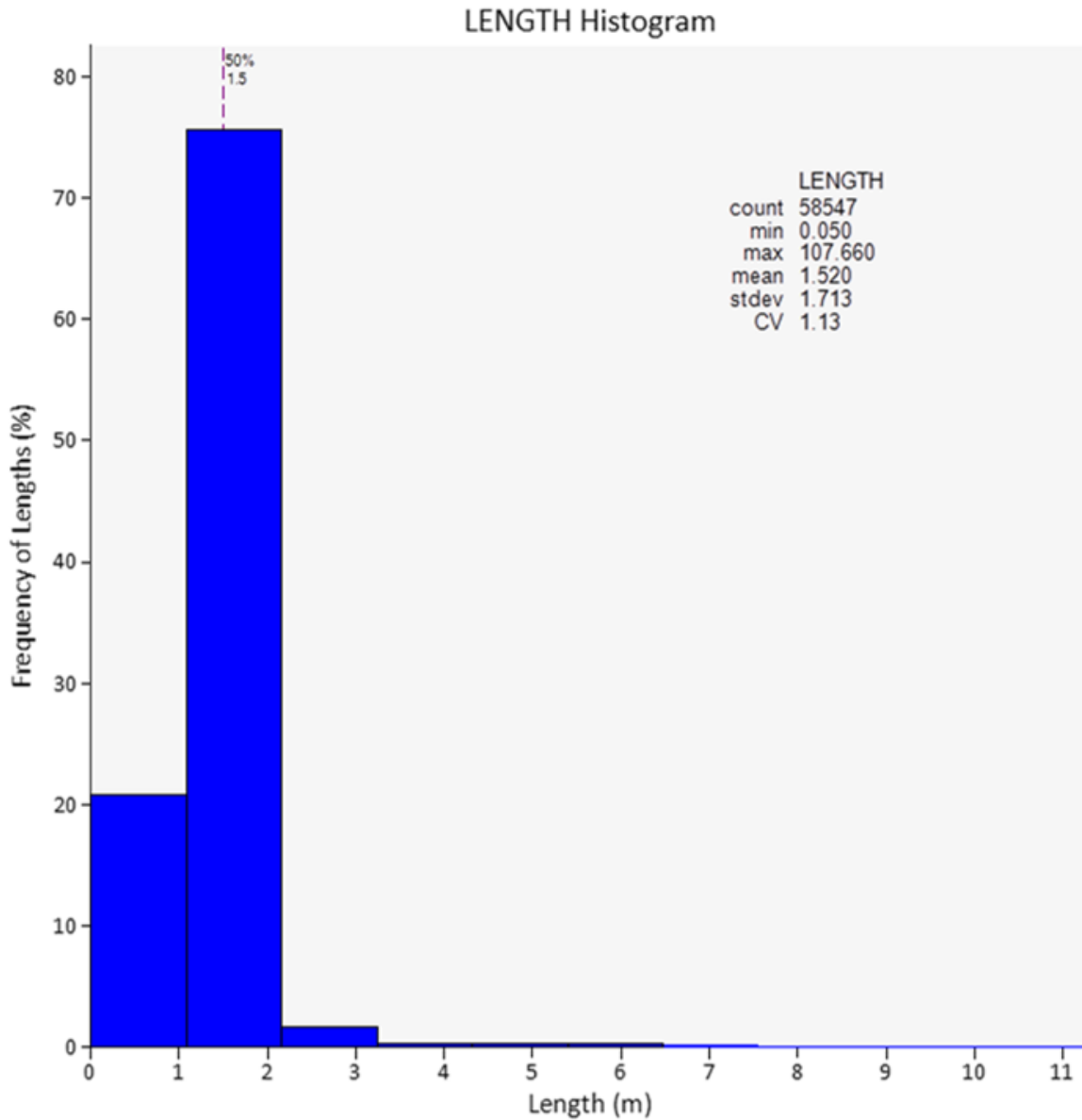
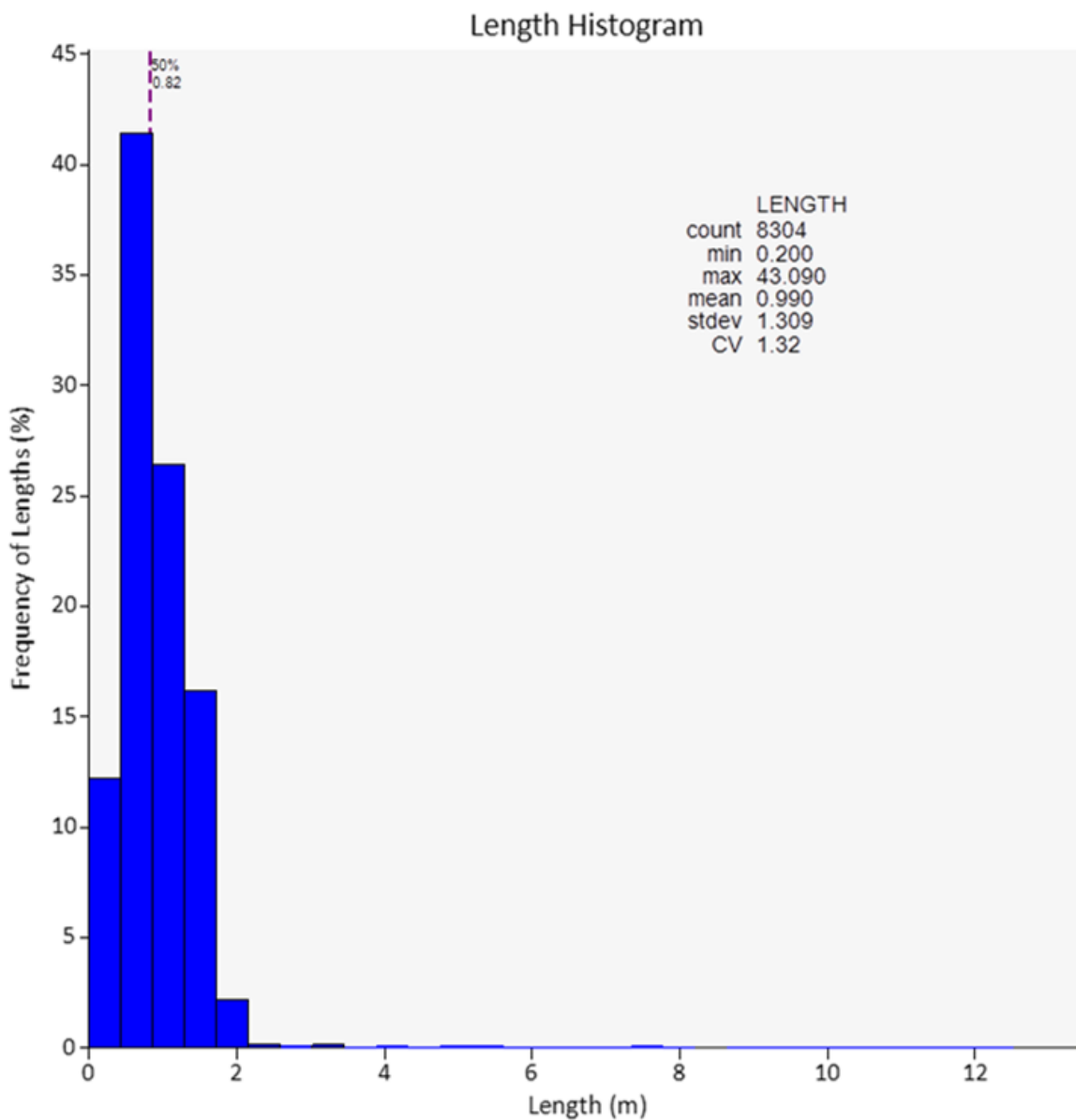


FIGURE 14-6 TOPE ASSAY LENGTH HISTOGRAM



Uncapped and capped composite statistics for gold are summarized in Tables 14-4 and 14-5, respectively.

**TABLE 14-4 UNCAPPED COMPOSITE STATISTICS – GOLD**  
**Calibre Mining Corp. - La Libertad Mine**

	Jabalí	San Juan	Tope	Mojón
No. of cases	4,139	759	1,777	8,465
Minimum	0.0030	0.0050	0.0025	0.0010
Maximum	322.51	184.56	34.82	120.12
Median	0.48	0.28	0.07	0.27
Arithmetic Mean	2.10	1.84	0.48	0.93
Weighted Mean	2.058	1.78	0.45	0.93
Standard Deviation	9.55	8.46	1.77	2.99
Coefficient of Variation	4.54	4.60	3.69	3.21

**TABLE 14-5 CAPPED COMPOSITE STATISTICS – GOLD**  
**Calibre Mining Corp. - La Libertad Mine**

	Jabalí	San Juan	Tope	Mojón
No. of cases	4,139	759	1,777	8,465
Minimum	0.0030	0.0050	0.0025	0.0010
Maximum	60.00	49.60	11.00	25.00
Median	0.48	0.28	0.07	0.27
Arithmetic Mean	1.62	1.44	0.38	0.85
Weighted Mean	1.60	1.42	0.36	0.86
Standard Deviation	3.55	4.17	1.00	1.87
Coefficient of Variation	2.18	2.89	2.60	2.19

## VARIOGRAPHY

Variogram parameters (Tables 14-6 and 14-7) and experimental semivariograms (Figures 14-7 and 14-8) were calculated by B2Gold from the composites for each domain in San Juan and Mojón. The major and semi-major directions were fit in the plane of the mineralization which was defined by inspecting the histogram of dip and dip direction of wireframe triangles for each domain. The experimental semivariograms were fit with a nugget effect structures as required. The downhole variograms were used to model the nugget effect and to fit the across-strike variogram models. In Tope, variography was performed on composites, however, most domains lacked sufficient samples to obtain robust variograms. For this reason, kriging was not used for interpolation. In the Spent Ore, no definitive directional trends were observed in the data so no variography parameters were defined. The search ellipse criteria in Spent Ore were set up to ensure that all pass 1 and pass 2 blocks are within at least two drill holes.

**TABLE 14-6 VARIOGRAM PARAMETERS – JABALÍ ANTENA**  
**Calibre Mining Corp. - La Libertad Mine**

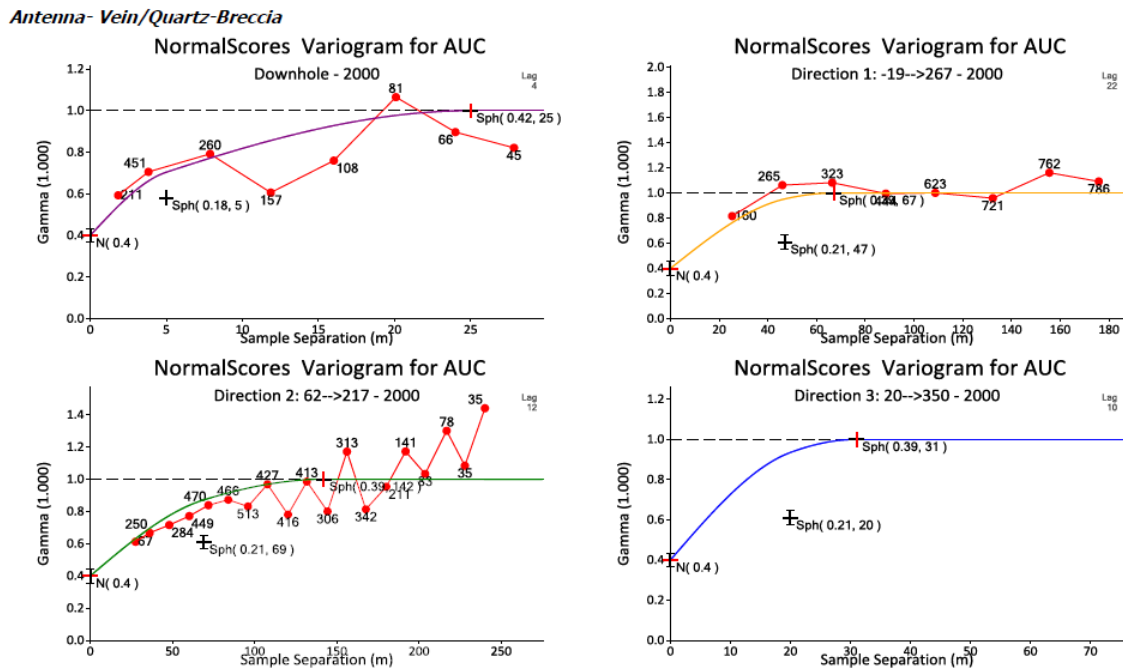
Domain	Nugget	C1	Range 1 Strike	Range 1 Dip	Range 1 Across	C2	Range2 Strike	Range 2 Dip	Range 2 Across
1000	0.25	0.40	50	30	15	0.35	200	70	20
2000	0.40	0.30	45"	70	15	0.30	70	140	25
3000	0.40	0.35	50	40	10	0.25	250	80	20
4000	0.40	0.40	50	160	20	0.20	175	135	50
8000	0.20	0.40	50	20	10r	0.40	120	40	20



