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JAGUAR MINING INC.

TECHNICAL REPORT ON THE CAETÉ MINING COMPLEX, MINAS GERAIS STATE, BRAZIL

NI 43-101 Technical Report

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1 SUMMARY

EXECUTIVE SUMMARY

Roscoe Postle Associates Inc. (RPA), now part of SLR Consulting Ltd. (SLR), was retained by Jaguar Mining Inc. (Jaguar) to prepare updated Mineral Reserve and Mineral Resource estimates for the Caeté Mining Complex, located in Minas Gerais, Brazil. The purpose of this report is to support the disclosure of the Mineral Reserves and Mineral Resources as of May 31, 2020. This Technical Report conforms to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). RPA has visited the Caeté Mining Complex a number of times, with the most recent site visit on December 10, 2018.

Jaguar is a Canadian-listed junior gold mining, development, and exploration company operating in Brazil with three gold mining complexes and a large land package covering approximately 20,000 ha. Jaguar's principal operating assets are located in the Iron Quadrangle, which is a greenstone belt in the state of Minas Gerais. The company's common shares are listed on the Toronto Stock Exchange under the symbol JAG.

The Caeté Mining Complex is operated by Jaguar's wholly-owned subsidiary, Mineração Serras do Oeste (MSOL). The complex includes the Roça Grande and Pilar mines as well as a processing plant. The plant is located at the Roça Grande site and has a nominal capacity of 2,050 tonnes per day (tpd). The fine flotation and carbon-in-pulp (CIP) tailings are deposited in separate tailings disposal areas. Electrical power is supplied through the national power grid.

The Roça Grande Mine produced approximately 200 tpd until Q1 2018 when it was placed on care and maintenance. The Pilar Mine's output averaged approximately 1,100 tpd in 2019.

Tables 1-1 and 1-2 summarize the Mineral Resource and Mineral Reserve estimates for the Caeté Mining Complex as of May 31, 2020. Canadian Institute of Mining, Metallurgy and Petroleum (CIM) for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM (2014) definitions) were followed for Mineral Resources and Mineral Reserves. No Mineral Reserves are currently estimated for the Roça Grande Mine.

TABLE 1-1 SUMMARY OF MINERAL RESOURCES AS OF MAY 31, 2020
Jaguar Mining Inc. – Caeté Mining Complex

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Roça Grande Mine:			
Measured	188	2.14	13
Indicated	889	2.91	83
Sub-total M&I	**1,077**	**2.77**	**96**
Inferred	1,759	3.48	197
Pilar Mine:			
Measured	2,266	4.39	319
Indicated	1,751	4.28	241
Sub-total M&I	**4,017**	**4.34**	**561**
Inferred	1,254	4.52	182
Total, Caeté Mining Complex:			
Measured	2,454	4.21	332
Indicated	2,640	3.82	324
Sub-total M&I	**5,094**	**4.01**	**657**
Inferred	3,013	3.91	379

Notes:
1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are estimated at a cut-off grade of 1.46 g/t Au for the Roça Grande and Pilar Mines.
3. Mineral Resources are estimated using a long-term gold price of US$1,400 per ounce for the Roça Grande Mine and US$1,500 per ounce for the Pilar Mine.
4. Mineral Resources are estimated using an average long-term foreign exchange rate of R$2.50 : US$1.00 for the Roça Grande Mine and R$4.50 : US$1.00 for the Pilar Mine.
5. Mineral Resources for the Roça Grande Mine are prepared by depletion of the 2015 resource block model by the excavation volumes as of May 31, 2020.
6. A minimum mining width of approximately two metres was used.
7. Gold grades are estimated using inverse distance cubed (ID^3) for the Roça Grande Mine and ordinary kriging (OK) for the Pilar Mine.
8. No Mineral Reserves are currently present at the Roça Grande Mine. Mineral Resources are inclusive of Mineral Reserves for the Pilar Mine.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not add due to rounding.

TABLE 1-2 SUMMARY OF MINERAL RESERVES AS OF MAY 31, 2020
Jaguar Mining Inc. – Caeté Mining Complex

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Proven	858	3.9	106
Probable	1,009	4.1	133
Total	**1,866**	**4.0**	**240**

Notes:
1. CIM (2014) definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated at a cut-off grade of 2.14 g/t Au.
3. Mineral Reserves are estimated using an average long-term gold price of US$1,300 per ounce and a foreign exchange rate of R$4.50:US$1.00.
4. A minimum mining width of 2.0 m was used.
5. Bulk density is 2.89 t/m^3.
6. Numbers may not add due to rounding.

The Qualified Persons (QP) are not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other factors that could materially affect the Mineral Resource and Mineral Reserve estimates.

CONCLUSIONS

RPA's conclusions by area are summarized below.

GEOLOGY AND MINERAL RESOURCES

- In RPA's opinion, the Roça Grande and Pilar Mineral Resource estimates were prepared in a professional and diligent manner by qualified professionals and the estimates comply with CIM (2014) definitions.

Roça Grande Mine

- As the Roça Grande Mine is currently on a care-and-maintenance basis with no additional work completed since the previous disclosure of the Mineral Resources, the Mineral Resources remain unchanged.
- The Mineral Resource estimate for the Roça Grande Mine was prepared based on drilling and channel sample data using a data cut-off date of June 30, 2015. The wireframe models of the mineralization remained unchanged from 2015. The wireframe models of the excavated volumes for the Roça Grande Mine were constructed using the information available as of December 31, 2018.
- At a cut-off grade of 1.46 g/t Au, the Measured and Indicated Mineral Resources at the Roça Grande Mine total approximately 1.08 million tonnes (Mt), at a grade of 2.77 g/t Au, containing approximately 96,000 ounces of gold. In addition, Inferred Mineral Resources total approximately 1.76 Mt, at a grade of 3.48 g/t Au, containing approximately 197,000 ounces of gold.

- Surface-based exploration programs carried out in 2018 and 2019 were successful in locating gold mineralization at the Catita target and the Córrego Brandão target, both located in the vicinity of the Roça Grande Mine.

Pilar Mine

- The Pilar Mine has been in continuous production since 2008 and has produced a total of 446,431 oz of gold as of December 31, 2019.
- The Mineral Resource estimate for the Pilar Mine was prepared based on drilling and channel sample data using a data cut-off date of May 19, 2020. The wireframe models of the excavated volumes for the Pilar Mine were constructed using the information available as of May 31, 2020.
- At a cut-off grade of 1.46 g/t Au, the Measured and Indicated Mineral Resources at the Pilar Mine total approximately 4.02 Mt, at an average grade of 4.34 g/t Au, containing approximately 561,000 ounces of gold. In addition, Inferred Mineral Resources total approximately 1.26 Mt, at an average grade of 4.52 g/t Au, containing approximately 182,000 ounces of gold.
- Surface-based exploration activities carried out at surface at the Pilar Mine have been successful in locating gold mineralization at the Pilarzinho target and have also been successful in locating the surface location of the Torre mineralization.
- The underground diamond drilling campaigns carried out in 2019 and H1 2020 have been largely focussed on providing additional detailed information on the gold distribution of the known mineralized zones with the goal of improving the reliability of the Mineral Reserve estimates.
- A program of detailed lithological, mineralization, and structural mapping has been successful in demonstrating that the gold mineralization is hosted in a variety of rock types such as BIF (e.g. BA, BF, BF II, and BF III deposits), mafic metavolcanics (LFW deposit), and mafic/ultramafic metavolcanics (e.g., Torre deposit). As past exploration activities have been largely focussed towards evaluating the gold-bearing potential of the BIF units, RPA believes that the potential for the remaining host rocks has been under-evaluated.
- The mapping programs have clearly demonstrated that the entire stratigraphic sequence and gold mineralized zones have been affected by a period of west-northwest to east-southeast compression (D1) that has transposed all of the host rocks and mineralized zones into a series of broad, open folds at surface, to a series of compact, tightly folded structural slices at depth.
- The observation that the gold-bearing zones have been affected by this D1 folding event presents clear evidence that the gold mineralizing event took place prior to this deformation event. The observation that some of the mineralized zones (e.g., the LPA deposit) are approximately parallel to the D1 axial plane orientation suggests that a second gold mineralizing event may have occurred. All host rocks and mineralized zones are affected by a series of late-stage reverse faults.
- The continuity and distribution of the gold grades for selected mineralized wireframe domains were examined by means of contoured longitudinal projections. Review of the longitudinal projections for these selected domains suggests that the samples with gold grades above the 3 g/t Au to 5 g/t Au range seem to occur as somewhat isolated pods measuring approximately 15 m to 30 m in size that have a slightly preferred

elongation along the down-plunge orientation of the folded mineralized wireframes, possibly influenced by the F1 fold axes. The lower grade samples generally show a more pronounced preferred elongation along the down-plunge orientation of the folded mineralized wireframes.

- The Jaguar team have adopted a slightly modified workflow when carrying out their reconciliation studies. In this approach, the excavation volumes from the January 2019 to May 2020 period are applied against the block model completed at year-end 2018 and the resulting data are compared against the plant production data for the January 2019 to May 2020 period. Considering that these excavation volumes are querying areas in the year-end 2018 block model for which no grade control data were available, RPA considers that this approach is examining the predictive capabilities as well as the accuracy of the estimation procedures and parameters that were in place as of year-end 2018. In this manner, RPA is of the opinion that this approach can provide a means for measuring the accuracy of the data, sample density, workflows and estimation parameters that Jaguar uses to prepare its Mineral Resource estimates for the period under examination. This approach also allows the formation of an opinion on the forward accuracy of the current block model, as the procedures and parameters are similar to those used for the previous block model.
- Examination of the results suggests that the year-end 2018 block model has performed well for the period reviewed in terms of the predicted tonnages. The predicted grades are generally in good agreement as well, apart from the second quarter of 2020 where the block model grades were significantly less than the plant feed grades. This good performance suggests that the sampling procedures and Mineral Resource estimation workflows and parameters are satisfactory.
- Reconciliation of the current block model with plant production data from 2018, 2019 and H1 2020 suggests that the Q2 2020 block model has performed well for the period reviewed in terms of the predicted tonnages. The predicted grades are generally in good agreement as well, apart from the second quarter of 2020 where the block model grades were significantly less than the plant feed grades.

MINING AND MINERAL RESERVES

- The Pilar Mine is a well-run and professional operation currently producing at 1,300 tonnes per day (tpd).
- The Pilar Mineral Reserve estimates were prepared in a professional and diligent manner by qualified professionals and the estimates comply with CIM (2014) definitions.
- At a cut-off grade of 2.14 g/t Au, the Proven and Probable Mineral Reserves at the Pilar Mine comprise 1.87 Mt at an average grade of 4.0 g/t Au containing 240,000 ounces of gold.
- Total dilution included in reserves averages approximately 25%, which is in agreement with results for 2019 mining.
- The Life of Mine Plan (LOMP) for Pilar Mine forecasts 4.5 years of production, at a rate of 1,300 tpd. Gold production is forecast to average 55,000 ounces per year.
- The LOMP cash flow model confirms the economic viability of the Mineral Reserves, at a gold price of US$1,300/oz and an exchange rate of US$1.00=R$4.50.
- The Roça Grande Mine is presently on care and maintenance. Mineral Reserves are not currently estimated at the mine.

LIFE OF MINE PLAN

- The current LOMP leaves capacity for processing more material, should it become available. The plant schedule is adjusted to the available feed to reduce costs.
- At the current production rate of 1,300 tpd, the mine is approaching the maximum output for continuing at depth. In order to further increase production, a different haulage system would be required. Alternatively, other sustainable sources of ore would be required at the site in order to increase production.
- RPA reviewed capital and operating cost estimates prepared by Jaguar and found them to be reasonable.

MINERAL PROCESSING

- In RPA's opinion, the processing circuit unit operations are reasonable to recover gold as expected and provide for adequate throughput.
- A flowsheet modification to detoxify the process waters will have a positive effect on reducing raw water usage.
- Recent test work was aimed at identifying differences between the orebodies within the Pilar Mine, designated: BF, BF2, BF3, TORRE, LPA1, LPA2, and LPA3.
    - Minor variations by orebody were observed, with gold recoveries ranging from 85% to 95%. A weighted average recovery for the reserve orebodies is 89%.
    - Flotation tests indicated that there is the possibility of increased recovery using Sodium Xanthate Isobutyl (SIBX) or Potassium Amil Xantrate (PAX).
- Further test work is underway to identify the possibility of optimizing existing processes.

ENVIRONMENT

- RPA is not aware of any environmental liabilities on the property.
- No known environmental issues were identified from the documentation available for review to RPA. The Project complies with applicable Brazilian permitting requirements. The approved permits and the licence renewals address the authority's requirements for mining extraction and operation activities.
- There is an environmental monitoring program in place, which includes surface water quality, groundwater quality (at the Pilar site only), air quality and ambient noise.
- The review of social or community requirements indicates that, at present, Jaguar's operations at Pilar and Roça Grande represent a positive contribution to sustainability and community well-being. Jaguar continues to develop a strong relationship with the nearby communities and stakeholders. Their commitment to community development and programs is demonstrated through their ongoing investments in the "Seeds of Sustainability" program. Information on any existing or potential archeological resources was not provided at the time of this review, nor were any site-specific policies or guidelines. However, based on the information available and discussion with Jaguar staff, the operations at Pilar and Roça Grande appear to be aligned with International Finance Corporation (IFC) Performance Standards.

RECOMMENDATIONS

RPA's recommendations by area are summarized below.

GEOLOGICAL AND SAMPLING DATA

1. Select and assay on a remedial basis a selection of pulp samples from the 2019 and H1 2020 diamond drilling programs representing approximately 2% of the total samples analyzed.
2. Reduce the insertion frequency of the blank and standard reference materials to a frequency of approximately one blank for standard reference material sample for every 50 sample assays.

MINERAL RESOURCES

1. Review the Mineral Resource estimate for the Roça Grande Mine in light of the increased metal price and change in the exchange rate.
2. Undertake a program of re-sampling for those un-sampled intervals located within the Pilar mineralized wireframe boundaries if sufficient drill core is available.
3. Undertake all efforts to carry out whatever remedial actions are available and appropriate to correct the erroneous or suspicious information for those suspect drill holes that are located in the as-yet un-mined portions of the Pilar Mine. For those suspect drill holes for which remedial corrections are not possible, RPA recommends that those holes be transferred from the active database into a database that is dedicated specifically for these suspect records.
4. Evaluate the gold-bearing potential of the mafic metavolcanic and the ultramafic metavolcanic units within the Pilar Mine.
5. Update the lithologic and structural models to reflect the current information and level of understanding of the nature of the folding and faulting of the host rock units at the Pilar mine.
6. Amend the cut-off grade strategy used for preparation of the mineralization wireframes to better reflect the potentially economic in-situ gold grades. As a minimum, the mineralization wireframes should be created using a cut-off grade similar to the reporting cut-off grade.
7. Continue to collect bulk density values for those samples within the mineralized wireframe outlines, especially for those zones having a low number of density values.
8. Prepare wireframe models of the major lithological units as aides in coding the density values to the block model.
9. Consider the use of a dynamic anisotropy method for estimation of grades so as to more accurately reflect the gold grade variations at the local scale.
10. In those cases where no Cavity Monitoring Survey (CMS) model is available for a given excavation volume, use the design shape for the excavations in question (suitably modified for the estimated amount of overbreak) as a proxy when preparing the reconciliation reports.
11. Evaluate the impact of a higher metal price on the cut-off grade and the resulting estimated Mineral Resources.

12. Review and re-evaluate the reporting volumes for the remaining mineralization above Level 12 in consideration of the current metal price environment and short-range outlook.

MINING AND MINERAL RESERVES

1. Continue efforts to reduce dilution with cable bolts and stope pillars, and measurements using CMS should be used to analyze dilution by mining type. Measured results should be used to choose inputs to the reserve estimation process.
2. Continue with the plans and implementations put in place by the rock mechanics engineers should continue. The implementation of stope pillars, cable bolt designs, and regular maintenance of the main infrastructure should continue.

LIFE OF MINE PLAN

1. Review alternative feed sources to utilize unused capacity at the process plant. This is in progress regarding remnant mining in the upper levels, which has increased the Mineral Reserves. Toll milling from other properties is also another option.
2. Review alternatives for the plant operating schedule.
3. Continue efforts to exploit the opportunities in the upper areas of the mine to increase the LOMP. There are additional Mineral Resources in the old workings that can potentially be mined at reduced haulage distances. A detailed mining plan and costing is required.
4. Consider undertaking studies to explore the opportunities of an open pit at Pilar. There are Mineral Resources close to surface that may potentially be mined using surface mining methods.
5. The current LOMP has reached the extents of the resource limits at depth. Normally Jaguar has a buffer of one mining level (three sublevels). RPA recommends that buffer be established through drilling.

MINERAL PROCESSING

1. Plant trials to optimize flotation reagents should be carried out.
2. Metallurgical test work should continue, and should include samples from the SW orebody (which makes up one third of the Mineral Reserves) to assess variations in metallurgical performance.
3. The long term stability of ferric arsenate should be studied, in relation to the ongoing operation of the Moita dam.

ENVIRONMENT

1. Conduct geochemical sampling, testing, and characterization for waste rock and tailings to verify that acid rock drainage and metal leaching are not an issue that requires management actions and implementation of specific environmental mitigation measures to meet applicable water quality standards.
2. Consider expanding the air quality monitoring program by adding stations given that only one station at Pilar and one station at Roça Grande are part of the current program.

3. Review management and mitigation corrective actions, as applicable, based on the data collected from the environmental monitoring programs.
4. Consider the implementation of a monitoring program for fauna and flora.
5. Install piezometers and displacement monitoring instrumentation for the existing and proposed filtered tailings stacks.
6. Monitor the long-term displacement and phreatic levels within filtered tailings stacks to observe trends and confirm physical stability.
7. Contract a third party to conduct regular safety reviews of the existing and proposed filtered tailings stacks.
8. Include ancillary water management structures to collect contact water in the design of the proposed filtered tailings stacks.
9. Monitor seepage from all tailings storage facilities to confirm chemical stability.
10. Make site specific corporate policies related to health and safety, community engagement, and employee relations readily available.
11. Make the results of the recent archeological survey and any Chance Find procedures readily available.

ECONOMIC ANALYSIS

This section is not required as Jaguar is a producing issuer, the property is currently in production, and there is no material expansion of current production. RPA reviewed a LOMP cash flow model that confirms the economic viability of the Mineral Reserves, at a gold price of US$1,300/oz and an exchange rate of US$1.00=R$4.50.

TECHNICAL SUMMARY

PROPERTY DESCRIPTION AND LOCATION

The Caeté Mining Complex consists of the Roça Grande and Pilar mines and Caeté processing plant. The Roça Grande and Pilar mines are located in the municipalities of Caeté and Santa Bárbara, respectively, and the Caeté processing plant is located at the Roça Grande Mine. Caeté (44,718 inhabitants) and Santa Bárbara (31,324 inhabitants) are comparably sized towns, located 55 km and 110 km, respectively, east of Belo Horizonte, the capital city of the state of Minas Gerais, Brazil. The two towns have good urban infrastructure, including banks, hospitals, schools, and commercial businesses.

The Pilar ore is transported to the Caeté processing plant by trucks using paved and dirt public roads totalling 45 km.

Belo Horizonte is the capital and also the largest city of the state, with a population in excess of four million. It is the major centre for the Brazilian mining industry. A large commercial airport with domestic and international flights services Belo Horizonte, which hosts several state and federal government agencies and private businesses that provide services to the mining industry.

Jaguar maintains a corporate office in Belo Horizonte.

LAND TENURE

The land tenure package for the Caeté Mining Complex comprises 29 mining leases and exploration concessions granted by the Agência Nacional de Mineração (ANM), and four surface rights holdings. The mining leases and exploration concessions cover an area totalling 19,479.97 ha. The surface rights holdings comprise nine separate agreements that cover a total area of 757.87 ha.

Mining leases are renewable annually and have no set expiry date. Each year Jaguar is required to provide information to ANM summarizing mine production statistics.

Jaguar must pay a royalty equivalent to 1% of net sales to ANM. In addition, one royalty payment and three lump sum annual rental payments are associated with the Caeté Mining Complex.

HISTORY

Initial exploration activities carried out by Companhia Vale do Rio Doce (Vale) between 1973 and 1993 in the Roça Grande Mine area consisted of regional geological reconnaissance, exploratory geochemistry, and geophysical surveys, along with excavation of a number of exploration trenches and diamond drilling to evaluate the gold mineralization found in the area. Vale also carried out geological mapping, geological interpretation, and exploration and in-fill drilling at the Pilar deposit.

In December 2003, Jaguar acquired the Santa Bárbara property, which included the Pilar mineral concessions, from Vale. In November 2005, Jaguar entered into a mutual exploration and option agreement with Vale, which resulted in final transfer of the Roça Grande concessions to Jaguar in December 2010 and August 2011.

Jaguar initiated exploration activities at Pilar in 2006, and initially contemplated building a sulphide plant on site, however, the acquisition of the Roça Grande concessions created an opportunity to develop an expanded project, with greater plant capacity to receive ore from several mineral properties.

In 2007, Jaguar completed a scoping study of the Caeté Project, received the Implementation Licence, and secured the power contract for the start-up. A feasibility study was completed in 2008, and by the end of the third quarter in 2008, Jaguar initiated construction of the milling and treatment circuits.

In December 2008, Jaguar began transporting ore by truck from the Pilar Mine to Jaguar's Paciência Mining Complex to supplement the ore being supplied from Paciência Santa Isabel Mine.

The Caeté processing plant was commissioned in June 2010. The first gold pour was conducted in August 2010 and commercial production was declared in October 2010. From 2010 to December 31, 2019, gold production from the plant totalled approximately 417,000 ounces from approximately 4.9 Mt of feed at an average gold recovery of 88%.

GEOLOGY AND MINERALIZATION

The Roça Grande and Pilar deposits are located in the eastern part of the Iron Quadrangle. Gold was produced from numerous deposits, primarily in the northern and southeastern parts of the Iron Quadrangle, most hosted by Archean or Early Proterozoic BIFs contained within greenstone belt supracrustal sequences.

In the Brumal-Pilar region, outcrops belonging to the granitic-gneissic basement, and to the Nova Lima and Quebra-Ossos groups of the Archean Rio das Velhas Supergroup, occur. The granitic-gneissic basement consists of leucocratic and homogeneous gneisses and migmatites, making up a complex of an initial tonalitic composition intruded by Archean rocks of granitic composition. The contacts between the supracrustal sequences and the granitic-gneissic basement are discordant and tectonically induced by reverse faulting. The Rio das Velhas Supergroup is regionally represented mainly by meta-volcanic and meta-epiclastic packages of the Nova Lima Group and by the meta-ultramafic rocks of the Quebra-Ossos Group including serpentinites, talc schists, and meta-basalts. "Algoma-type" BIFs occur as the more prominent volcanogenic-sedimentary rock packages in the Nova Lima Group with thicknesses of up to 15 m to 20 m.

ROÇA GRANDE MINE

The Roça Grande Mine is located in the upper unit of the Nova Lima Group. The dominant rock types found in the mine are a mixed assemblage of meta-volcanoclastics and meta-tuffs. These are represented by quartz sericite and chlorite schists with variable amounts of carbonate facies BIF, oxide-facies BIF, meta-cherts, and graphitic schists. The iron formations, chert units, and graphitic schist units are intimately inter-bedded with each other, such that they form an assemblage of chemical and clastic sedimentary units.

Two important BIF horizons are present at the Roça Grande Mine the North Structure (Structure 1) which hosts the RG01 mineralized body and the South Structure (Structure 2) which hosts the RG02, RG03, and RG06 mineralized bodies. The RG07 mineralized body is located immediately in the hanging wall of Structure 1 and is hosted mostly by a quartz vein. The bedding is well defined by the carbonate-facies iron formation and chert found in the BIF horizons, with an overall strike of azimuth 70º to 80º, and dipping approximately 30º to 35º south.

Gold mineralization is more commonly associated with BIF horizons. In RG01, RG02, RG03, and RG06 mineralized bodies, the gold mineralization is developed roughly parallel to the primary bedding and is related to centimetre-scale bands of massive to disseminated pyrrhotite and arsenopyrite. In many cases, better gold values are located along the hangingwall contact of the iron formation sequence and is hosted by carbonate-facies iron formation. The grades generally decrease towards the footwall where the iron formation becomes more silica-rich.

In the RG07 mineralized body, gold is found to be hosted in quartz veins that are contained within a sericite (chlorite) schist associated with an east-west oriented shear zone.

PILAR MINE

The Pilar deposit is hosted by the basal units of the Nova Lima Group, and by sequences of the Quebra-Ossos Group. The rock packages in the immediate area of the mine are comprised of tholeiitic meta-basalts, mica-quartz schists, chlorite-quartz schists, quartz-chlorite-sericite schists, and volcano-chemical and clastic meta-sedimentary rocks of the Santa Quitéria Unit (Nova Lima Group), and further to the east, of meta-komatiite flows (along with their intrusive equivalents) of the Quebra-Ossos Group. The volcano-chemical meta-sedimentary rock packages include cherts, BIFs, and carbonaceous phyllites. At the east edge of the Pilar property, the supracrustal units of the Rio das Velhas Supergroup are in fault contact with migmatites and granitic gneisses of the Santa Bárbara Complex, the unit that locally represents the basement sequence.

The Pilar Mine occurs at the northernmost end of the northeasterly oriented Brumal-Pilar BIF trend, which corresponds to a package of “Algoma-type” BIFs that represent the main economic target as hosts of the Pilar deposit. The “Algoma-type” BIFs typically range between five metres and 15 m to 20 m in thickness, however, within the Pilar property, they have been severely and tightly folded and thickened as a result of a west-verging compressional regional deformation event that affected the entire eastern border of the Rio da Velhas Supergroup exposures in the Iron Quadrangle Terrain.

The resulting folded geometry of the Pilar deposit stratigraphic package is now described as a series of overturned synform-antiform folds (a synclinorium) mainly outlined by the Pilar BIF Unit, and which locally may show some degree of stratigraphic transposition and/or stratigraphic thickening at their hinge zones. The axes generally plunge to the southeast, with some instances of very local mesoscopic folds plunging to the northeast. The axial-planar tectonic cleavage of the overturned synform-antiform folds dip steeply to the east-southeast.

Gold mineralization at the Pilar Mine is hosted by the folded, and locally re-folded, “carbonatic-oxide-facies” Pilar BIF Unit and by the conformably folded Eastern Torre meta-volcanic sequence. The main zones of mineralization at Pilar, including SW, São Jorge, BF III, BF II, BF, LPA, and BA, occur as scattered, stratabound lenses (or “pods”) of sulphide-facies BIFs within the Pilar BIF Unit. Arsenopyrite and pyrrhotite are the most important sulphide minerals in mineralized bodies, with pyrite, chalcopyrite, galena, and sphalerite commonly present as accessory minerals. The sulphide minerals occur mostly as disseminations in the host rocks, but can achieve semi-massive to massive concentrations locally, over a few metres. Individual quartz veins also occur and are typically less than one metre in width.

MINERAL RESOURCES

Table 1-1 summarizes the Mineral Resources as of May 31, 2020 based on a US$1,400/oz gold price and exchange rate of R$2.50 : US$1.00 for the Roça Grande Mine and a US$1,500/oz gold price and exchange rate of R$4.50 : US$1.00 for the Pilar Mine. A cut-off grade of 1.46 g/t Au was used to report the Mineral Resources for both the Roça Grande and Pilar Mines. As the Roça Grande Mine is currently on a care and maintenance basis with no additional work completed since the previous disclosure of the Mineral Resources, no changes have been made to the block model since the previous Mineral Resource estimate.

ROÇA GRANDE MINE

The block model for the Roça Grande Mine is based on drilling and channel sample data using a data cut-off date of March 30, 2015 and June 30, 2015, respectively. The database comprises 649 drill holes and 6,517 channel samples. The estimate was generated from a block model constrained by three-dimensional (3D) wireframe models that were constructed using a minimum width of one metre. The purpose of the minimum width criteria was to attempt to identify any areas of high grade mineralization that could be candidates for extraction using highly selective underground mining methods. A two metre minimum width criteria were subsequently applied to the Mineral Resource reporting criteria by using a minimum grade times thickness product of 3.0 gram-metres.

Gold grades were estimated using the ID^3 interpolation algorithm using composited capped assays. A capping value of 30 g/t Au was applied for the RG01 and RG06 orebodies while a capping value of 50 g/t Au was applied for the RG02, RG03, and RG07 orebodies. The wireframe models of the mineralization and excavated material for the Roça Grande Mine were constructed using the excavation information as of December 31, 2018. The Roça Grande Mine was put on a care and maintenance basis in Q1 2018.

Mineralized material for each orebody was classified into the Measured, Indicated, or Inferred Mineral Resource categories on the basis of the search ellipse ranges obtained from the variography study, observed continuity of the mineralization, drill hole and channel sample density, and previous production experience with these orebodies. Reporting polygons were created to ensure that the “reasonable prospects for eventual economic extraction” requirement of the CIM (2014) definitions were met. These reporting polygons were used to appropriately code the block model and prepare the Mineral Resource reports.

PILAR MINE

The updated block model for the Pilar Mine is based on drilling and channel sample data using a data cut-off date of May 19, 2020. The database comprises 1,941 drill holes and 22,716 channel samples. The estimate was generated from a block model constrained by 3D wireframe models that were constructed using a minimum width of two metres. Gold grades were estimated with OK interpolation and ID^3 algorithms using composited capped assays. Various capping values were applied to each of the different orebodies, ranging from 60 g/t Au for the BA Orebody to 20 g/t Au for the LPA Orebody. The wireframe models of the excavated material for the Pilar Mine were constructed using the information as of May 30, 2020.

Mineralized material for each orebody was classified into the Measured, Indicated, or Inferred Mineral Resource categories on the basis of the search ellipse ranges obtained from the variography study, observed continuity of the mineralization, drill hole and channel sample density, and previous production experience with this deposit. Reporting volumes were created using the Hexagon HxGN MinePlan 3Dv.15.30 mine modelling software package (Mine Plan 3D) or using the functions available through the Deswik mine modelling software package to ensure that the “reasonable prospects for eventual economic extraction” requirement of the CIM (2014) definitions were met. These reporting volumes were used to appropriately code the block model and prepare the Mineral Resource reports.

MINERAL RESERVES

Table 1-2 summarizes the Mineral Reserves for Pilar Mine as of May 31, 2020 based on a gold price of US$1,300/oz. A break-even cut-off grade of 2.14 g/t Au was used to report the Mineral Reserves for the Pilar Mine. There are no Mineral Reserves for Roça Grande Mine.

Dilution was applied to the designed stopes as planned dilution (portions of the stopes that project outside the resource wireframes) and unplanned dilution (a factor to account for overbreak). Internal and external dilution estimates average approximately 25%.

Extraction (mining recovery) is assumed to be 95%. Although some losses are encountered during blasting and mucking, they are minimal, and reconciliation to mill results indicates that high dilution/high extraction assumptions are in good agreement.

RPA is not aware of any mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

It is RPA’s opinion that the Pilar Mineral Reserve estimates were prepared in a professional and diligent manner and that the estimates comply with CIM (2014) definitions.

MINING METHOD

At the Pilar Mine, gold mineralization is contained within a shear zone with an average 50º to 60º dip. The mineralization is structurally complex due to intense folding and displacements (up to one metre) due to local faulting. This results in direction changes and pinching and swelling of the vein over relatively short distances.

There are two mining methods in use. The current LOMP includes longhole mining for the Mineral Reserves. Mechanical cut and fill mining is used when ore geometry does not favour longhole mining. The 2019 production rates averaged approximately 1,100 tpd. Recently, the mine has increased from three to four eight-hour shifts per day and the production rate has increased to 1,300 tpd.

The mine is accessed from a five metre by five metre primary decline located in the footwall of the deposit. The portal is located at an elevation of 760 metres above sea level (MASL). The mine is divided into levels with Level 01 established at an elevation of 690 MASL. Starting at this point, the level spacing is 75 m vertical, i.e., Level 02 is at an elevation of 615 MASL, Level 03 at an elevation of 540 MASL, etc. A three-metre thick sill pillar is left between levels. Sublevels have also been excavated from the main ramp at 20 m vertical intervals to provide for intermediate access to the mining panels. The decline has reached Level 07, a vertical depth of approximately -150 MASL.

Longhole mining is carried out on a longitudinal retreat sequence, towards a central access. Stopes are 50 m in length and separated by three metre to five metre wide pillars, depending on the thickness of the zone. When the mining of each longhole stope has been completed, the excavation is filled using development waste. Development waste volume is well matched to the backfill volume needed. There are times when development waste rock is either hauled to surface or hauled from surface to an underground stope being filled due to timing. The mine has potential to use hydraulically placed cemented classified flotation tailings backfilling. Mining then proceeds upward to the next sublevel and the sequence is repeated until the sill pillar is reached. Stopes are mined from several sublevels simultaneously in order to provide the required number of active workplaces needed to meet production targets.

The mine is highly mechanized. Development and mining activities are accomplished with a fleet of two two-boom and two one-boom electric-hydraulic jumbos. Longhole drilling is completed with three Sandvik production drills. Four 10t Sandvik LH410 Load-Haul-Dump

(LHD) units are used for mucking. A fleet of four Volvo A30 articulated trucks and one Iveco 25 t truck are used to haul broken rock to surface.

LIFE OF MINE PLAN

Stope and development designs, and production scheduling were carried out using Deswik mine design software and depleted for stopes mined out as of May 31, 2020.

The production schedule covers a mine life of 4.5 years based on current Mineral Reserves and is summarized in Table 1-3.

TABLE 1-3 LOMP PRODUCTION SCHEDULE
Jaguar Mining Inc. – Caeté Mining Complex

Item	Units	June-Dec. 2020	2021	2022	2023	2024	2025*	Total
Ore Tonnes	000 t	300	498	506	342	147	74	1,866
	g/t Au	3.68	3.81	3.75	3.72	3.92	9.64	3.99
Total Mill Feed	000 t	300	498	506	342	147	74	1,866
	g/t Au	3.68	3.81	3.75	3.72	3.92	9.64	3.99
	000 oz	35	61	61	41	19	23	240
Recovery	%	90%	90%	90%	90%	90%	90%	90%
Gold Produced	000 oz	32	55	55	37	17	21	216

Note.* three months' production

There is capacity for processing more material, up to 2,050 tpd, should it become available. The plant operating schedule is matched to the available ore feed to reduce operating cost.

Production rates in the LOMP are forecast to be 1,300 tpd. The increase of production is based on adding a fourth shift to the work day and adding haulage equipment to move the ore to surface. The mining sequence provides two active stopes per sublevel, with simultaneous access to multiple sublevels. The current production of 1,300 tpd has been demonstrated to be achievable in the short-term and, in RPA's opinion, this rate can be maintained over the LOMP time period.

As mining advances at depth, the Mine will approach its maximum output due to truck haulage cycle times and ventilation limitations. The addition of Mineral Reserves in the SW and Torre orebodies at a shallow depth has the potential to increase haulage capacity.