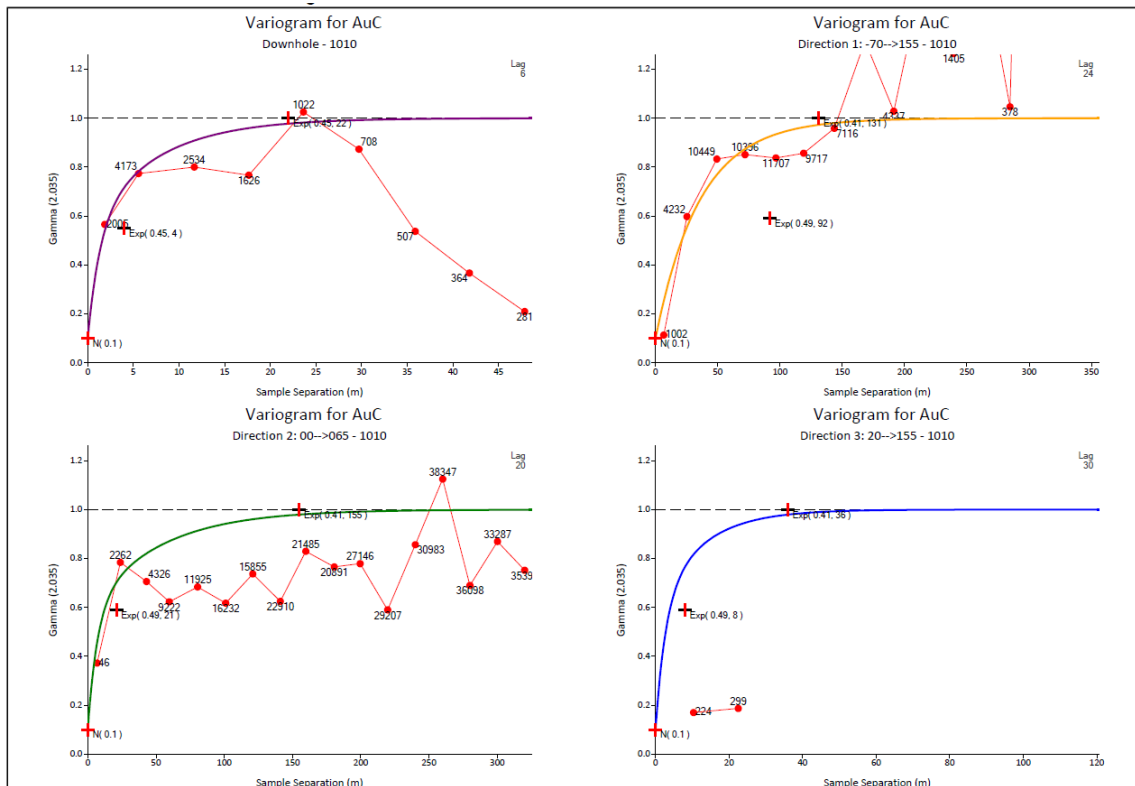
**TABLE 14-7 VARIOGRAM PARAMETERS – MOJÓN**  
**Calibre Mining Corp. - La Libertad Mine**

Domain Code	Domain Name	Domain Type	Variogram Model	Number of Structures	C0	C1	A1	VMinor Ratio1	C2	A2	VSemi Ratio2	VMinor Ratio2	Analysis	Var. Rot1	Var. Rot2	Var. Rot3
1000	main3	V	NESTED EXPOTENTIAL	2	0.10	0.5	21	1	0.40	88	1	1.7	Generic 1			
1010	main2	V	NESTED EXPOTENTIAL	2	0.10	0.49	92	1	0.41	131	1	3.6	Domain Specific			
1015	main2_hg	HG	NESTED EXPOTENTIAL	2	0.10	0.39	30	1	0.51	134	1	4.0	Domain Specific			
1020	main1	V	NESTED EXPOTENTIAL	2	0.10	0.50	21	1	0.40	88	1	1.7	Generic 1			
1030	hw5	V	NESTED EXPOTENTIAL	2	0.10	0.50	21	1	0.40	88	1	1.7	Generic 1			
1040	hw2	V	NESTED EXPOTENTIAL	2	0.10	0.50	60	1	0.40	90	1	5.0	Domain Specific			
1045	hw2_hg	HG	NESTED EXPOTENTIAL	2	0.10	0.50	21	1	0.40	88	1	1.7	Generic 1			
1080	cross3	V	NESTED EXPOTENTIAL	2	0.10	0.50	21	1	0.40	88	1	1.7	Generic 1	Aligned with zone by dynamic anisotropy direction parameters in each block		
1090	cross2	V	NESTED EXPOTENTIAL	2	0.10	0.50	21	1	0.40	88	1	1.7	Generic 1			
2000	s_main	S	NESTED EXPOTENTIAL	2	0.10	0.40	9	1	0.50	50	1	4.0	Generic 2			
2010	s_hw5	S	NESTED EXPOTENTIAL	2	0.10	0.40	9	1	0.50	50	1	4.0	Generic 2			
2020	s_hw5	S	NESTED EXPOTENTIAL	2	0.10	0.40	9	1	0.50	50	1	4.0	Generic 2			
2040	s_cross3	S	NESTED EXPOTENTIAL	2	0.10	0.40	9	1	0.50	50	1	4.0	Generic 2			
2050	s_cross2	S	NESTED EXPOTENTIAL	2	0.10	0.40	9	1	0.50	50	1	4.0	Generic 2			
2060	s_cross1	S	NESTED EXPOTENTIAL	2	0.10	0.40	9	1	0.50	50	1	4.0	Generic 2			

**FIGURE 14-7 B2GOLD EXPERIMENTAL SEMI-VARIOGRAMS FOR VEIN/QUARTZ BRECCIA IN JABALÍ**



**FIGURE 14-8 B2GOLD EXPERIMENTAL SEMI-VARIOGRAMS FOR DOMAIN 1010 IN MOJÓN**



## SEARCH STRATEGY AND GRADE INTERPOLATION PARAMETERS

Grade interpolation into parent blocks used ordinary kriging (OK) for the Jabalí and Mojón deposits, inverse distance cubed ( $ID^3$ ) for the Tope deposit, and inverse distance squared ( $ID^2$ ) for the San Juan deposit and spent ore. All interpolations used three passes. In RPA's opinion, the estimation strategies are appropriate for this type of deposit.

Search ellipses for grade interpolation were oriented using dynamic anisotropy, with the longest axis parallel to strike and the second longest axis down-dip. Search distances ranged from 35 m to 200 m in three estimation passes depending on the deposit (Table 14-8).

**TABLE 14-8 SEARCH DISTANCES**  
Calibre Mining Corp. – La Libertad Mine

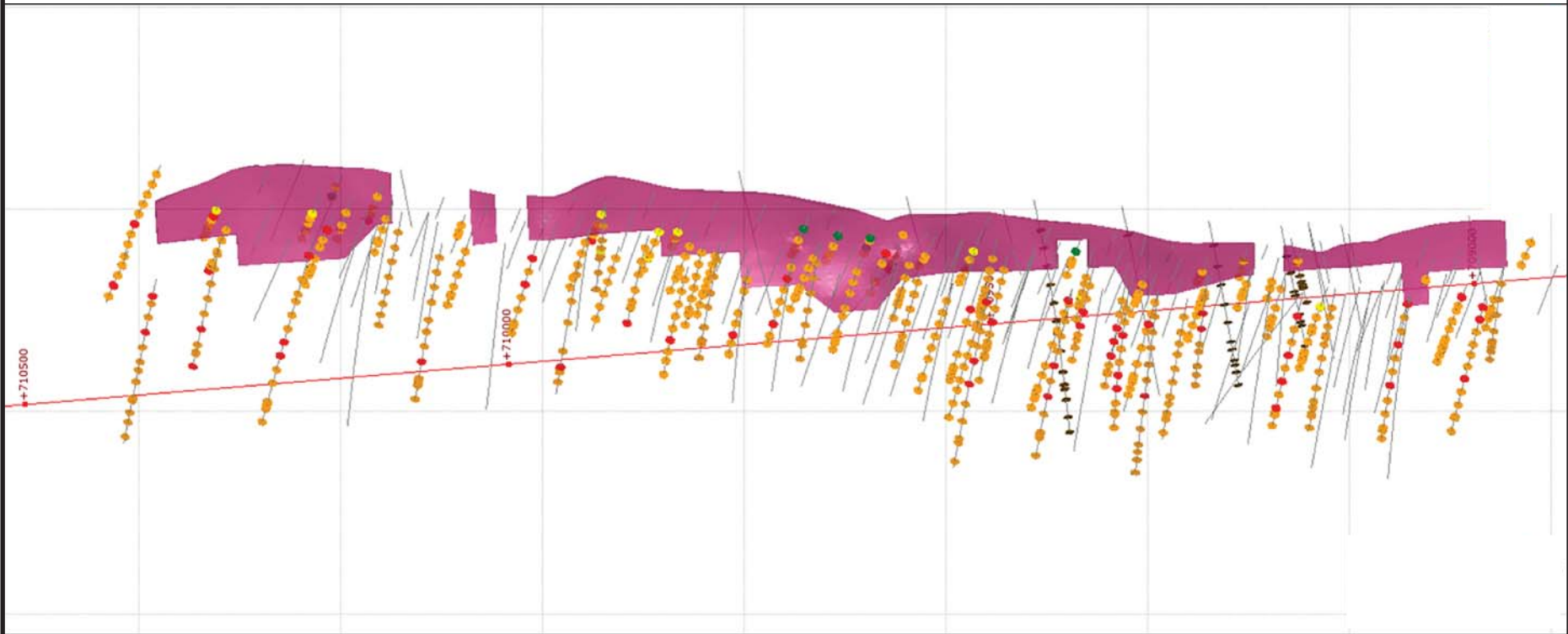
Deposit	1 <sup>st</sup> Pass			2 <sup>nd</sup> Pass			3 <sup>rd</sup> Pass		
	X-axis (m)	Y-axis (m)	Z-axis (m)	X-axis (m)	Y-axis (m)	Z-axis (m)	X-axis (m)	Y-axis (m)	Z-axis (m)
Jabalí	60	10	45	90	15	67.5	120	20	90
San Juan	60	10	45	90	15	67.5	120	20	90
Tope	15	75	40	22.5	112.5	60	30	150	80
Mojón	35-55	35-55	14-22	65-90	65-90	26-36	200	200	100
Spent Ore	60	60	10	90	90	15	120	120	20

## BULK DENSITY

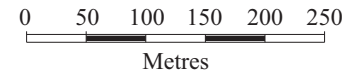
Density measurements were, in general, collected on core samples every 20 m down hole (Figure 14-9). Samples were weighed, coated with wax, weighed in air, then suspended in water and weighed again. Average densities by domain code and oxidation were then used for tonnage calculations. Densities range from 1.70 t/m<sup>3</sup> to 2.24 t/m<sup>3</sup> in saprolite and saprock and 2.40 t/m<sup>3</sup> to 2.65 t/m<sup>3</sup> in fresh rock. In RPA's opinion, these are reasonable densities for this type of mineralization.

The modelled mined out areas have poor or no recovery and varying portions of fill and voids. For this material, the fill density was applied then factored by the estimated recovery %. Therefore, an interval with 50% recovery in galleries would be given a specific gravity (SG) of  $1.9 \times 50\% = 0.95 \text{ t/m}^3$ .

Oblique View  
Looking North



14-17



Density (t/m <sup>3</sup> )	
<span style="display:inline-block; width:15px; height:15px; background-color:blue; border:1px solid black;"></span>	> 1.52
<span style="display:inline-block; width:15px; height:15px; background-color:green; border:1px solid black;"></span>	2.0 - 1.52
<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span>	2.0 - 2.2
<span style="display:inline-block; width:15px; height:15px; background-color:orange; border:1px solid black;"></span>	2.2 - 2.8
<span style="display:inline-block; width:15px; height:15px; background-color:red; border:1px solid black;"></span>	< 2.8

Figure 14-9

**Calibre Mining Corp.**

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*La Libertad Mine*  
Chontales Department, Nicaragua

**Location of Density  
Samples in Jabalí**

Density (SG) was applied to the block models based on a combination of modelled rock type and weathering intensity (Tables 14-9 and 14-10). Obvious erroneous data was removed from the dataset prior to calculating averages. Domains without representation were based on regression from other domains or assumptions by material type.

**TABLE 14-9 NUMBER OF DENSITY VALUES  
Calibre Mining Corp. - La Libertad Mine**

Weathering	Material	Vein			
		Jabalí	San Juan	Tope	Mojón
Saprolite	High Grade Vein	0	N/A	N/A	N/A
	Vein/Breccia	0	0	0	N/A
	Stockwork	0	0	0	N/A
	Bedrock/Waste	1	10	1	N/A
Saprock	High Grade Vein	0	N/A	N/A	N/A
	Vein/Breccia	0	0	0	N/A
	Stockwork	0	35	0	N/A
	Bedrock/Waste	19	74	21	N/A
Rocksap	High Grade Vein	N/A	N/A	N/A	N/A
	Vein/Breccia	N/A	N/A	9	N/A
	Stockwork	N/A	N/A	11	N/A
	Bedrock/Waste	N/A	N/A	42	N/A
Fresh	High Grade Vein	31	244	N/A	N/A
	Vein/Breccia	104	0	28	178
	Stockwork	136	0	47	203
	Bedrock/Waste	710	0	170	882
Colluvium		0	0	0	N/A
Fill		0	0	0	N/A

**TABLE 14-10 DENSITY VALUES IN SAN JUAN  
Calibre Mining Corp. - La Libertad Mine**

Weathering	Material	Vein			
		Jabalí	San Juan	Tope	Mojón
Saprolite	High Grade Vein	2.02	N/A	N/A	N/A
	Vein/Breccia	2.05	1.70	2.10	N/A
	Stockwork	2.05	1.70	2.10	N/A
	Bedrock	2.10	1.70	2.03	N/A
Saprock	High Grade Vein	2.28	N/A	N/A	N/A
	Vein/Breccia	2.30	2.20	2.27	N/A
	Stockwork	2.30	2.20	2.24	N/A
	Bedrock/Waste	2.36	2.20	2.01	N/A

Weathering	Material	Vein			
		Jabalí	San Juan	Tope	Mojón
Rocksap	High Grade Vein	N/A	N/A	N/A	N/A
	Vein/Breccia	N/A	N/A	2.49	N/A
	Stockwork	N/A	N/A	2.36	N/A
	Bedrock	N/A	N/A	2.19	N/A
Fresh	High Grade Vein	2.53	N/A	N/A	N/A
	Vein/Breccia	2.56	2.54	2.50	2.40
	Stockwork	2.56	2.50	2.46	2.35
	Bedrock	1.65	2.55	2.46	2.40
Colluvium		1.70	1.70	1.60	N/A
Fill		1.90	1.90	N/A	N/A

## BLOCK MODELS

The block sizes for Indicated and Inferred Mineral Resource estimations are between 2.0 m and 12.0 m (Table 14-11). Some of the mineralized wireframes are very narrow in some places. RPA recommends that minimum thickness constraints should be applied to wireframes in the La Libertad deposit, where required. RPA considers the block model sizes appropriate for the mining methods and the dip of the veins.