MINERAL PROCESSING

The Caeté processing plant has a design capacity of 720,000 tonnes per year (tpa) of run-of-mine (ROM) ore. The plant produced 40,682 ounces of gold at a recovery of 86.94% for 2019. For 2020 YTD (end of May) gold production was 20,690 ounces at a recovery of 88.06%.

In 2019 and 2020 YTD, the plant processed feed from the Pilar Mine. In 2019 and 2020 YTD, the Caeté processing plant operated at approximately 60% of its design capacity. Tailings filtration capacity could be expanded if future mine production exceeds filtration capacity of 720,000 tpa.

The process flowsheet consists primarily of the following unit operations:

- Crushing
- Grinding
- Gravity Gold Recovery
- Flotation
- Leaching and CIP
- Gold Recovery
- Detoxification
- Tailings Disposal

In RPA's opinion, the processing circuit unit operations are reasonable to recover gold as expected and provide for adequate throughput. The modified flowsheet to detoxify the process waters will have a positive effect on reducing raw water usage.

PROJECT INFRASTRUCTURE

The Caeté Mining Complex includes a nominal 2,050 tpd processing plant with separate tailings disposal areas for both fine flotation tailings and carbon-in-pulp (CIP) tailings. The electric power is supplied through the Brazilian national grid. The process plant is located at the Roça Grande site, at an elevation of approximately 1,250 MASL.

An administration complex is located at the entrance to the plant site, with such ancillary buildings as offices, conference rooms, cafeteria, maintenance shops, compressors (mine and mill), a dry, a first aid station, warehouse, backfill preparation, and a water treatment plant, which is located near the process plant. The assay laboratory and process testing laboratory are also located near the process plant. The adjacent Roça Grande Mine (under care and maintenance since Q1 2018) is accessed by an adit that is located approximately 800 m to the southwest of the plant, at an elevation of approximately 1,100 MASL.

The surface infrastructure at the Pilar Mine is limited to shops, offices, cafeteria, first aid, and warehouse facilities. The mine is accessed by an adit that is located at an elevation of approximately 750 MASL.

The explosives and blasting accessories warehouses are located away from the mine area, in compliance with the regulations set forth by the Brazilian Army.

ENVIRONMENTAL, PERMITTING AND SOCIAL CONSIDERATIONS

Environmental impact assessments were completed for the Pilar site in 2006 and for the Roça Grande site in 2007 followed by development of environmental management plans in 2008 for the Pilar and Roça Grande mine operations. These plans outline the identified potential impacts on the physical, biological and social environments, mitigation measures applicable to construction and operations, and environmental monitoring programs to verify the effectiveness of the mitigation measures and the compliance with the applicable environmental standards.

Environmental monitoring being carried out by Jaguar includes surface water quality, groundwater quality (at the Pilar site only), air quality, and ambient noise. Results of the environmental monitoring for water quality are reported to the Brazilian authorities whereas air quality and ambient noise monitoring results are reported internally only.

Jaguar has all required permits to conduct the proposed work on the property. The approved permits and the licences under renewal address the authority’s requirements for mining extraction and operation activities.

Jaguar continues to develop a strong relationship with the nearby communities and stakeholders. Jaguar's commitment to community development and programs is demonstrated through its ongoing investments in the "Seeds of Sustainability" program.

As of December 31, 2019, Jaguar has maintained progressive rehabilitation and reclamation provisions of US$6.6 million for the Roça Grande Mine, the process plant and the Pilar Mine which represent the undiscounted, uninflated future payments for the expected rehabilitation costs.

CAPITAL AND OPERATING COST ESTIMATES

CAPITAL COSTS

The capital costs estimate for the Caeté Mining Complex was prepared by Jaguar and includes primary access development, mine equipment replacement, plant equipment replacement, sustaining capital, tailings dam expansion, and mine closure. Table 1-4 summarizes the capital cost estimate for the LOMP of the Caeté Mining Complex.

TABLE 1-4 CAPITAL COSTS
Jaguar Mining Inc. – Caeté Mining Complex

Description	Units	June-Dec. 2020	2021	2022	2023	2024	2025	Total
Mining	US$000	3,249	1,637	1,637	1,637	1,637	1,637	11,434
Plant	US$000	3,121	450	450	450	450	450	5,373
Exploration	US$000	491	806	806	806	806	806	4,520
Closure	US$000	33	204	890	283	331	669	2,410
Total	**US$000**	**6,894**	**3,097**	**3,783**	**3,176**	**3,224**	**3,562**	**23,736**

OPERATING COSTS

Table 1-5 presents the unit operating costs for the Caeté Mining Complex. These costs were prepared by Jaguar based on recent actual costs and include mining, process, and general and administration (G&A) expenses.

TABLE 1-5 UNIT OPERATING COSTS
Jaguar Mining Inc. – Caeté Mining Complex

Description	Units	2016	2017	2018	2019	2020 Budget
Mining	US$/t milled	107.99	57.71	48.06	39.87	39.63
Processing	US$/t milled	16.18	21.08	22.30	26.62	27.19
G&A	US$/t milled	8.32	11.52	12.86	5.33	7.63
Total	**US$/t milled**	**132.49**	**90.31**	**83.22**	**71.82**	**74.45**
Production	**000 t**	**296**	**335**	**380**	**433**	**470**

2 INTRODUCTION

Roscoe Postle Associates Inc. (RPA), now part of SLR Consulting Ltd. (SLR), was retained by Jaguar Mining Inc. (Jaguar) to prepare updated Mineral Reserve and Mineral Resource estimates for the Caeté Mining Complex, located in Minas Gerais, Brazil. The purpose of this report is to support the disclosure of the Mineral Reserves and Mineral Resources as of May 31, 2020. This Technical Report conforms to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101).

Jaguar is a Canadian-listed junior gold mining, development, and exploration company operating in Brazil with three gold mining complexes and a large land package covering approximately 20,000 ha. Jaguar's principal operating assets are located in the Iron Quadrangle, which is a greenstone belt in the state of Minas Gerais. The company's common shares are listed on the Toronto Stock Exchange under the symbol JAG.

The Caeté Mining Complex is operated by Jaguar's wholly-owned subsidiary, Mineração Serras do Oeste (MSOL). The complex includes the Roça Grande and Pilar mines as well as a processing plant. The plant is located at the Roça Grande site and has a nominal capacity of 2,050 tonnes per day (tpd). The fine flotation and carbon-in-pulp (CIP) tailings are deposited in separate tailings disposal areas. Electrical power is supplied through the national power grid.

The Roça Grande Mine produced approximately 200 tpd until Q1 2018 when it was placed on care and maintenance. The Pilar Mine's output averaged approximately 1,100 tpd in 2019.

SOURCES OF INFORMATION

RPA was unable to arrange a site visit to the Caeté Mining Complex during the preparation of this Technical Report due to travel restrictions imposed by the coronavirus pandemic. RPA personnel, however, have been to the complex on previous occasions. Most recently, Mr. Jeff Sepp, P.Eng., RPA Senior Mining Engineer, visited the Pilar Mine on December 10, 2018. At that time, he was accompanied by Mr. Jon Hill, Exploration & Geology Expert Advisor, and Mr. Helbert Taylor Vieira, Resources and Reserves Manager of Jaguar. Before then, RPA had visited the Pilar and Roça Grande mines in 2014 and 2017.

Discussions were held with the following Jaguar's staff and consultants that contributed to the preparation of the Mineral Resource and Mineral Reserve estimates for the Pilar and Roça Grande mines.

Name	Position	Company
Jonathan Victor Hill	VP, Geology & Exploration	Jaguar
Armando José Massucatto	Geology & Exploration Manager	Jaguar
Gesner José Ilário dos Santos	Technical Services Manager	Jaguar
Tiago Pedro de Souza	Geology Coordinator	Jaguar
Hugo Leonardo de Avila Gomes	Resource Geologist	Jaguar
Márcio Andre Sales	Geology and Structural Consultant	MAS
Iuri Pinto Mascarenhas	Plant Manager	Jaguar
Gustavo Pereira de Aguiar	Financial Manager	Jaguar
Francisco Bittencourt Oliveira	Regional Manager	Deswik
Bruno Tomaselli	Consulting Manager	Deswik
Rayssa Garcia de Sousa	Environmental Manager	Jaguar
Frederico José da Costa Silva	Finanial Coordinator	Jaguar
Carla Fernandes Moura Tavares	Legal Manager	Jaguar
Juliana Souza Dolabela	Human Resources Manager	Jaguar
Ana Thereza Nápoles Balbi	Institutional Relations	Jaguar
Christiane Delgado Alam	Institutional Relations	Jaguar
Ana Andrade	Consulting	Deswik
Bruna Rozendo	Consulting	Deswik

The following RPA staff members participated in the preparation of the Mineral Resource and Mineral Reserve estimates for the Pilar and Roça Grande mines and are the Qualified Persons (QP) for this Technical Report.

Qualified Person	Position at RPA	Sections Prepared
Stephan R. Blaho, MBA, P.Eng.	Principal Mining Engineer	2, 3, 19, 21 to 24
Reno Pressacco, M.Sc. (A), P.Geo.	Principal Geologist	4 to 12, 14
Jeff Sepp, P.Eng	Senior Mining Engineer	15, 16
Holger Krutzelmann, P.Eng.	Associate Principal Metallurgist	13, 17, 18
Luis Vasquez, M.Sc., P.Eng.	Senior Hydrotechnical Engineer	20

All QPs share responsibility for Sections 1, 25, 26, and 27 of this Technical Report.

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

3 RELIANCE ON OTHER EXPERTS

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

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

For the purpose of this report, RPA has relied on ownership information provided by Jaguar. RPA has not researched property title or mineral rights for the Roça Grande and Pilar mining operations and expresses no opinion as to the ownership status of the property.

RPA has relied on Jaguar for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from the Roça Grande and Pilar mining operations.

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 Roça Grande and Pilar mines and the Caeté processing plant form the Caeté Mining Complex, located to the east of Belo Horizonte, the capital city of the state of Minas Gerais (Figures 4-1 and 4-2). The Caeté processing plant is located at the Roça Grande Mine and currently processes ore from the Pilar Mine. The Roça Grande Mine was placed on care and maintenance in Q1 2018. The Roça Grande and Pilar mines are located in the municipalities of Caeté and Santa Bárbara, respectively, in the state of Minas Gerais, Brazil. Caeté (44,718 inhabitants) and Santa Bárbara (31,324 inhabitants) are comparably sized towns, located 55 km and 110 km, respectively, from Belo Horizonte. The two towns have good urban infrastructure, including banks, hospitals, schools, and commercial businesses.

From Caeté, the main access to the Roça Grande Mine is by a seven kilometre public dirt road that links Caeté to the town of Barão de Cocais. The Roça Grande Mine has geographic coordinates of 19°57’ S latitude and 43°38’ W longitude.

The Pilar ore is transported to the Caeté processing plant by trucks using paved and dirt public roads totalling 45 km. The Pilar Mine has geographic coordinates of 19°58’4.43” S latitude and 43°28’ 25.70” W longitude.

Belo Horizonte is the capital and also the largest city of the state, with a population in excess of four million. It is the major centre for the Brazilian mining industry. A large commercial airport with domestic and international flights services Belo Horizonte, which hosts several state and federal government agencies and private businesses that provide services to the mining industry.

Jaguar maintains a corporate office in Belo Horizonte.

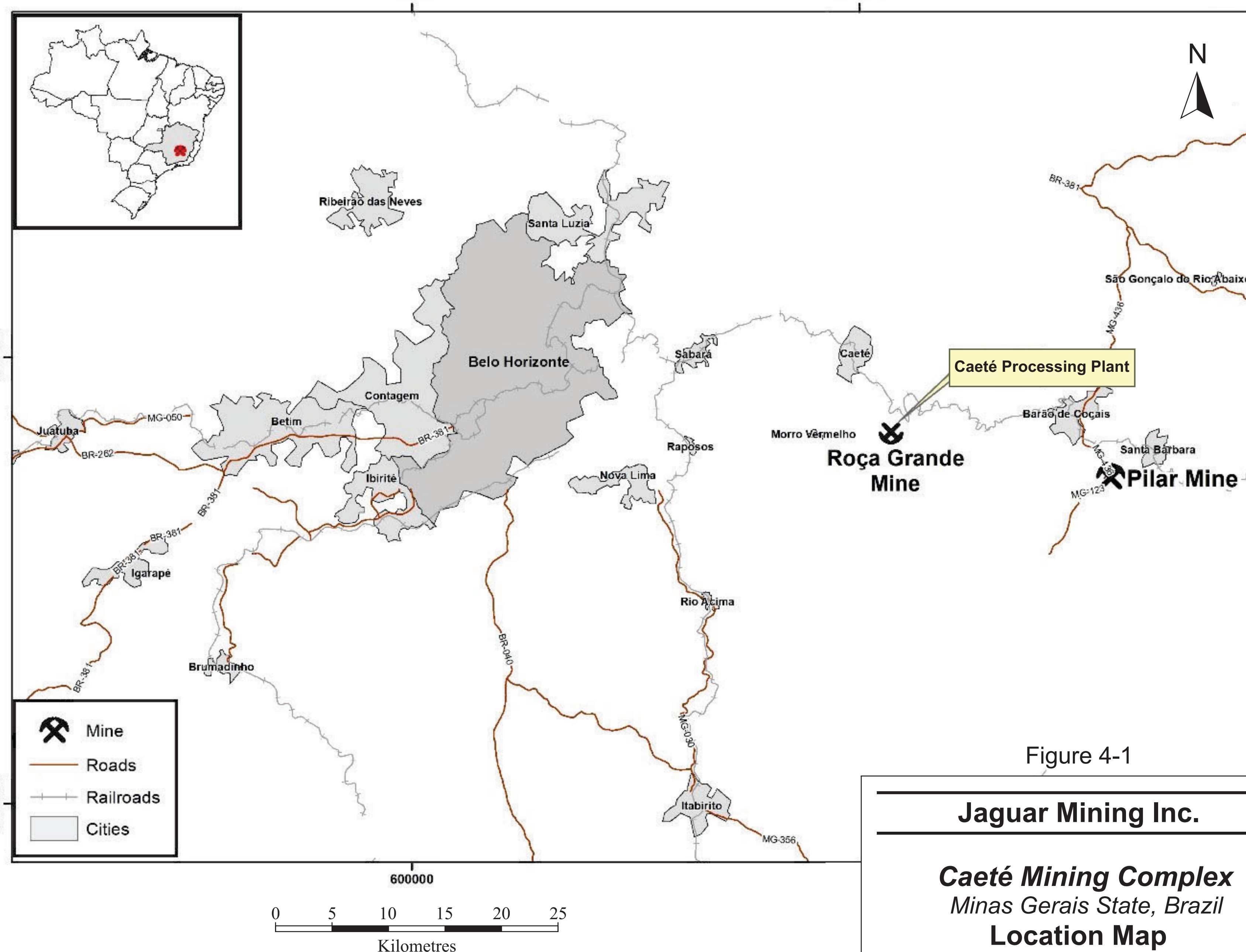

Figure 4-1

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Location Map

August 2020

Source: Jaguar Mining Inc., 2020.

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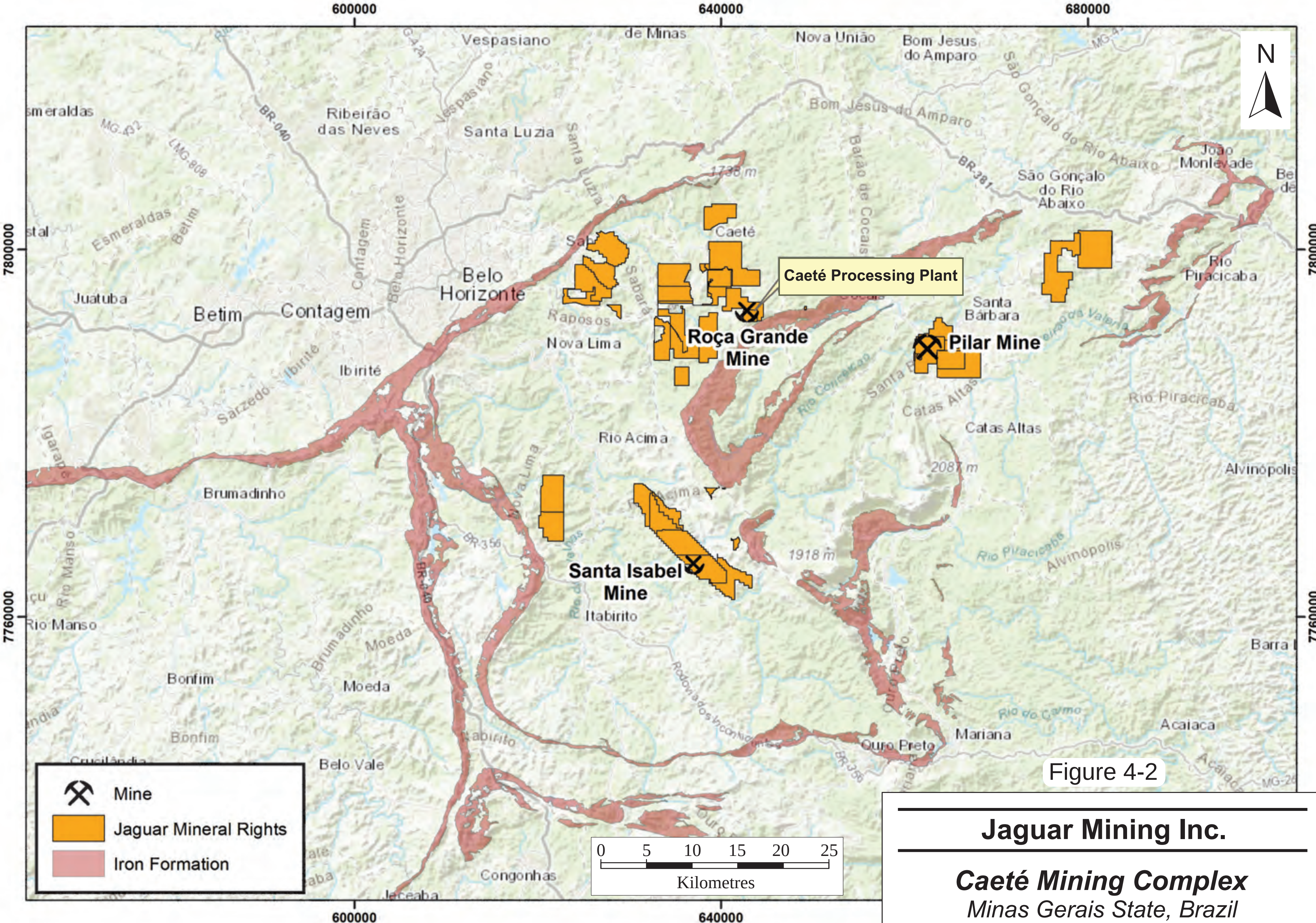

Figure 4-2

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Roça Grande and Pilar Mines Location

August 2020

Source: Jaguar Mining Inc., 2020.

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MINERAL TENURE AND SURFACE RIGHTS

The land tenure package for the Caeté Mining Complex comprises 29 mining leases and exploration concessions granted by the Agência Nacional de Mineração (ANM), and four surface rights holdings (Figures 4-3 and 4-4). The mining leases and exploration concessions cover an area totalling 19,479.97 ha (Table 4-1). The surface rights holdings comprise nine separate agreements that cover a total area of 757.87 ha (Table 4-2).

TABLE 4-1 SUMMARY OF MINERAL RIGHTS HOLDINGS
Jaguar Mining Inc. – Caeté Mining Complex

ANM Tenement	Target	Area (ha)	Licence No.	Licence Published (DD/MM/YYYY)	Licence Renewal Date (DD/MM/YYYY)	Status
Pilar:						
830.187/2004	Cubas	600	3867	05/05/2004	05/03/2007	Exploration Licence Renewal Application
830.463/1983	Pilar	961.66	206	17/08/2005	-	Mining Concession
831.878/2013	Pilarzinho	35.33	13494	30/08/2018	-	Exploration Licence Renewal Application
830.402/2016	Pilar	1,237.98	2578	17/03/2016	16/01/2019	Exploration Licence (Negative Report)
831.233/2017	Pilar	1,227.97	-	-	-	Exploration Application
Sub-total, Pilar		**4,062.94**				
Roça Grande and Caeté Processing Plant:						
430.001/1935	Zona A	1,000.01	229	24/07/1996	-	Mining Concession
430.002/1935	Zona B	654.41	236	25/07/1996	-	Mining Concession
807.482/1976	Boa Vista	675.18	322	21/10/2009	-	Mining Concession
830.037/2015	Camará 1	8.15	-	-	-	Mining Concession Application
830.038/2015	Camará 2	12.72	-	-	-	Mining Concession Application
830.807/2017	Fazenda Gerisa	1,000	-	-	-	Mining Concession Application
830.935/1979	Morro do Adão	728.38	933	19/07/1990	-	Mining Concession Application
830.938/1979	Catita	521.7	264	03/09/2009	-	Mining Concession
830.940/1979	Juca Vieira	285.32	246	22/07/1993	-	Mining Concession
831.056/2010	RG 3	706.03	-	-	-	Mining Concession Application
831.057/2010	RG 1,2,5,6 and 7	193.08	105	28/03/1996	-	Mining Concession Application
831.196/2018	Fazenda dos Cristais	106.93	-	-	-	Exploration Licence (Initial)
831.282/2002	Arr.Velho de Santana	884.7	6047	12/05/2006	-	Exploration Licence (Positive Final Report Filed)
831.371/2003	Morro Vermelho	583.42	1433	05/06/2008	-	Exploration Licence (Positive Final Report filed)
831.580/2018	Fazenda dos Cristais	313.76	-	-	-	Exploration Application

ANM Tenement	Target	Area (ha)	Licence No.	Licence Published (DD/MM/YYYY)	Licence Renewal Date (DD/MM/YYYY)	Status
831.817/2003	Córrego Brandão	1,583.69	8078	06/12/2016	-	Exploration Licence (Positive Final report filed)
830.471/2019	Córrego Brandão	10.95	3838	03/07/2019	-	Exploration Licence (Positive Final report filed)
832.022/2018	Florália	1,618.45	-	-	-	Exploration Application
832.023/2018	Florália	1,500.51	-	-	-	Exploration Application
832.230/2003	Fazenda Cristais	339.99	9512	06/12/2016	-	Exploration Licence (Negative Report)
832.152/2002	Fazenda Furnas do Cutão	600.24	8782	26/04/2006	-	Mining Concession Application
834.126/2007	Carrancas	808.95	127	19/03/2013	-	Exploration Licence (Positive Final report filed)
834.409/2007	Água de Sapo	550.61	147	19/03/2013	-	Exploration Licence (Positive Final report filed)
830.807/2017	Morro da Mina	999.85	-	-	-	Mining Concession Application
Sub-total, Roça Grande and Caeté Processing Plant		**15,687.03**				
Total Caeté Mining Complex		**19,479.97**				

TABLE 4-2 SUMMARY OF SURFACE RIGHTS HOLDINGS
Jaguar Mining Inc. – Caeté Mining Complex

Fazenda	Area (ha)	Registry No.	Orebody or Utility		20% Area Forest Legal Reserve
Faz.Velha/Navantino Peixoto	140.00	Pending	Moita II	Inactive	Legal reserve area of 28.52 ha
Trindade	184.78	2920	Camará II	Inactive	Legal reserve area of 71.43 ha
Roça Grande	41.65	13171	Moita I Dam	Inactive	Legal reserve area of 9.23 ha
Roça Grande	177.71	13172	RG01, RG07 and RG05	Active	Not Available
Gongo Soco	64.00	8854	RG02, RG03 and RG06	Active	Not Available
Serra Luis Soares	9.38	13170	Processing Plant	Active	Not Available
Serra Luis Soares	99.47	12734	RG02W, Processing Plant and Waste Dump	Active	Not Available
Santa Rita	23.55	11379	Catita	Inactive	The legal reserve area of 4,29 ha
Serra Luis Soares/Saint Gobain	10.63	17033	Mechanic Workshop	Active	Not Available
José Engrácio	6.70	4191 AV-10	RG03	Active	Not Available
Total	**757.87**				

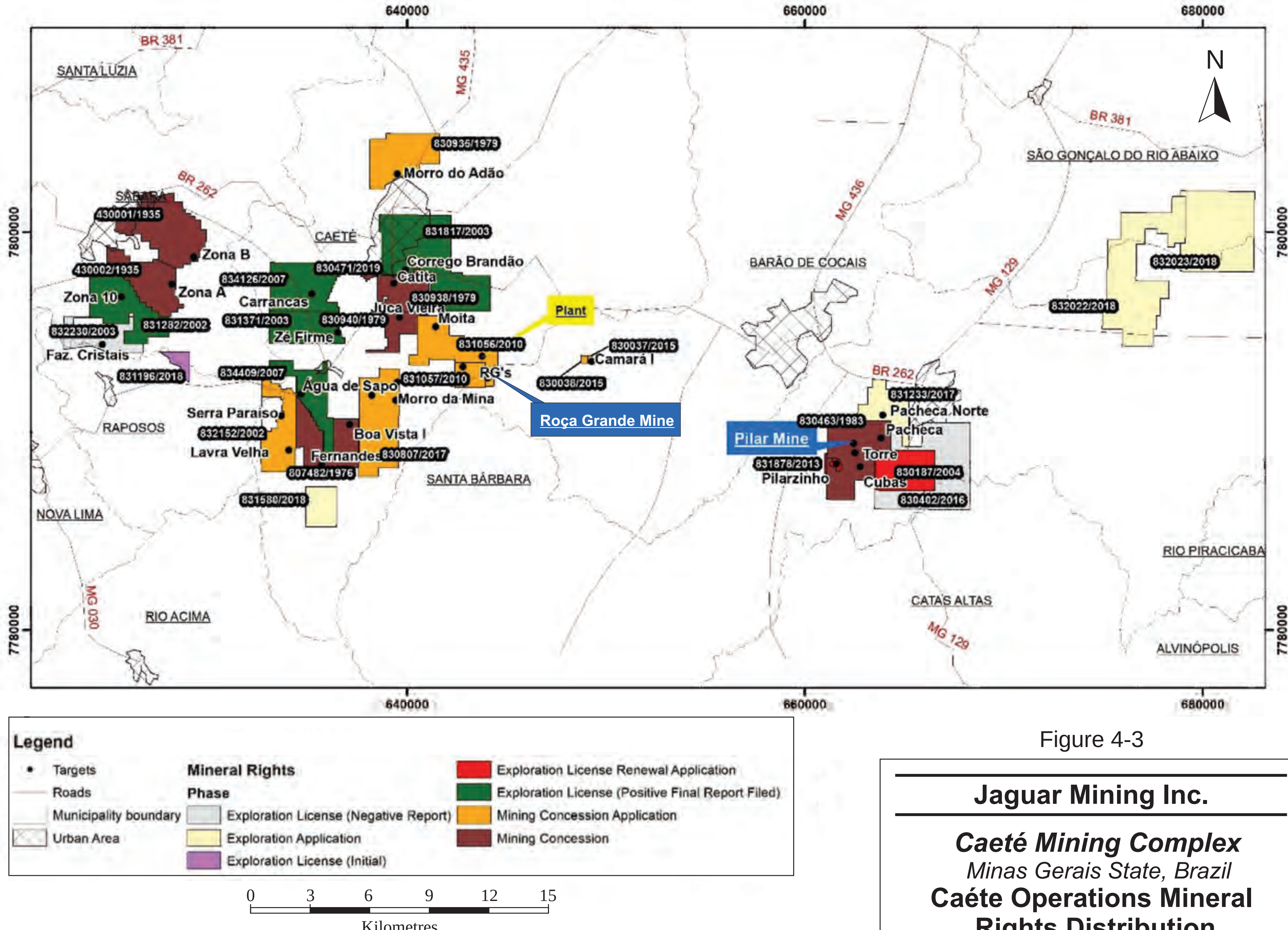

Figure 4-3

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Caéte Operations Mineral Rights Distribution

August 2020

Source: Jaguar Mining Inc, 2020.

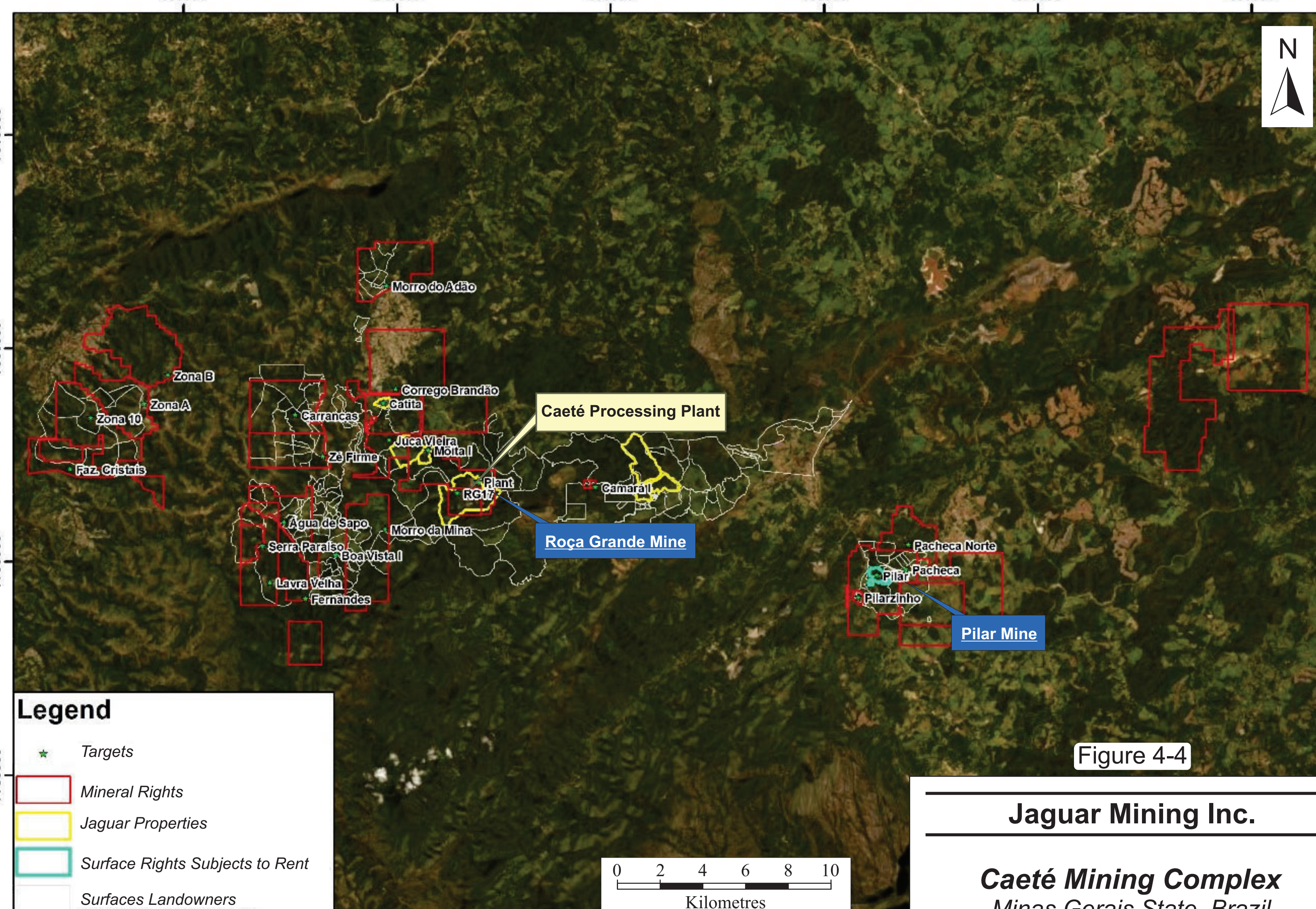

Figure 4-4

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Surface Rights Distribution

August 2020

Source: Jaguar Mining Inc., 2020.

RPA Now part of SLR

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Mining leases are renewable annually and have no set expiry date. Each year Jaguar is required to provide information to ANM summarizing mine production statistics. Exploration concessions are granted for a period of three years. Once a company has applied for an exploration concession, the applicant holds a priority right to the concession area as long as there is no previous ownership. The owner of the concession can apply to have the exploration concession renewed for one-time extension for a period of two or three years. Renewal is at the sole discretion of ANM. Granted exploration concessions are published in the Official Gazette of the Republic (OGR), which lists individual concessions and their change in status. The exploration concession grants the owner the sub-surface mineral rights. Surface rights can be applied for if the land is not owned by a third party.

The owner of an exploration concession is guaranteed, by law, access to perform exploration field work, provided adequate compensation is paid to third party landowners and the owner accepts all environmental liabilities resulting from the exploration work. The exploration permits are subject to annual fees based on their size.

The location of the mineralized wireframes in relation to the property boundaries for the Roça Grande Mine and the Pilar Mine is shown in Figures 4-5 and 4-6, respectively.