**TABLE 14-11 BLOCK SIZES**  
Calibre Mining Corp. - La Libertad Mine

Deposit	BM Type	Parent Block Size			Sub-block Size			Rotation
		X-axis (m)	Y-axis (m)	Z-axis (m)	X-axis (m)	Y-axis (m)	Z-axis (m)	Z-axis (°)
Jabalí Open Pit	Sub-blocked	12	2	6	2	0.05	0.10	0
San Juan	Sub-blocked	12	2	6	2	0.05	0.10	40
Tope	Sub-blocked	12	3	6	1	0.1	0.1	340
Mojón	Regular	2	5	5	N/A	N/A	N/A	60
Spent Ore	Regular	12	12	3	N/A	N/A	N/A	330

## VOLUMETRIC COMPARISON

Comparisons between block and wireframe volumes in selected domains were performed for the Jabalí and San Juan veins, and no material differences were observed.

## CLASSIFICATION

Definitions for resource categories used in this report are consistent with those defined by CIM (2014) and adopted by NI 43-101. In the CIM classification, a Mineral Resource is defined as “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”. Mineral Resources are classified into Measured, Indicated, and Inferred categories. A Mineral Reserve is defined as the “economically mineable part of a Measured and/or Indicated Mineral Resource” demonstrated by studies at Pre-Feasibility or Feasibility level as appropriate. Mineral Reserves are classified into Proven and Probable categories.

In Jabalí, San Juan, Tope, and Mojón, Mineral Resources were classified based on the distance to the nearest data points. Generally, open pit Indicated Mineral Resources required two drill holes within 30 m to 35 m. Underground Indicated Mineral Resources required two drill holes within 23 m to 30 m. Inferred Mineral Resources required two holes within 60 m (see Jabalí examples in Figure 14-10).

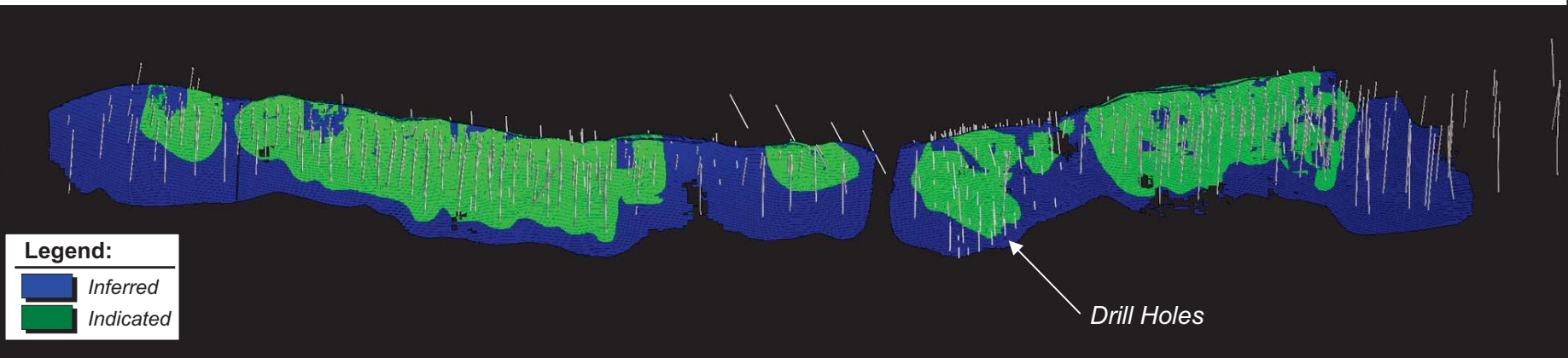
In Jabalí and San Juan, the backfill in underground workings is considered to be part of the Inferred Mineral Resources. A study regarding the reconciliation of backfill was not available for review. RPA recommends a reconciliation study of backfill material.

In places, it is assumed that a rim of Indicated Mineral Resources material remains adjacent to mined out underground workings. This rim material can be Indicated or Inferred Mineral Resources depending on the criteria described above.

In RPA’s opinion, the overall classification is reasonable.



*Oblique View  
Looking North*



14-21

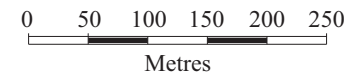


Figure 14-10

**Calibre Mining Corp.**

***La Libertad Mine***  
*Chontales Department, Nicaragua*  
**Classification in Jabalí**

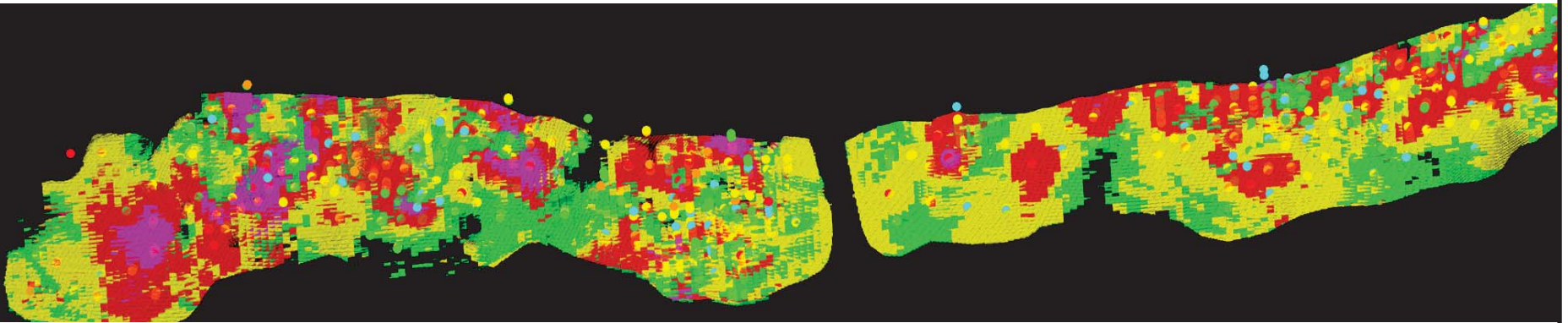
## **BLOCK MODEL VALIDATION**

RPA imported the San Juan and Tope block models into Leapfrog and Surpac software and viewed gold grades and proportions relative to the blocks, drilled grades, composites, and modelled solids. RPA observed that the block grades showed general accord with drilling and sampling and did not appear to smear significantly across sampled grades (Figure 14-11).

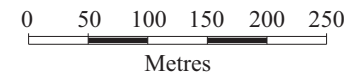
B2Gold verified the models using a combination of visual comparison of block grades to drill hole composites, swath plots, global bias checks, and model to true thickness comparisons (Figure 14-12). RPA produced comparative statistics and swath plots for Jabalí and San Juan and found that average composite grades were within +/- 10% of block grades (Figure 14-13). Swath plots generally showed good correlation with block grades being somewhat smoothed relative to composite grades, as expected. There were some areas where composite grades varied more than 10% from block grades. RPA suggests that these areas may indicate isolated high grades, which could be controlled by a combination of distance restriction and separate domains, if applicable.

RPA visually examined the mined solids in context of the block model and the result is reasonable in context of the work described by B2Gold.

Oblique View  
Looking North



14-23



**Au (g/t):**

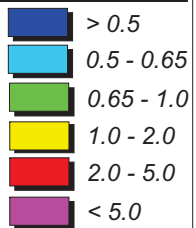


Figure 14-11

**Calibre Mining Corp.**

***La Libertad Mine***  
*Chontales Department, Nicaragua*  
**Composite and Block Model**  
**Grade Check - San Juan**

August 2019

Source: RPA, 2019.

**FIGURE 14-12 B2GOLD SWATH PLOTS BY EASTINGS - JABALÍ**

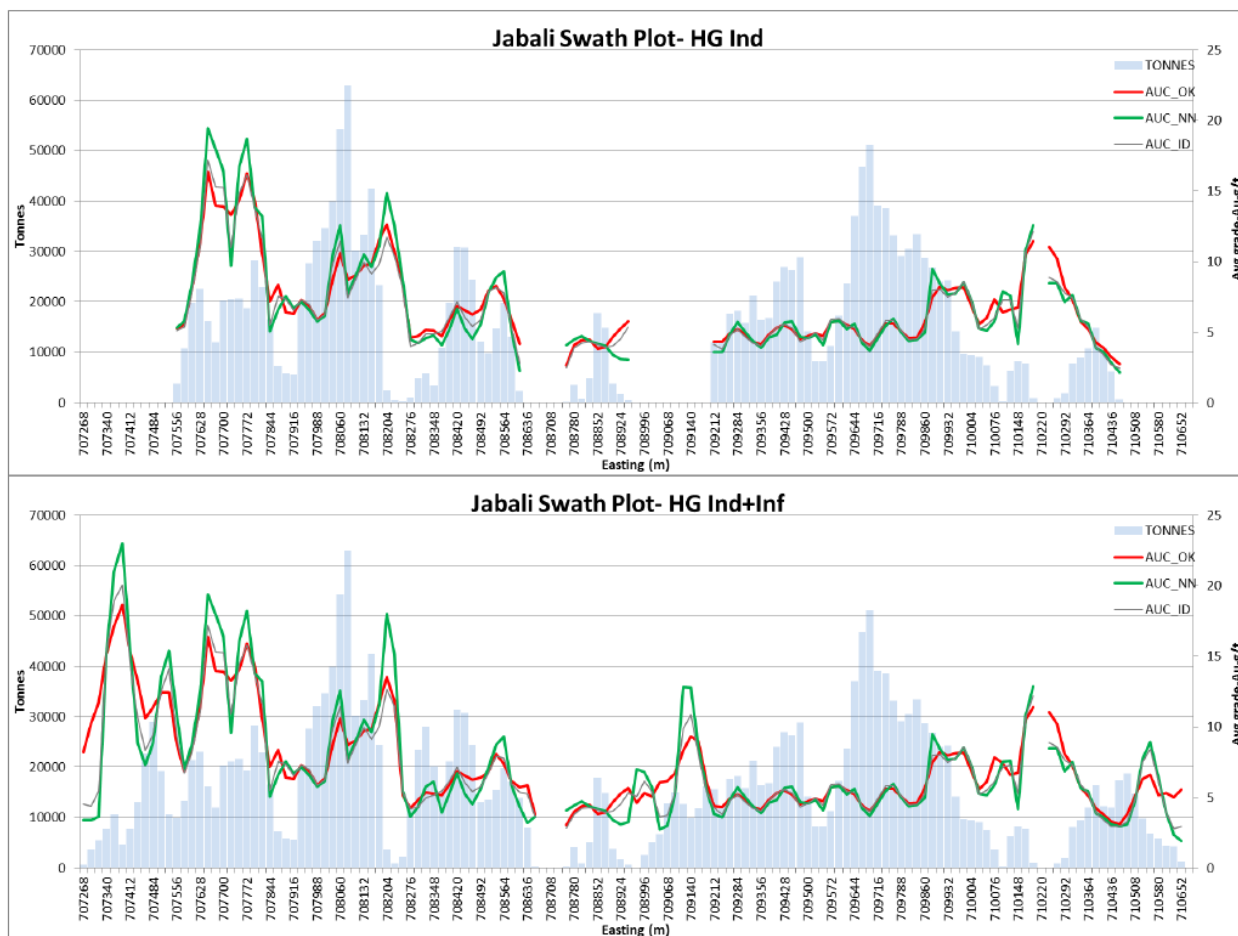
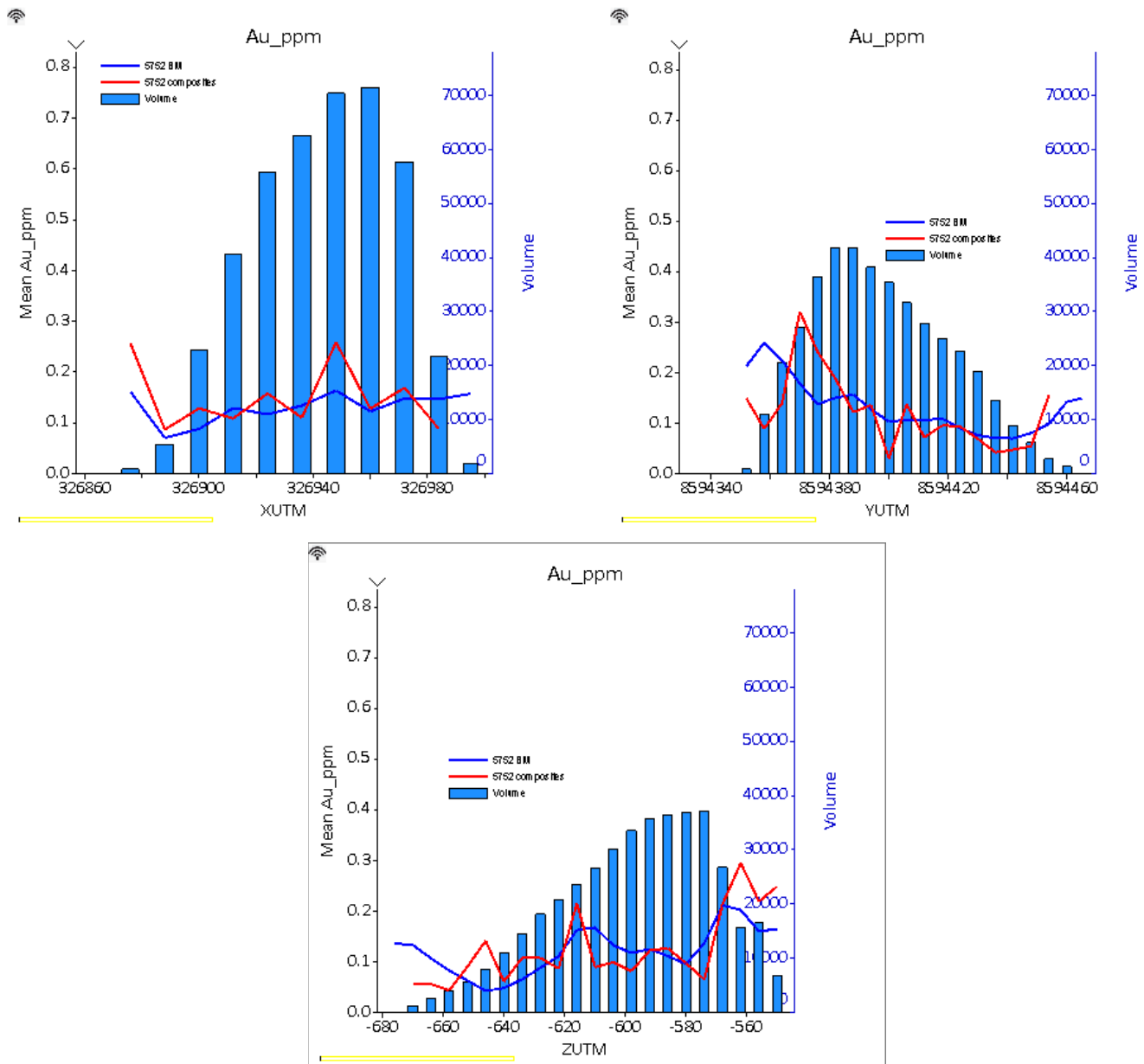


FIGURE 14-13 RPA SWATH PLOTS - JABALÍ



## 15 MINERAL RESERVE ESTIMATE

There are no Mineral Reserves on the property.