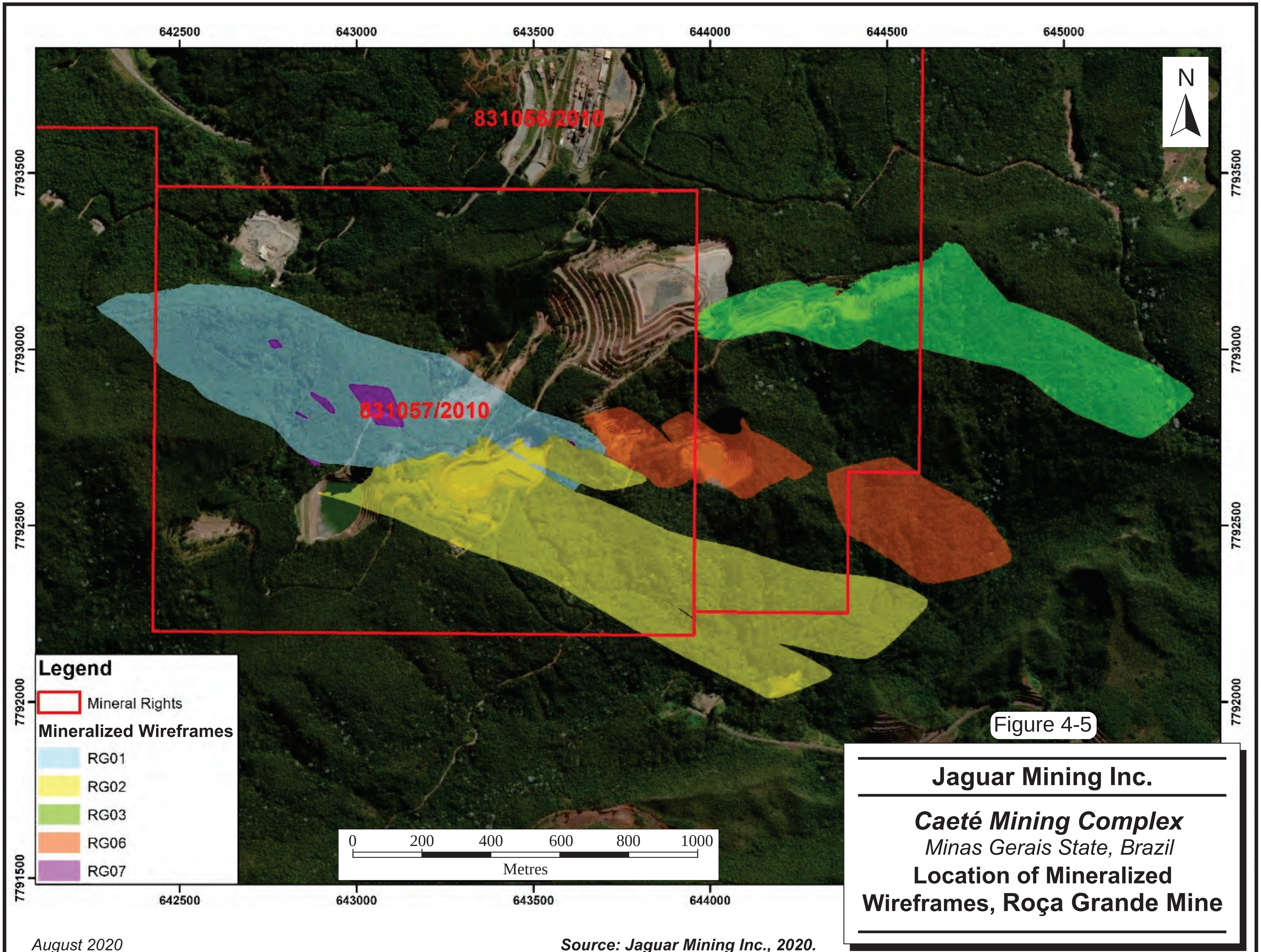


Figure 4-5

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Location of Mineralized Wireframes, Roça Grande Mine

August 2020

Source: Jaguar Mining Inc., 2020.

www.rpacan.com

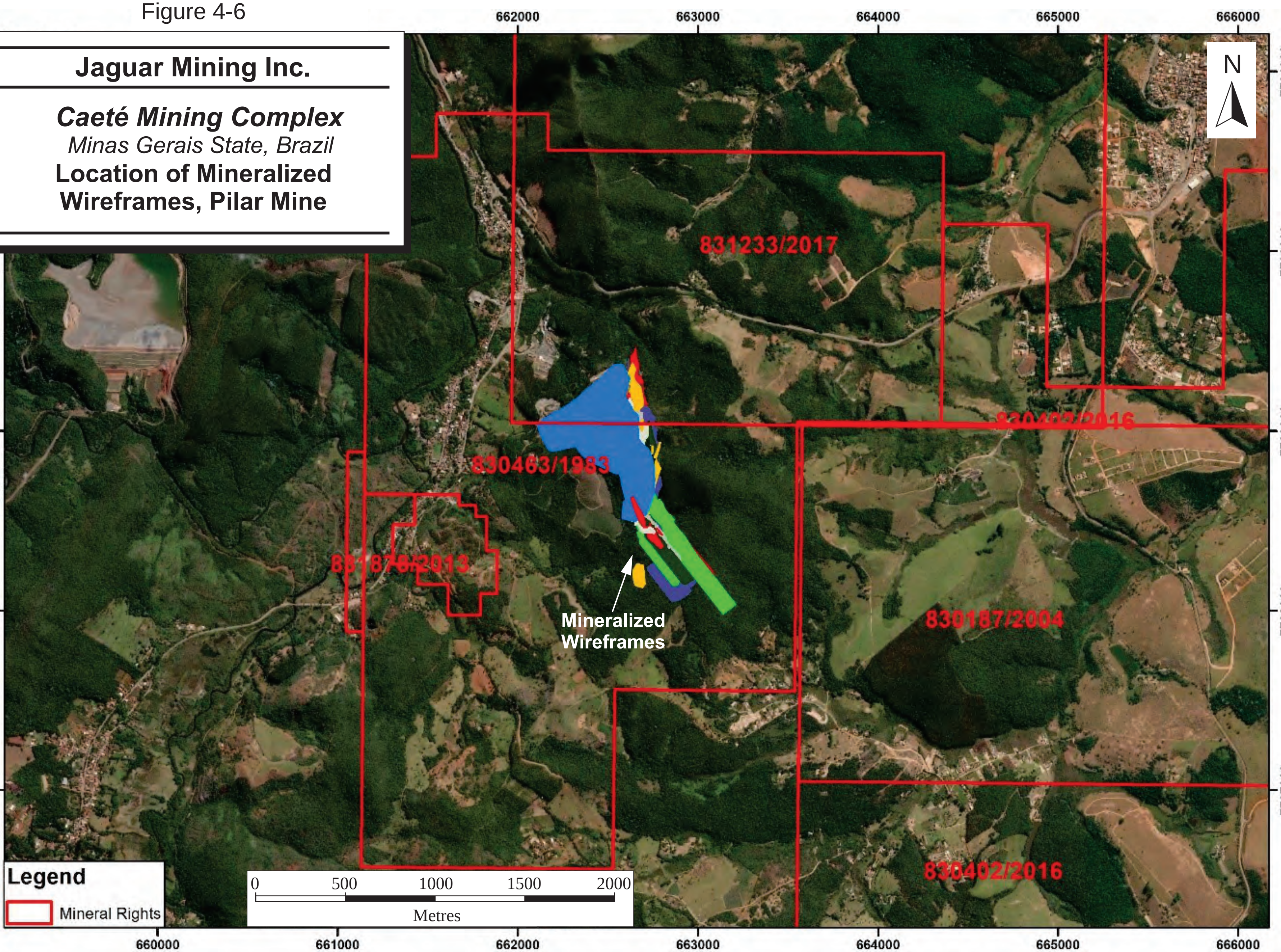
Figure 4-6

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Location of Mineralized Wireframes, Pilar Mine



August 2020

Source: Jaguar Mining Inc., 2020.

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ROYALTIES AND OTHER ENCUMBRANCES

Jaguar must pay a royalty equivalent to 1% of net sales to ANM. In addition, one royalty payment and three lump sum annual rental payments are associated with the Caeté Mining Complex (Table 4-3).

TABLE 4-3 SUMMARY OF ROYALTIES AND RENTS, 2019
Jaguar Mining Inc. – Caeté Mining Complex

Owner	Royalty	Orebody or Utility	Payments (BRL)
Carlos Marcelani	0.5% of Production Gross Profits (Concession 830.463/1983)	Pilar office, Mechanic Shop, BA, BF, BFII and SW orebodies	1,342,692.55

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

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

ACCESSIBILITY

The Caeté Mining Complex can be accessed via the federal highway BR-381 and state paved roads. The distance from Belo Horizonte, the capital city of the state, to the town of Caeté is 110 km along paved roads (and eight more kilometres by dirt road from the Caeté town to the Roça Grande metallurgical plant site). Access to the Pilar Mine is provided by a paved highway from both Belo Horizonte (93 km) and the Santa Bárbara town (seven kilometres). A partially paved, 45 km secondary road is used to transport Pilar run-of-mine (ROM) ore to the processing plant at the Roça Grande site.

Belo Horizonte has a large commercial airport with domestic and international flights.

CLIMATE AND PHYSIOGRAPHY

The Caeté Mining Complex lies at an elevation of approximately 1,000 MASL. The terrain in the area is rugged in many places, with numerous rolling hills incised by deep gullies along drainage channels. The relief in the area is approximately 400 m. Farming and ranching activities are carried out in approximately 50% of the region.

Annual rainfall in area of the Pilar Mine averages between 1,300 mm and 2,300 mm, 84% of which falls during the rainy season between October and March. Most of the precipitation falls in the months of December and January. The surface winds have a generally low average speed (less than one metre per second), and are predominantly from the south and southeast.

The annual average temperature is slightly above 20ºC. Air humidity does not exceed 90%, even during the summer months. The annual average evaporation is approximately 934 mm. The climate is suitable for year-round operations.

LOCAL RESOURCES

Belo Horizonte is one of the world's mining capitals, with a regional population in the range of four million people in its metropolitan region. Automobile manufacturing and mining services dominate the economy. General Electric has a major locomotive plant which produces engines for all of South America and Africa. Mining activities in Belo Horizonte and the surrounding area have been carried out in a relatively consistent manner for over 300 years.

This mining region has historically produced significant quantities of gold and iron from open pit and large-scale underground mining operations operated by AngloGold Ashanti Limited (AngloGold Ashanti), Companhia Vale do Rio Doce (Vale), Companhia Siderúrgica Nacional (CSN), and Eldorado Gold Corp. (Eldorado). Belo Horizonte is a well-developed urban metropolis and has substantial infrastructure including two airports, an extensive network of paved highways, a fully developed and reliable power grid, and ready access to process and potable water.

Both Caeté and Santa Bárbara have good urban infrastructure, including banks, hospitals, schools, and commercial businesses. The local economy is based on agriculture and iron mining, and skilled labour is readily available. Manpower, energy, and water are readily available too.

INFRASTRUCTURE

The Caeté Mining Complex includes a nominal 2,050 tpd processing plant with separate tailings disposal areas for both fine flotation tailings and carbon-in-pulp (CIP) tailings. The process plant is located at the Roça Grande site, at an elevation of approximately 1,250 MASL.

The Caeté Mining Complex is supplied by electric power from the Brazilian national grid, but back-up generator power is also available at the mine and plant sites.

An administration complex is located at the entrance to the plant site, with such ancillary buildings as offices, conference rooms, cafeteria, maintenance shops, compressors (mine and mill), a dry, a first aid station, warehouse, backfill preparation, and a water treatment plant, which is located near the process plant. The assay laboratory and process testing laboratory are also located near the process plant. The adjacent Roça Grande Mine (under care and maintenance since Q1 2018) is accessed by an adit that is located approximately 800 m to the southwest of the plant, at an elevation of approximately 1,100 MASL.

The surface infrastructure at the Pilar Mine is limited to shops, offices, cafeteria, first aid, and warehouse facilities. The mine is accessed by an adit that is located at an elevation of approximately 750 MASL. The explosives and blasting accessories warehouses are located away from the mine area, in compliance with the regulations set forth by the Brazilian Army.

At the time of RPA's most recent site visit, the Caeté Mining Complex was well-run and organized, provided a safe environment for the mine workforce, and had well-maintained maintenance and equipment facilities. The facilities are of a size and quality capable of supporting the forecasted production rates.

6 HISTORY

PRIOR OWNERSHIP

In December 2003, Jaguar acquired the Santa Bárbara property, which included the Pilar mineral concessions, from Vale. In November 2005, Jaguar entered into a mutual exploration and option agreement with Vale with respect to six concessions, known as the Roça Grande concessions, located on 9,500 acres of highly prospective gold properties along 25 km of a key geological trend in the Iron Quadrangle. The contract between Jaguar and Vale provided Jaguar with the exclusive right over a 28 month period beginning November 28, 2005 to explore and conduct feasibility studies and to acquire gold mining rights in the Vale properties if the studies supported economical mining operations. The contract granted corresponding rights for Vale to explore the Jaguar property for iron and acquire mineral rights in the property during a three-year period. In November 2007, Jaguar notified Vale of its intent to exercise the option to acquire all six Roça Grande concessions. The final transfers of the Roça Grande concessions to Jaguar were concluded in December 2010 and August 2011 (Jaguar, 2020). In November 2014, four of the six Roça Grande concessions acquired from Vale were returned to Vale by amending the original contract.

EXPLORATION AND DEVELOPMENT HISTORY

Initial exploration activities carried out by Vale in the Roça Grande Mine area consisted of regional geological reconnaissance, exploratory geochemistry, and geophysical surveys, along with excavation of a number of exploration trenches and diamond drilling to evaluate the gold mineralization found in the area. In total, 4,746 stream sediment samples were collected and 4,350 m of trenches were excavated during the 1973 to 1993 period.

Vale carried out geological mapping, geological interpretation, and exploration and in-fill drilling at the Pilar deposit. Eldorado executed a small drilling campaign to evaluate the deposit from 2002 to 2003 (Machado, 2010).

Soil sampling programs have been carried out throughout the various claim blocks within the Caeté Mining Complex. A summary of the soil samples collected by the various mining companies is presented in Table 6-1.

TABLE 6-1 CAETÉ MINING COMPLEX SOIL SAMPLES BY MINING COMPANY
Jaguar Mining Inc. – Caeté Mining Complex

Company	Total
MMV (Anglo)	1,270
DOCEGEO (Vale)	7,899
WMC (Western Mining Co.)	2,674
Jaguar Mining	10,472
Grand Total	**22,315**

Jaguar initiated exploration activities at Pilar in 2006, and initially contemplated building a sulphide plant on site, however, the acquisition of the Roça Grande concessions created an opportunity to develop an expanded project, with greater plant capacity to receive ore from several mineral properties.

In 2007, Jaguar completed a scoping study of the Caeté Project, received the Implementation Licence, secured the power contract for the start-up, and commissioned TechnoMine to prepare a NI 43-101 Technical Report on the Caeté Project mineral resources, which was completed during the year.

In 2008, expansion plans at the Caeté Project continued as TechnoMine completed a feasibility study. By the end of the third quarter in 2008, all necessary permits and licences for the construction and commissioning phase of the Caeté Project had been received and Jaguar initiated civil works for the milling and treatment circuits.

In November 2008, due to the decline in gold prices, the financial markets and worldwide equity values, including the gold sector, Jaguar temporarily suspended development of the Caeté Project pending an assessment of market conditions and the availability of capital to move the project forward. Consistent with the decision to suspend the development of the Caeté Project, underground work at the Roça Grande Mine was temporarily suspended; however, development at the Pilar Mine continued.

In December 2008, Jaguar began transporting ore by truck from the Pilar Mine to Jaguar's Paciência Mining Complex to supplement the ore being supplied from Paciência Santa Isabel Mine.

In March 2009, Jaguar completed an $86.3 million equity offering, the proceeds of which were primarily used to restart development and construction at Caeté. During 2009 and part of 2010, Jaguar focussed on the implementation and construction of the Caeté Project.

The Caeté processing plant was commissioned in June 2010. The first gold pour was conducted in August 2010 and commercial production was declared in October 2010. Capital expenditures for the Caeté Project totalled US$127 million (Jaguar, 2020). Since 2010, the Caeté processing plant has processed material from various local deposits including Roça Grande, Pilar, and Rio de Peixe.

At the Roça Grande Mine, mining activities focussed on the RG01 deposit. The principal access to the mine is provided by an adit and ramp system that has been developed to the 925 m elevation, approximately 175 m below the elevation of the adit collar. A crosscut to the south was begun from the 1,070 m elevation to provide access to the RG02 deposit but was abandoned when it encountered poor ground conditions.

The principal access to the Pilar Mine is provided by an adit and ramp system that has been developed up to 814 m below the elevation of the adit collar. Mining activities are focussed on a number of separate zones; however, the bulk of the production is now being derived from the BF and BF II zones.

PAST PRODUCTION

A small amount of gold was produced by DOCEGEO from the Roça Grande deposits (RG02, 03, 04, 05, and 06) during the 1996 to 2000 period. In total, approximately 1.02 Mt of material at an average grade of 2.2 g/t Au was mined by open pit mining methods and processed by heap leaching. A total of approximately 66,800 oz of gold was recovered (Machado, 2010).

Initial production from the Pilar Mine was processed at the Paciência Mining Complex during the 2008 to 2010 period. After 2010, the ore from the Pilar Mine was processed at the Caeté processing facility. Since 2008, the Pilar Mine has recovered approximately 417,468 oz of gold.

The Roça Grande Mine was put on a care and maintenance basis in Q1 2018.

Production for the Caeté Mining Complex is summarized in Table 6-2.

TABLE 6-2 CAETÉ MINING COMPLEX PRODUCTION
Jaguar Mining Inc. – Caeté Mining Complex

Year	Pilar Production		Roça Grande Production		Caeté Plant Production			
	Tonnes (t)	**Grade (g/t Au)**	**Tonnes (t)**	**Grade (g/t Au)**	**Tonnes (t)**	**Grade (g/t Au)**	**Recovery (%)**	**Ounces Produced (oz Au)**
2008	7,000	5.43	-	-	-	-	-	-
2009	163,000	4.39	-	-	-	-	-	-
2010	291,000	3.73	58,000	2.48	290,000	2.71	88	19,319
2011	453,000	3.55	204,000	2.35	674,000	2.90	87	54,998
2012	426,000	3.36	208,000	3.30	657,000	2.96	89	54,995
2013	450,000	3.23	156,000	2.81	624,000	2.94	88	52,170
2014	391,000	2.85	172,000	2.39	596,000	2.57	88	44,251
2015	308,000	3.32	159,000	2.29	469,000	2.92	90	39,762
2016	296,000	3.35	89,000	2.16	380,000	3.02	91	33,349
2017	335,000	3.80	69,000	2.51	406,000	3.27	90	38,685
2018	353,000	4.24	12,000	2.69	377,000	3.81	89	41,788
2019	427,000	3.85	-	-	433,000	3.37	87	40,682
Total	**3,900,000**	**3.56**	**1,127,000**	**2.59**	**4,905,000**	**3.02**	**89**	**419,999**

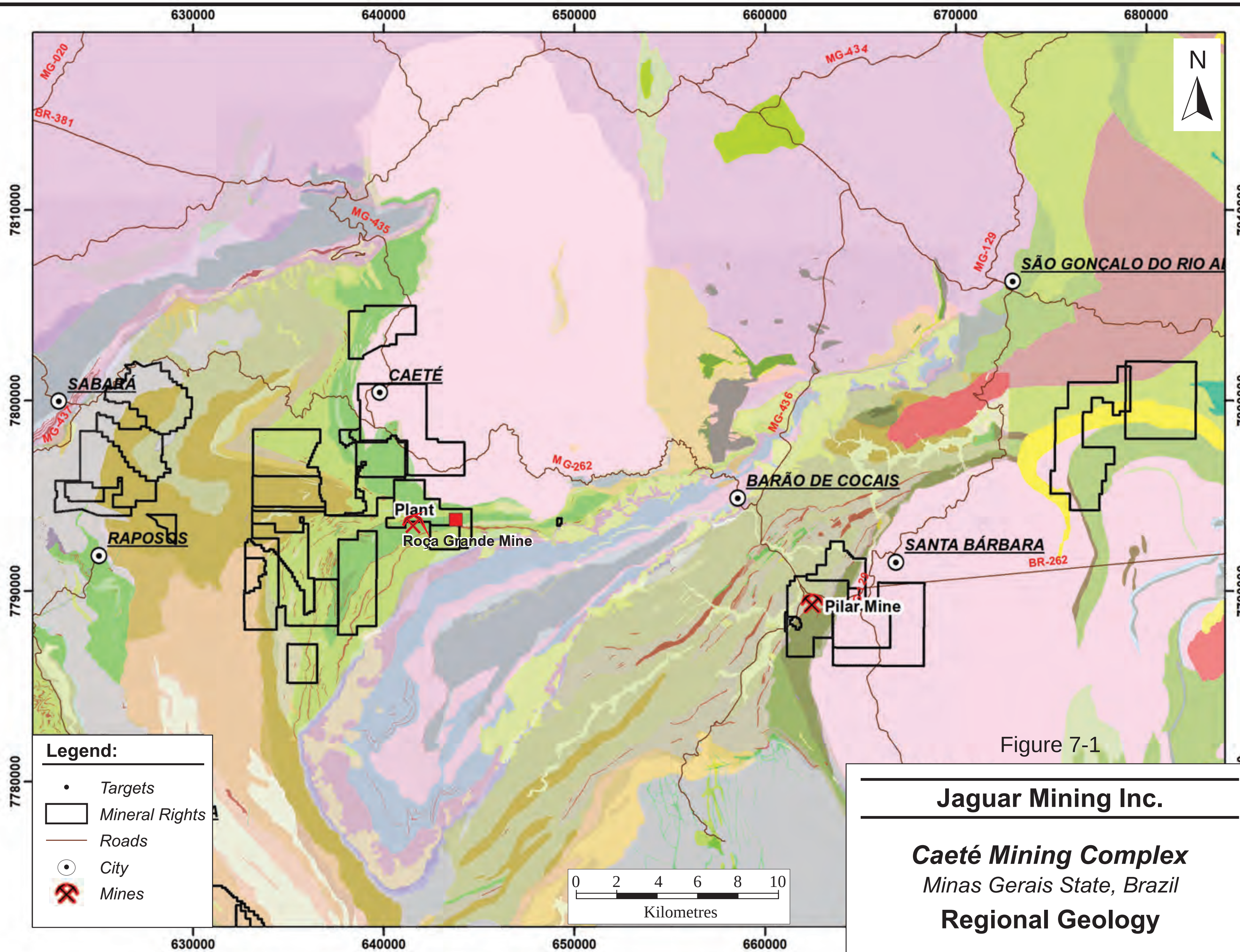
Note:
1. From 2008 to 2011, some of Pilar ore was processed at Paciência.
2. From 2010 to 2012, open pit oxide ore from Roça Grande was mined and processed.

7 GEOLOGICAL SETTING AND MINERALIZATION

REGIONAL GEOLOGY

The Roça Grande and Pilar deposits are located in the eastern part of the Iron Quadrangle, which had been the largest and most important mineral province in Brazil for centuries until the early 1980s, when the Carajás mineral province, in the state of Pará, attained equal status. Many commodities are mined in the Iron Quadrangle, the most important being gold, iron, manganese, bauxite, imperial topaz, and limestone. The Iron Quadrangle was the principal region for the Brazilian hard rock gold mining until 1983 and accounted for approximately 40% of Brazil's total gold production. Gold was produced from numerous deposits, primarily in the northern and southeastern parts of the Iron Quadrangle, most hosted by Archean or Early Proterozoic banded iron formations (BIF) contained within greenstone belt supracrustal sequences.

In the Brumal-Pilar (Santa Bárbara) region, outcrops belonging to the granitic-gneissic basement, and to the Nova Lima and Quebra-Ossos groups of the Archean Rio das Velhas Supergroup, occur. The granitic-gneissic basement is comprised of leucocratic and homogeneous gneisses and migmatites, making up a complex of an initial tonalitic composition intruded by Archean rocks of granitic composition. The contacts between the supracrustal sequences and the granitic-gneissic basement are discordant and tectonically induced by reverse faulting. The Rio das Velhas Supergroup is regionally represented mainly by meta-volcanic and meta-epiclastic packages of the Nova Lima Group and by the meta-ultramafic rocks of the Quebra-Ossos Group including serpentinites, talc schists, and meta-basalts (Figure 7-1). "Algoma-type" BIFs occur as the more prominent volcanogenic-sedimentary rock packages in the Nova Lima Group with thicknesses of up to 15 m to 20 m.



August 2020

Source: Jaguar Mining Inc., 2020.

Figure 7-1

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Regional Geology

www.rpacan.com

PHANEROZOIC

Cenozoic

NEOGENO

Pleistocene-Holocene

- N34al — Alluvium: sand and gravel
- N34co — Colluvial deposits: Blocks, boulders and Pebbles of Quartzite and cango in alluvial soil
- N23ca — Canga: rock fragments cemented by limonite
- N23co — Colluvial deposits: Quartzite blocks, blocks and pebbles, itabirite and canga in alluvial soil

PALEOGENE

Eocene-Oligocene

- E23sl — Lake sediment: argillite, sandstone and lignite

PALEOGENE

- Eca — Canga: rock fragments cemented by limonite

PROTEROZOIC

PALEOPROTEROZOIC

RIACIANO

ITACOLOMI GROUP

- PP2i — Undivded - Quartzite with conglomerate and Phyllite lenses
- PP2isa — Santo Antônio Formation - Phyllite, quartzite, conglomerate and dolomite. Lenses of rock rich in iron or iron formation

PROTEROZOIC

PALEOPROTEROZOIC

MINES SUPER GROUP

RIACIANO

GROUP WILL KNOW

- PP2ms — Undivided - Chlorite-sericite shale, serictic quartzite, feldspar quartzite and metagravit

SIDERIAN

PIRACICABA GROUP

- PP1mp — Undivided - Phyllite, quartzite, ferruginous quartzite and quartz-sericite shale
- PP1mpb — Barreiro Formation - Graffite shale, schist mica and phyllite
- PP1mpf — Formation Fêcho do Funil - Phyllite, dolomitic phyllite, dolomite; quartzite and subordinate iron formation
- PP1mpc — Cercadinho Training - Ferruginous quartzite , quartzite, grit, quartz sericite shale, phyllite, sericita shale, talco xisto e grafita xisto

ITABIRA GROUP

- PP1mi — Undivided - Itabirito, phytotic and dolomitic itabirite; high-content, friable hematite (h)
- PP1mig — Gandarela Training - Dolomite, dolomite itabirite, limestone and phyllite Itabirito (it)
- PP1mic — Cauê Formation - Itabirito and dolomitic itabirite, with dolomite lenses. Compact and friable hematite (h)

CARAÇA GROUP

- PP1mc — Undivided- Quartzite, quartzite phyllite, Phyllite and conglomerate
- PP1mcb — Batatal Training- phyllite seriolitic, phyllite carbonaceous, finite quartzite lens and iron formation
- PP1mcm — Training Currency - Gray quartzite, grit and conglomerate, quartz-sericite shale with interspersed philite lenses; quartzite phyllite, quartz-mica shale and conglomerate

ARCHEAN

NEOARCHEAN - MESOARCHEAN

SRIO DAS VELHA SUPERGROUP

NEOARCHEAN

MACHINE GROUP

STRONG HOUSE FORMATION

- A4rmcc — Capanema Unit - Sericite shale and sericite-quartz shale. (Association of Non-Marine Litofacies: alluvial-floating metasediments)
- A4rmce — Unit Córrego do Engenho- Seritic quartzite of medium granulation and subordinate conglomerate quartzite. Association of non-marine lithofacies: alluvial-flown metasediments)
- A4rmcj — Jaguara Unit- Medium-to-thick granular sericitic quartzite and grit; polymorphic metaconglomerate and quartz-mica suborporate shale. Preserved cross-sectional and cross-sectional stratification. (Association of Non-Marine Litofacies: alluvial-fluvial metastasis)
- A4rmcdc — Unit Girl Owner, Fácies Córrego da Cidreira - Metaparaconglomerado polymic and quartzite (Association of Non-Marine Litofacies: alluvial-fluvial metasediments)
- A4rmcdv — Unit Girl Owner, Fácies Córrego do Viana - Polycyclic metaconglomerate and serictic quartzite with gradient and cross-grooved and tangential cross stratification; Quartz mica subordinate shale. Polymorphic conglomerate (cg). (Association of non-marine lithofacies: alluvial-flown metasediments)

PALMITAL FORMATION

- A4mprp — Rio de Pedras Unit - Sericotic quartzite and quartz-sericite schist with small to medium cross stratification; shale carbonated subordinate. Quartzito seriolitic (qts). (Association of Litofacies Ressedimentada: proximal metaturbidites)

GROUP NOVA LIMA

- A4mcp — Stream Unit of Paina - Quartz-mica-chlorite shale, clorita shale, biotita-small feldspar shale; local ferrous formation. (Association of Litofacies Retentionation: target distal turbidites)
- A4mfv — Old Farm Unit- Chlorite-quartz feldspar shale, biotite-sericite-chlorite feldspar shale, biotita-moscovita shale, rocha calcis-silicática e metargilito carbonoso (metapsamites and metapelites with small gradational and cross stratification). (Association of Litofacies Staphylococci: metapsamitos and metapelites with small gradational and cross strati fication)
- A4mcm — Catarina Mendes Unit - Carbonate-quartz-feldspar-biotite-chlorite shale, sericite-biotite-chlorite-quartz shale, quartz-chlorite shale, calcissilictic rock, metaconglomerado e fm. ferrifera. Ferrous formation (ff). Grenada-staurolite schist in contact metaphoric aureole (ge). (Association of Litofacies Ressedimentada: metagrauvaca with cyclic and gradational stratification and plane-parallel and cross stratification)
- A4mcs — Site Stream Unit - Quartz-carbonate-mica-chlorite shale, quartz-mica shale, charcoal phyllite; fsubordinate ferrous formation. Ferrous formation (ff). Sericita-quarzto shale (sq). (Association of Litofacies Ressedimentada: metapelites and metapsamitos with gradational and cross-sectional esti trati fi cation)
- A4mm — Minda Unit - Plagioclase-chlorite-mica-quartz shale, sericite-quartz shale, quartz-chlorite-mica shale; shale and subordinate iron formation. (Association of Litofacies Ressedimentada: metapsamitos and metapelites with pre-served gradation stratification)

MESOARCHEAN

- A3msq — Santa Quitéria Unit - Mica-quartz shale, chlorite-quartz shale, sericite-chlorite shale, carbonic shale, iron formation and meta-chert. Ferrous formation (ff). (Classification of Sedimentary Litofacies)
- A3mmv — Morro Vermelho Unit - Teolitic and Komatic metabasalt, Iron formation and Metachert; piclastic and fissile-subordinate metavolcanic shale. Ferrous formation (ff). (Association of Vulcanosedimentary-chemical Litofacies)
- A3mof — Fine Gold Unit - Teolitic and Komatic metabasalt, metaperidotite and basic metatuph; acid metavulcanic, metachert, iron formation and subordinate carbonaceous shale. Ferrous formation (ff). (Association of Volcanic Milky-Ultramafic Litofacies)

MESOARCHEAN

BASE COMPLEX

- A3b — Mix, sediment or granite

IGNEOUS ROCKS OF UNKNOWN AGE

- d — Diabase Dykes

GEOLOGIC STRUCTURES

- Strike and Dip
- Foliated Bedding
- Inverted Layers
- Inverted bedding with sub-parallel foliation
- Layering/Compositional Banding
- Direction of Vertical Layers
- Direction of vertical schistosity
- Direction and diving of foliation
- Measured Dip Foliation, Phase 2
- Vertical Foliation, Phase 2
- Dip of Shale
- Dip of cleavage
- Dip of Crenulated cleavage or fracture, Phase 3
- Dip of Crenulated cleavage or fracture, Phase 4
- Direction of vertical Cleavage
- Plunge of Joints
- Junta measured Dip
- Vertical Jointing
- Direction of Lineaments
- Direction of Intersections and Lineaments
- Lineaments B
- Lineaments B, Phase 2
- Lineaments B, Phase 3
- Linear shearing of Minerals
- Linear shearing of Minerals, Phase 1
- Linear shearing of Minerals, Phase 2
- Pencil Structures
- Crenulation Axis
- Small Folds, with inducated folds

- Geologic Contact
- Inferred Contact
- Normal Fault
- Inferred Normal Fault
- Thrust Fault
- Inferred Thrust Fault
- Transverse Fault
- Normal Fault
- Inferred Normal Fault
- Axial Trace Anticline Normal
- Inferred Axial Trace Anticline Normal
- Axial Trace Sycline Normal
- Inferred Axial Trace Sycline Normal
- Inferred Axial Trace Anticline Inverted
- Inferred Axial Trace Sycline Inverted

Figure 7-1A

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Regional Geology Legend

April 2019

Source: Jaguar Mining Inc., 2015.

The Nova Lima Group can be sub-divided into three units:

- A basal unit composed of mafic (basic) to intermediate meta-volcanic rocks interlayered with meta-pelites, Algoma-type BIFs, and rare acidic meta-volcaniclastic rocks
- An intermediate unit represented by meta-mafic to meta-felsic volcanic rocks and meta-volcaniclastic rocks interlayered with graphitic phyllites and horizons of Algoma-type BIFs
- An upper unit composed of meta-pelites interlayered with felsic meta-volcanic rocks and meta-volcaniclastic rocks, quartzites, and meta-conglomerates

LOCAL AND PROPERTY GEOLOGY

ROÇA GRANDE DEPOSIT

The Roça Grande Mine is located in the upper unit of the Nova Lima Group. The dominant rock types found in the mine are a mixed assemblage of meta-volcanoclastics and meta-tuffs. These are represented by quartz sericite and chlorite schists with variable amounts of carbonate facies BIF, oxide-facies BIF, meta-cherts, and graphitic schists. The iron formations, chert units, and graphitic schist units are intimately inter-bedded with each other, such that they form an assemblage of chemical and clastic sedimentary units.

Two important BIF horizons are present at the Roça Grande Mine and they are separated by a central unit of sericitic phyllites and schists (Figure 7-2). The two BIF horizons are roughly parallel and are called Structures 1 and 2. In general, the southern BIF unit (Structure 2) is thicker than the northern BIF unit (Structure 1). The North Structure (Structure 1) hosts the RG01 mineralized body and the South Structure (Structure 2) hosts the RG02, RG03, and RG06 mineralized bodies (Figure 7-3). The RG07 mineralized body is located immediately in the hanging wall of Structure 1 and is hosted mostly by a quartz vein. The bedding is well defined by the carbonate-facies iron formation and chert found in the BIF horizons, with an overall strike of azimuth 70º to 80º, and dipping approximately 30º to 35º south (Figure 7-4).

At the mine scale, folding of the iron formation stratigraphy is generally absent. Local folding and faulting in Structure 2 has been observed at the RG06 mineralized body where a 200 m to 300 m strike length of the stratigraphy has been folded.

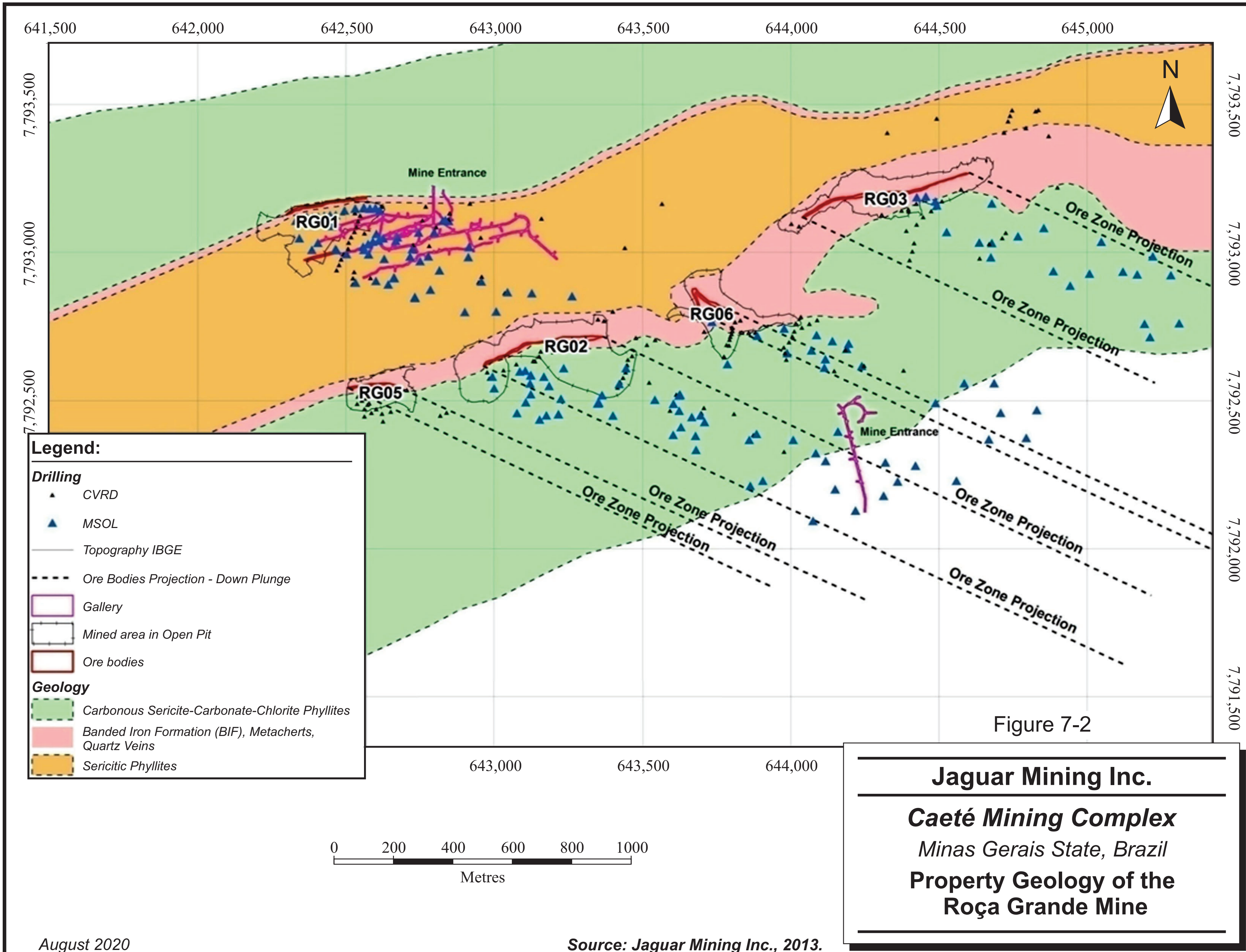


Figure 7-2

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Property Geology of the Roça Grande Mine

August 2020

Source: Jaguar Mining Inc., 2013.

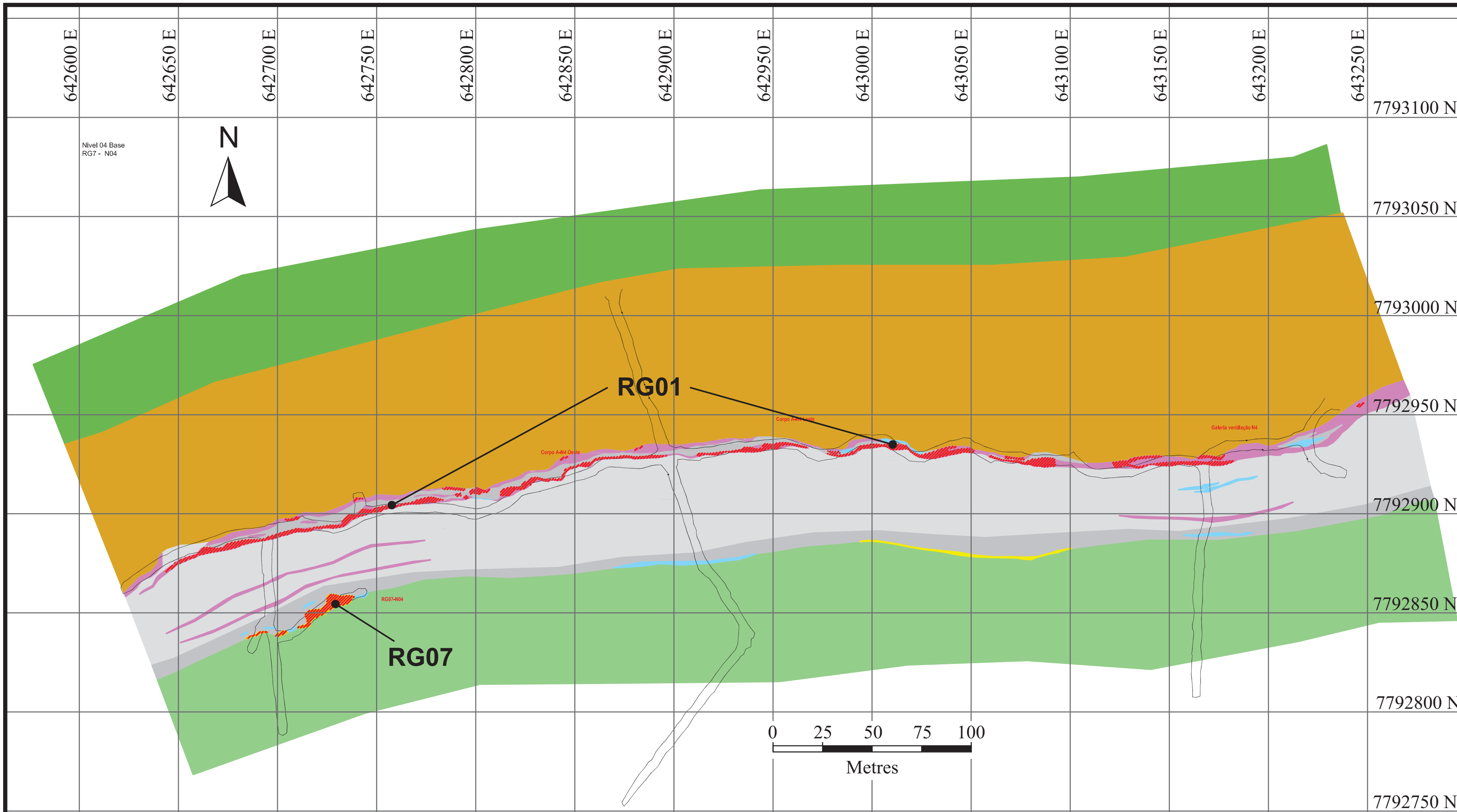


Figure 7-3

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Level Plan, 4th Level, Roça Grande Mine

Legend:

FF - Banded Iron Formation

XG - Graphitic Schist

X1 - Carbonate quartz schist with sericite and carbon

X2 - Carbonate quartz schist with sericite

X2Cl - Carbonate quartz schist with sericite and clorite

XS - Carbonate clorite sericite quartz schist with volcanic quartz

VQz - Quartz vein

VQz - Smoky Quartz vein with free gold

Ore Zone

August 2020

Source: Jaguar Mining Inc., 2015.

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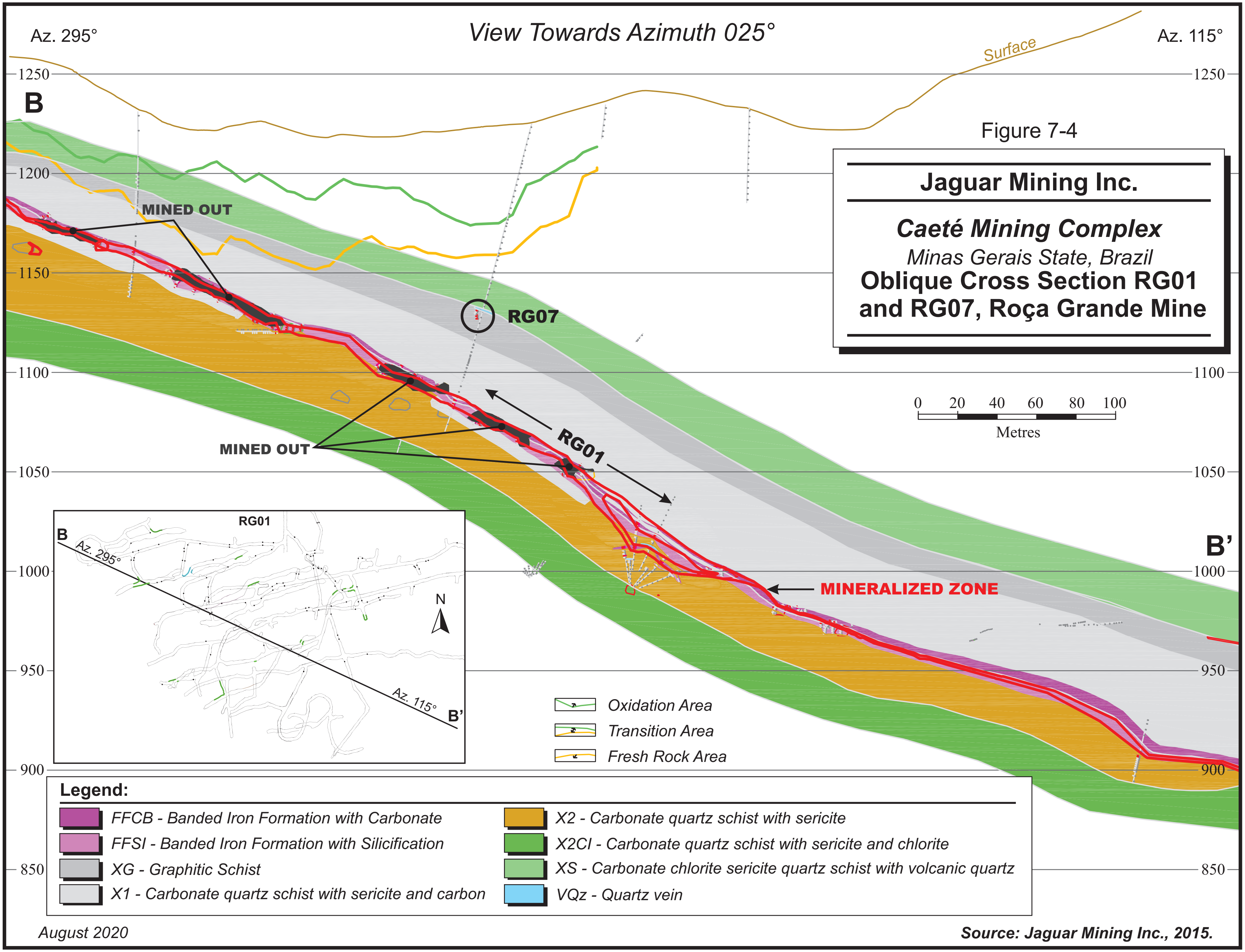

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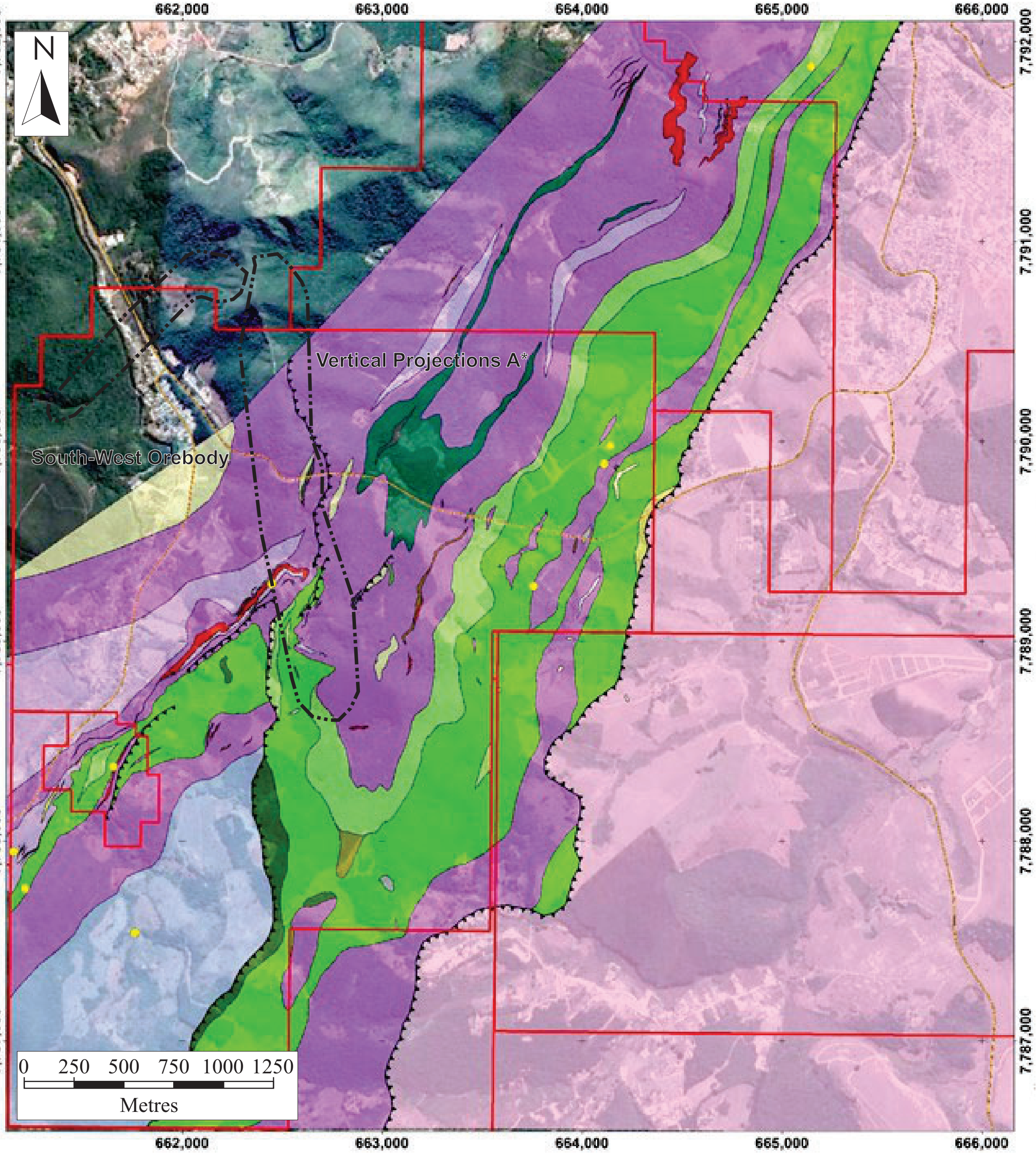
PILAR DEPOSIT

The Pilar deposit is hosted by the basal units of the Nova Lima Group, and by sequences of the Quebra-Ossos Group (Figure 7-5). The rock packages in the immediate area of the mine are comprised of tholeiitic meta-basalts, mica-quartz schists, chlorite-quartz schists, quartz-chlorite-sericite schists, and volcano-chemical and clastic meta-sedimentary rocks of the Santa Quitéria Unit (Nova Lima Group), and further to the east, of meta-komatiite flows (along with their intrusive equivalents) of the Quebra-Ossos Group. The volcano-chemical meta-sedimentary rock packages include cherts, BIFs, and carbonaceous phyllites. At the east edge of the Pilar property, the supracrustal units of the Rio das Velhas Supergroup are in fault contact with migmatites and granitic gneisses of the Santa Bárbara Complex, the unit that locally represents the basement sequence.

Within the current (2019-2020) footprint of the Pilar Mine, there are only two known zones of mineralization that outcrop at surface and which were previously mined in an open pit operation; South-West (SW) and São Jorge Synform (Figure 7-5). The currently mined BF and BF II zones are truly “blind” mineralized zones that occur at deeper levels of the Pilar deposit and were discovered and put into production by Jaguar only after the initial years of the underground operation.



Legend

Cartographic convetions

- Gold occurrences (CPRM data base)
- Drainage
- Main roads
- Jaguar's tenements

Geologic structures

- Main foliation
- Reverse shear zone
- Inferred geological contact

Lithologies

- ALU Alluvium (inconsolidated sediments)
- FF Banded iron formation
- (T)CLSX-Cb Carbonaceous (talc)-chlorite-sericite schist
- XG Carbonaceous schist
- CbSTX Carbonate-sericite-talc schist
- CLSQX Chlorite-sericite-quartz schist
- (Q)CLSX (Quartz)-Chlorite-sericite schist
- CLQSX Chlorite-quartz-sericite schist
- (CL)STQX (Chlorite)-Sericite-talc-quartz schist
- CLTX Chlorite-talc schist
- DQ Dike
- (Q)CLTX Fe Ferruginous (quartz)-chlorite-talc schist
- GN Gnaisse
- MCH Metachert
- MUM Metaultramafic
- QCbSX Quartz-carbonate-sericite schist
- QTZ Quartzite
- VQZ Quartz vein
- SQX Sericite-quartz schist
- SX (Ko) (Kaolinitic) Sericite schist

Figure 7-5

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Property Geology, Pilar Mine

August 2020

Source: Jaguar Mining Inc., 2020.

www.rpacan.com

The Pilar Mine occurs at the northernmost end of the northeasterly oriented Brumal-Pilar BIF trend. The Brumal BIF trend extends for many kilometres to the southwest from the Pilar deposit. In regional terms, the Brumal-Pilar BIF linear trend corresponds to a package of "Algoma-type" BIFs (oxide-facies, silicate-facies, and carbonate-facies lithotypes) that represent the main economic target as hosts of the Pilar deposit.

Past regional mapping showed that the Brumal BIF trend within the Pilar mine site is folded into a considerably tight, overturned synform-antiform fold of approximately one kilometre in amplitude, with axes statistically plunging steeply to the southeast and with an axial-planar tectonic cleavage dipping steeply in the east-southeast direction.

Jaguar has completed systematic geological-structural mapping at a number of deep operational levels of the mine (e.g., Level 13, Level 12, Level 11, Level 10, and Level 8) to better understand the structural setting of the Brumal BIF trend. Figures 7-6 and 7-7 show schematic level plans based on the results from these underground mapping initiatives.

The "Algoma-type" BIFs typically range between five metres and 15 m to 20 m in thickness, however, within the Pilar property, they have been severely and tightly folded and thickened as a result of a west-verging compressional regional deformation event that affected the entire eastern border of the Rio da Velhas Supergroup exposures in the Iron Quadrangle Terrain. Structural geometries recorded at the Pilar Mine indicate that the mine stratigraphic package may have been folded and re-folded during this event. Moreover, some major reverse faults and/or accommodation faults (such as faulted synform closures) formed during this regional compressional event locally show evidences of the presence of later superimposed events (mainly tilting and/or rotation of the previously faulted blocks).

The resulting folded geometry of the Pilar deposit stratigraphic package is now described as a series of overturned synform-antiform folds (a synclinorium) mainly outlined by the Pilar BIF Unit, and which locally may show some degree of stratigraphic transposition and/or stratigraphic thickening at their hinge zones (see Figure 7-3 above). The axes generally plunge to the southeast, with some instances of very local mesoscopic folds plunging to the northeast. The axial-planar tectonic cleavage of the overturned synform-antiform folds dip steeply to the east-southeast.

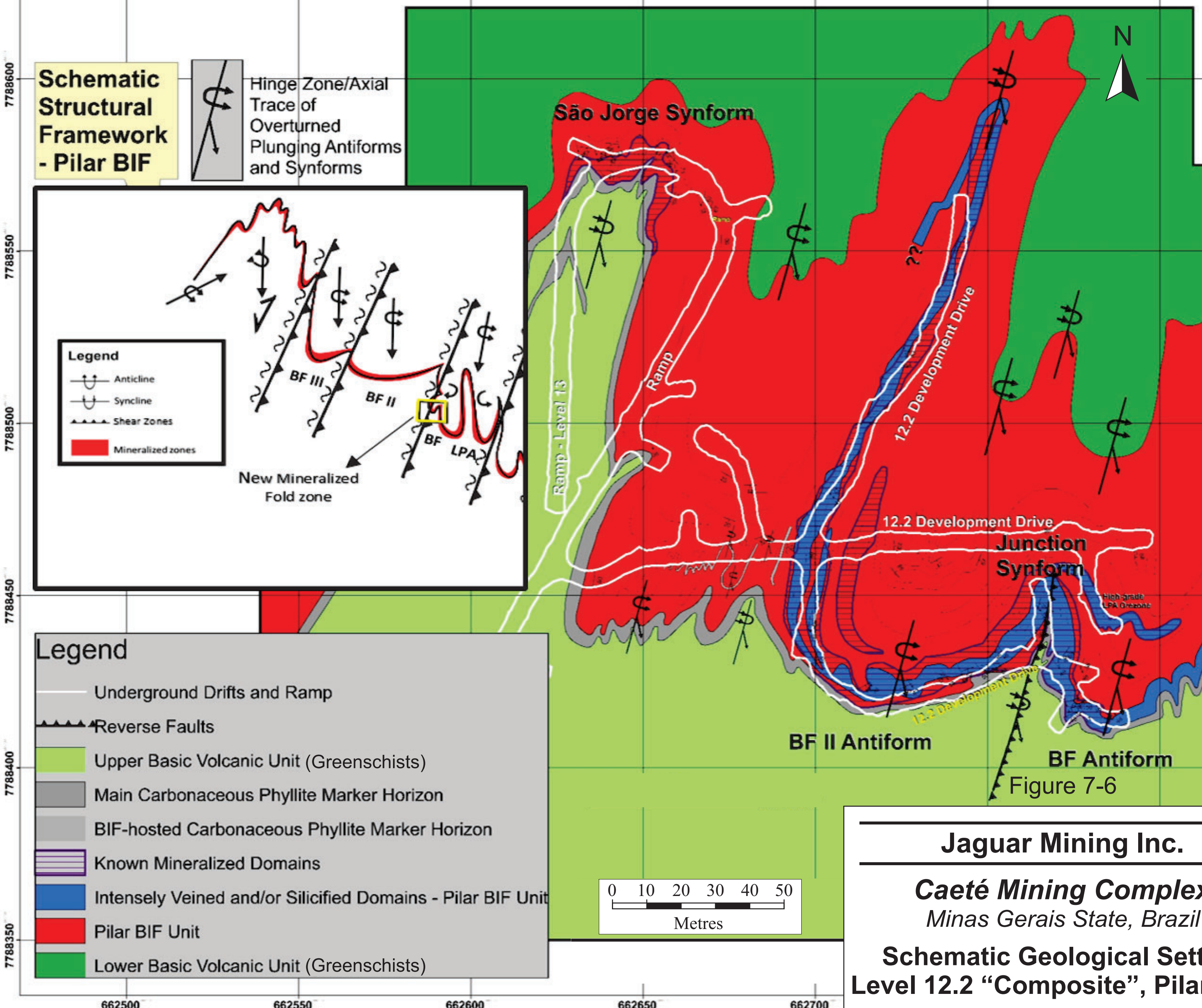


Figure 7-6

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Schematic Geological Setting
Level 12.2 "Composite", Pilar Mine

August 2020

Source: Jaguar Mining Inc., 2020.

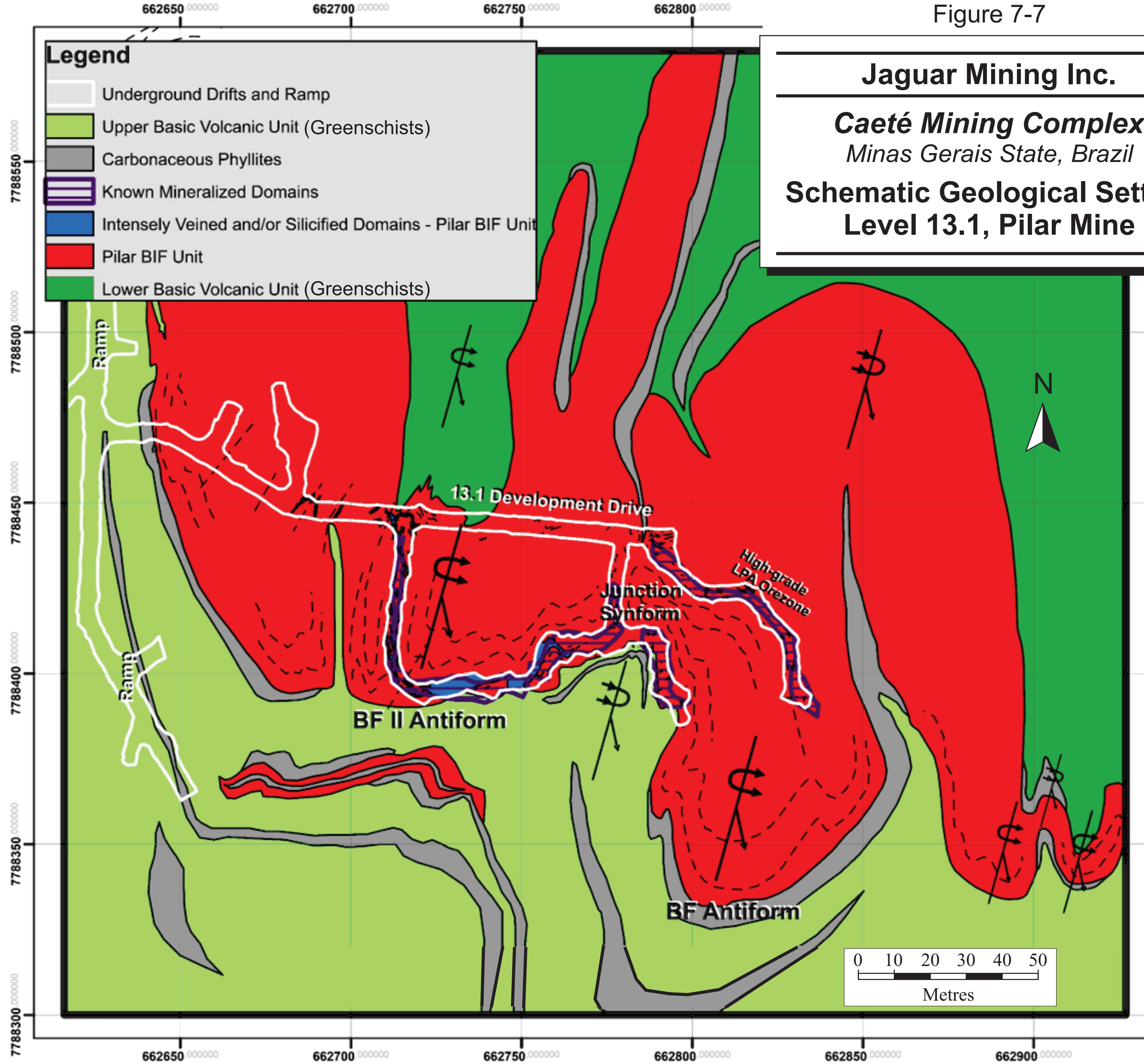
Figure 7-7

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Schematic Geological Setting
Level 13.1, Pilar Mine



August 2020

Source: Jaguar Mining Inc., 2020.

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The deposit-scale synform closures at Pilar locally tend to nucleate “accommodation” reverse faults (with considerably variable relative slips between the opposite faulted blocks) due to the tight nature of the west-verging compressional-folding event. As expected, the differential and heterogeneous relative movements observed along the two sides of these reverse faults are directly responsible for the difference in footprint/plane expressions of the Pilar BIF Unit in different levels of the mine.

Stratigraphically, the Pilar BIF Unit is overlain by a two to five metre thick layer of carbonaceous phyllites, which in turn is overlain by a thick package of greenschists (meta-basic volcanic rocks - “Upper Basic Volcanic Unit”). The Pilar BIF Unit is underlain by a thick package of greenschists (“Lower Basic Volcanic Unit”). The Lower and Upper basic volcanic units are very similar in nature, if not identical, considering their lithologies, lithostratigraphic record, penetrative structural petrofabrics mapped, etc. (Figures 7-6 and 7-7).

At the mesoscopic scale, the visibly dominant penetrative planar petrofabrics observed in underground exposures at Pilar are the depositional bedding, mapped in all of the Pilar BIF Unit lithotypes (Figure 7-8), and the main tectonic cleavage, generally associated with the more incompetent schistose lithologies of the enveloping greenschists units (Figure 7-9). This main tectonic cleavage/schistosity is commonly not present in the more competent, carbonate-quartz rich lithotypes of the Pilar BIF Unit but does occur in those localities underground where the BIF lithologies are more “impure”, i.e., containing phyllosilicates.

Detailed studies carried out by mine geologists at Pilar indicate the presence of three types of penetrative planar tectonic fabrics:

i. The first type is characterized by a tectonic cleavage that appears to record the compressional phase of the regional deformation-shear zone event (the main tectonic cleavage), which is axial-planar to folded geometries of all scales.

ii. The second type represents an extensional tectonic cleavage, thought to be associated with the reactivation of shear zones and faulted planes, with surfaces approximately parallel to the main tectonic cleavage. In BIF lithotypes, this extensional cleavage is filled by “open” sets of quartz veinlets oriented almost parallel to the axial planes of coeval mesoscopic folds, as seen underground in hinge zones (Figure 7-10).

iii. The third type is a mild, spaced crenulation cleavage that records the last regional penetrative deformation event in the Pilar Mine package. The later crenulation cleavage dips to the northwest, and is more easily seen in more incompetent, phyllosilicate-rich lithologies.

FIGURE 7-8 TYPICAL FOLDING IN BARREN "CARBONATE-FACIES" BANDED IRON FORMATION (PILAR BIF UNIT, LEVEL 10)

FIGURE 7-9 MAIN PENETRATIVE TECTONIC CLEAVAGE (MAIN SCHISTOSITY), PILAR MINE

FIGURE 7-10 PENETRATIVE EXTENSIONAL CLEAVAGE IN COMPETENT ROCKS, PILAR MINE

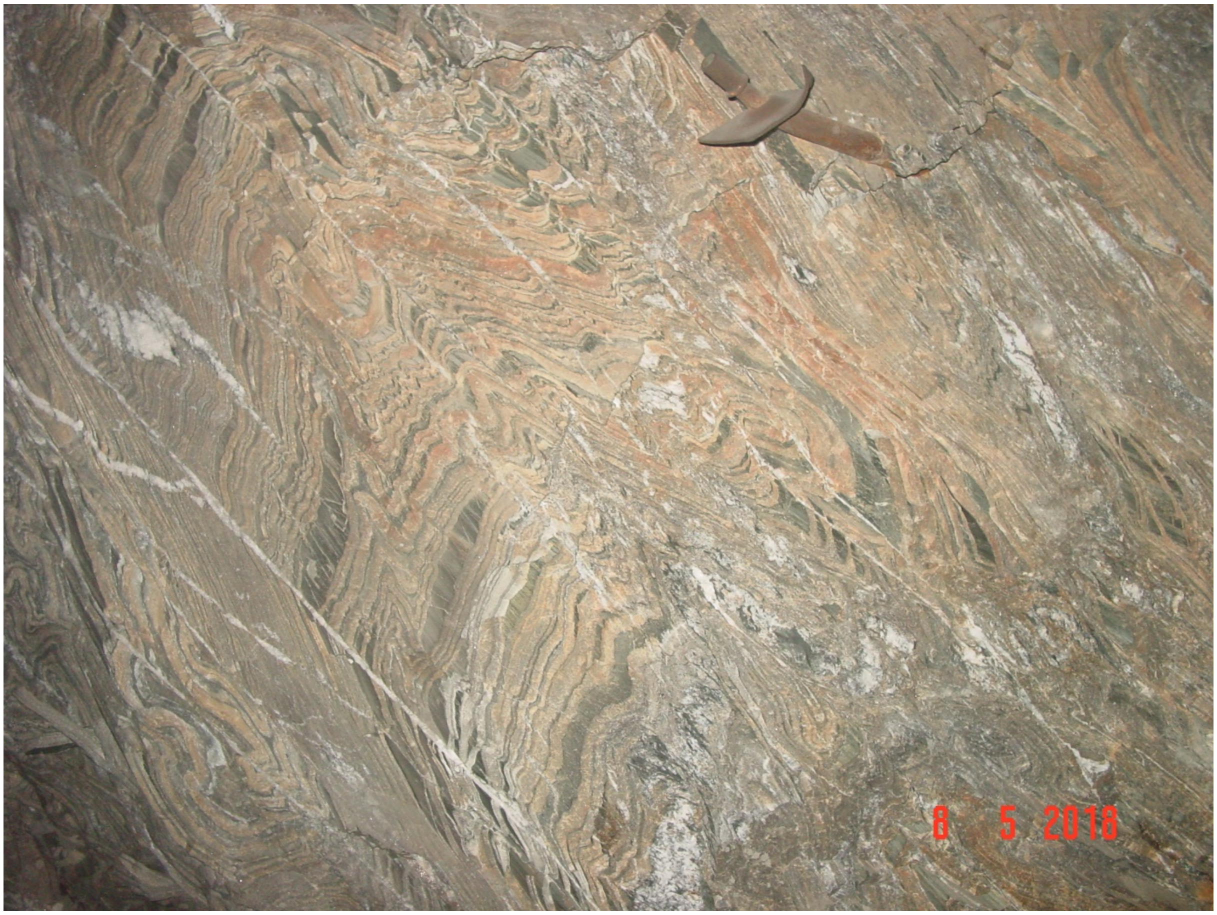
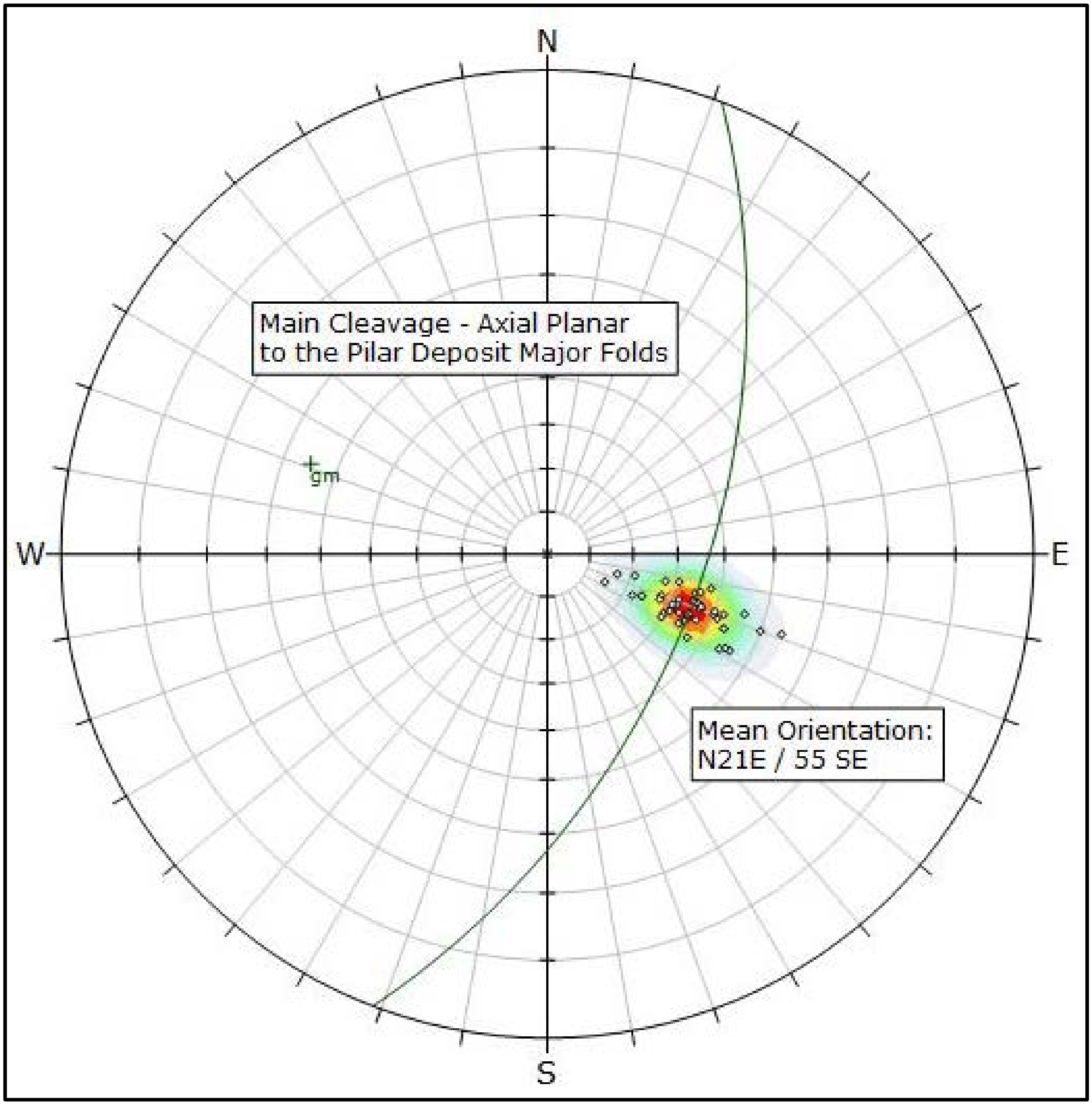


Figure 7-11 is a representative, equal-area stereonet showing the distribution of the attitudes of the main cleavage/schistosity planes measured in underground exposures of Level 10 and Level 11. The maximum of the distribution obtained for the whole Pilar deposit is interpreted to be around the attitude N21E/55^0 SE. This tectonic schistosity is then interpreted to be the axial-planar cleavage to the deposit-scale overturned synforms and antiforms (e.g., São Jorge Synform, BF Antiform, BF II Antiform - see Figure 7-6), and to most of the mesoscopic folds that have been mapped underground.