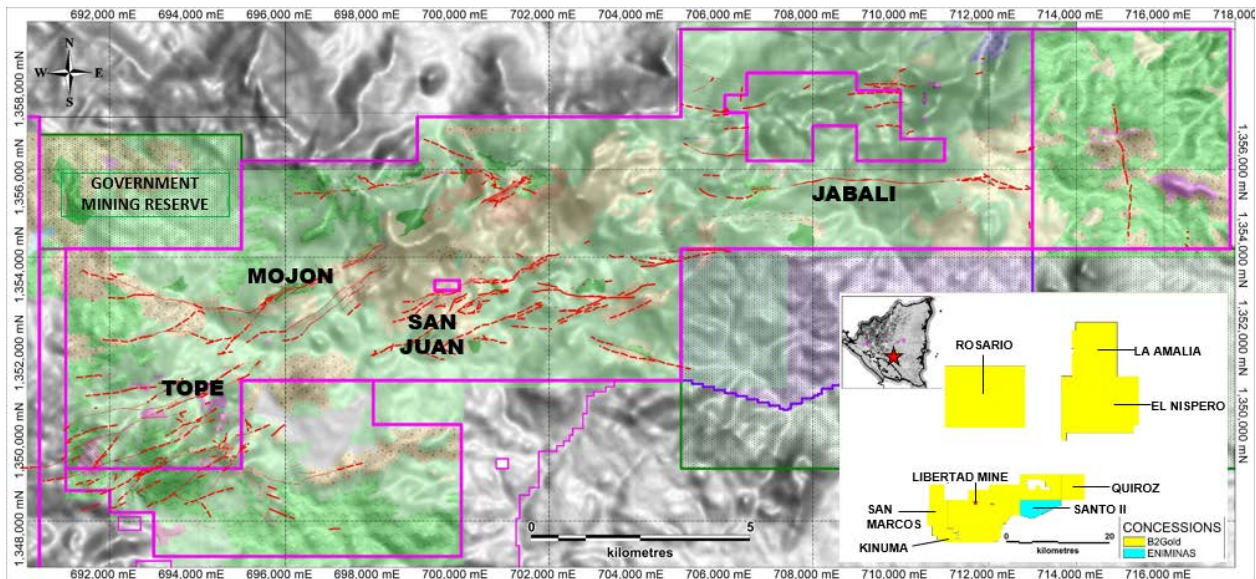
# 16 MINING METHODS

There are no Mineral Reserves on the Project, however, there is a current two-year production schedule to mine the remaining Mineral Resources.

The two-year plan calls for processing a total of 2.4 million tonnes of ore at an average grade of 1.45 g/t Au and process gold recovery of 94%, with the majority of the planned gold ounces coming from the San Juan and Tope (San Diego) open pits, Jabalí open pit and underground mines, and the spent-ore stockpile from the previous heap leach operations.

Active mining areas at La Libertad are shown in Figure 16-1.

**FIGURE 16-1 LA LIBERTAD ACTIVE MINING AREAS**



Source: B2Gold, 2018

B2Gold operates La Libertad Mine through its subsidiary, DESMINIC. Drilling, blasting, and ore control are performed by Calibre personnel. Loading and haulage of both ore and waste are performed by a contractor, Constructora Santa Fe Limitada (Constructora Santa Fe).



## SURFACE MINING

Mining operations at La Libertad use conventional open pit mining methods at the San Juan, Tope, and Jabalí Antena pits, and spent heap leach material at Tope. Strip ratios in the pits range average 7.7:1 with maximums of 37.1:1.

### CUT-OFF GRADE AND DILUTION

The marginal mill cut-off grades of 0.74 g/t Au at Jabalí Antena and 0.66 g/t Au for spent ore were used to separate ore from waste. The cut-off grade calculations are summarized in Table 16-1.

**TABLE 16-1 CUT-OFF GRADE CALCULATIONS**  
**Calibre Mining Corp. – La Libertad Mine**

Parameter	Units	Antena	Spent Ore
Gold Price	\$/oz	1,250	1,250
Doré Freight	\$/oz Au produced	2.31	2.31
Refining Cost	\$/oz Au produced	2.50	2.50
Ad Valorem Tax	\$/oz Au produced	36.96	36.96
Royalties	\$/oz Au produced	24.68	24.68
<b>Total Selling Cost</b>	<b>\$/oz Au produced</b>	<b>66.45</b>	<b>66.45</b>
Processing Gold Recovery	%	94	90
Operating Costs			
Ore Mining Cost	\$/t mined	2.50	1.37
Waste Mining Cost	\$/t mined	2.50	
Ore Overhaul to Plant	\$/t milled	4.75	0.20
Process Cost	\$/t milled	14.80	14.80
Site General Cost	\$/t milled	3.50	3.50
Tailings Facility Cost	\$/t milled	2.57	2.57
Sustaining Capital Cost	\$/t milled	0.11	0.11
Mining Concession Tax	\$/t milled	0.04	0.04
Tax Advance (Minimum Tax)	\$/t milled	0.51	0.51
<b>Total Operating Cost</b>	<b>\$/t milled</b>	<b>26.28</b>	<b>21.83</b>
<b>Marginal Plant Cut-off Grade</b>	<b>g/t Au</b>	<b>0.74</b>	<b>0.66</b>

RPA is of the opinion that the methodology used to estimate cut-off grades is to industry standard.

There are two main sources of dilution: external dilution on the edges of the vein and stockwork zones being mined and internal dilution caused by narrow waste interbands in the stockwork

and vein zones. As a result, mining dilution is expected to be high. Both external and internal dilution are unavoidable but can be monitored and controlled. The third source of dilution is operational dilution that accounts for production errors, pressures, and schedule demands.

## MINING EQUIPMENT

The equipment used at the mine is typical of conventional truck and shovel open pit mining operations, and includes trucks, excavators, dozers, drill rigs, and light vehicles.

The major mining equipment fleet is summarized in Table 16-2.

**TABLE 16-2 OPEN PIT MINE EQUIPMENT**  
**Calibre Mining Corp. – La Libertad Mine**

<b>Equipment Type</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Quantity</b>
Drill	Ingersoll Rand	ECM590	6
Excavator	Caterpillar	374	3
Front Loader	Caterpillar	972H	2
Articulated truck	Caterpillar	740	2
Rigid Truck	Caterpillar	775	3
Bulldozer	Caterpillar	D8T	3
Explosive Truck	Mack		1
<b>Total</b>			<b>20</b>

The mining contractor's equipment on site is summarized in Table 16-3.

**TABLE 16-3 CONTRACTOR’S OPEN PIT EQUIPMENT  
Calibre Mining Corp. – La Libertad Mine**

<b>Equipment Type</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Quantity</b>
Excavator	Caterpillar	320	3
Excavator	Caterpillar	336	1
Excavator	Caterpillar	349	7
Excavator	Caterpillar	385	1
Front Loader	Caterpillar	966H	2
Articulated truck	Caterpillar	740	33
Rigid Truck	Caterpillar	773	3
Rigid Truck	Caterpillar	775	4
Bulldozer	Caterpillar	D6T	1
Bulldozer	Caterpillar	D8T	2
Bulldozer	Caterpillar	D9T	1
Explosive Truck	Mack		4
Motor Grader	Caterpillar	14M	1
Motor Grader	Caterpillar	140M	1
Back Hoe	Caterpillar	416E	4
Compactor	Caterpillar	CS533-C	2
<b>Total</b>			<b>70</b>

In addition, there are some light vehicles, fuel and lube trucks, welding trucks, water trucks, lighting plants, and pumps.

## UNDERGROUND MINING

Underground mining is being carried out at the Jabalí mine. The operation uses conventional mining techniques with bottom-up sequenced long hole stoping with unconsolidated backfill at an average rate of approximately 500 tpd ore.

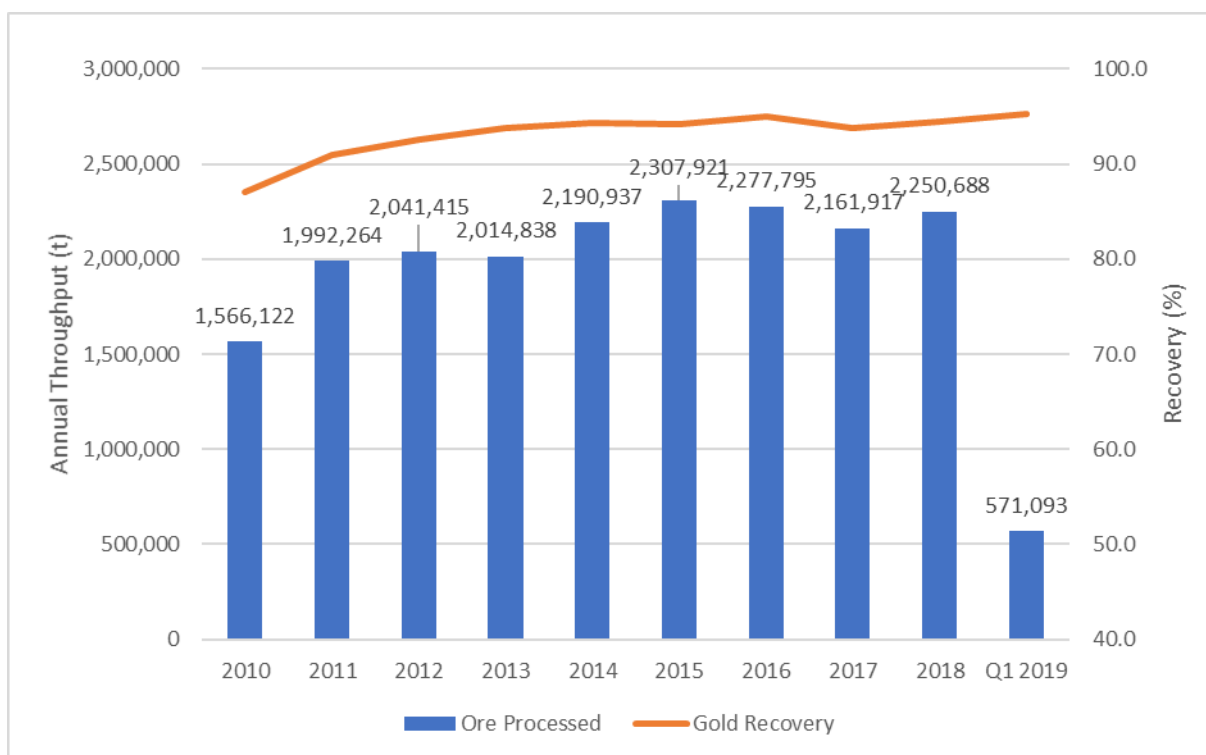
Underground mining accounts for 10% of the mined ore tonnes and 42% of the contained ounces in the two-year production schedule.

Underground mining has been performed in the past by a contractor but is planned to transition to an in-house team starting in 2020.

## 17 RECOVERY METHODS

The La Libertad processing plant is a conventional processing plant consisting of comminution, agitated cyanide leaching, and carbon adsorption, followed by carbon elution, electrowinning, and doré production. The plant can treat approximately 2.25 million tpa (Figure 17-1) and current gold recoveries are approximately 94% to 95%.

**FIGURE 17-1 PROCESSING PLANT THROUGHPUT AND RECOVERY**



The plant processes a combination of ore from open pit and underground mines and reclaimed spent ore from the historical heap leach operations. Historical operations at La Libertad were originally heap leach (on-off heap leach pads) from 1994 to 1996 and from 2001 to 2007. During the heap leach operations, spent ore from the heap leach pads was disposed of between the location of the current processing plant and the current tailings storage facility (La Esperanza TSF). The disposal site for spent ore is not lined. Reclamation and re-treatment of spent ore currently makes up approximately two thirds of the feed to the processing plant. There are reportedly approximately 3 million tonnes of spent ore remaining. Reclamation of

the spent ore allows for both the recovery of residual gold in the spent ore and the disposal of the subsequent waste material in a lined TSF.