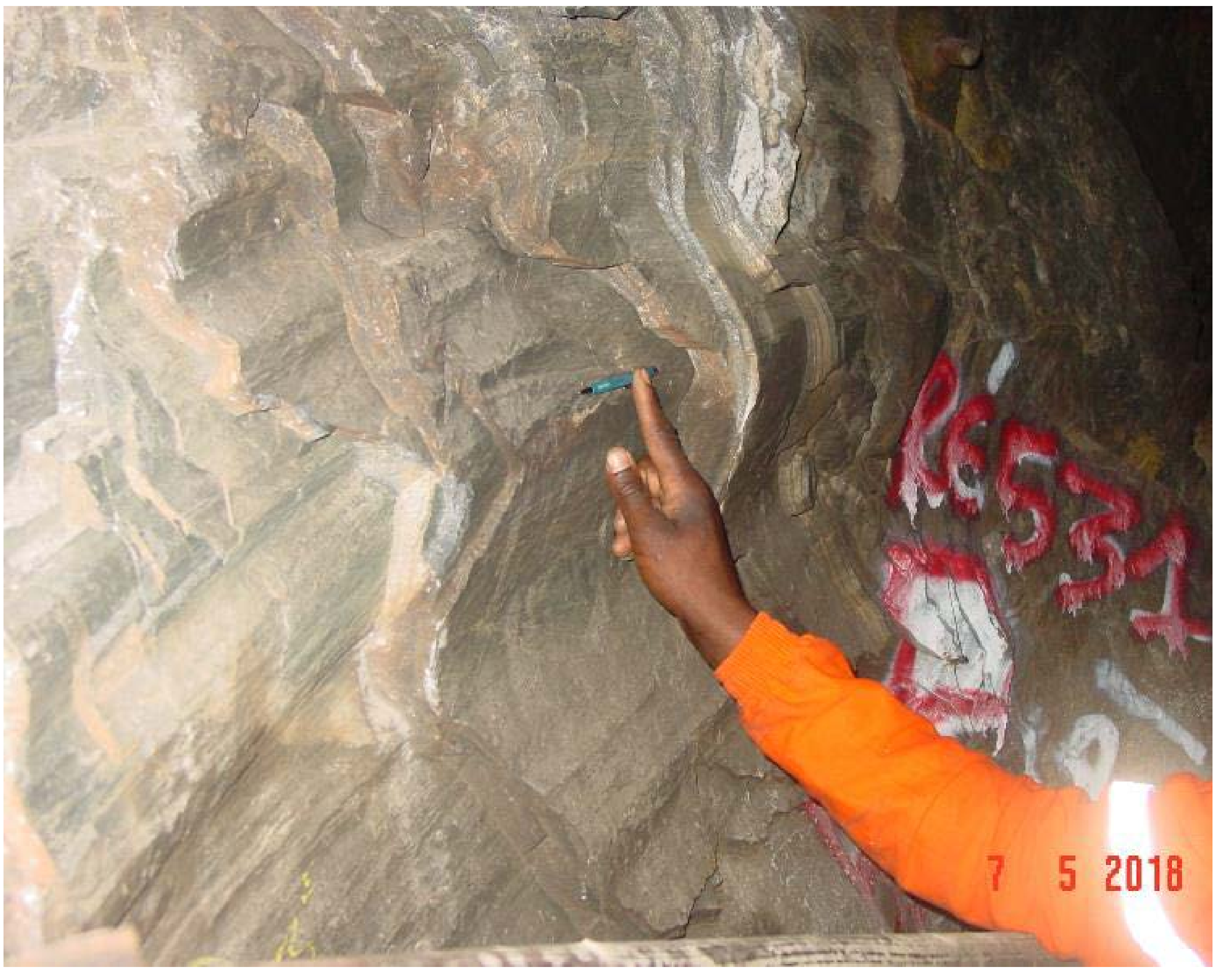
FIGURE 7-11 STEREONET SHOWING THE DISTRIBUTION OF ATTITUDES OF MAIN CLEAVAGE PLANES IN UNDERGROUND EXPOSURES



Mesoscopic folds at the Pilar deposit are variable in size, with amplitudes that may range from less than a 10 cm to several tens of metres. Mesoscopic folds in more incompetent rock types tend to be moderately tight to tight, more rarely near-isoclinal, while decametre-scale folds in the competent Pilar BIF Unit may range from moderately open to closed. These folds are typically near-reclined, as both axes and axial surfaces generally plunge to the southeast, with only few plunging to the northwest or northeast, or being nearly horizontal.

Mesoscopic fold axes, as well as the inferred axes of the deposit-scale synforms and antiforms, generally mimic the orientation of the main intersection lineation that is easily measured on both the main tectonic cleavage and bedding surfaces/S0 and represents the intersection lines between the bedding and cleavage planes (Figure 7-12). Therefore, the nearly “stratabound” mineralization of the Pilar deposit is also expected to plunge (continuities towards greater depths) with the same orientation measured for the intersection lineation in the bedded BIFs of the Pilar Mine.

FIGURE 7-12 TYPICAL PENETRATIVE INTERSECTION LINEATION ON FOLDED BEDDING (S0) SURFACES OF THE PILAR BIF UNIT (LEVEL 10)



Equal-area stereonets showing the distribution of the orientations (and statistical maximums) for the main penetrative intersection lineation measured in various localities and at various elevations (Level 10, Level 11, Level 12, and Level 13) in the Pilar deposit are shown in Figures 7-13 to 7-15.

Geological mapping and underground observations show that mineralized bodies of the Pilar BIF Unit represent scattered, generally stratabound lenses of "sulphide-facies" BIF ranging from 15-20 m to 100-200 m in strike-length and two metres to 10-15 m in thickness. In the Pilar deposit, the best grade BIF-hosted mineralized zones are typically located along the contact between the Pilar BIF Unit and the layer of carbonaceous phyllites that occurs immediately adjacent to the greenschists of the Upper Basic Volcanic Unit (see Figure 7-6). The BIF-hosted mineralized bodies are conformably folded together with the whole Pilar BIF Unit at the deposit-scale "synclinorium" of the Pilar deposit (São Jorge Synform, BF II Antiform, Junction Synform, BF Antiform, BA Antiform).

FIGURE 7-13 DISTRIBUTION OF ATTITUDES OF MAIN PENETRATIVE INTERSECTION LINEATION IN SÃO JORGE SYNFORM, LEVEL 12 (LEFT) AND BF ANTIFORM, LEVEL 10 (RIGHT)

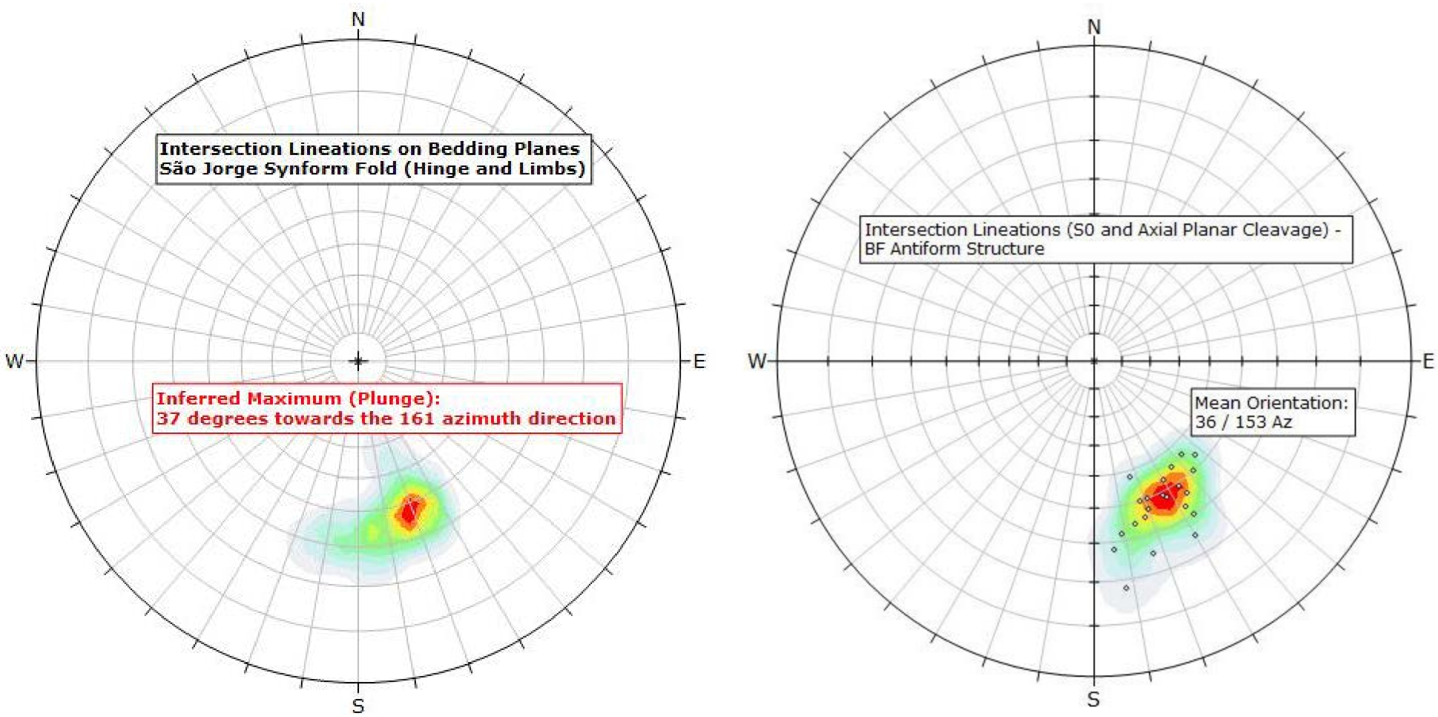


FIGURE 7-14 DISTRIBUTION OF ATTITUDES OF MAIN PENETRATIVE INTERSECTION LINEATION AT SUBLEVEL 13.1 IN BF II OREZONE AND LPA OREZONE

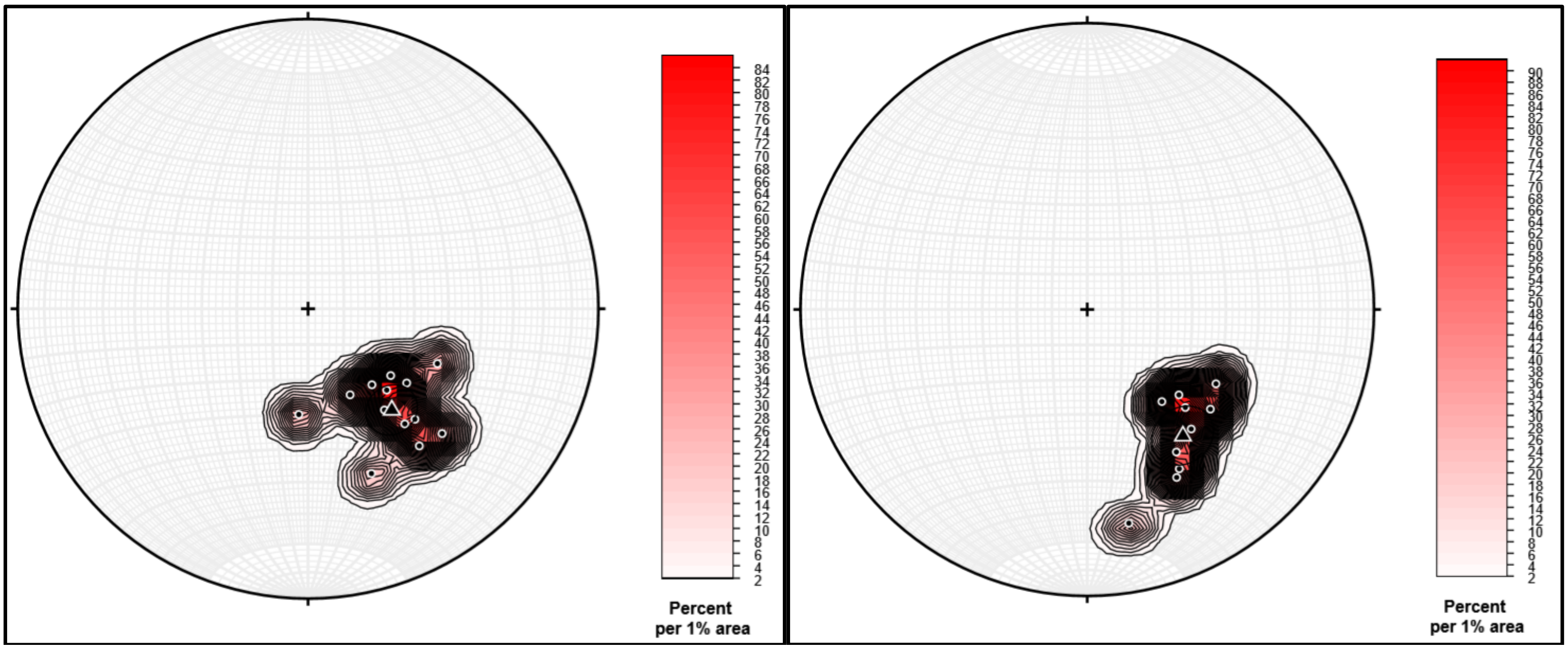
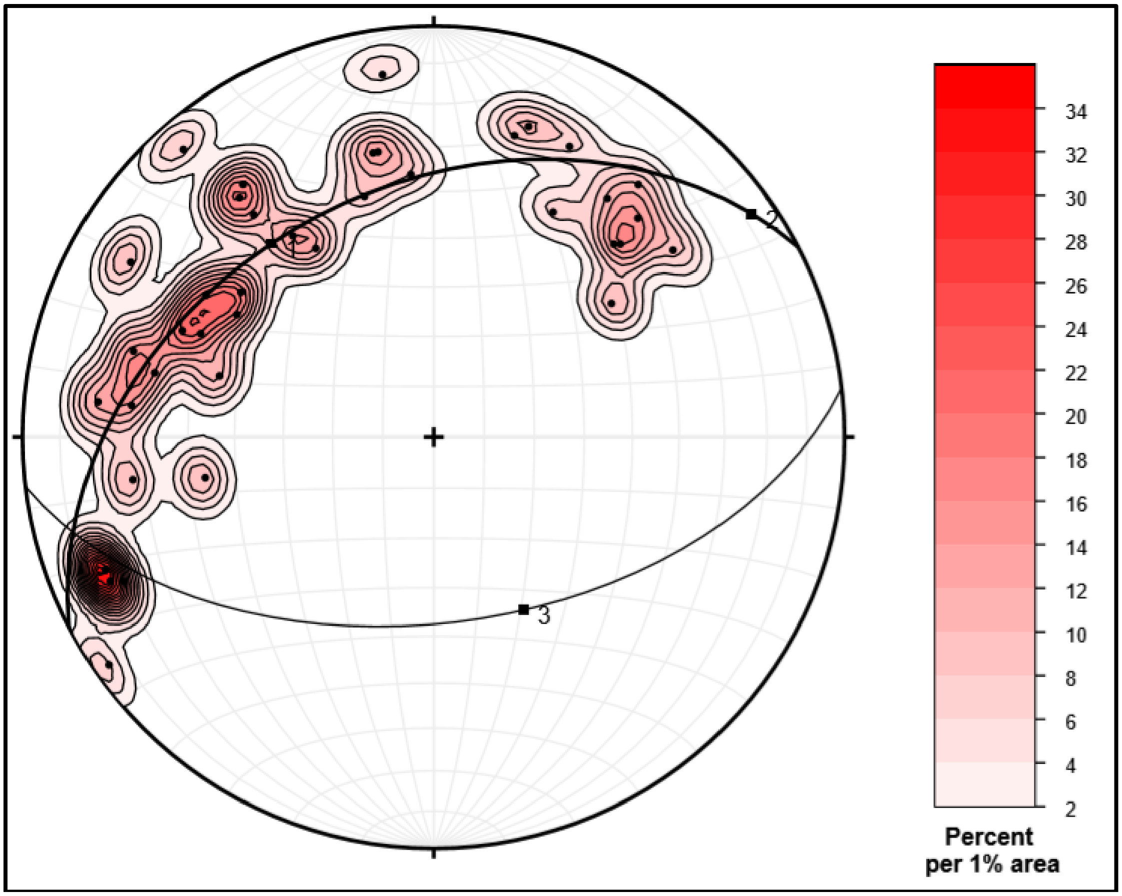


FIGURE 7-15 DISTRIBUTION OF BEDDING SURFACES (POLES TO BEDDING) IN BF II ANTIFORM SUBLEVEL 13.1



OTHER ZONES OF MINERALIZATION

EASTERN TORRE MINERALIZED ZONES/LENSES

The Eastern Torre stratigraphic sequence of the Pilar Mine package is somewhat distinct from the mafic/basic volcanic packages (greenschists) that host the Pilar BIF Unit. Where not hydrothermally altered, the Torre stratigraphic sequence is composed predominantly of the same mafic/basic greenschists that have been mapped in other portions of the Pilar deposit, although repeated alternations of distinct, very thinly foliated, greenish coloured talc-Mg chlorite schists up to tens of metres in thickness also occur.

These talc-Mg chlorite schists consist of approximately 11% to 20% MgO and 800 ppm to 1,500 ppm Cr, however, due to limited access to their exposures underground in the eastern portion of the Pilar operation, the nature of these schists is not yet clear. They may either represent individual volcanic horizons/intercalations of different composition, or they could also correspond, genetically and geometrically, to metamorphosed intrusive bodies (sills, laccoliths, etc.).

The individual altered and mineralized “lenses” hosted by the recently mapped (underground) Torre sequence (Figure 7-16) are composed of highly silicified schists, disseminated sulphides (pyrrhotite, arsenopyrite and some chalcopyrite), coarser grained phyllosilicates, and calcite, and have very encouraging gold grades (Figure 7-17). The Eastern Torre stratigraphic sequence, including the mineralized lenses, has been conformably folded in reclined/overturned southeast-plunging antiforms and synforms of considerable amplitude in a similar manner to the whole Pilar mine package (Figure 7-16).

Based on recent exploration/development activities carried out at the Sublevel 8.1, the average thickness of individual Torre mineralized (and potentially economic) lenses is 2.5 m, and the sequence can be traced for 180 m along strike.

Outcrops of the Torre mineralized stratigraphic package were discovered during past surface exploration at Pilar. The area of the mineralization was subsequently tested at a few shallower elevations and underground levels of the Pilar Mine. However, the different stratigraphic setting, the lack of the traditional BIF lithologies, the structural complexity, and only moderate average gold grades discouraged any further exploration in this sequence.

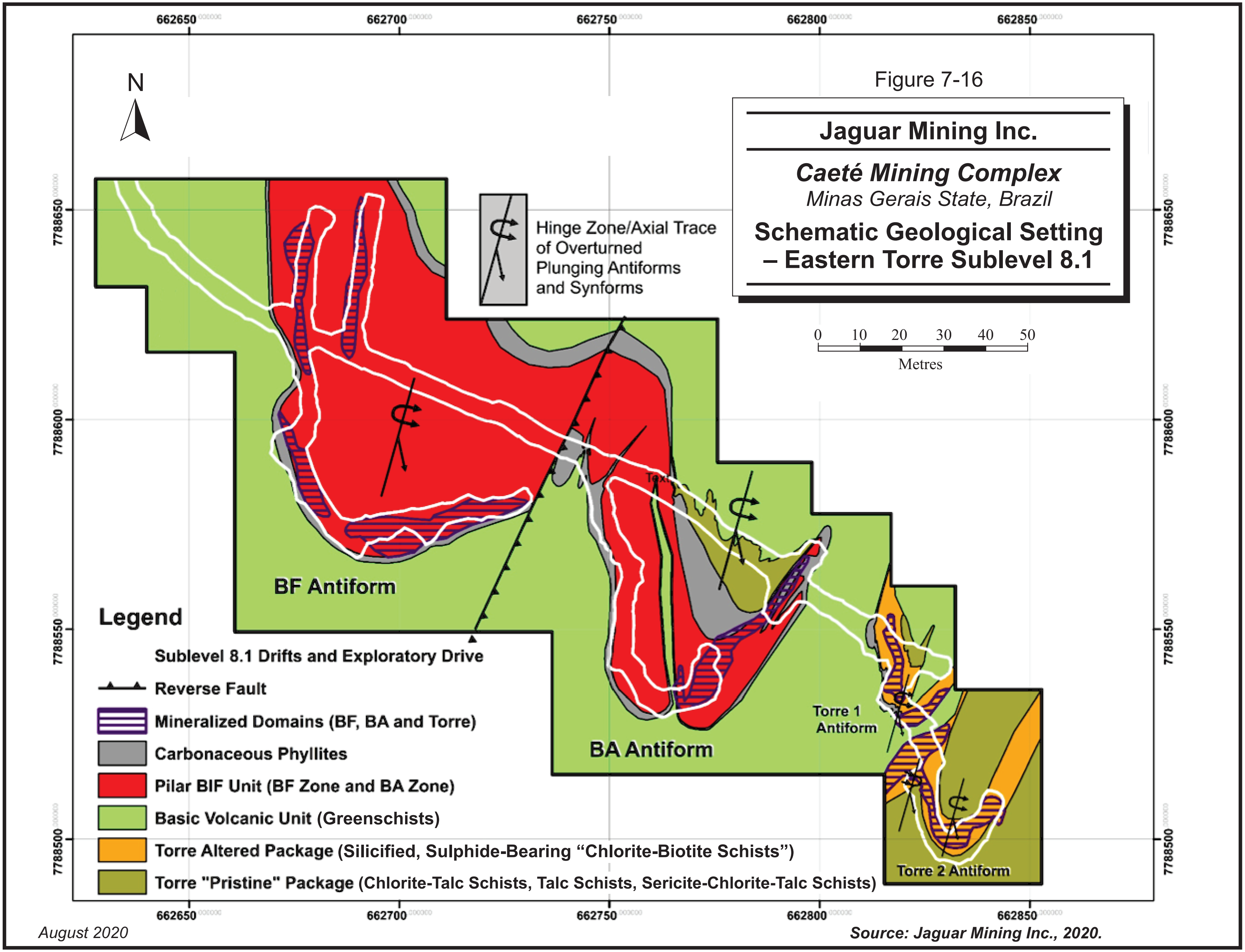


Figure 7-16

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Schematic Geological Setting – Eastern Torre Sublevel 8.1

FIGURE 7-17 REPRESENTATIVE CORE SAMPLES OF EASTERN TORRE MINERALIZATION

SÃO JORGE SYNFORM MINERALIZED ZONE

The São Jorge Synform Mineralized Zone is a roughly stratabound “saddle-reef”-type BIF-hosted mineralized zone which was recently re-visited and mapped at the main ramp of the Pilar operation (Level 13), right at the deposit-scale synformal closure of the same name (see Figure 7-16).

The São Jorge Synform Mineralized Zone was previously mined at surface, in a small open-pit operation. The São Jorge saddle-reef mineralized body is understood as a two to three metre thick horizon that has a total strike-length of no more than 140 m. However, as was observed at different shallower operational levels of the mine, the zone has highly variable characteristics (geometry, volumes, and average grades) and as a result, the development and mining activities in this zone were discontinued during the initial years of the Pilar underground operation.

SW LIMB OF THE PILAR DEPOSIT FOLDED STRUCTURE

The SW limb of the deposit-scale Pilar folded structure corresponds to the hypothetical northeasternmost termination of the regional mineralized lineament known as the Brumal-Pilar trend (Figure 7-17). The SW Limb Mineralized Zone was previously mined at surface, in a small open-pit operation. At surface, this potential high-grade zone has a strike-length of 200 m and an average thickness of approximately three metres.

This zone was mined in the past at upper operational levels of the Pilar underground mine, however, mining ceased after poor results had been encountered at several successive shallow levels.

THE NEWLY-DEFINED BF III ANTIFORMAL FOLDED STRUCTURE

Structurally, the BFIII Mineralized Zone corresponds to a deposit-scale antiform structure, which is adjacent to the well-known BF II overturned antiform and has recently been identified from Level 11 downwards (see Figure 7-6). It appears that this antiform structurally nucleated at Level 11 and can be of greater strategic importance for the operation at deeper levels of the Pilar deposit.

The style of the BIF-hosted gold mineralization in this area is similar to the BIF-hosted gold mineralization in the adjacent BF II Orezone, however, the average thickness of this zone, based on data available to date, does not exceed 1.5 m. This zone may require re-visiting when development and exploration activities are undertaken at the deeper operational levels of the Pilar mine.

MINERALIZATION

ROÇA GRANDE

At Roça Grande, gold mineralization is more commonly associated with BIF horizons. In RG01, RG02, RG03, and RG06 mineralized bodies, the gold mineralization is developed roughly parallel to the primary bedding and is related to centimetre-scale bands of massive to disseminated pyrrhotite and arsenopyrite. In many cases, better gold values are located along the hangingwall contact of the iron formation sequence and is hosted by carbonate-facies iron formation. The grades generally decrease towards the footwall where the iron formation becomes more silica-rich. The thicknesses of the iron formations are observed to be affected by broad-scale boudinaged structures. Better gold grades are found in the thicker portions while the narrower portions of the boudinaged structures have lower grades. Late-stage, barren quartz veins are also ubiquitously present and also display a boudinaged form.

RPA recommends that structural mapping information be integrated with isopach maps of the carbonate iron formation and trend analyses of the gold distribution to identify any primary controls on the distribution of the BIF-hosted gold mineralization.

In the RG07 mineralized body, gold is found to be hosted in quartz veins that are contained within a sericite (chlorite) schist associated with an east-west oriented shear zone (Machado 2010).

PILAR

As explained above, the economic gold mineralization at the Pilar Mine is hosted by the folded, and locally re-folded, Pilar BIF Unit including the SW, São Jorge, BF III, BF II, BF, LPA, and BA mineralized zones, and by the conformably folded Eastern Torre meta-volcanic sequence.

The main zones of mineralization occur as scattered, stratabound lenses (or "pods") of sulphide-facies BIFs within the "carbonatic-oxide-facies" deposit-scale Pilar BIF Unit (Figures 7-18 to 7-20). Economic mineralized bodies consist of stratabound, but not stratiform, concentrations of gold-bearing sulphides that occur in scattered grains, in seams, and in irregular-shaped granular aggregates located along <u>and replacing</u> iron carbonates-rich bands of the BIFs. Arsenopyrite and pyrrhotite are the most important sulphide minerals in mineralized bodies, with pyrite, chalcopyrite, galena, and sphalerite commonly present as accessory minerals. A direct relationship can generally be established between the amounts of arsenopyrite (percentage per volume) and the gold concentrations in mineralized BIF samples of the Pilar deposit.

There is a clear temporal-spatial-genetic relationship between the epigenetic replacement/sulphidation of the host BIFs and the onset of a structurally controlled, district-scale silicification event. Carbonate-rich bands of mineralized BIFs commonly show sulphide-enriched alteration/replacement halos that are symmetrically distributed around swarms of quartz veins and veinlets (Figure 7-21). The sulphide minerals occur mostly as disseminations in the host rocks, but can achieve semi-massive to massive concentrations locally, over a few metres.

Individual quartz veins are typically less than one metre in width and can be observed to be of three generations. The quartz veins of the first generation are typically associated with the gold mineralization and are folded by the main tectonic event which affected the Pilar mine package as a whole. The quartz veins of the second generation are typically lower grade or barren and are not affected by folding. Lastly, the quartz veining of the third generation is associated to the above-mentioned extensional tectonic cleavage and may also be related to halos of mineralization/sulphidation where related to hinge structural domains.

At the Pilar deposit, increased average gold grades and higher sulphide/arsenopyrite concentrations (within the economic mineralized zones and orebodies) are almost everywhere (or at least very frequently) mapped in association with the deposit-scale, larger, higher-amplitude fold hinge geometries. Increased average gold grades and higher sulphide/arsenopyrite concentrations have also been observed in association with a second folding event (and/or with a subsequent third folding event) in the Pilar BIF package (Tiago Souza, 2020). The second folding event would have brought mineralized quartz veins into the BIF Pilar package, however, according to Tiago Souza (2020), the third folding event was the one responsible for the generation of the economic mineralization hosted by the large fold hinge geometries of the mine package (São Jorge synform, BF II antiform, BF antiform, BF II-BF Junction synform, BA antiform, and the smaller-amplitude Torre antiforms).

FIGURE 7-18 TYPICAL "SULPHIDE-FACIES", HIGH-GRADE, ARSENOPYRITE-RICH BIFS AT PILAR SUBLEVEL 10.2

FIGURE 7-19 TYPICAL PROXIMAL "CARBONATE-FACIES", BARREN BIFS AT PILAR SUBLEVEL 10.2

FIGURE 7-20 TYPICAL DISTAL "OXIDE-FACIES", NON-MINERALIZED BIFS AT PILAR SUBLEVEL 10.2

FIGURE 7-21 RELATIONSHIP BETWEEN EPIGENETIC REPLACEMENT/SULPHIDATION AND STRUCTURALLY CONTROLLED, DISTRICT-SCALE SILICIFICATION EVENT

8 DEPOSIT TYPES

The gold metallogeny in the Iron Quadrangle is complex. Gold mineralization has been found mainly within three general types of deposits:

- Archean-age, invariably stratabound-like, Algoma BIF-hosted deposits.
- "Quartz vein swarms-style", clearly mesothermal deposits.
- Early-Proterozoic, Witwatersrand-type paleo-placer deposits.

The Pilar and Roça Grande deposits are examples of the Algoma BIF-hosted type. The main geological characteristics of this group are summarized as follows:

Main host/fertile "Algoma-type" BIF Units: These units host the mineralization and are stratigraphically located at the waning stages of major volcanic cycles of the Rio da Velhas greenstone belt. They are overlain by later sedimentary rocks composed of greywackes and turbidites.

Mineralization style: The mineralization consists of mainly "lateral" replacements/sulphidations of the iron carbonate-rich bands of the host Algoma-type BIF units. However, the BIF-hosted gold mineralization is not syngenetic in nature (in relation to the deposition of the host rock packages), rather it is clearly an epigenetic event that has occurred after the formation of the host rock units. There is a clear temporal-spatial-genetic relationship between the replacement/sulphidation of the host BIFs and the onset of a structurally controlled, district-scale silicification event.

Dimensions of the economic orebodies: Economic strike-lengths of only 50 m to 350 m for individual mined zones. Average thicknesses of the BIF-hosted orebodies may range from 2 m to 20 m.

Structural-geometric controls and down-plunge continuities of the orebodies: Orebodies plunge with the orientation of an intersection lineation (between bedding planes and a tectonic cleavage) that mimics the orientation of axes of major, deposit-scale reclined folds. Increased gold grades and higher sulphide concentrations are typically mapped in association with fold hinge zones of the deposit-scale reclined folds.

Orebodies with incredible down-plunge persistence towards great depths: Major BIF-hosted orebodies and underground operations show consistent continuities for many kilometres down-plunge despite the relatively small lateral dimensions (along the strike of the host units). They can be longer than 5 km along the plunge, similar to the main zones of the AngloGold Ashanti Morro Velho and Cuiabá Mines. All major BIF-hosted orebodies are open at depth and warrant additional deep drilling to expand resources.

BIF-hosted gold deposits amenable to both bulk mining and more selective high-grade underground operations: Mine packages almost everywhere show good average gold grades and attractive thicknesses and may be amenable to both bulk and selective mining.

9 EXPLORATION

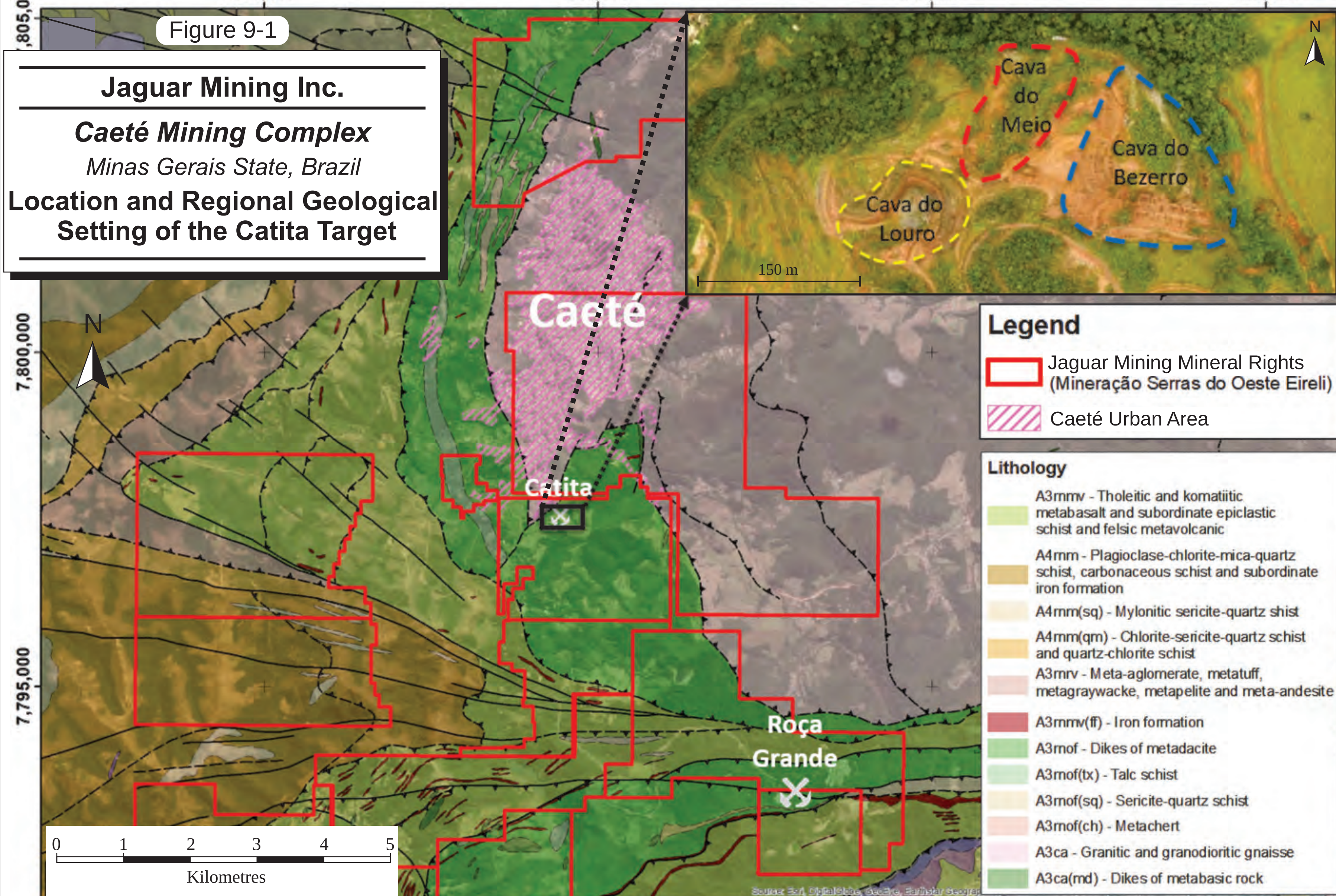
ROÇA GRANDE AREA

Jaguar has not carried out any surface-based exploration programs on the Roça Grande Mine property other than the drilling programs described in Section 10. In 2018 and 2019, Jaguar did carry out exploration programs on two of its exploration concessions located to the north of the Roça Grande Mine.

CATITA TARGET

The Catita target is located on Mineral Tenement 830.938/1979, approximately seven kilometres north of the Roça Grande Mine, and along the southern perimeter of the city of Caeté (Figure 9-1). Mineralization at the Catita target was first discovered during the colonial period and more recently gold was extracted from this deposit by MSOL by means of open pit and underground mining operations in 2004 to 2006. Three open pits were excavated – Cava do Louro, Cava do Meio, and Cava do Bezerro. A total of 3,319 ounces of gold were produced.

Exploration activities carried out by Jaguar exploration teams at the Catita target in 2018 and 2019 included re-logging and re-sampling a limited amount of remaining available drill core from holes completed from underground drilling stations and local-scale geological mapping. Channel sampling was carried out at the Cava do Louro and Cava do Bezerro open pits to search for the presence of any remaining mineralization, and to aid in the understanding of the style of the mineralization and any structural controls that may be present (Figure 9-2). A total of 225 channel samples were collected from within these two open pits.



August 2020

Source: Jaguar Mining Inc., 2020.

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FIGURE 9-2 CHANNEL SAMPLING PROGRAM AT THE CAVA DO BEZZERO OPEN PIT

Beyond the open pit mines, a program of auger drilling and soil sampling was carried out which confirmed the presence of anomalous gold values in close proximity to the contact with the Caeté complex of foliated rocks of granitic composition.

The auger drilling program was carried out by the Jaguar exploration team using a man-portable drilling rig model TR2 that was supplied by the Brazilian manufacturer Trado. The drilling rig was powered by a Honda GX 200 (6.5 hp, 196 cc) engine and used a barrel that was 50 cm in length. Only the lower 30 cm of the sample material in the barrel was usually collected, as it is common that material from the wall of the hole collapse and collect at the bottom of the hole after every run. Drilling activities are not carried out under rainy conditions. The sample material is inspected and those portions of the sample that are judged to not be representative are removed – usually the first and last 5 cm of the drilling run. The remaining material is geologically described and is placed into a clean sample bag along with suitable identification tags.

The soil sampling grid was planned based on local geological knowledge, orientating the lines to best crosscut the geologic structures which are expected to host gold mineralization. With the aid of a handheld global positioning system (GPS) unit, the exploration team open trails to reach the established sampling sites. Samples are collected from the B soil horizon using a post hole digger. For each sample site, the depth of the B soil horizon is reached in different depths depending on the geomorphological setting. If a stoneline is reached, it was penetrated in order to collect the underlying residual soil. One to two kilograms of B horizon soil is withdrawn and placed over a clean PVC canvas. The sample is described, bagged, and identified. If necessary, the sample is disaggregated and sieved to remove the coarse material (>2 mm).

Channel sampling is performed on outcrops, usually of saprolite as fresh rock is rare. The exposure is initially "cleaned", removing any superficial material (approximately 5 cm) which might contain non-representative transported particles and is most exposed to weathering, including rain leaching. Then, channel sample limits are marked by a technician or a geologist with small wood stakes (using spray paint if necessary), in an orientation so as to obtain the best knowledge about the outcrop being sampled – usually crosscutting the target feature and respecting lithological contacts. The sampler and an assistant collect the sample along the defined channel, with a duck head hammer and a clean aluminum tray, extracting material from an approximately 5 cm wide and 3 cm deep band. The total weight of a one metre sample is approximately three kilograms. It is bagged and identified. Geologic description and structural bearings are taken by a geologist, along with a field sketch.

All soil, channel, and auger samples were analyzed at ALS laboratory in Belo Horizonte using the PREP-31 method for preparation and Au-AA26 (fire assay for gold – 50 g) analytical method. All soil and channel samples were also analyzed by the ME-MS61 method for 48 elements. Chip samples were analyzed at the internal Jaguar mine site laboratory by fire assay with an atomic absorption spectroscopy (AAS) finish.

A summary of the exploration work carried out on the Catita target during 2018 and 2019 is presented in Table 9-1. A summary of significant intersections returned from the auger drilling program and the channel samples taken in the Cava do Bezerro open pit is presented in Table 9-2 and are shown in Figures 9-3 and 9-4.

TABLE 9-1 SUMMARY OF EXPLORATION SAMPLES, CATITA TARGET
Jaguar Mining Inc. – Caeté Mining Complex

Item	Number	Remarks
Soil samples	664	Multi-element analysis. Best value 1.94 g/t Au.
Chip sampling	30	13 samples had gold grades greater than 1 g/t Au. Best value was 4.4 g/t Au.
Channel Sampling	225 samples along 29 channels	
Auger drilling	5 holes total 56.7 m 57 samples taken	Best intercept was 1.88 g/t Au along 3 m.

TABLE 9-2 LIST OF SIGNIFICANT RESULTS, CATITA TARGET 2018 AND 2019 EXPLORATION PROGRAMS
Jaguar Mining Inc. – Caeté Mining Complex

Sample type	HoleID	From (m)	To (m)	Length (m)	Grade (g/t Au)	Grade x Thickness	Composite
Channel	CCAT0001	8.09	9.22	1.13	2.14	2.41	1.13m@2.14g/t
Channel	CCAT0001	17.11	18.35	1.24	2.58	3.21	1.24m@2.58g/t
Channel	CCAT0001	30.18	31.40	1.22	1.04	1.26	1.22m@1.04g/t
Channel	CCAT0003	0.00	1.19	1.19	1.05	1.25	1.19m@1.05g/t
Channel	CCAT0004	7.19	8.17	0.99	5.15	5.07	0.99m@5.15g/t
Channel	CCAT0004	11.25	12.52	1.28	3.14	4.01	1.28m@3.14g/t
Channel	CCAT0006	0.00	1.13	1.13	4.45	5.03	1.13m@4.45g/t
Channel	CCAT0007	0.00	1.43	1.43	3.69	5.26	1.43m@3.69g/t
Channel	CCAT0008	6.41	7.22	0.80	2.23	1.79	0.8m@2.23g/t
Channel	CCAT0011	0.00	9.05	9.05	1.87	16.92	9.05m@1.87g/t including 1.02m@12.2g/t
Channel	CCAT0012	0.00	1.07	1.07	2.13	2.28	1.07m@2.13g/t
Channel	CCAT0012	2.47	3.44	0.97	4.35	4.20	0.97m@4.35g/t
Channel	CCAT0013	0.00	2.64	2.64	2.72	7.18	2.64m@2.72g/t
Channel	CCAT0013	5.92	6.86	0.94	3.76	3.53	0.94m@3.76g/t
Channel	CCAT0013	13.22	14.67	1.45	1.61	2.33	1.45m@1.61g/t
Channel	CCAT0014	0.00	2.47	2.47	2.89	7.13	2.47m@2.89g/t
Channel	CCAT0015	4.01	8.06	4.05	1.79	7.26	4.05m@1.79g/t
Channel	CCAT0016	0.00	0.93	0.93	2.53	2.35	0.93m@2.53g/t
Channel	CCAT0023	5.70	8.05	2.35	2.05	4.83	2.35m@2.05g/t
Channel	CCAT0024	0.00	2.42	2.42	3.52	8.53	2.42m@3.52g/t
Auger	ACAT0002	5.00	8.00	3.00	1.88	5.64	3m@1.88g/t

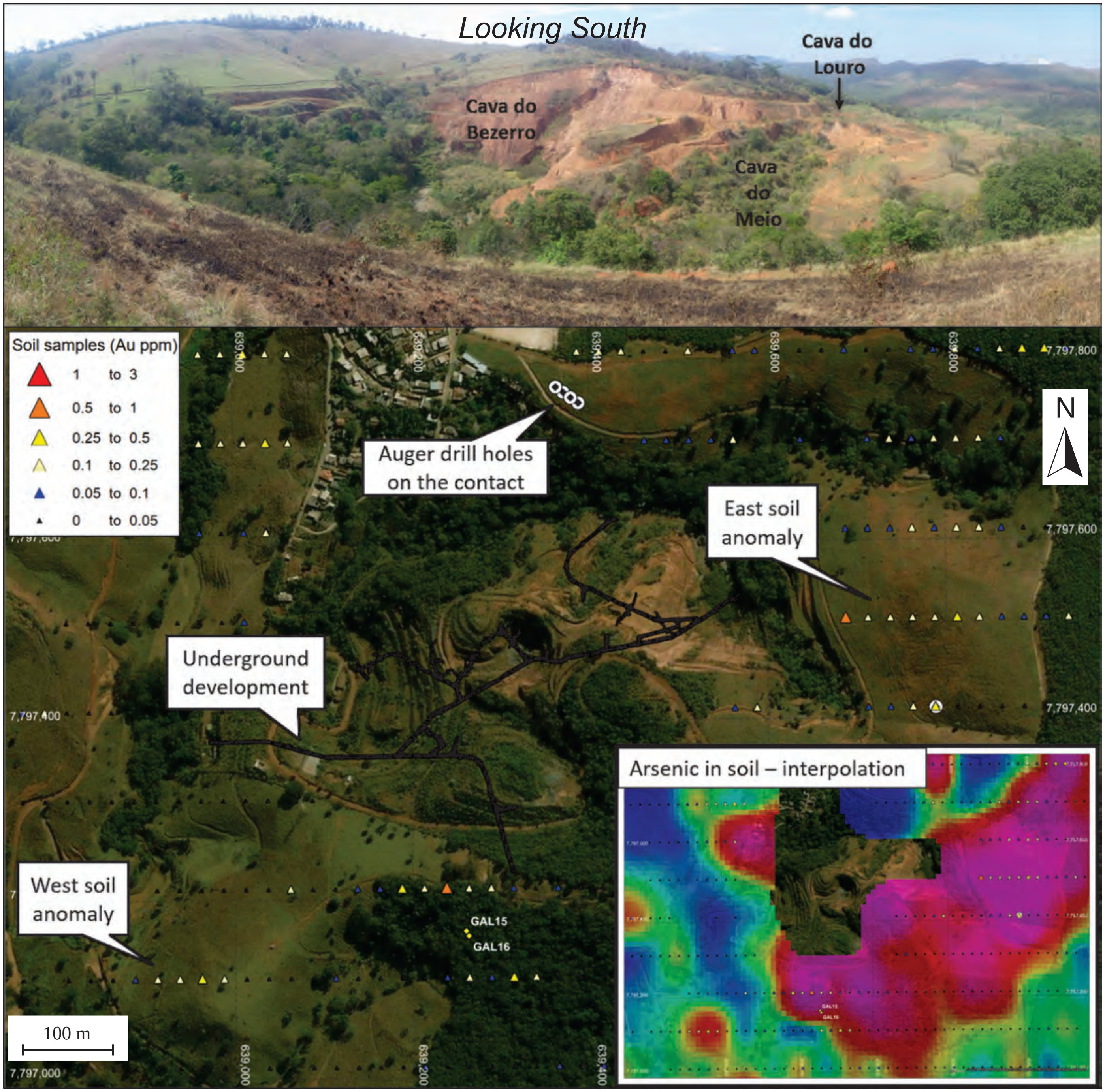


Figure 9-3

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

View of the Current Open Pits, Extent of the Underground Workings, and Location of Exploration Samples at Cava Do Bezerro

August 2020

Source: Jaguar Mining Inc., 2020.

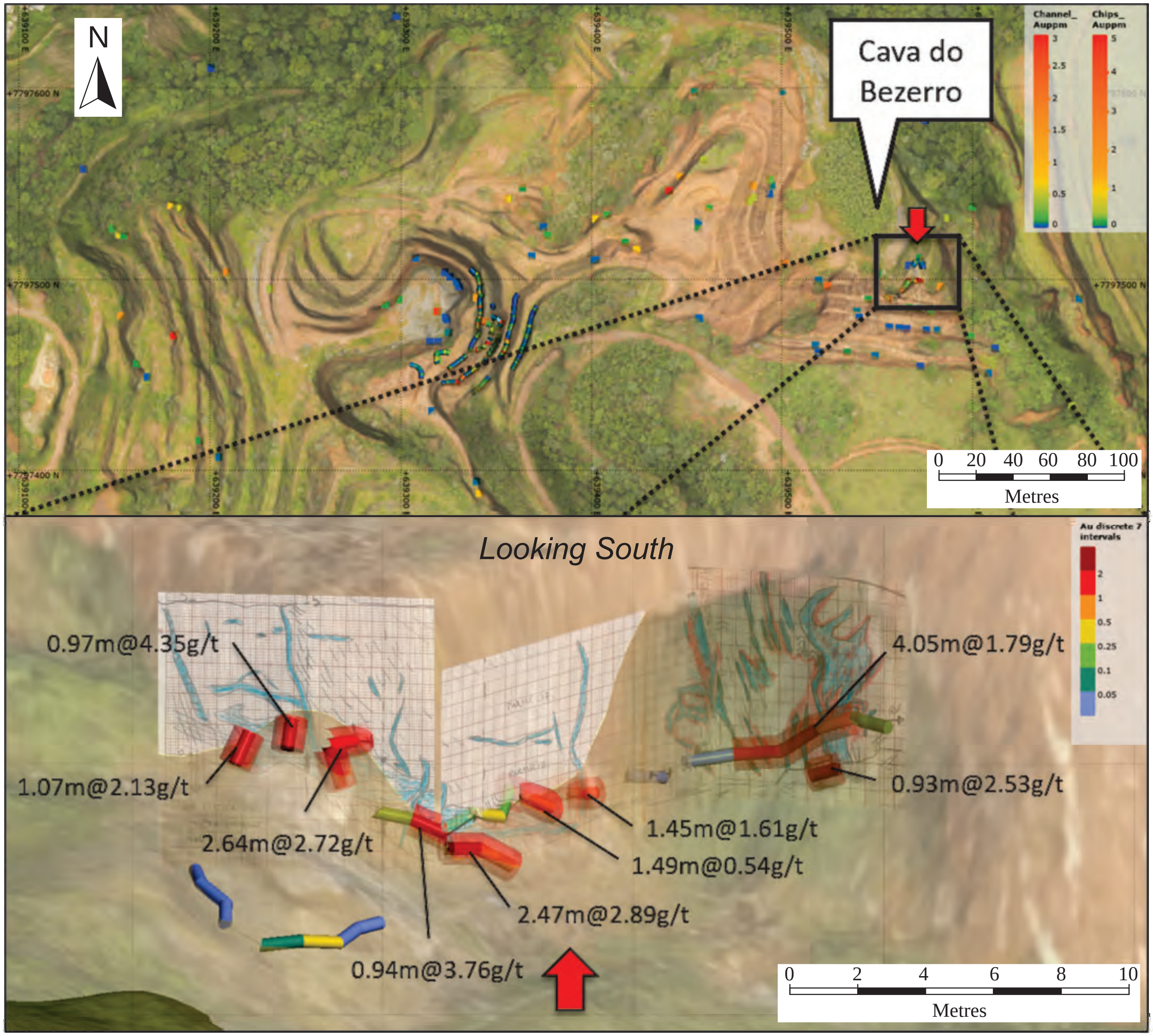


Figure 9-4

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Location of Significant Channel Samples Collected from the Cava Do Bezerro Open Pit

August 2020 **Source: Jaguar Mining Inc., 2020.**

CÓRREGO BRANDÃO TARGET

The Córrego Brandão target is located on Mineral Tenements 831.817/2003 and 830.471/2019, approximately seven kilometres north of the Roça Grande Mine, approximately 800 m northeast of the Catita target, and along the southern perimeter of the city of Caeté (Figure 9-5).

Exploration activities carried out by the Jaguar exploration teams at the Córrego Brandão target included geological mapping, soil and chip sampling, channel sampling, auger drilling, and trenching. A summary of the equipment and procedures used to collect the auger, channel, and soil samples is presented above. All soil, channel, and auger samples were analyzed at ALS laboratory in Belo Horizonte using the PREP-31 method for preparation and Au-AA26 (fire assay for gold – 50 g) analytical method. All soil and channel samples were also analyzed by the ME-MS61 method for 48 elements. Chip samples were analyzed at the internal Jaguar mine site laboratory by fire assay with an AAS finish.

A summary of the exploration work carried out on the Córrego Brandão target during 2018 and 2019 is presented in Table 9-3, and a summary of the significant intersections from the auger and trench sampling programs is presented in Table 9-4. A representative cross section showing the significant results from the auger drilling program is presented in Figure 9-6, and Figure 9-7 presents an oblique view of a portion of the auger drilling program in the mineralized area.

Examination of the gold-bearing saprolite samples from the auger holes suggest that they have a high iron content (likely up to 80% Fe_2O_3), are magnetic, and contain mainly quartz and chlorite with lesser quantities of talc and sericite.

TABLE 9-3 SUMMARY OF EXPLORATION SAMPLES, CÓRREGO BRANDÃO TARGET
Jaguar Mining Inc. – Caeté Mining Complex

Item	Number	Remarks
Soil Samples	183	Multi-element analysis. Best value 2.62 g/t Au
Chip Sampling	104	6 samples had gold grades greater than 1 g/t Au. Best value was 7.31 g/t Au
Channel Sampling	31 samples collected along 5 channels	
Auger Drilling	17 holes total 280.8 m 292 samples taken	
Trenches	3 trenches for a total length of 29.5 m 26 samples collected	

TABLE 9-4 SUMMARY OF SIGNIFICANT INTERSECTIONS, AUGER AND TRENCHES, CÓRREGO BRANDÃO TARGET
Jaguar Mining Inc. – Caeté Mining Complex

Hole/Trench ID	From (m)	To (m)	Downhole Interval (m)	Gold Grade (g/t Au)	Grade x Thickness	Type	Date (MM/DD/YYYY)
TCBR0001	0	4.9	4.9	1.13	5.54	Trench	1/11/2019
TCBR0002	0	10.22	10.22	1.59	16.25	Trench	1/25/2019
Including	0	5.06	5.06	2.77	14.04		
TCBR0003	0	12.23	12.23	1.89	23.11	Trench	3/18/2019
Including	6.53	12.23	5.7	3.08	17.53		
ACBR0003	0	11	11	1.44	15.84	Auger	1/29/2019
Including	2	4	2	2.3	4.59		
ACBR0004	10	22.8	12.8	21.32	272.9	Auger	2/8/2019
Including	10	13	3	60.08	180.25		
ACBR0005	9	20	11	7.08	77.88	Auger	2/12/2019
Including	9	12.8	3.8	16.91	64.26		
Including	9	11	2	28.7	57.4		
ACBR0006	8	17.5	9.5	2.72	25.84	Auger	5/14/2019
Including	9	11	2	3.01	6.02		
Including	11.5	17.5	6	3.14	18.84		
ACBR0011A	8	9	1	1.85	1.85	Auger	5/24/2019
ACBR0012	0	2	2	2.25	4.5	Auger	5/27/2019
	11	12	1	1.17	1.17		
ACBR0013	9	16.5	7.5	1.97	14.78	Auger	5/28/2019
Including	10	12.5	2.5	4.37	10.93		
ACBR0014	5	17	12	1.51	18.12	Auger	5/30/2019
Including	15	17	2	3.28	6.56		

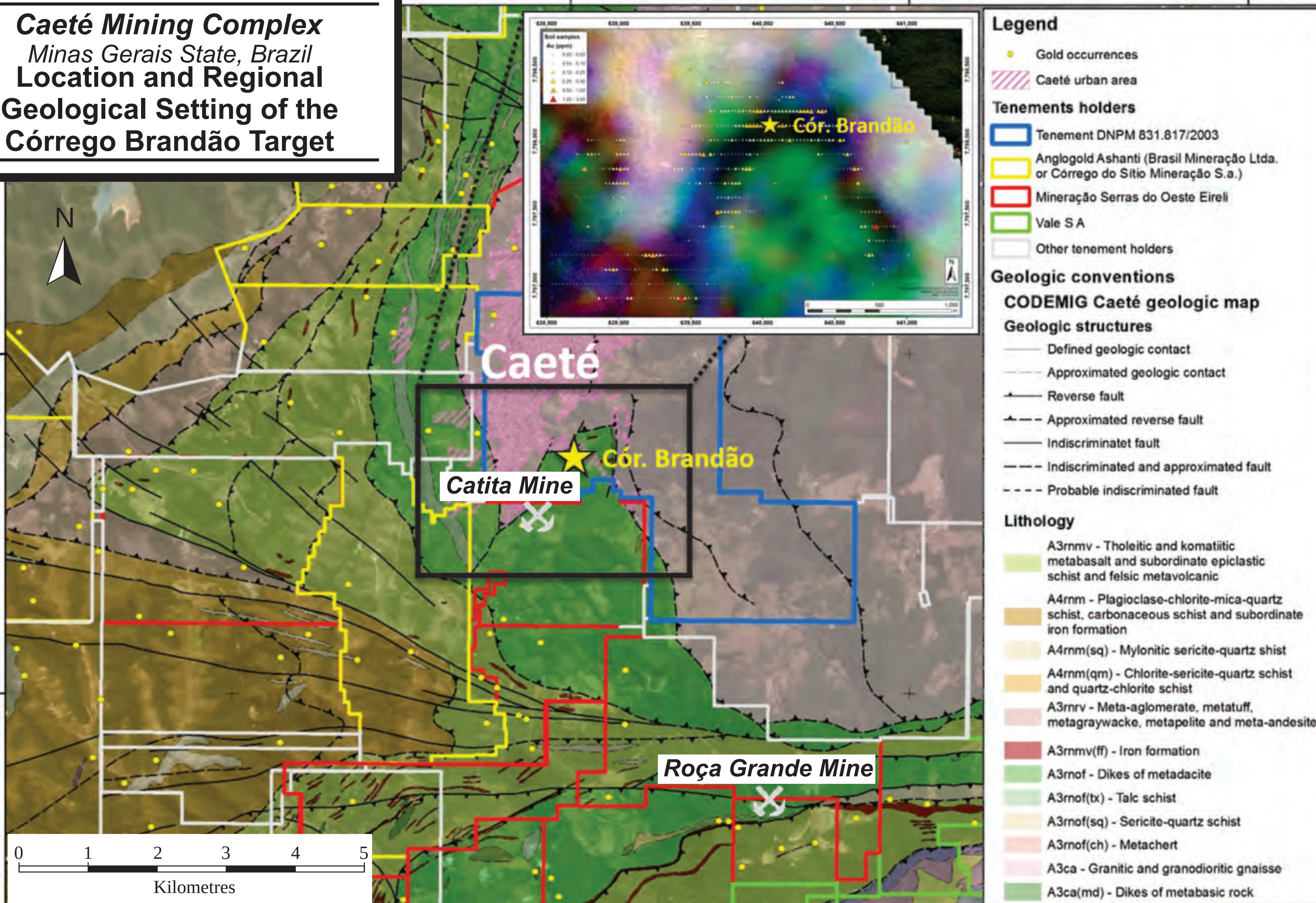
Figure 9-5

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Location and Regional Geological Setting of the Córrego Brandão Target



August 2020

Source: Jaguar Mining Inc., 2020.

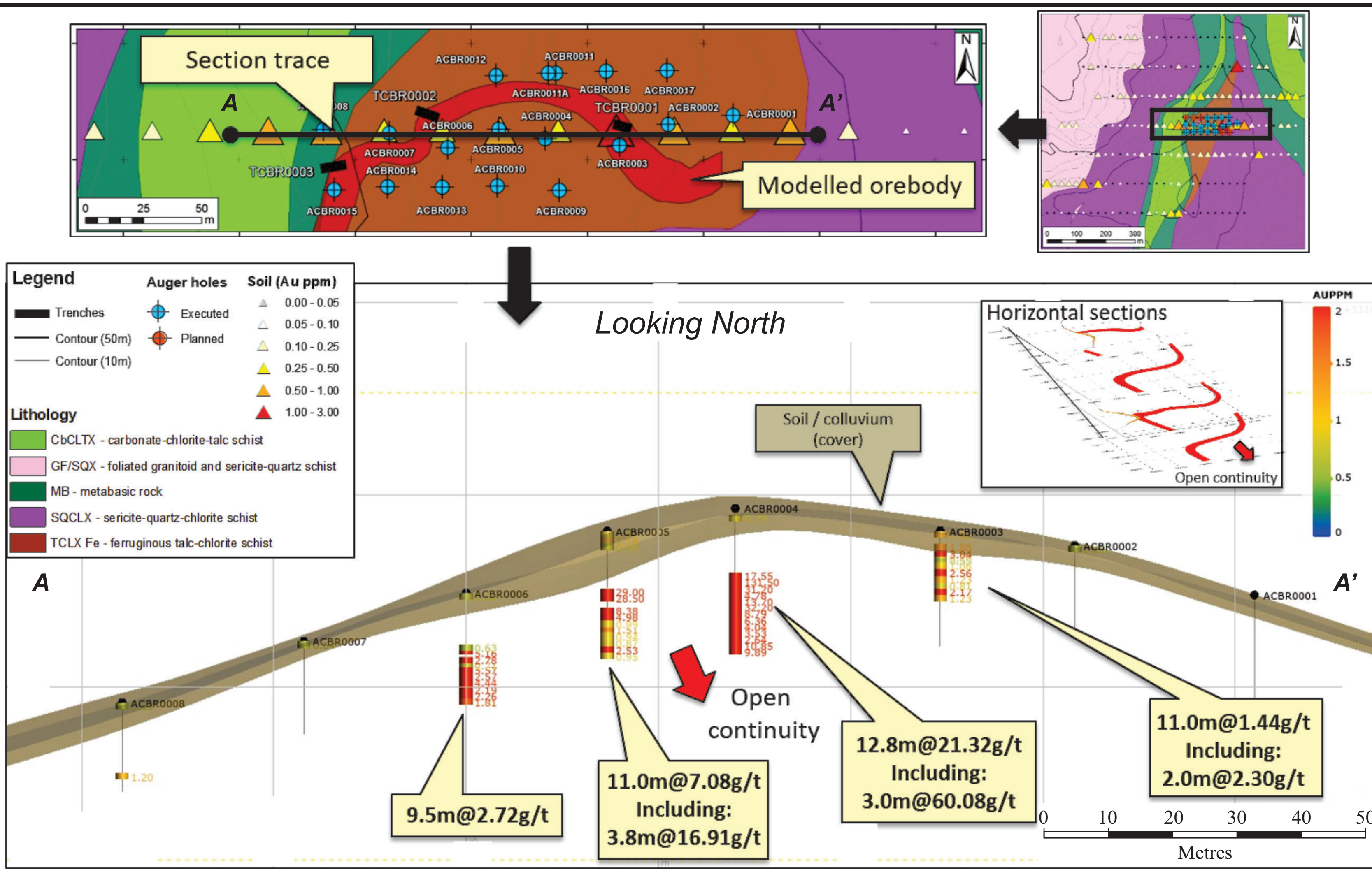


Figure 9-6

Jaguar Mining Inc.

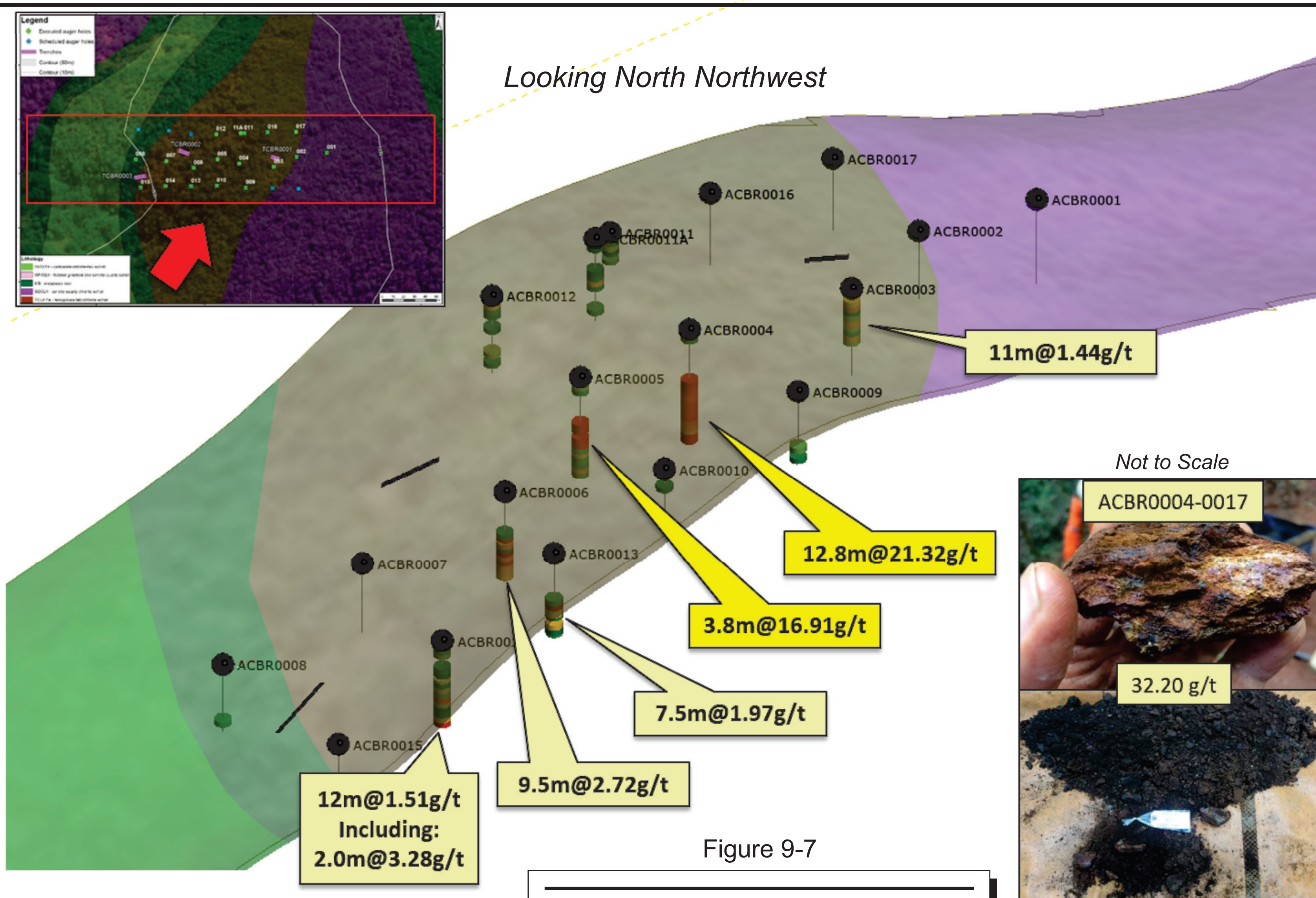
Caeté Mining Complex

Minas Gerais State, Brazil

Sample Cross Section of the Auger Drilling Program, Córrego Brandão Target

August 2020

Source: Jaguar Mining Inc., 2020.



Note: Photos from Auger Hole ACBR00004-0017

Figure 9-7

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Isometric View of the Auger Drilling Program, Córrego Brandão Target

August 2020

Source: Jaguar Mining Inc., 2020.

PILAR MINE

The following exploration activities were carried out by Jaguar on the Pilar Mine property:

- 2014:
  - Re-processing of magnetic data from the airborne Companhia de Desenvolvimento Econômico de Minas Gerais (CODEMIG) survey.
- 2015:
  - High definition induced polarization (IP) ground survey covering the south extension of the Pilar Mine. The estimated depth of penetration of the survey was up to 1,000 m.
  - Geological mapping and soil sampling on the Pacheca and Cubas targets.
  - Soil sampling campaign, 744 samples. Anomalous values (0.15 g/t Au to 0.48 g/t Au) were outlined along an 800 m long area oriented in a northeast-southwest direction.
- 2017 and 2018:
  - Detailed geological mapping, soil and chip sampling campaigns, channel sampling, and auger drilling on the Pilarzinho and Torre targets.

PILARZINHO TARGET

The Pilarzinho target is located on Mineral Tenement 831.878/2013, approximately 1,400 m southwest of the Pilar Mine, and along the southwestern strike projection of the Southwest deposit (Figure 9-8). This area has been the focus of previous exploration and mining activities as evidenced by the presence of excavations completed by previous owners of the property (Figure 9-9). Records from this previous work are not currently available.

The location and results of the soil sampling program is presented in Figure 9-10. A summary of the sample collection methods for the soil and channel samples was presented above. A summary of the exploration work carried out on the Pilarzinho target is presented in Table 9-5. All soil, channel, and auger samples were analyzed at ALS laboratory in Belo Horizonte using the PREP-31 method for preparation and Au-AA26 (fire assay for gold – 50 g) analytical method. All soil and channel samples were also analyzed by the ME-MS61 method for 48 elements. Chip samples were analyzed at the internal Jaguar mine site laboratory by fire assay with an AAS finish.

TABLE 9-5 SUMMARY OF EXPLORATION SAMPLES, PILARZINHO TARGET
Jaguar Mining Inc. – Caeté Mining Complex

Item	Number	Remarks
Soil Samples	296	Multi-element analysis completed for 289 samples. Best value 0.92 g/t Au.
Chip Sampling	37	One sample had a gold grade of 2.36 g/t Au.
Channel Sampling	255 samples collected along 15 channels	Best result is 8.56 g/t Au along a length of 2.63 m (includes 9.46 g/t Au / 2.0 m).
Auger Drilling	6 holes total 66 m, 68 samples taken	No significant values intersected.