The processing plant consists of the following unit operations:

- Single-stage crushing with two jaw crushers capable of processing approximately 400 t/h and 200 t/h, one utilized for ROM ore and the other for spent ore, followed by a crushed ore stockpile.
- Two-stage grinding to 70% passing 75  $\mu\text{m}$  utilizing a conventional SABC (semi-autogenous grinding (SAG) followed by ball milling and pebble crushing) circuit. The grinding circuit consisting of one SAG mill followed by two ball mills operating in parallel and an integrated pebble crushing circuit; the SAG and ball mills are 20 ft x 9 ft and 13 ft x 20 ft, respectively, each with a 1,680 kW motor.
- Pre-leach thickening to 45% solids, followed by leaching in 11 leach tanks (4 x 1,500 m<sup>3</sup> and 7 x 570 m<sup>3</sup>) with oxygen addition for a total of 32 hours residence time. Carbon adsorption is carried out in six 550 m<sup>3</sup> CIP tanks.
- Tailings disposal by pumping to the lined La Esperanza TSF; the current TSF reportedly has remaining capacity for the disposal of current processing plant tailings until June 2021. Studies have been conducted for disposal of tailings to one of the spent open pits (approximately 3.5 years capacity) and a new TSF (approximately 5 years capacity).
- Stripping of loaded carbon using a pressure-Zadra stripping process, in either of two carbon stripping columns with a combined capacity for two stripping campaigns, or 12 tpd of carbon, with stripped carbon returned to the adsorption circuit after regeneration in a gas-fired kiln.
- Gold recovery from the pregnant elution solution by electrowinning, with the precipitate being smelted in a liquefied petroleum gas (LPG) fired furnace to produce doré bars typically containing up to 55% silver, depending on the source of ore. Doré is sent to the US for refining.
- Tailings return water for process water. Cyanide destruction is deemed not necessary because of the low levels of cyanide in the water.
- Energy, water, and process material specific consumptions are not anticipated to change materially over the remainder of the LOM.

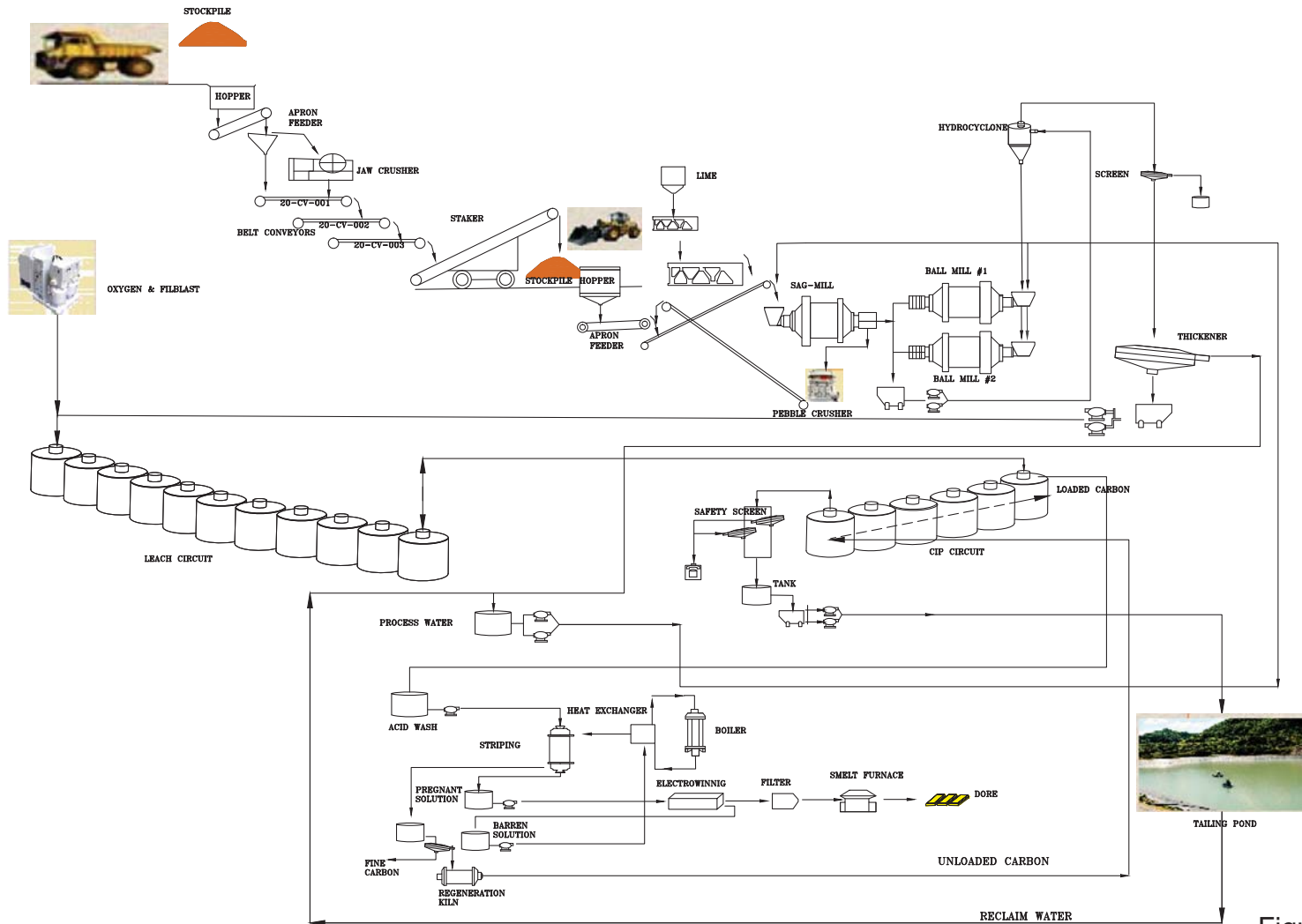


Figure 17-2

**Calibre Mining Corp.**

*La Libertad Mine*  
 Chontales Department, Nicaragua  
**La Libertad Process Flowsheet**

17-3

## 18 PROJECT INFRASTRUCTURE

La Libertad currently operates three mines and has all required infrastructure necessary for a mining complex including:

- One underground mine: Jabalí West Underground.
- Two surface mines: San Juan and Tope.
- Existing spent heap leach pad area which occupies approximately 0.41 ha. When the Project was converted from a heap leach to a CIP plant, the reprocessing of these ores was included to recover additional gold remaining after heap leaching.
- A conventional processing plant with comminution, agitated cyanide leaching, and carbon adsorption, followed by carbon elution, electrowinning, and doré production, with a current nominal capacity of 2.25 million tonnes of ore per year.
- Mine and mill infrastructure including warehouses, administration buildings, dry facilities, and maintenance shops.
- A conventional TSF is located near and just below the plant and office area. The TSF was constructed when the project shifted from a heap leach to a CIP plant in 2008. Since that time, the permit has been modified twice to raise the impoundment in 2014 and 2015. In addition, the deposition of tailings in the mined-out Crimea pit was permitted. As of the effective date of the report, there is remaining operating capacity for 4.7 million tonnes, sufficient to complete the current LOM plan.
- Electrical power from the national grid system. There are high voltage power lines that provide power to Santo Domingo, however, the power supply can be limited. Service to the mine is via a dedicated 138 kVA line which is fed from a substation near Juigalpa. The existing transformer has a capacity of 20 MW, and current mine consumption is 7.5 MW.
- An adequate water supply exists at the Project for year-round operation. Process water for the ADR plant comes predominantly from the tailings sub-drain (250 gpm) and from the sub-drain of the backfilled Crimea pit (waste dump #7), which is potable (300 gpm). Supplemental process water is available from the Paslama River (up to 900 gpm).
- Mine ventilation fans and ventilation systems.
- Haulage roads from the mines to the plant.
- Stockpile areas.
- Maintenance facilities.
- Administrative office facilities.
- Core storage and exploration offices.
- Security gates and manned security posts at mine entries.
- Access road network connecting the mine infrastructure to the town site and to public roads.

A site plan is shown in Figure 18-1.

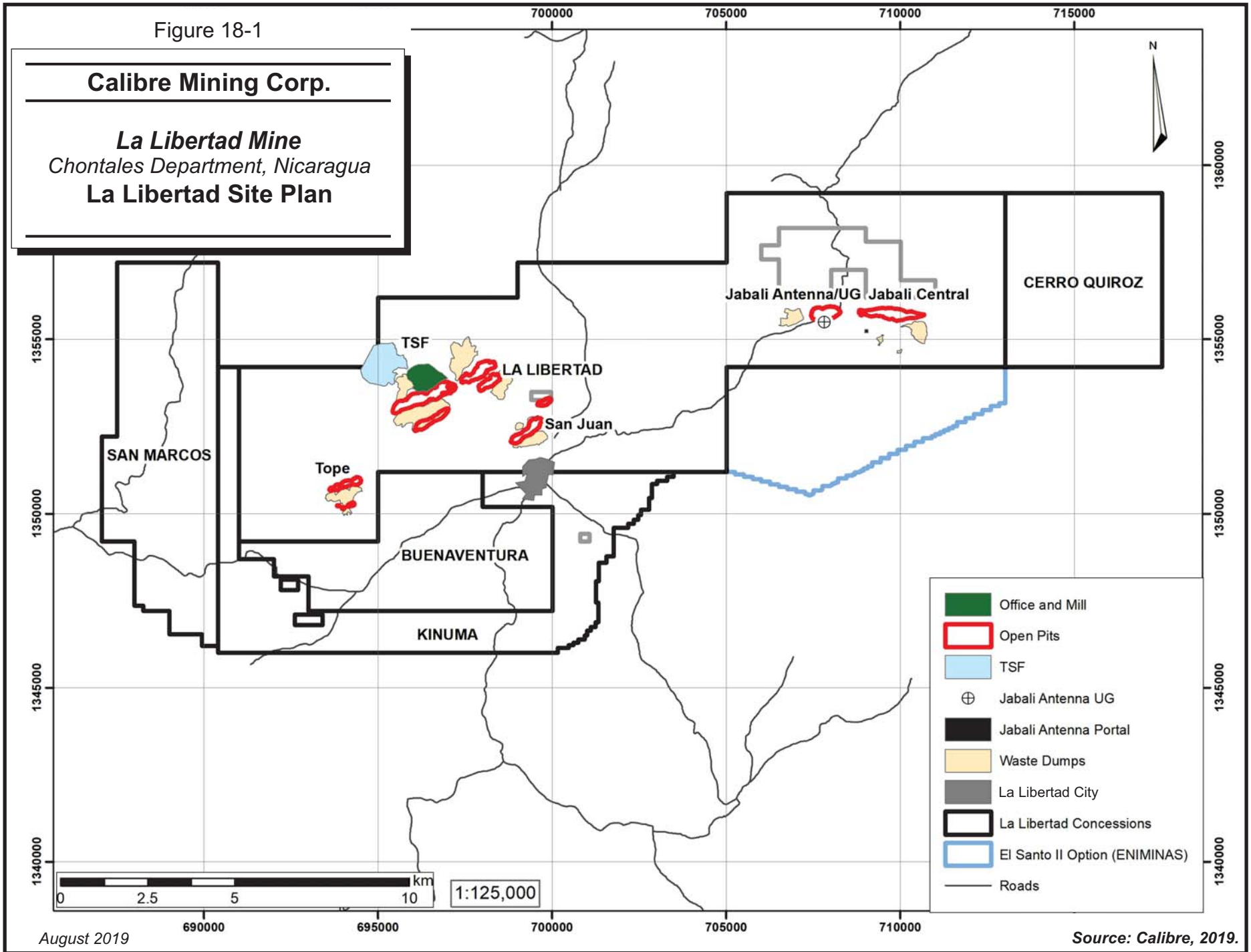


Figure 18-1

**Calibre Mining Corp.**

**La Libertad Mine**  
Chontales Department, Nicaragua  
**La Libertad Site Plan**

18-2



- Office and Mill
- Open Pits
- TSF
- + Jabali Antenna UG
- Jabali Antenna Portal
- Waste Dumps
- La Libertad City
- La Libertad Concessions
- El Santo II Option (ENIMINAS)
- Roads

August 2019

Source: Calibre, 2019.

## 19 MARKET STUDIES AND CONTRACTS

The principal commodity at La Libertad is freely traded, at prices that are widely known, so that prospects for sale of any production are virtually assured.

## **20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT**

### **ENVIRONMENTAL STUDIES**

The La Libertad Mine is located in the municipality of La Libertad, Department of Chontales, located in the north of Nicaragua in the Chontaleña mountain range and a distance from the capital city of 186 km. Its main economic activity is livestock and mining.

### **TOPOGRAPHY**

The Chontaleña mountain range comprises 33% of the total surface of the country (42,400 km<sup>2</sup>) and is located at the centre of Nicaragua. This province is topographically the highest region in Nicaragua and is composed of high mountain ranges altering with deep valleys. It extends from the northwest border of the Nicaraguan Depression to the Atlantic Plain. The province consists of numerous volcanic plateaus that have been eroded by rivers. The elevations range between 500 MASL and 2,000 MASL in the northern portion (the Upper Basin of Rio Coco), and an average elevation of 200 MASL in the San Juan River basin in the south.

The predominant forms of relief are the high plateaus, hills, mountain chains, mountainous areas, and broken mountain terrain. The typical inclination of terrain varies from moderate to very steep and ranges from 15% to 75% or more.

### **HYDROLOGY AND HYDROGEOLOGY**

The La Libertad Mine study area is located within the Atlantic region. In a regional scale, the area falls in the basin of the Escondido River (Cuenca No. 61). The Siquia River, the Mico River, and the Rama River, come together to form the Escondido River, which runs to the Caribbean coast near Bluefields. The main transport route between the Pacific and the Atlantic is made from Bluefields to Managua, in part, by means of these rivers.

On a more local scale, the study area rests on a part of the Mico and Rio Sucio rivers. The Mico River flows through the western part of the study area and passes through the town of La Libertad. The northern and eastern ends of the exploitation concession are located within

the Siquia River basin. The Rio Sucio, the main tributary of the Siquia River, passes through the concession and through the town of Santo Domingo. The Mico River and the Rio Sucio are important hydraulic resources for the populations of La Libertad and Santo Domingo, respectively.

The area is located within a fault system, which is considered of great importance from the hydrogeological point of view as permeabilities could increase here. The fault system gives rise to springs in the highlands. The fault and fracture system cross the area with a predominant orientation of northeast-southwest; the mineralization and large dislocations of the rocks of the area are related with these faults. Below the rocks of this province are sedimentary rocks from the Cretaceous and Tertiary.

## **CLIMATE**

The La Libertad Mine study area is located in the Subtropical Transition Life Zone, according to the Holdrige classification. The annual precipitation of this area is between 1,000 mm and 2,000 mm, and the average temperature is 24°C.

Using the W. Koppen classification, the area is located in the Climate of Sabana Tropical region. This is the climate that predominates in the Pacific region of Nicaragua and in the western areas of the Central Mountain Range, from sea level to 1,000 m altitude.

The temperature varies from 21°C in the highest areas of the Central Mountains to 29°C in the Pacific coastal region.

## **BIOLOGICAL ENVIRONMENT**

Due to the fact that the mine has been in operation for several decades, the flora and fauna within the direct project footprint is highly disturbed. Recent flora or fauna studies have been carried out for the TSF to determine potential impacts and displacements.

## **PERMITTING**

Based on discussions with the site environmental manager during a site visit in April 2019, all permits to operate the site in the near future are in place.

Exploration Permits, which require the submission of a semi-detailed Environmental Impact Assessment (Evaluaciones de Impactos Ambientales semi-detallado, or EIAsd), are dependent on engaging the community and regulators. La Libertad has technical records to support exploration efforts, however, timelines in receiving permits are not consistent. No set timeframe for Nicaraguan exploration permits could be found or determined. The process appears to be dependent on engagement and relationship with the community and regulators.

In summary, to obtain Exploration Permit approval, it would be reasonable to assume that it would take the proponent approximately one month to prepare scope of exploration and potential impacts and thereafter up to five additional months for the review by government authorities and additional information requests, to a total of six months, until the Exploration Permit is approved.

To start the Exploitation Permit process, the proponent requires: a Project Terms of References (términos de referencia, or TdR), legal representation, a construction company for development, public deed of ownership, mining concession, and declaration of the project. The timeline to gather this information is unknown. Once the TdR has been submitted and accepted by regulators, the proponent has approximately six months to complete and submit the required EIA based on the TdR. There is an opportunity for an extension of three months, however, the process for this request is unclear. If the EIA is accepted, public consultation is fourteen working days with two additional weeks for comments to be provided to regulators. If the EIA is not accepted, the proponent has three months to re-submit as an addendum for approval, then ten working days for MARENA to review, and then proceed to public consultation. Once all comments are received, the timeline to resolve and issue the Exploitation Permit is approximately sixty working days.

The Exploitation Permit process is well documented as per MARENA. The process includes checklists for application stages, timeframes for response from both the proponent and regulators, along with next steps and costing. Timeframes for exploitation permits appear to be consistent.

In summary, it takes a minimum of 11 months from the submission of the TdR until the EIA is approved. If there are additional comments from the regulator review or consultation, this timeframe can increase by three to 14 months.

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## SOCIAL OR COMMUNITY REQUIREMENTS

La Libertad has adopted an Environmental Policy (2018) and a Biodiversity Policy (2018) designed to ensure that environmental risks are adequately addressed while committing to environmental protection for all its activities. In addition, La Libertad has established an Occupational Health and Safety Policy (2018) aimed at minimizing risks to its workers.

These policies are, in part, implemented through the site Health, Safety and Environment Management System (HSEMS). This system provides La Libertad staff with a clear understanding of the company's expectations regarding how to effectively manage the key risks associated with Health, Safety, and Environment (HSE). The HSEMS is based on 18 standards. These standards are:

1. Leadership and Commitment
2. Hazard Identification and Assessment of HSE Risks
3. Planning and Organizing
4. Legal Obligations and Evaluation of Compliance
5. Resources, Responsibilities and Accountabilities
6. Competency and Awareness
7. Consultation and Participation
8. HSE Documentation, Document Control and Records Management
9. Operational Planning and Control
10. Crisis and Emergency Preparedness and Response
11. Change Management
12. Outsourcing, Procurement and Contractor Management
13. HSE Monitoring, Measurement and Reporting
14. Incident Reporting and Investigation
15. Non-conformances, Corrective Action Management and Improvement
16. Planned Inspections and Task Observations
17. Auditing
18. Management Review

This management system is based on international standards including compliance with in-country regulations, relevant International Organization for Standardization (ISO) and Occupational Health, Safety and Security standards, and reliance on the International Finance Corporation (IFC) Performance Standards and international best practices in cases where national regulatory systems are not sufficiently stringent.

The site has established a Corporate Social Responsibility policy that commits it to engage openly and respectfully with community stakeholders and make meaningful and sustainable contributions to its host communities.

La Libertad has also developed and implements a Social Management System for the identification and management of risks and impacts in a structured and constant manner with the aim of promoting sustainable social performance that leads to positive financial, environmental, and social outcomes. The system is described in a manual (March 2018) and is based on a set of eight standards that describe the processes, practices, and tools to be applied. These standards are:

1. Relationship with Actors
2. Community Grievance Management
3. Community Investment
4. Access to Land and Resettlement
5. Local Content
6. Human Rights
7. Artisanal and Small-scale Mining
8. Social Closure

The management system, including its processes, practices, and tools, is intended to be dynamic in nature and subject to periodic reviews by the management team. The procedures included in the 2018 manual are to be reviewed regularly, at least once every three years.

Successful identification and management of critical social risks is the way the site has chosen to develop constructive relationships with its key stakeholders. This is being accomplished at La Libertad by identifying and maintaining a register of potentially affected stakeholders within the sphere of influence of each site. The site analyzes the key characteristics of the stakeholders, including their rights and claims, relevant, attitudes towards the business turn (support), their ability to influence (power) and how much can be affected by the business (impact), as well as relationships with other stakeholders (network) and potential drivers and triggers of tension or conflicts. This analysis supports environmental and social risk assessments of the La Libertad operations.

B2Gold had developed and implemented its Community Grievance Management process (Standard 2), aimed at receiving, investigating, and responding to grievances from



neighbouring communities. The process is intended to identify, manage, and mitigate impacts in a timely, respectful, and locally appropriate manner. Sites are required to demonstrate that their Grievance Mechanism meets the principles for good practice as supported by the IFC and is compatible with the United Nation's Guiding Principles for Business, and the systems recommended by the by International Council on Mining & Metals (ICMM) for handling and resolving local concerns and grievances.

## **LABOUR AND WORKING CONDITIONS**

The collective bargaining agreement covering the workers at La Libertad Mine is effective until December 31, 2019. A new agreement was signed in January 2018.

La Libertad performs pre-employment, annual employment, and post-employment medical examinations, which allow it to identify potential occupational health risk factors, detect the onset of potential occupational diseases, mitigate occupational exposures, and provide care as necessary to the workforce.

La Libertad Mine has fully developed and implemented an HSE management system based on corporate performance standards. The HSE management system and performance includes annual internal auditing by independent experts. HSE committees are in place at La Libertad to provide a forum for employees and contractors to address HSE related issues.

La Libertad Mine reduced its lost time incidents (LTI) Frequency Rate by over 60%, from 1.65 in 2016 to 0.62 in 2017.

## **COMMUNITY HEALTH AND SAFETY**

La Libertad has developed and continues to implement its Community Investment policy (Standard 3) aimed at meeting commitments made to make meaningful, positive, and sustainable contributions to the communities where the mine operates. All Community Investment activities are to meet relevant Canadian and in country legal requirements. Community investment activities prioritize opportunities for improving community health, education, and livelihoods and are aimed at contributing to wider long-term development in the host community, while not creating a dependency culture.

Local needs are identified through written requests or participatory meetings that include a range of stakeholders. Community investment projects are developed and implemented in collaboration with the municipality, Ministry of Education, Ministry of Health, Ministry of Mines, church representatives, and other stakeholders including political and community leaders, local NGOs, and community organizations that represent vulnerable groups such as impoverished children, women, elderly, youth, people with disabilities, and small farmers.

The 2019 Community Investment Plan for the La Libertad, Juigalpa and Santo Domingo operations have a budget of approximately \$770,000, with approximately 51% allocated to the La Libertad site. Support is planned for the education sector in the municipality of La Libertad (e.g., University Scholarship Program for young people of La Libertad); health promotion; sports, cultural and recreational activities in the municipality of La Libertad; a vulnerable group feeding program; a drinking water project; and further development of the artisanal mining program.

The Local Content policy (Standard 5) aims to support economic development in the communities where the mine operates through the implementation of local content strategies to generate employment and procurement opportunities in a local region, building the capacity of local people, employees, businesses, and organizations.

In support of this policy, the site recognizes the legitimate role of artisanal miners in the community and promotes improvements in their working conditions. La Libertad reports that approximately 847 artisanal miners work within the company's concession in the municipalities of La Libertad and Santo Domingo. B2Gold supported the foundation of a small industrial plant established exclusively to process the ore of authorized artisanal miners on the site's concession in La Libertad and Santo Domingo, with health and safety standards and environmental safeguards. It is estimated that the operation of this plant prevents the discharge of approximately one tonne of waste mercury per year into the local environment.

## **LAND ACQUISITION AND INVOLUNTARY RESETTLEMENT**

A resettlement policy (Standard 4) aims to ensure that all land access and acquisition activities avoid and minimize involuntary resettlement. Where involuntary resettlement is unavoidable, any economic or physical displacement is to be mitigated by improving or restoring livelihoods and standards of living. La Libertad has committed that all resettlement and land access

activities will be carried out in accordance with relevant national legislation and embody the principles of IFC Performance Standard 5 – Land Acquisition and Involuntary Resettlement.

Resettlement is required to advance the Jabalí Antena project. For the Jabalí Antena project, 44 households have been resettled, with 191 people resettled or pending resettlement. Resettlement has occurred in the recent past and seems to have been well executed, however, no specific plans were provided for review.

### **INDIGENOUS PEOPLES**

Based on available information regarding existing land and resource uses on and near the La Libertad properties, IFC Performance Standard 7 does not appear to be applicable. Even though the area is abundant in natural resources, there is no information provided regarding Indigenous populations living in the area.

### **CULTURAL HERITAGE**

No information was available regarding the presence of known or registered archaeological sites or other cultural heritage features on the La Libertad properties.

### **SOCIAL UNREST**

From April to July 2018, Nicaragua saw significant social unrest. This development resulted in protests by citizens and ultimately led to roadblocks being established near La Libertad, which temporarily restricted the supply of key consumables (fuel and lime) and affected gold production at the mine. While regular operations at La Libertad (including the development of the Jabalí Antena Underground) have resumed since the onset of social unrest, there is the risk that operations could be materially impacted by further work stoppages due to illegal road blockades or social conflict in the future.

### **OWNERSHIP**

In 1990, the Mining Sector Nationalization Law was repealed in Nicaragua and a bidding process was initiated to privatize the state's mining assets.

## **RESETTLEMENT**

Resettlement is required to advance the Jabalí Antena project. The reported main challenges have included the completion of negotiated agreements within a compensation framework and continuing the resettlement process without any social conflict. Negotiations continue with those whose expectations surpass the terms included in the compensation framework. The compensation framework was not available for review.

## **GRIEVANCES**

A total of 103 grievances were filed in 2017, of which 100 were addressed and resolved. Most of the complaints in Nicaragua relate to blasting, dust from trucks, and contractor behaviour. Ongoing mining in areas close to human settlements can be expected to result in further grievances that will require resolution.

## **ARTISANAL MINING**

In Nicaragua, there is a long history of small scale miner activity throughout the country. Nicaraguan law provides that 1% of a mining concession should be available for artisanal (non-mechanized) activity. Areas of the La Libertad Mine are subject to significant small-scale and artisanal mining activity. The number of artisanal miners is increasing. There is a risk of conflict with the small-scale miners that may require to be relocated. To mitigate this risk, several agreements have been executed with local cooperatives, and artisanal miner issues are managed by a specific specialized group at La Libertad Mine with the aim of maintaining co-existence within the concession.

## **HUMAN RIGHTS AND SANCTIONS**

On November 27, 2018, U.S. President Donald Trump issued an Executive Order creating a new sanctions program that targets certain persons who are found to be involved in serious human rights abuses, political repression, or public corruption in Nicaragua, as well as all persons who have served as Nicaraguan government officials since January 10, 2007 (the Nicaraguan EO).

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## WATER MANAGEMENT

### WATER MANAGEMENT SYSTEM

No acid rock drainage (ARD) potential nor metal leaching concerns are identified in the documentation available for review at this time, however, no specific reports on geochemistry test work and/or characterization for waste rock and tailings were available.

Water supply for mine operation comes from mine dewatering and collection of contact water within the mine site. The water management system is comprised of the following main facilities:

- La Esperanza TSF pond
- ARD ponds
- Detox ponds
- Diversion channels

Water from the TSF is reclaimed to the mill for ore processing via the ARD ponds. The barge pump of the TSF controls the volume of supernatant water stored in the tailings pond. Seepage from the TSF is collected and either pumped back to the tailings pond or released to the environment if it meets water quality standards. Excess water collected in the ARD ponds and water from the heap leach are discharged to the Detox ponds for treatment prior to final discharge to the environment. The discharge of excess water follows treatment through carbon columns and a series of water treatment ponds (i.e., Detox ponds). Discharge takes place on an as-needed basis in consultation with Tierra Group, an external consultant (i.e., the discharge frequency is not fixed).

La Esperanza TSF is lined with low permeability compacted soil underlying a linear low-density polyethylene (LLDPE) geomembrane to minimize infiltration from the facility into the ground. The TSF has an underdrain system to intercept infiltrations from the facility and groundwater, which drains by gravity to a collection sump located downstream of the TSF dam near the toe. Daily water quality sampling takes place in the sump to assess if it meets water quality standards for direct discharge to the environment. Depending on the results, the water is pumped back to the TSF or released to the environment.

Four diversion channels reduce the catchment area of the TSF to minimize the amount of contact water to be collected and either reused at the mine site or treated prior to being discharged to the environment.

The stormwater management design criteria are as follows:

- The TSF was designed to store the flood with an annual exceedance probability of one third between the 1:1000-year runoff event and the Probable Maximum Flood following dam safety guidelines from the Canadian Dam Association.
- The minimum freeboard to be maintained in the TSF at all times is one metre.
- The stormwater runoff conveyance structures (e.g., diversion channels) were sized for the 100-year 24-hour rainfall storm event.

The TSF is not equipped with an overflow emergency spillway during the operation phase. Hence, prevention of dam overtopping relies on maintaining adequate storage capacity available through operation procedures (i.e., pumping to and from the TSF) to be able to store the runoff resulting from storm events. There is a plan to construct a spillway at closure with capacity to convey the Probable Maximum Flood. Discharge from the closure phase spillway will be conveyed to the North Diversion Outfall, which has been sized for the Probable Maximum Flood in anticipation of the construction of the spillway at closure.