The gold mineralization found in the channel sample is interpreted to be hosted by the same stratigraphic package that hosts the SW Limb of the Pilar Mine. The gold mineralization is observed to be hosted by BIF layers and is interpreted to occur as free gold and associated with sulphides (as evidenced from pan concentrates and boxwork textures observed in outcrop, respectively). Silicification and quartz veining are also observed in the area.

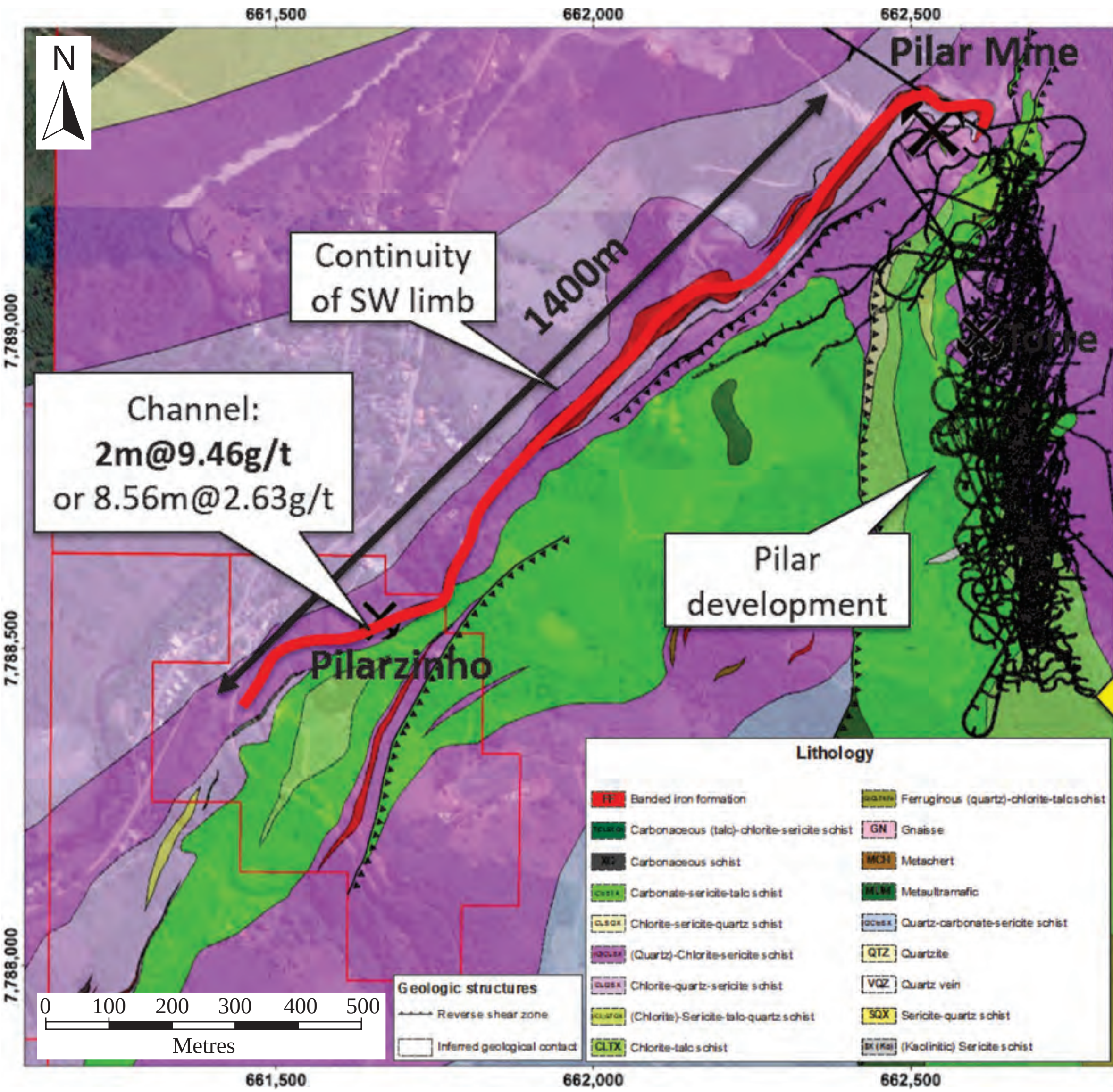
Figure 9-8

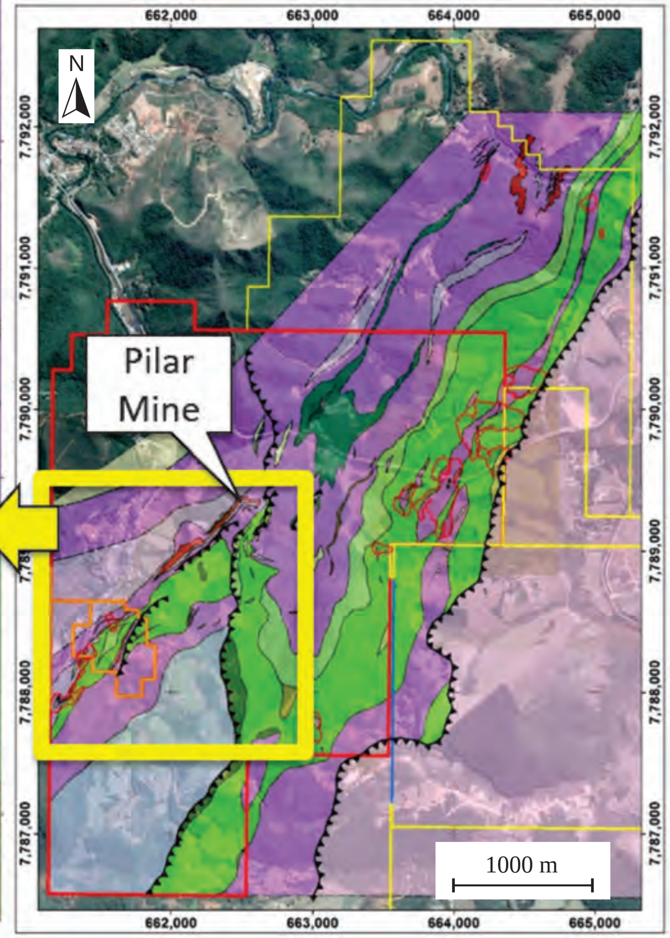
Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Location and Property Scale Geological Setting of the Pilarzinho Target





August 2020

Source: Jaguar Mining Inc., 2020.

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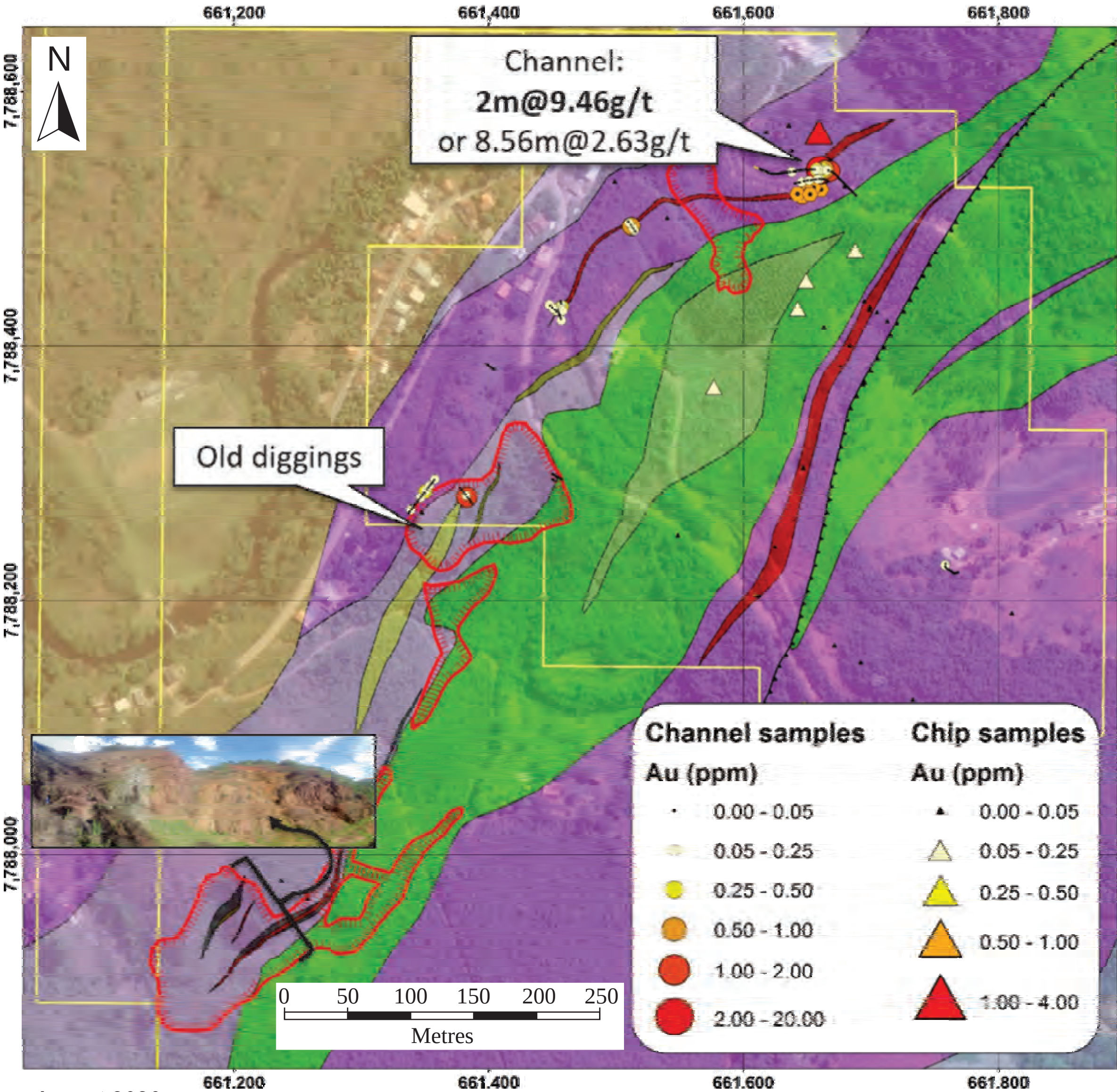
Figure 9-9

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Local Geological Setting of the Pilarzinho Target



Legend

Auger holes

Tenement

Geologic structures

Reverse shear zone

Inferred geological contact

Excavations

Lithology

ALU Alluvium

FF Banded iron formation

XG Carbonaceous schist

CbSTX Carbonate-sericite-talc schist

(Q)CLSX (Quartz)-Chlorite-sericite schist

(Q)STX (Quartz)-Sericite-talc schist

CLQSX Chlorite-quartz-sericite schist

CLTX Chlorite-talc schist

QCbSX Quartz-carbonate-sericite schist

SQX Sericite-quartz schist

August 2020

Source: Jaguar Mining Inc., 2020.

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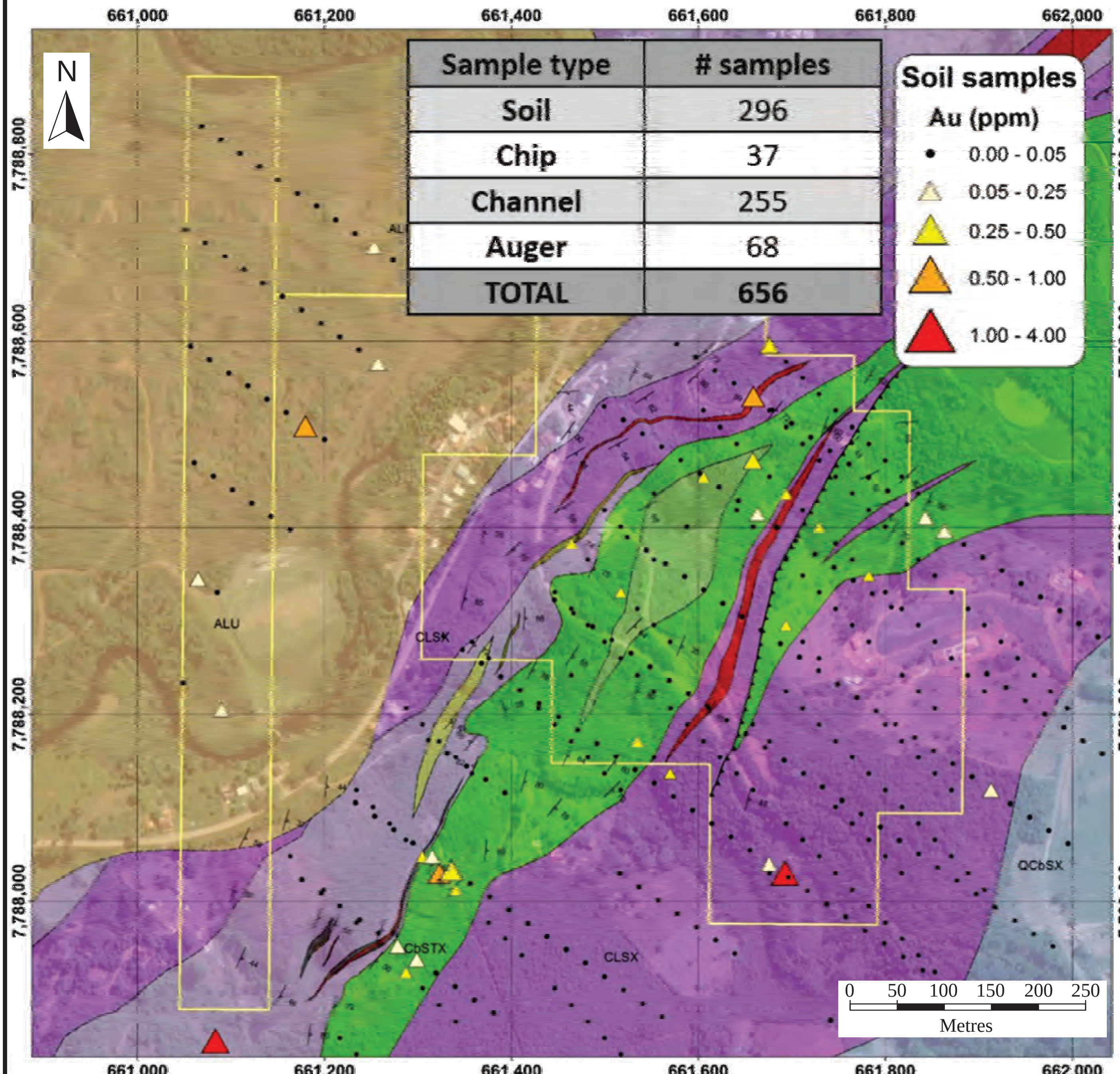


Figure 9-10

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Location and Results of the Soil Samples, Pilarzinho Target

August 2020 **Source: Jaguar Mining Inc., 2020.**

TORRE TARGET

The Torre target is located immediately to the south of one of the previously excavated open pits at the Pilar Mine. Figure 9-11 is the surface expression of the Torre deposit, which has been traced by drilling and channel samples in the mine to a depth of approximately 800 m to 850 m beneath the surface. Images of the Torre mineralization at depth have been presented in Section 7.

In this area, chemical and clastic sedimentary rocks of the Santa Quitéria Unit are in contact with tholeiitic basalts and komatiites (now metamorphosed to talc-chlorite schists) of the Quebra-Ossos Unit. These two units are in contact across a shear zone which can be traced to the northeast where it crosses the BIF units in the São Jorge region. A previous open pit mine (Pit 15) was excavated along a mineralized portion of this shear zone that now forms part of the Torre deposit in the mine. At the extreme southern end of this pit, the strike of the host rocks changes abruptly by 90° for a distance of approximately 250 m. This inflection in the strike of the host rocks forms the Torre target.

The strike of the host rock units in the Torre target area are generally west-northwest to east-southeast, and the foliations observed in the rock units varies widely in both direction and angle. In the area of the inflection at the southern end of Pit 15, the dip of the foliations are towards the southwest, but gradually change to a southeasterly dip along strike to the east. The dip angle of the foliations vary from sub-vertical to approximately 35°. The gold mineralization appears to be related to the first recognizable penetrative foliation (Sn) which is observed to be folded along a fold axis that plunges -37° towards an azimuth of 168°. A younger penetrative foliation is recognized in this region (Sn+1), as is an even younger deformation event (Sn+2) that is expressed as a crenulation cleavage. Observations suggest that the intersection lineation between the first and second penetrative fabrics may be associated with the plunge of the mineralization at Torre.

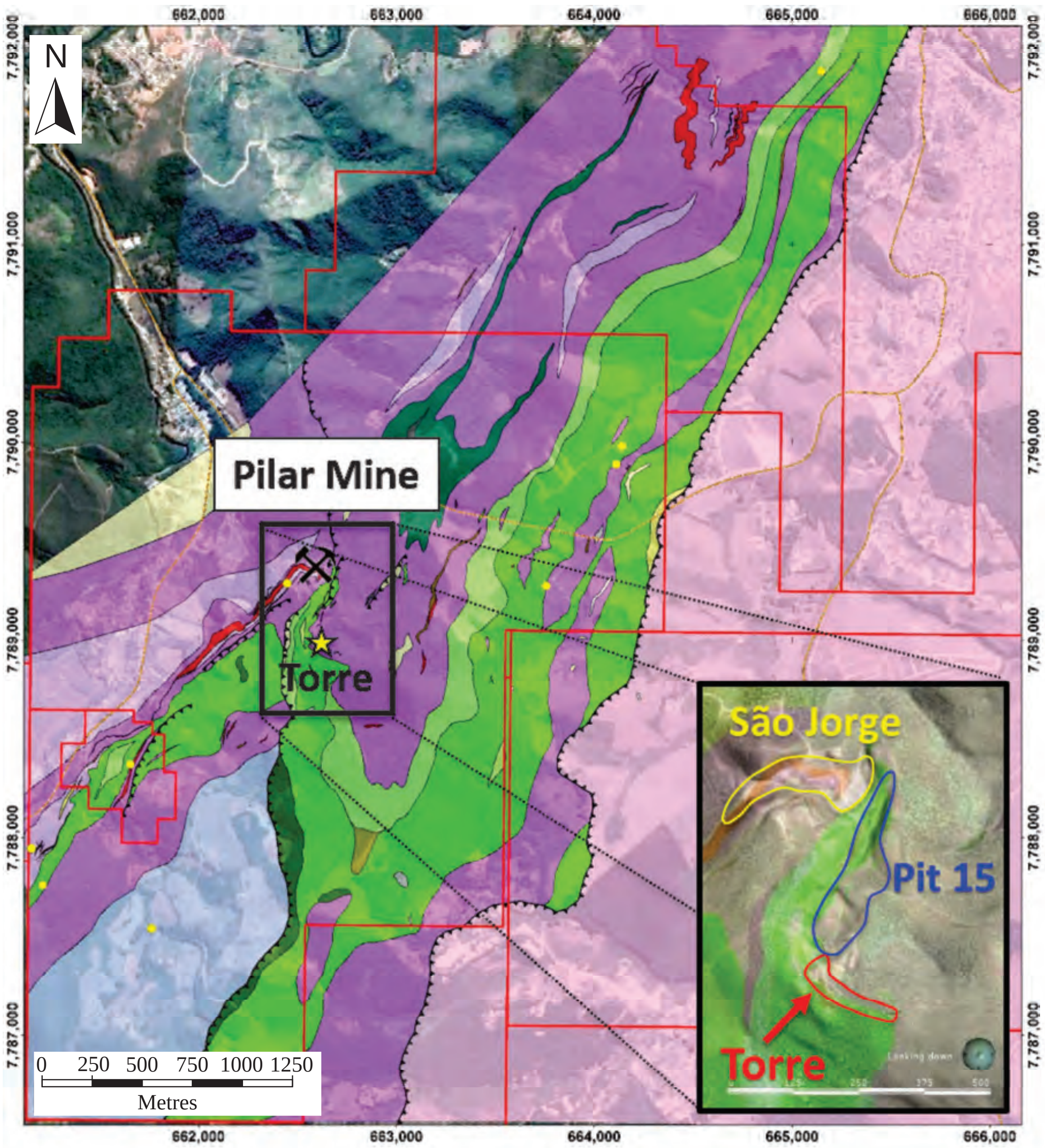
Figure 9-11

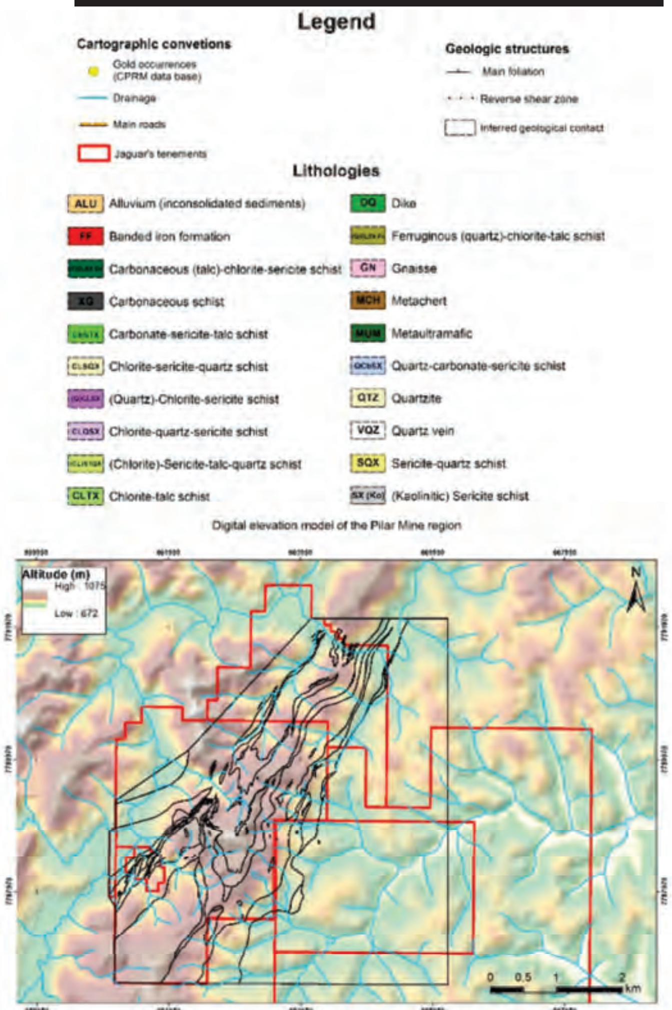
Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Local Geological Setting of the Torre Target





August 2020

Source: Jaguar Mining Inc., 2020.

The thickness of the cover materials (soils and colluvium) increases along strike to the east-southeast. This required the excavation of trenches and collection of samples by mechanical auger in order to observe and describe the lithologies present in this region. The location of the trenches and auger drill holes completed at the Torre target are presented in Figure 9-12.

A summary of the equipment and procedures used to collect the auger, channel, and soil samples is presented above. All soil, channel, and auger samples were analyzed for gold at the internal Jaguar mine site laboratory using fire assay with an AAS finish. All soil samples were analyzed by SGS using the ICM14B method for multielement analysis.

A summary of the exploration work carried out on the Torre target is presented in Table 9-6. A summary of significant values returned from this work is presented in Table 9-7 and their locations are presented in Figure 9-13.

TABLE 9-6 SUMMARY OF EXPLORATION SAMPLES, TORRE TARGET
Jaguar Mining Inc. – Caeté Mining Complex

Item	Number	Remarks
Soil Samples	766	Multi-element analysis completed for 722 samples. Best value 2.23 g/t Au.
Chip Sampling	147	Highest value of 7.86 g/t Au.
Channel Sampling	378 samples collected along 30 channels	
Auger Drilling	15 holes total 152 m 161 samples taken	
Trenching	6 trenches completed for a total length of 160 m. 130 samples collected	

TABLE 9-7 SUMMARY OF EXPLORATION SAMPLES, TORRE TARGET
Jaguar Mining Inc. – Caeté Mining Complex

Sample Type	HoleID	Length (m)	Grade (g/t Au)	Remarks
Auger	ACUB005	5	1.71	-
Auger	ACUB012	2.5	1.25	-
Channel	CLCUB038	4.93	3.92	-
Channel	CLCUB048	3.3	4.85	-
Channel	CLCUB051	5.79	1.86	-
Channel	CLCUB057	1	7.74	-
Channel	CLCUB071	2.53	2.79	-
Channel	CLCUB081	1.15	2.63	-
Channel	CLCUB141	3.61	9.86	includes 7.91 m @4.8 g/t Au
Channel	CLCUB156	2.74	1.5	-
Trench	TTOR0004	10.61	1.27	includes 3.51 m @2.49 g/t Au

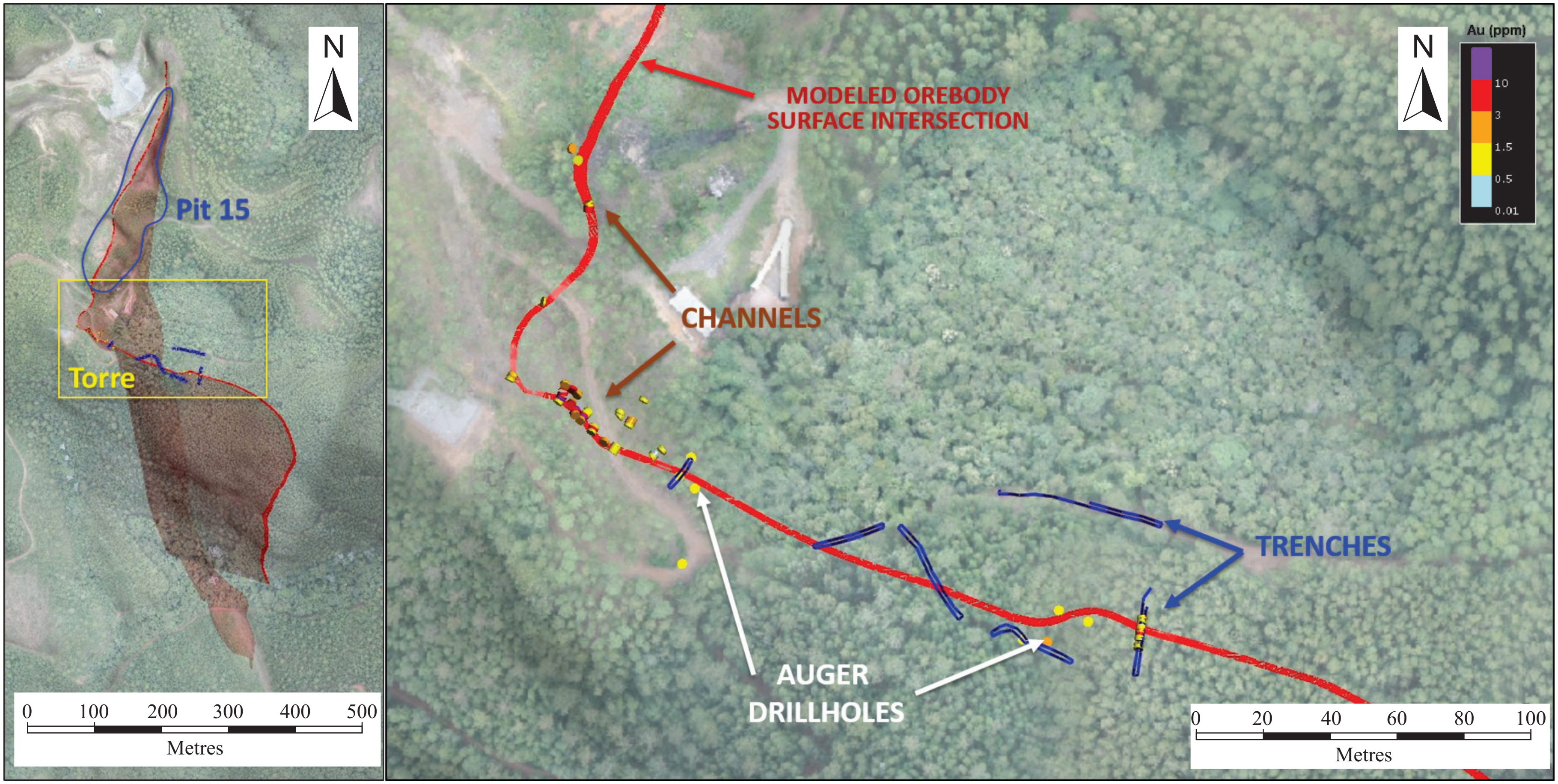


Figure 9-12

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Location of Exploration Trenches and Auger Holes, Torre Target

Source: Jaguar Mining Inc., 2020.

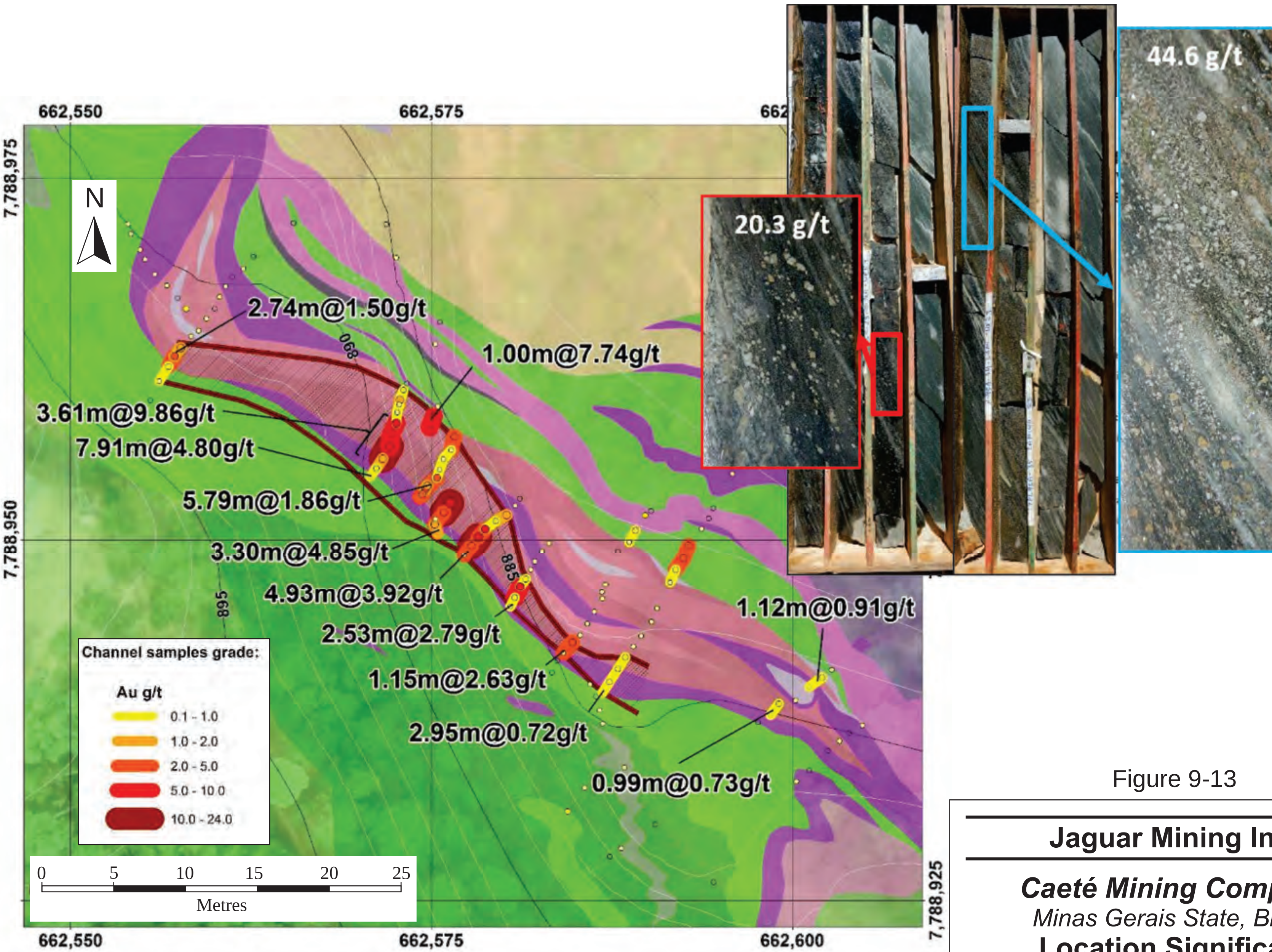


Figure 9-13

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Location Significant Results, Torre Target

August 2020

Source: Jaguar Mining Inc., 2020.

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10 DRILLING

Jaguar has carried out a number of surface-based and underground-based drilling programs at the Roça Grande Mine since entering into a mutual exploration and option agreement with Vale in 2005. These in-fill and exploration drilling programs were focussed primarily on the RG01/07, RG02, RG03, and RG06 deposits.

ROÇA GRANDE

Jaguar started diamond drilling at Roça Grande in August 2006. Following the completion of the first exploratory holes drilled at the RG01/07, RG02, RG03, and RG06 mineralized zones, Jaguar carried out an in-fill program to delineate these zones. No drilling has been completed at the Roça Grande Mine in 2019.

A summary of the drilling campaigns completed at the Roça Grande Mine is provided in Table 10-1. The distribution of drill holes and channel samples is shown in Figure 10-1.

TABLE 10-1 SUMMARY OF DRILLING CAMPAIGNS, ROÇA GRANDE MINE
Jaguar Mining Inc. – Caeté Mining Complex

Period	Target	Diamond Drilling No. Holes	Diamond Drilling Total Length (m)	Roto-Percussive Drilling No. Holes	Roto-Percussive Drilling Total Length (m)
		Vale			
1973-1993	Roça Grande	116	18,288	-	-
1994-1995	Roça Grande	-	-	313	17,270
1996-1999	RG01	8	550	-	-
	RG02	9	910	-	-
	RG05	18	1,530	-	-
	RG03,04 and 06	10	625	-	-
2000	RG02	4	410	-	-
	RG03	8	571	-	-
	RG05	1	63	-	-
	RG06	3	379	-	-
Sub-total, Vale		**177**	**23,325**	**313**	**17,270**
		Jaguar			
2004-2010	RG01/07	111	10,625	-	-
	RG02	59	16,580	-	-
	RG03	56	9,407	-	-
	RG06	55	7,954	-	-
2011	RG01/06	79	10,769	-	-
2012	RG01/07	124	14,142	-	-
2013	RG01/07	82	13,373	-	-
2014	RG03/RG06	14	794	-	-
Sub-total, Jaguar		**580**	**83,643**	**-**	**-**

The QP has not identified any drilling, sampling, or core recovery issues that could materially affect the accuracy or reliability of the core samples at the Roça Grande Mine.