During the site visit, RPA observed a very high water level in La Esperanza TSF. Appropriate implementation of the water management operating practices should be confirmed.

According to the Operation, Maintenance, and Surveillance (OMS) manual for the TSF, water balance modelling conducted for stages 6 and 7 of the TSF expansion shows the following:

- The TSF is located in an environment with a net positive balance (i.e., total water inflow exceeds total outflow resulting in excess water on an annual basis).
- As the TSF is expanded, the facility has enough capacity to continue managing the volume of water collected in the tailings pond from tailings discharge and runoff contribution.

A water balance has been developed in linked spreadsheets to account for inflows and outflows, and track water volumes managed at the mine site. It is unclear if the water balance is used during operation to support decision making associated with water management.

## WATER MANAGEMENT STANDARDS

The following standards related to water management have been developed:

- Cyanide Management. The standard defines the requirements to ensure that the on-site storage, handling, and use of cyanide are protective of human health and the environment. The standard applies to the purchase, transportation, handling, mixing, storage, and the operation of on-site cyanide mixing and storage facilities. It is largely derived from the July 2012 version of the International Cyanide Management Code and includes controls to manage cyanide at sites.
- Tailings Management. The standard defines the requirements for the characterization of tailings, protection of groundwater and surface water, prevention of uncontrolled releases to the environment, the management of process water, and monitoring requirements.
- Water Management. The standard defines the requirements for effectively managing water at sites, including site water balances, process water, stormwater, discharges, and mine dewatering activities and monitoring to ensure that no loss of beneficial use occurs, and that human health and the environment are protected. Additional water management requirements related to mining infrastructure are included in the Environmental and Biodiversity Performance Standard.

## WATER ENVIRONMENTAL MONITORING

Water monitoring results are documented in monthly environmental reports and also in the monthly operations report, which includes a section on environmental performance and monitoring. Monthly environmental reports for the period January 2018 to March 2019 were available for review.

According to the figures available for review showing monitoring stations in the area of influence of La Libertad Mine, the water monitoring program encompasses both surface water and groundwater quality.

Biannual water quality monitoring activities are conducted to determine physical and chemical properties of the Mico and Sucio rivers and other adjacent tributaries. The samples are analyzed by SGS Canada and Laquisa - Nicaragua (a third-party laboratory) for the following parameters: As, Hg, Cd, Fe, Pb, Zn, Ni, Cr, Mn, Cu, Ba, Ag, Cr, Cr<sup>6+</sup>, Al, total suspended solids (TSS), total sediment solids, nitrates, and pH. Biannual samples of water impounded within the pits are also taken for analysis. A total of 15 locations are reported in the summary tables of monitoring results. Pursuant to the new Decree 21-2017, published by the Nicaraguan government in December 2017, the required monitoring frequency is biannual, with the most recent sampling for La Libertad Mine taking place in July 2018 and December 2018.



According to the monitoring reports, the free cyanide concentrations of samples collected from stations along the Mico and Sucio Rivers were below detection limits. For heavy metals monitoring under Class C water bodies, exceedances were recorded in some stations along the Sucio River for Fe, Al, and Mn. Laboratory results for water samples from the pit areas showed that all parameters are within the limits of Decree 21-17 except two sites: El Olote stream, which descends from the Tope pit (exceedance of Fe, Al, TSS, and sediment solids), and El Sapo, which descends from WRD 7 (exceedance of Fe). Iron is considered to be found naturally, because concentrations slightly above the limit have been observed since completion of baseline studies.

Daily water quality monitoring of Cyanide (CN) Total is conducted at the process plant areas and the TSF. Water quality monitoring of the Detox system effluent discharge is also carried out when discharge takes place, sometimes in the presence of MARENA and the Municipal Government's Environmental Unit.

Daily water quality monitoring of streams/creeks around the process plant areas and the TSF showed presence of CN Total under the limit of 1 mg/L. Weak Acid Dissociate (WAD) CN averages of water samples taken from the TSF water pool (unfiltered samples) were within the 50 mg/L commitment. Free CN levels were under the limit stipulated in Decree 21-17 (0.1 ppm). According to monitoring results for the effluent discharge, concentrations of all heavy metals and TSS were found under the limits of Decree 21-17 (there was one instance of free cyanide found 0.05 ppm above the limit), and free CN sampled immediately before the discharge point showed values <0.01 mg/L (the limit in Decree 21-17 for free CN is 0.1 mg/L).

According to the monthly environmental reports, there were no water contamination incidents and no erosion/subsidence incidents during the reviewed period.

## **MINE WASTE AND TAILINGS MANAGEMENT**

The available information suggests that a single ex-pit TSF (Esperanza) has been used since 2008, in addition the mined out Crimea pit has been used for tailings storage. The current tailings management plan provides capacity for tailings until the end of 2020.

Documents pertaining to the design and construction of the Esperanza TSF dams and supporting drainage and infrastructure were not reviewed. The Esperanza TSF at La Libertad

is nearly at the design capacity and has a large pond with little freeboard to the crest. The final tailings deposition plan snapshots indicate that the plan places the pond against the dam, which does not mitigate dam safety risks. The proposed closure plan calls for a soil cover over the interior of the TSF, including through the current pond area, however, this involves schedule and cost risks due to material sourcing and construction on wet tailings. Closure planning documents indicate that a three metre Stage 7a raise of the TSF is being considered or is in use.

For future tailings management, Calibre is looking into in-pit tailings deposition. In-pit tailings deposition is a good opportunity due to the numerous completed pits on the Project and the typically low risk that in-pit tailings deposition presents (because there is no risk of loss of containment).

The mine waste rock is considered non-acid generating and has been stored in a number of waste rock dumps around the open pits. The closure plan indicates that all dumps on the Project site will be revegetated and that channels will be constructed as needed to manage surface water and ensure erosional stability. No design documents for the waste rock dumps have been reviewed to confirm physical and geochemical stability of the waste rock dumps.

## **CLOSURE**

The La Libertad and Santo Domingo Mines Phase 2 Closure and Transition Plan (the Phase 2 Plan) prepared by Knight Piésold Ltd. and dated August 20, 2018 was provided to RPA for review.

A phased approach has been selected to help organize the process and to build consensus among internal stakeholders for the decisions that are required to support closure planning and implementation. Phase 1 was completed in September 2017 and resulted in the development of a strategic closure and transition plan that included:

- Outlining the planning process
- Summarizing closure activities completed through August 2017
- Recommendations for closure and transition actions
- Updated cost estimates

During Phase 1, a C&M option to postpone closure was evaluated with an estimated annual cost of \$4.5 million. The understood objective of C&M is to minimize costs and activities while Calibre evaluates options for continued operations, full closure, or other suitable alternatives to be determined. As Phases progress, the goal is to minimize cost while keeping support staff on site to maintain control of assets, prevent access by artisanal miners and community members, along with maintenance of monitoring and environmental programs required by environmental permits.

The Phase 2 Plan included varying levels of engineering design by each mine component, completed between September 2017 and June 2018. Phase 3 of the process is the implementation of the final closure designs and social transition planning. The expected timing for Phase 3 is dependent on the approval of the concepts for Phase 2 by DESMINIC and the government of Nicaragua. Uncertainties in the Phase 2 closure actions will need to be further evaluated in Phase 3. External stakeholders have been engaged in Phase 2, which will continue into Phase 3.

The overall objectives of the Phase 2 Plan include:

- Comply with all legal requirements in Nicaragua.
- Protect human health and the environment now and for the foreseeable future.
- Minimize long-term environmental impacts.
- Complete social transition in an information and orderly process that includes stakeholder engagement.
- Minimize social impacts and recognize potential opportunities for the employees and local communities.
- Manage costs to effectively complete closure transition.

With the exception of structures deemed desirable for transfer/annexation to the local community(ies) or those to be retained for historic preservation purposes, general best management practices will be utilized to decommission and remove buildings and ancillary facilities.

Safety berms and fences will be placed around pit perimeters to secure them from the public. Most mine roads will remain in place to facilitate post-closure monitoring and to provide access to public housing and other public areas. If any roads are to be reclaimed, they will be ripped

to loosen the compacted soil. Once ripped, roads will be regraded to shed water, blend with the surrounding topography, limit erosion, and promote revegetation.

Closure of the TSF currently in operation involves the construction of a closure spillway, along with placement of a vegetation cover (thickness modelling is on-going) on the impoundment basin, upstream slope dam face, and upstream crest. The cover's primary function is for surface water runoff management, directing runoff to the closure spillway, as well as solidifying the final reclaimed surface. A closure cover optimization study for La Esperanza TSF was completed in August 2018. Surface water management controls, i.e., swales on the cover and diversion channels, will be constructed as appropriate. Tailings deposition and reclaim water pipelines will be removed and the underdrain system will be maintained and monitored until approved by MARENA to cease, at which point the underdrain pond can be breached, allowing flow to discharge freely. Embankment toe drains will be maintained.

Several waste rock dumps around the site have already been closed and revegetated. At closure, the remaining waste rock dumps will be revegetated and have surface water and erosional controls established where necessary.

A Closure Monitoring Plan (CMP) has been prepared which considers the existing operational monitoring program and establishes a monitoring plan effective through termination of operations and into closure. The CMP describes the pre-, active-, and post-closure monitoring needs for the mine. The pre-closure and active-closure monitoring objectives are to gather additional data for the various mine components to support detailed closure design and transition into post-closure monitoring. The main objective of the post-closure monitoring is to verify successful stabilization of the site facilities.

The total estimated cost to complete La Libertad and Santo Domingo Mines Closure and Transition Plan by 2028 is \$30.5 million, inclusive of five-year post-closure monitoring (2023-2028) and factors indirect costs. It accounts for social closure costs, severance, closure monitoring and additional studies. The closure cost estimate was not reviewed at this time. Hence, third party review of the cost estimate is recommended.

## 21 CAPITAL AND OPERATING COSTS

### CAPITAL COSTS

A summary of the LOM capital costs for the remaining two years of the production schedule in 2019 and 2020 is given in Table 21-1.

**TABLE 21-1 LIFE OF MINE CAPITAL COSTS**  
**Calibre Mining Corp. – La Libertad Mine**

Item	Total (\$000)
Mining	8,864
Process	11,054
Site General	143
Distributable	-
General and Administrative (G&A)	-
<b>Total Sustaining Capital</b>	<b>20,062</b>
<b>Total Closure/Reclamation Capital</b>	<b>28,249</b>
<b>Total Capital</b>	<b>48,310</b>

The sustaining capital costs for La Libertad mainly consist of a TSF dam raise in 2019 and equipment purchase for mining the Jabalí underground mine. Note that capitalized waste costs were included as expensed operating cost for simplicity since the operation only has a two-year production window.

Total mine closure costs are estimated to be \$28.2 million spent over 10 years, with \$20 million of direct closure/reclamation costs over the first five years and \$8.2 million over the remaining five years of post closure monitoring.

### OPERATING COSTS

The unit operating costs for the Project are listed in Table 21-2.

**TABLE 21-2 LIFE OF MINE OPERATING COSTS**  
**Calibre Mining Corp. – El Limón Mine**

<b>Item</b>	<b>Units</b>	<b>Total \$</b>
Surface Mining <sup>1</sup>	\$/t mined	2.98
Surface Mining <sup>1</sup>	\$/t milled	16.78
Underground Mining <sup>1</sup>	\$/t milled	52.42
Processing	\$/t milled	14.37
Site General	\$/t milled	4.21
Annual Licence	\$/t milled	0.05
Corporate G&A	\$/t milled	1.66
CSR Projects	\$/t milled	0.37
<b>Total Unit Operating Cost</b>	<b>\$/t milled</b>	<b>89.85</b>

Note.

1. Includes capitalized waste costs

The operating cost estimates are prepared based on recent operating performance and the current operating budget. RPA considers these operating cost estimates to be reasonable, as long as the production targets are realized.

It should be noted that the costs of open pit pre-stripping and underground development are considered expensed in Table 21-2 whereas usually they would be considered capitalized waste costs and not included in operating cost unit rates. This was done for simplicity since the operation only has a two-year production schedule.

Corporate G&A costs include the Managua regional office and the Vancouver head office operations costs.

## 22 ECONOMIC ANALYSIS

This section is not applicable.



## 23 ADJACENT PROPERTIES

There are no adjacent properties to report in this section.

## **24 OTHER RELEVANT DATA AND INFORMATION**

No additional information or explanation is necessary to make this Technical Report understandable and not misleading.

## 25 INTERPRETATION AND CONCLUSIONS

RPA has the following conclusions.

### GEOLOGY AND MINERAL RESOURCES

- The La Libertad deposits are low-sulphidation epithermal deposits hosted by volcanic lithologies.
- The sampling, sample preparation, analyses, security, and data verification meet industry standards and are appropriate for Mineral Resource estimation.
- The composite lengths are reasonable.
- The interpretation of the mineralization, wireframes, and block sizes are appropriate.
- Capping restrictions are reasonable, however, a distance restriction should be considered to control the smearing of high grade in some deposits.
- The grade interpolation strategies are appropriate for the style of mineralization.
- The parameters, assumptions, and methodology used for Mineral Resource estimation are appropriate for the style of mineralization.
- Total Mineral Resources at La Libertad are:
  - Indicated – 2.0 million tonnes, grading 2.61 g/t Au, containing 167,000 oz Au
  - Inferred – 3.2 million tonnes, grading 4.37 g/t Au, containing 452,000 oz Au
- The overall Mineral Resource classification is reasonable and conforms to CIM (2014) definitions.
- There is potential to outline additional Mineral Resources with an exploration program.

### MINING

- There are no Mineral Reserves on the Project, however, there is a two-year production schedule to mine much of the remaining Mineral Resources in 2019 and 2020 totalling 2.4 million tonnes grading 1.45 g/t Au resulting in a total of 115,000 contained gold ounces.
- Most of the planned ounces in the remaining two years of production come from the San Juan and Tope open pits, Jabalí open pit and underground mines, and spent heap leach ore stockpile.

## PROCESS

- The La Libertad processing plant can treat approximately 2.25 million tpa, and current gold recoveries are approximately 94% to 95% for a blend of spent ore and ROM ore.
- Feed grades to the processing plant were significantly below budget in 2017 and 2018, a trend which has continued into 2019. In RPA's opinion, this trend is likely to continue unless mitigating strategies are implemented.

## ENVIRONMENTAL CONSIDERATIONS

- La Libertad has adopted an Environmental Policy (2018) and a Biodiversity Policy (2018) designed to ensure that environmental risks continue to be identified and are adequately addressed while committing to environmental protection for all its activities. In addition, La Libertad has established an Occupational, Health and Safety Policy (2018) aimed at minimizing risks to its workers and a Corporate Social Responsibility policy to openly and respectfully engage with community stakeholders. These policies are, in part, implemented through the site Health, Safety and Environment Management System and Social Management System. These systems provide La Libertad staff with a clear understanding of the company's expectations regarding how to effectively manage the key risks associated with La Libertad, which leads to positive environmental and social outcomes.
- This management system is based on international standards including compliance with in-country regulations, relevant ISO and Occupational Health, Safety and Security standards, and reliance on the IFC Performance Standards and international best practices in cases where national regulatory systems are not sufficiently stringent.
- According to the monthly environmental reports, there were no water contamination incidents and no erosion/subsidence incidents during the reviewed period.
- The Esperanza TSF at La Libertad is nearly at the design capacity of its current raise, stage 7, and has a large pond with little freeboard to the crest. For future tailings management, Calibre is looking into in-pit tailings deposition, which is a good opportunity for the Project due to the numerous completed pits and the typically low risk posed by in-pit tailings deposition.
- A C&M strategy has been developed to minimize closure cost activities while options for continued operation, full closure, or suitable alternatives are developed. The C&M strategy carries a \$4.5 million annual cost. The total estimated cost to complete La Libertad and Santo Domingo Mines Closure and Transition Plan by 2028 is \$30.5 million, inclusive of five-year post-closure monitoring (2023-2028) and factors indirect costs. It accounts for social closure costs, severance, closure monitoring, and additional studies.

## 26 RECOMMENDATIONS

RPA has the following recommendations.

### GEOLOGY AND MINERAL RESOURCES

- Complete additional drilling of mined out areas in open pit resources that were not surveyed and host backfill that is classified as Inferred Mineral Resources to determine the true extent of the openings and grade of the material contained therein.
- Complete further review of the methodology for estimation of tonnage and grade in grade material backfill classified as Inferred Mineral Resources.
- Conduct a study on reconciliation of grade material backfill.
- Apply minimum thickness constraints to narrow areas of selected wireframes in the La Libertad deposit.
- In addition to capping high grade outliers, consider using a distance restriction to control the smearing of high grade in some deposits.
- Conduct a two-phase exploration program with Phase 2 contingent on the results of Phase 1.
- Phase 1 – 30,000 m diamond drilling and related studies - C\$10 million.
- Phase 2 - 40,000 m diamond drilling and related studies – C\$14 million.

### MINING

- Account for multiple sources of dilution, including internal dilution due to grade variability within the SMU, external dilution resulting from geological/geometric contacts, and operational dilution that accounts for production errors, pressures, and schedule demands. Therefore, adherence to a strict grade control program will be essential to achieve good control of dilution.

### PROCESS

- Analyze the strategic and financial benefits of reduced plant throughput to accommodate reduced ROM ore production, or the exhaustion or exclusion of spent ore from the processing plant. This can be achieved by the implementation of various grinding circuit configurations.

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## ENVIRONMENTAL CONSIDERATIONS

- Discuss, with regulators, the opportunity of providing an Umbrella Semi-detailed Environmental Impact Assessment (EIAsd) that covers all foreseeable exploration activities for any given calendar year, in order to minimize permitting activities.
- Continue to evaluate noise and vibration impacts resulting from the Project to ensure operations are within International Best Practices.
- Continue to evaluate noise and vibration impacts resulting from the Project and include limits in all monitoring with corrective actions for compliance.
- Continue to implement the site Environmental Management Plan which monitors and manages potential environmental impacts resulting from the Project to inform permit applications and the closure plan.
- Air quality monitoring indicates consistent particulate matter exceedances. Review management and mitigation corrective actions for compliance.
- Review existing flora and fauna studies within the Project footprint and the area of influence, with the aim of informing the closure plan and siting studies for future operations and site infrastructure development.
- Continue to ensure all necessary permits are obtained for operating the site in the medium and long term.
- Carry out studies regarding the presence of known or registered archaeological sites or other cultural heritage features on the La Libertad property.
- Implement a water balance for ongoing operations (if a water balance is not already in place) by mine operations personnel using meteorological and water monitoring data on a regular basis. The water balance is an important tool to track trends and conduct short-term predictions through simulation of variable operating and/or climatic scenarios to support decision making associated with pond operation (e.g., maintaining adequate freeboard at all times) and water discharge.
- The Esperanza TSF closure costs require additional consideration and review. The existing tailings deposition plan up to closure may have significant fill volume requirements for regrading and potential construction challenges associated with placing fill over soft wet tailings.
- To improve dam safety and to simplify closure cover requirements, deposition planning in the Esperanza TSF should be revised to displace the pond away from the dam using tailings and to promote drainage towards the spillway. Additional capacity at the Esperanza TSF should be considered if beneficial for reducing the facility closure costs and risk.
- Opportunities for in-pit tailings depositions should be investigated for future tailings management strategies.

## 27 REFERENCES

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## 28 DATE AND SIGNATURE PAGE

This report titled “Technical Report on the La Libertad Mine, Chontales Department, Nicaragua” and dated August 30, 2019 as amended on January 31, 2020 (with an effective date of June 30, 2019) was prepared and signed by the following authors:

**(Signed and Sealed) Grant A. Malensek**

Dated at Denver, CO  
January 31, 2020

Grant A. Malensek, P.Eng./P.Geo.  
Managing Principal Mining Engineer

**(Signed and Sealed) Wayne W. Valliant**

Dated at Toronto, ON  
January 31, 2020

Wayne W. Valliant, P.Geo.  
Principal Geologist

**(Signed and Sealed) Brenna J.Y. Scholey**

Dated at Toronto, ON  
January 31, 2020

Brenna J.Y. Scholey, P.Eng.  
Principal Metallurgist

**(Signed and Sealed) José M. Texidor Carlsson**

Dated at Toronto, ON  
January 31, 2020

José M. Texidor Carlsson, M.Sc., P.Geo.  
Senior Geologist

**(Signed and Sealed) Luis Vasquez**

Dated at Toronto, ON  
January 31, 2020

Luis Vasquez, M.Sc., P.Eng.  
Senior Environmental Consultant and  
Hydrotechnical Engineer  
SLR Consulting (Canada) Ltd.

## 29 CERTIFICATE OF QUALIFIED PERSON

### GRANT A. MALENSEK

I, Grant A. Malensek, P.Eng./P.Geo., as an author of this report entitled “Technical Report on the La Libertad Mine, Chontales Department, Nicaragua” prepared for Calibre Mining Corp. and dated August 30, 2019 as amended on January 31, 2020 (with an effective date of June 30, 2019), do hereby certify that:

1. I am Managing Principal Mining Engineer with Roscoe Postle Associates Inc. of Suite 505, 143 Union Boulevard., Lakewood, CO USA 80228.
2. I am a graduate of the University of British Columbia, Canada, in 1987 with a B.Sc. degree in Geological Sciences and Colorado School of Mines, USA in 1997 with a M.Eng. degree in Geological Engineering.
3. I am registered as a Professional Engineer/Geoscientist in the Province of British Columbia (Reg. #23905). I have worked as a mining engineer/geologist for a total of 25 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Feasibility, prefeasibility, and scoping studies
  - Fatal flaw, due diligence, and Independent Engineer reviews for equity and project financings
  - Financial and technical-economic modelling, analysis, budgeting, and forecasting
  - Property and project valuations
  - Capital cost estimates and reviews
  - Mine strategy reviews
  - Options analysis and project evaluations in connection with mergers and acquisitions
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I did not visit the La Libertad Mine.
6. I am responsible for overall preparation of the Technical Report, and specifically for Sections 15, 16, 18, 19, 21, 22, and 24 and related disclosure in Sections 1, 2, 3, 25, 26, and 27.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 31<sup>st</sup> day of January, 2020.

**(Signed and Sealed) Grant A. Malensek**

Grant A. Malensek, P.Eng./P.Geo.

**WAYNE W. VALLIANT**

I, Wayne W. Valliant, P.Geo., as an author of this report entitled "Technical Report on the La Libertad Mine, Chontales Department, Nicaragua" prepared for Calibre Mining Corp. and dated August 30, 2019 as amended on January 31, 2020 (with an effective date of June 30, 2019), do hereby certify that:

1. I am Principal Geologist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON M5J 2H7.
2. I am a graduate of Carleton University, Ottawa, Ontario, Canada in 1973 with a Bachelor of Science degree in Geology.
3. I am registered as a Professional Geologist in the Province of Ontario (Reg. #1175). I have worked as a geologist for a total of 44 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Review and report as a consultant on more than fifty mining operations and projects around the world for due diligence and resource/reserve estimation
  - General Manager of Technical Services for corporation with operations and mine development projects in Canada and Latin America
  - Superintendent of Technical Services at three mines in Canada and Mexico
  - Chief Geologist at three Canadian mines, including two gold mines
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I did not visit the La Libertad Mine. I visited the B2Gold Corp.'s office in Vancouver, BC on April 29-30, 2019.
6. I am responsible for Sections 4 to 12 and 23 and related disclosure in Sections 1, 2, 3, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 31<sup>st</sup> day of January, 2020.

**(Signed and Sealed) Wayne W. Valliant**

Wayne W. Valliant, P.Geo.

**BRENNA J.Y. SCHOLEY**

I, Brenna J.Y. Scholey, P.Eng., as an author of this report entitled “Technical Report on the La Libertad Mine, Chontales Department, Nicaragua” prepared for Calibre Mining Corp. and dated August 30, 2019 as amended on January 31, 2020 (with an effective date of June 30, 2019), do hereby certify that:

1. I am Principal Metallurgist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave., Toronto, ON M5J 2H7.
2. I am a graduate of The University of British Columbia in 1988 with a B.A.Sc. degree in Metals and Materials Engineering.
3. I am registered as a Professional Engineer in the Province of Ontario (Reg. #90503137) and British Columbia (Reg. #122080). I have worked as a metallurgist for a total of 31 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Reviews and reports as a metallurgical consultant on numerous mining operations and projects for due diligence and regulatory requirements.
  - Senior Metallurgist/Project Manager on numerous base metals and precious metals studies for an international mining company.
  - Management and operational experience at several Canadian and U.S. milling, smelting and refining operations treating various metals, including copper, nickel, and precious metals.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I did not visit the La Libertad Mine.
6. I am responsible for Section 13 and 17 and related disclosure in Sections 1, 2, 3, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 31<sup>st</sup> day of January, 2020.

**(Signed and Sealed) Brenna J.Y. Scholey**

Brenna J.Y. Scholey, P.Eng.

**JOSÉ M. TEXIDOR CARLSSON**

I, José M. Texidor Carlsson, M.Sc., P.Geo., as an author of this report entitled “Technical Report on the La Libertad Mine, Chontales Department, Nicaragua” prepared for Calibre Mining Corp. and dated August 30, 2019 as amended January 31, 2020 (with an effective date of June 30, 2019), do hereby certify that:

1. I am Senior Geologist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave., Toronto, ON M5J 2H7.
2. I am a graduate of University of Surrey, United Kingdom, in 1998 with a Master of Engineering, Electronic, and Electrical degree and Acadia University, Nova Scotia, in 2007 with a M.Sc. degree in Geology.
3. I am registered as a Professional Geologist in the Province of Ontario (Reg. #2143). I have worked as a geologist for a total of 11 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Mineral Resource estimation and NI 43-101 reporting for different types of deposits, including gold deposits
  - Supervision of exploration properties and active mines in Canada, Mexico, and South America
  - Experienced user of geological and resource modelling software
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I did not visit the La Libertad Mine. I visited the B2Gold Corp.'s office in Vancouver, BC on April 29-30, 2019.
6. I am responsible for Section 14 and related disclosure in Sections 1, 2, 3, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 31<sup>st</sup> day of January, 2020.

**(Signed and Sealed) José M. Texidor Carlsson**

José M. Texidor Carlsson, M.Sc., P.Geo.



**LUIS VASQUEZ**

I, Luis Vasquez, M.Sc., P.Eng., as an author of this report entitled “Technical Report on the La Libertad Mine, Chontales Department, Nicaragua” prepared for Calibre Mining Corp. and dated August 30, 2019 as amended January 31, 2020 (with an effective date of June 30, 2019), do hereby certify that:

1. I am a Senior Environmental Consultant and Hydrotechnical Engineer with SLR Consulting (Canada) Ltd. at 36 King St. East 4th Floor in Toronto, ON, M5C-1E5.
2. I am a graduate of Universidad de Los Andes, Bogotá, Colombia, in 1998 with a B.Sc. degree in Civil Engineering, and a M.Sc. in Water Resources Engineering in 1999.
3. I am registered as a Professional Engineer in the Province of Ontario (Reg. #100210789). I have worked as a as a civil engineer on mining related projects for a total of 15 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Preparation of environmental impact assessments for mining projects located in Canada and South America for regulatory approval.
  - Preparation of mine closure plans for mining projects in Canada and South America.
  - Preparation of several scoping, prefeasibility, feasibility and detailed design level studies for projects located in North America, South America, the Caribbean, and Asia with a focus on planning, design and safe operation of water management systems and waste disposal facilities.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I did not visit the La Libertad Mine.
6. I am responsible for Section 20 and related disclosure in Sections 1, 2, 3, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 31<sup>st</sup> day of January, 2020.

**(Signed and Sealed) Luis Vasquez**

Luis Vasquez, M.Sc., P.Eng.