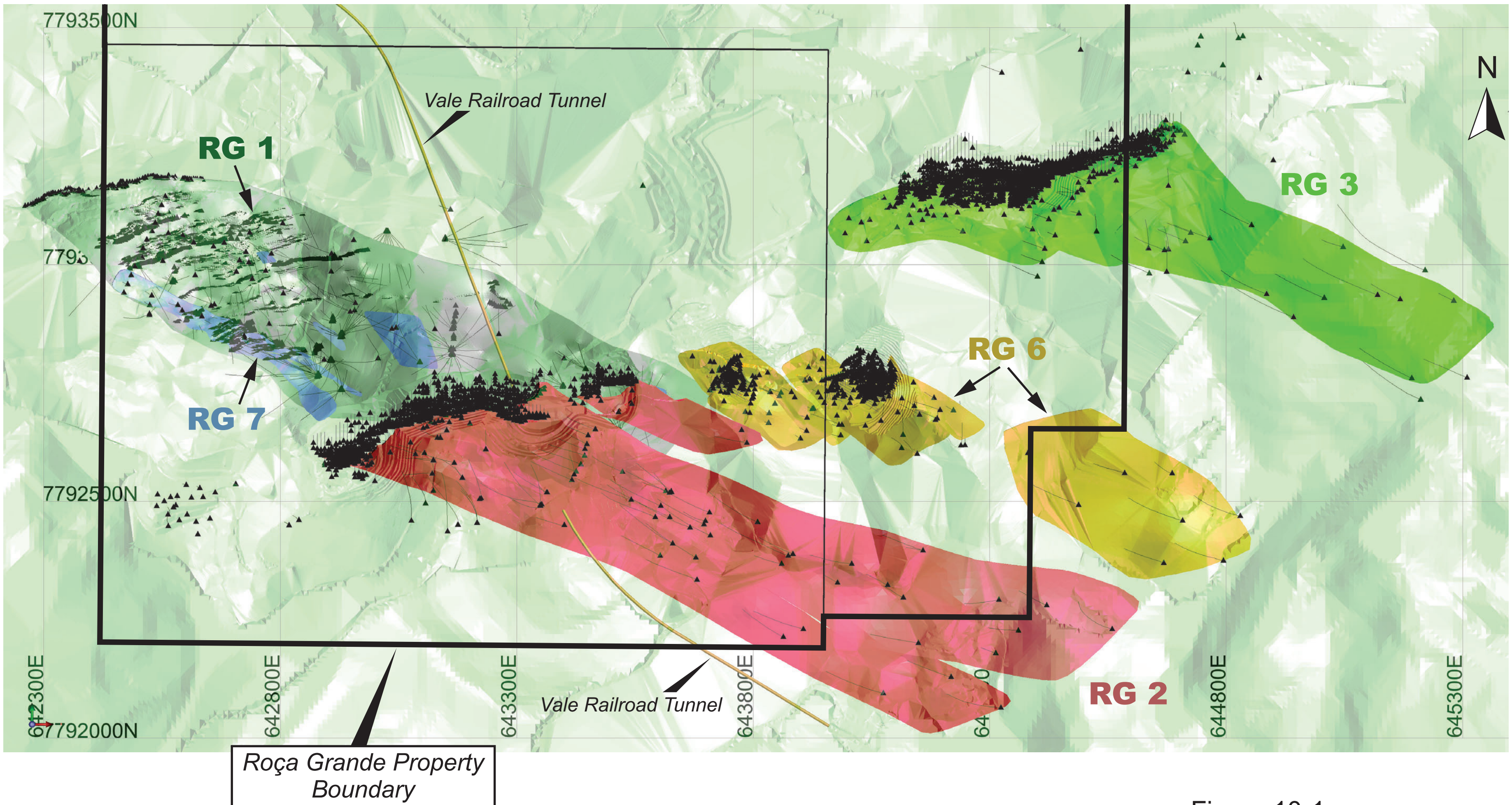

Figure 10-1

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Drill Hole and Channel Sample Locations, Roça Grande Mine

August 2020

Source: RPA, 2016.

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PILAR

Exploration activities were carried out on the Pilar property by Vale in the 1989 to 1994 period and again between 2002 and 2003. Beginning in 2004, Jaguar has carried out drilling programs to search for gold-bearing mineralization located in and about the Pilar Mine. The targets in the early years included the near surface portions (within 200 m of the surface) of the Pilar Sul, São Jorge, and the São Jorge Extensão areas of the mine property. The targets of the drilling programs have subsequently involved evaluating the depth extensions of the gold mineralized zones that were found at the surface. A summary of the drilling programs for the 2004 to 2018 period is provided in Table 10-2. Additional details regarding these drilling campaigns have been presented in RPA (2019) and the references therein.

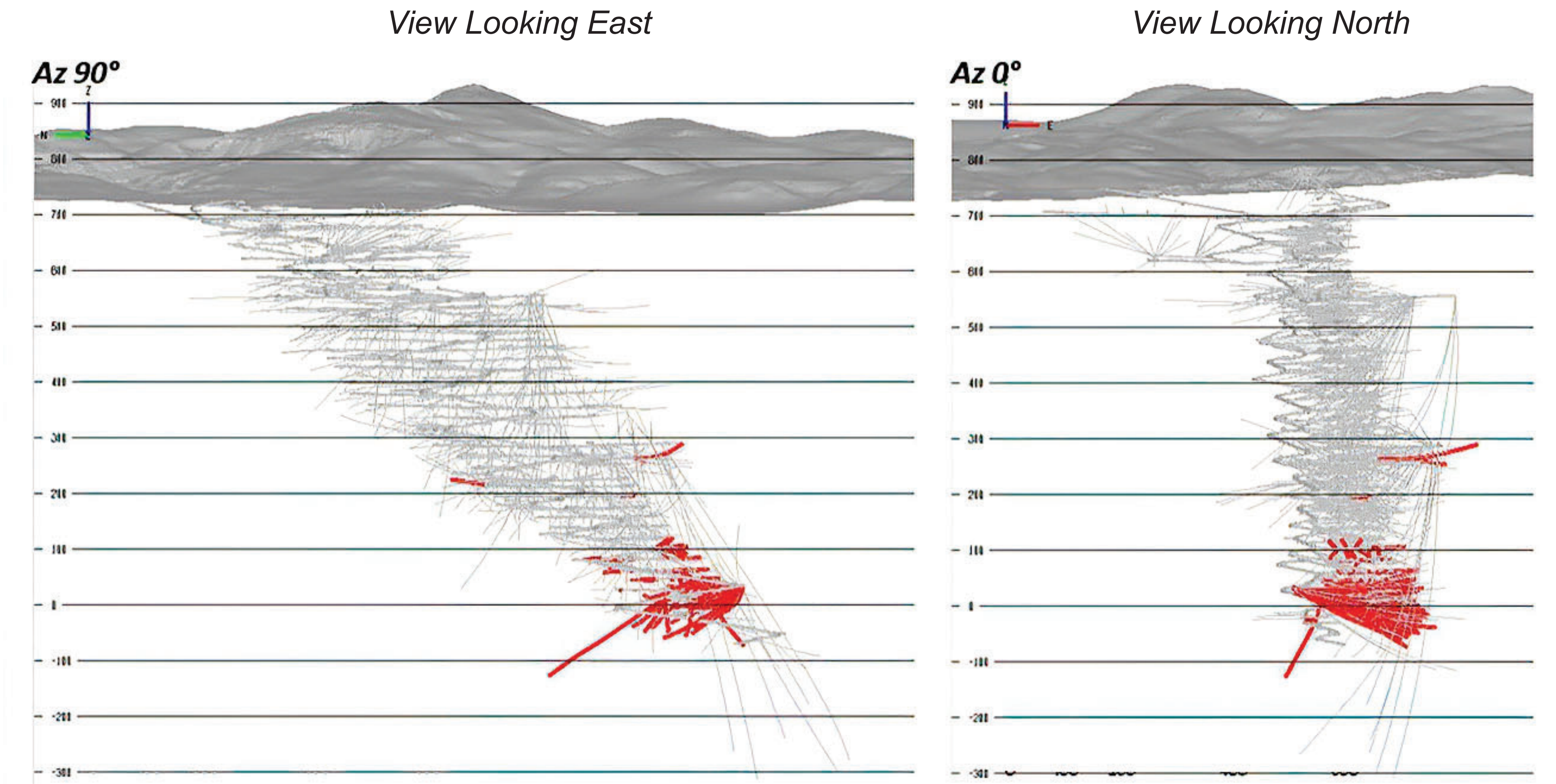
TABLE 10-2 SUMMARY OF DRILLING CAMPAIGNS, PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Period	Target	Diamond Drilling		Roto-Percussive Drilling	
		No. Holes	Total Length (m)	No. Holes	Total Length (m)
		Vale			
1989-1994	-	65	11,812	60	2,960
2002-2003	-	10	3,069	-	-
Sub-total, Vale	**-**	**75**	**14,881**	**60**	**2,960**
		Jaguar			
2004-2010	Phase 1	36	6,489	-	-
	Phase 2	41	12,926	-	-
	Phase 3-UG	180	11,200	-	-
	Phase 3-Surface	19	10,186	-	-
Q4 2010-2011	-	44	12,574	-	-
2012	UG-Exploration	31	4,005	-	-
	UG-Definition	121	9,705		
2013	UG- Exploration	40	5,978	-	-
	UG-Definition	51	3,557		
2014	UG- Exploration	60	8,398	-	-
	UG-Definition	125	10,818		
	Surface Exploration	9	910		
2015	UG- Exploration	30	6,477	-	-
	UG-Definition	12	879		
2016	UG- Exploration	19	2,994	-	-
	UG-Definition	89	8,143		
2017	UG- Exploration	23	7,081	-	-
	UG-Definition	150	9,534		
2018	UG- Exploration	3	328	-	-
	UG-Definition	172	12,172		
2019	UG-Definition	83	6,206	-	-
	UG-In-Fill	20	3,293		
	UG-Exploration	22	4,822		

Period	Target	Diamond Drilling No. Holes	Diamond Drilling Total Length (m)	Roto-Percussive Drilling No. Holes	Roto-Percussive Drilling Total Length (m)
2020	UG-Definition	36	1,779	-	-
	UG-In-Fill	1	9		
	UG-Exploration	47	8,307		
Sub-total, Jaguar		**1,464**	**168,770**	**-**	**-**

In 2019, Jaguar carried out a delineation and grade control drilling program totalling 9,499 m in total length that focussed on upgrading the categories of the Mineral Resources so as to improve the reliability of the Mineral Reserves. The deposits targeted by this drilling were BF, BFII BA, and Torre located between elevation 301 m and -127 m (Figure 10-2). In late 2019, Jaguar began an exploration drilling project with main objectives of testing for the presence of the down plunge continuity in the BA and Torre deposits and improving the confidence of the mineralization. This drilling program targeted areas between the elevations 230 m and -15 m and totalled 3,771 m of drilling (Figure 10-3). An additional 831 m of drilling was completed to test targets in the Southwest, São Jorge, and the LFW deposits (Figure 10-4). Overall, 14,321 m of drilling in 163 drill holes was completed in 2019.

The drilling completed in the first half of 2020 was designed to provide additional geological information to support the mining operations and to confirm the interpreted continuity of the mineralization discovered by the 2019 drilling campaign. The goal of this drilling was to evaluate the spatial location and grade distribution of the gold mineralization in the Torre deposit, to begin the evaluation of the mineralization for the Southwest and LPA deposits, to continue to upgrade the confidence of the Mineral Resources, and to provide geological information in support of current mining operations. To June 30, 2020, a total of 1,787 m of drilling was completed for grade control and in-fill drilling of the BF, BFII, BFIII, LPA, and the Torre deposits. A total of 4,364 m of evaluation drilling was completed targeting the Southwest, BFII, BF, and Torre deposits proximal to the current mine workings. A total of 3,942 m of exploration drilling was completed to test portions of the BF and Torre deposits located at a further distance from the current mine workings. Overall, 85 drill holes were completed in the first half of 2020 that totalled 10,094 m in length (Figures 10-5, 10-6, and 10-7).



Legend:
- 2019 Drill Holes
- Previous Drill Holes

0 100 200 300 400 500
Metres

Figure 10-2

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Location of Infill and Grade Control Drill Holes Completed in 2019, Pilar Mine

August 2020

Source: Jaguar Mining Inc., 2020.

www.rpacan.com

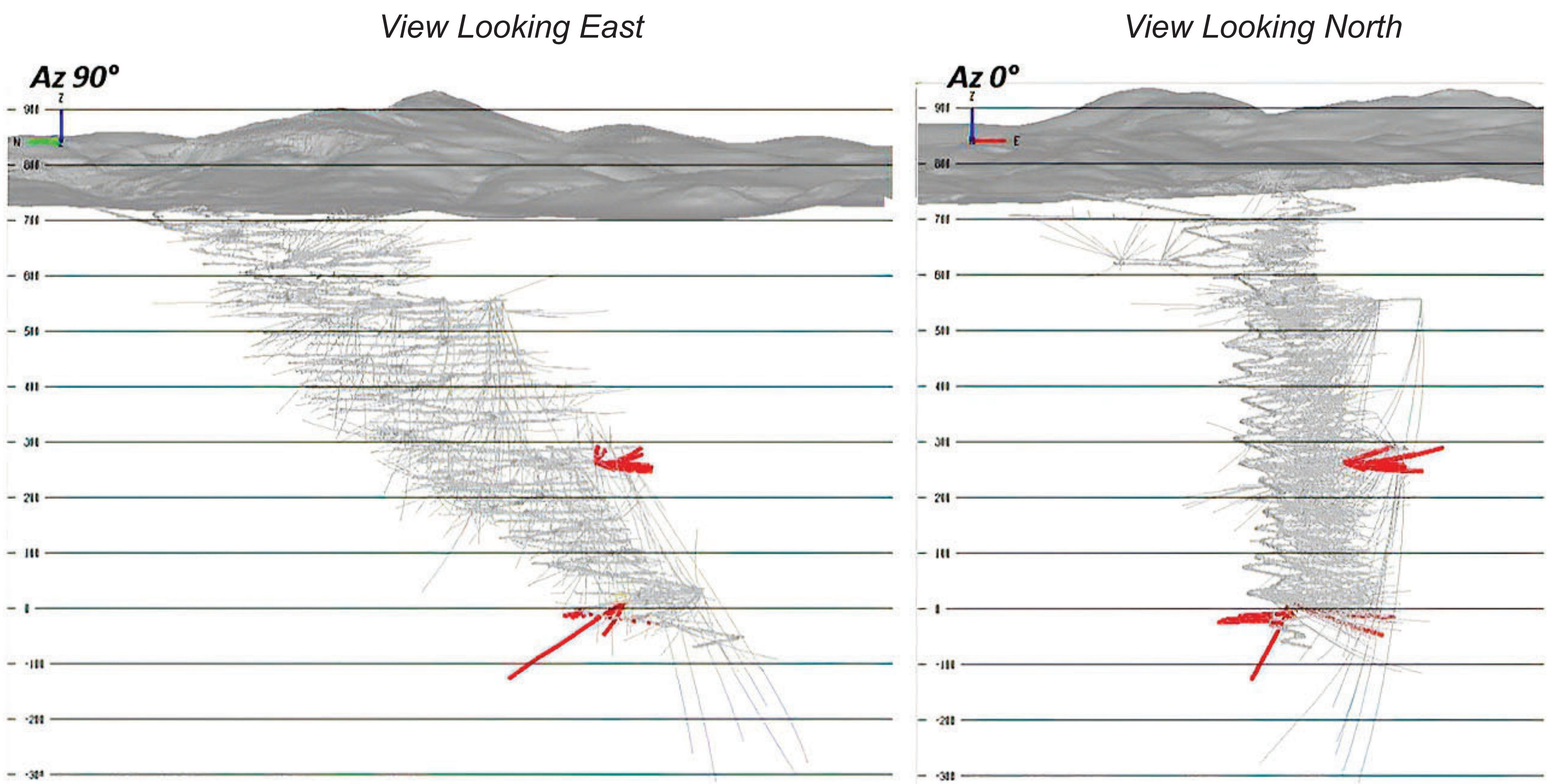


Figure 10-3

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Location of Exploration Drill Holes Completed in 2019, Pilar Mine

Legend:

2019 Drill Holes

Previous Drill Holes

0 100 200 300 400 500

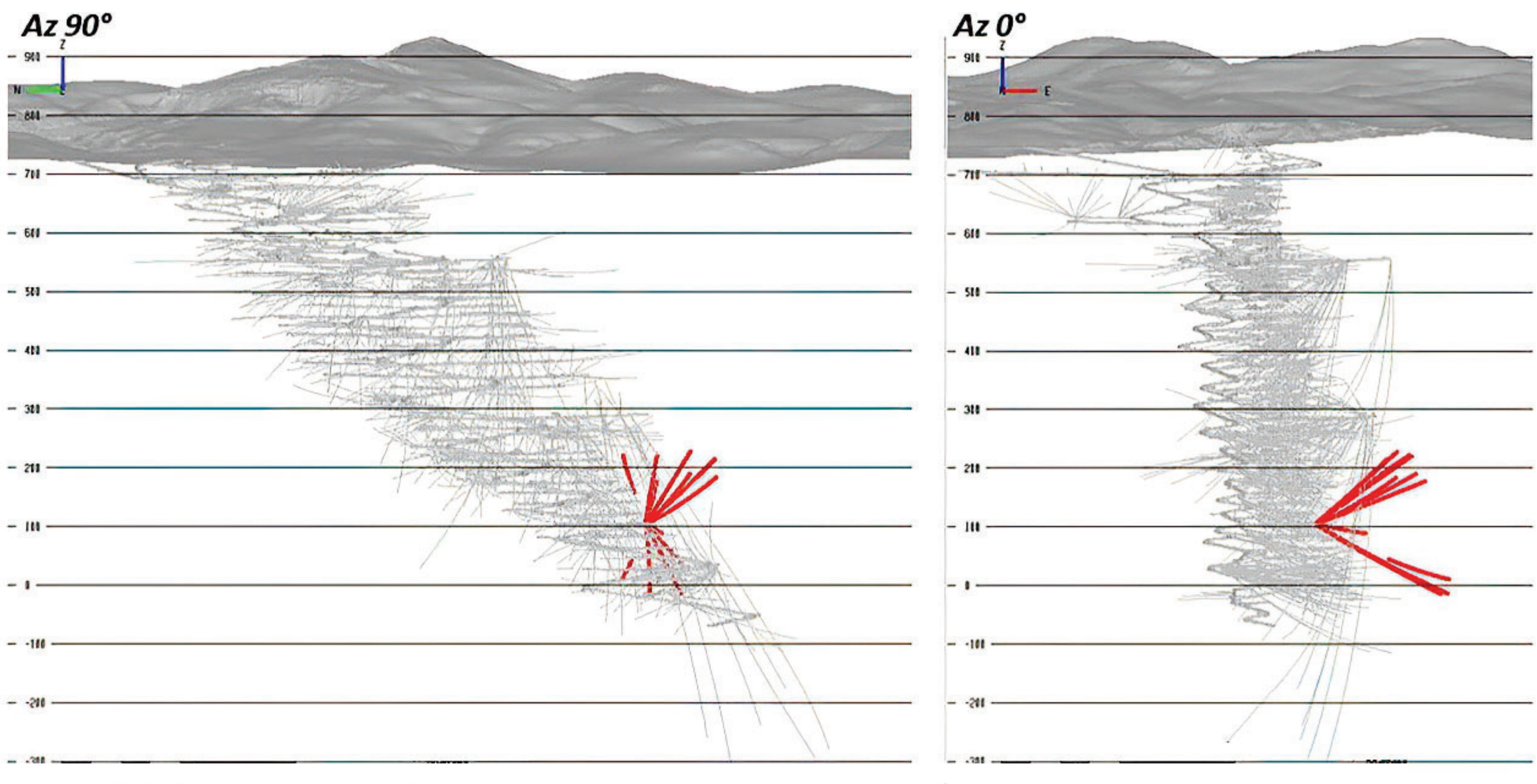
Metres

August 2020

Source: Jaguar Mining Inc., 2020.

RPA Now part of SLR

www.rpacan.com



Legend:
- 2019 Drill Holes
- Previous Drill Holes

0 100 200 300 400 500
Metres

Figure 10-4

Jaguar Mining Inc.

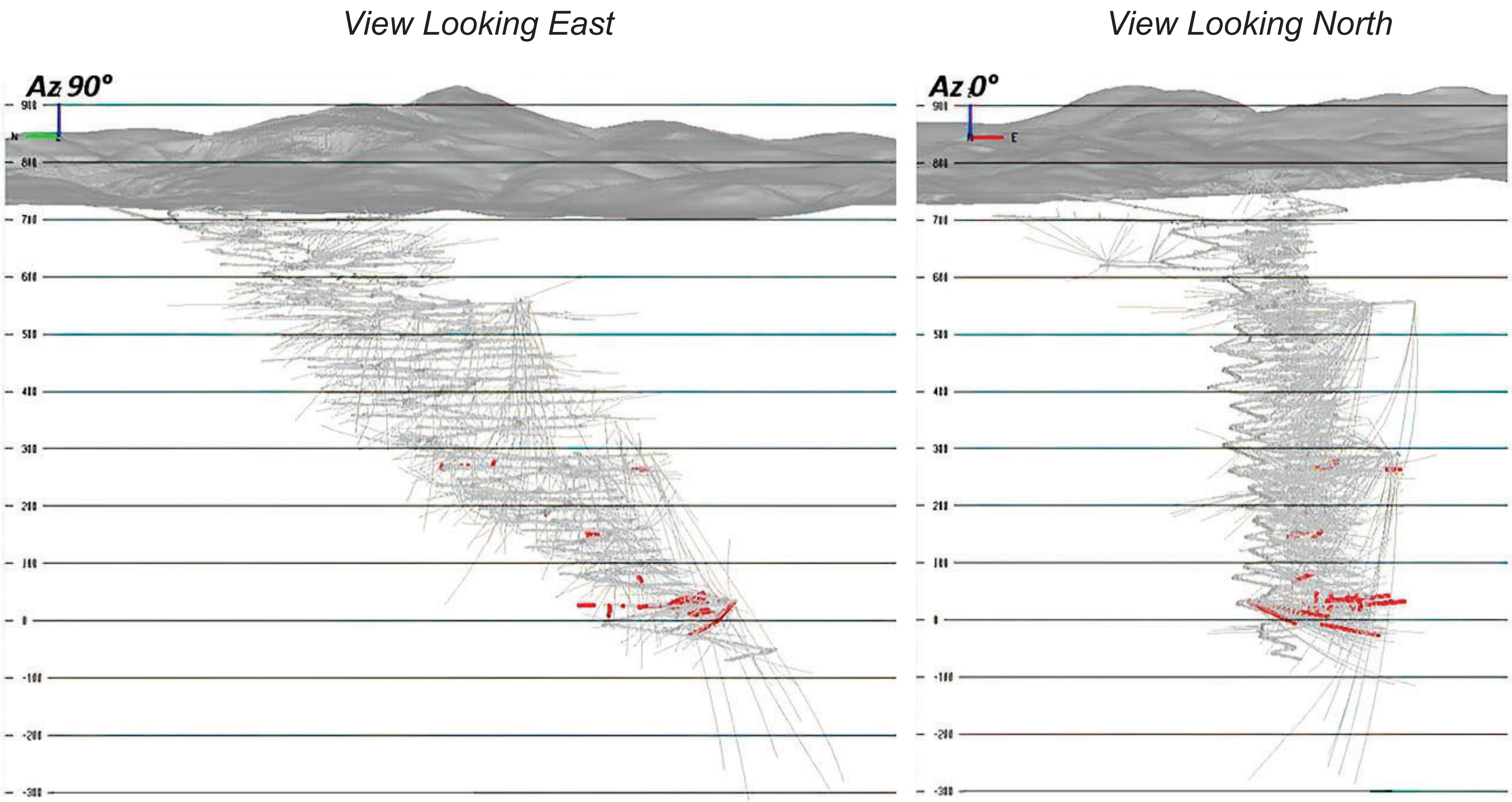
Caeté Mining Complex

Minas Gerais State, Brazil

Location of External Exploration Drill Holes Completed in 2019, Pilar Mine

August 2020

Source: Jaguar Mining Inc., 2020.



Legend:
- *2020 Drill Holes*
- *Previous Drill Holes*

0 100 200 300 400 500
Metres

August 2020

Source: Jaguar Mining Inc., 2020.

Figure 10-5

Jaguar Mining Inc.

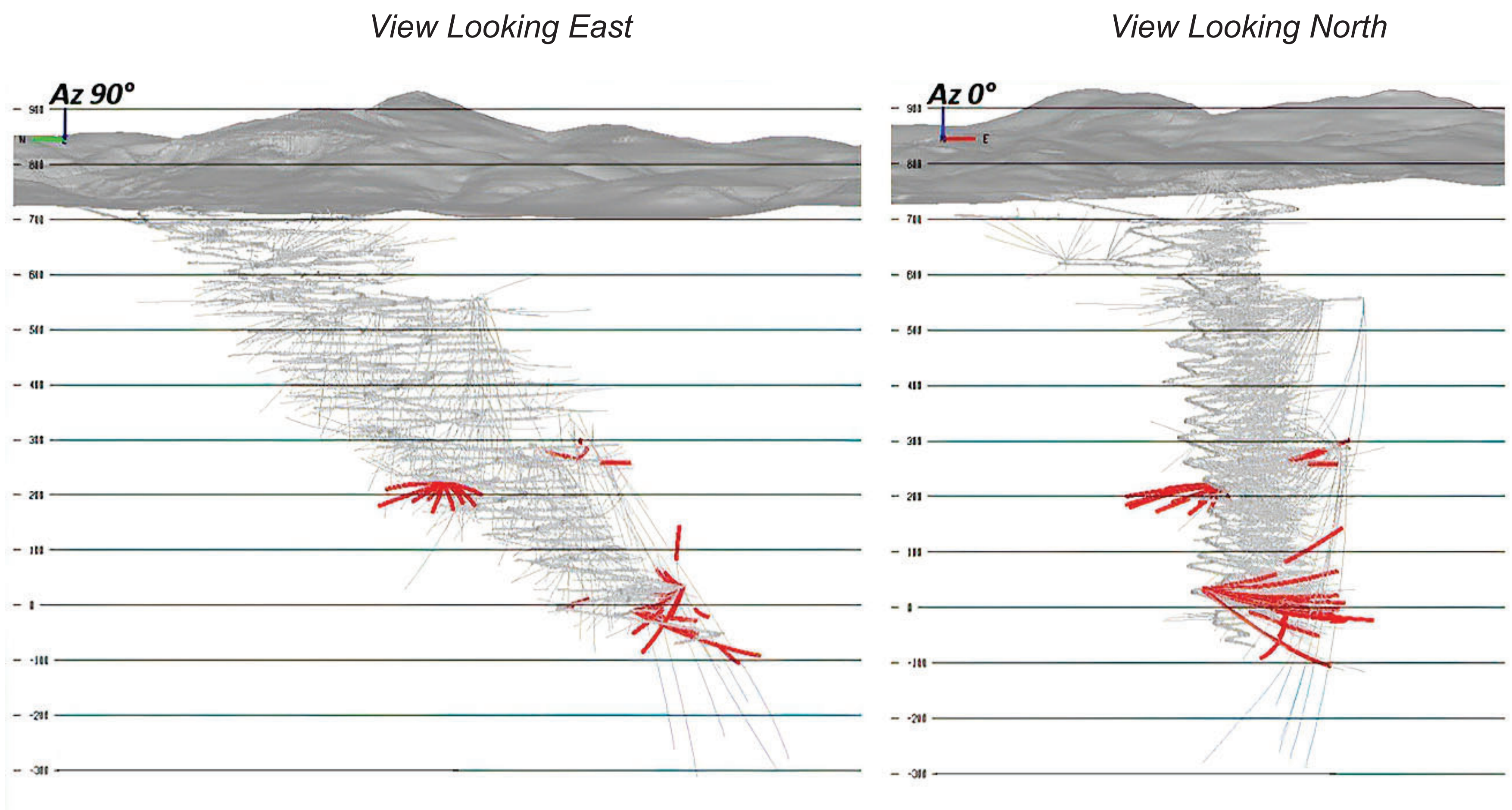
Caeté Mining Complex

Minas Gerais State, Brazil

Location of Infill and Grade Control Drill Holes Completed in 2020, Pilar Mine

RPA Now part of SLR

www.rpacan.com



Legend:
- *2020 Drill Holes*
- *Previous Drill Holes*

0 100 200 300 400 500
Metres

Figure 10-6

Jaguar Mining Inc.

Caeté Mining Complex
Minas Gerais State, Brazil

Location of Exploration Drill Holes Completed in 2020, Pilar Mine

August 2020

Source: Jaguar Mining Inc., 2020.

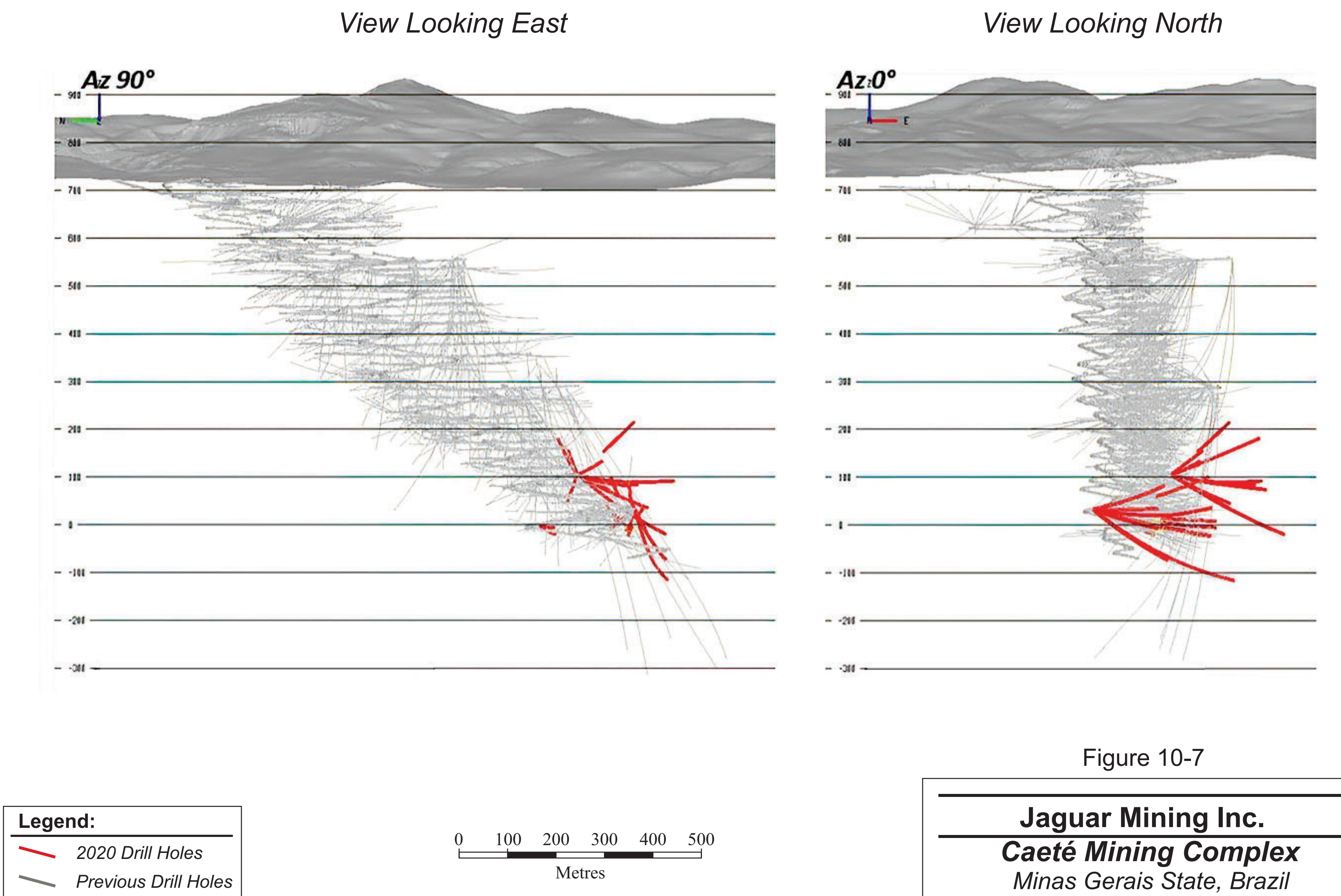


Figure 10-7

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Location of External Exploration Drill Holes Completed in 2020, Pilar Mine

August 2020

Source: Jaguar Mining Inc., 2020.

The 2019 and 2020 underground drilling programs were executed by Jaguar staff and equipment and by Major Drilling Brasil Ltd. using BQ (36.5 mm) and NQ (47.6 mm) sized equipment. The locations of all 2020 diamond drill hole collars were accurately surveyed using a Total Station survey instrument, and all downhole deviations were surveyed using the non-magnetic Reflex Gyro Sprint-IQ equipment. The departing drill hole orientations were determined using the Reflex™ north-seeking gyroscopic equipment. All drill holes were logged and marked for sampling according to Jaguar's Standard Operating Procedures CCA-GEO-05-01-PP-016 (Descrição Geológica de Testemunho do Sondagem) and CCA-GEO-05-01-PP-007 (Descrição Geotécnica de Testemunho do Sondagem). A selection of significant intersections from the 2019 and 2020 drilling programs is provided in Table 10-3.

TABLE 10-3 SUMMARY OF SIGNIFICANT INTERSECTIONS, 2019 AND 2020 DRILLING PROGRAMS, PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Hole ID	From	To	Core Length (m)	Estimated True Width (m)	Average Grade (g/t Au)
PPL518	40.7	46.0	5.4	5.1	3.5
	47.0	52.4	5.4	5.3	4.3
	62.5	66.9	4.4	4.2	2.5
	76.1	82.2	6.1	5.5	1.6
	99.0	106.4	7.4	7.3	3.2
	113.0	131.9	18.9	18.6	6.9
PPL419A	3.4	9.6	6.3	5.1	2.8
	40.5	67.2	26.7	22.9	2.5
	71.2	74.4	3.3	2.8	4.7
PPL420	25.6	38.5	12.9	11.8	1.5
	46.2	61.6	15.5	14.2	12.4
	69.4	74.3	4.9	4.5	1.4
	101.3	108.3	7.0	6.5	1.4
PPL446	0.0	4.3	4.3	3.6	3.1
	100.4	118.2	17.8	15.7	3.9
	123.6	126.3	2.7	2.4	1.7
FSB732	0.6	2.6	2.0	2.0	1.9
	12.7	14.3	1.6	1.6	4.2
FSB733	4.6	15.4	10.9	10.5	8.2
PPL543	43.9	46.5	2.6	2.5	9.4
	59.9	64.6	4.6	4.4	2.2
	84.1	91.0	6.9	6.4	1.2
PPL520	85.1	90.1	5.0	4.9	2.1
	129.6	137.6	8.0	8.1	1.3
	147.0	156.5	9.5	9.4	2.5
PPL444A	0.0	9.9	9.9	8.8	1.3
	86.4	100.0	13.6	12.5	2.3
	113.0	119.0	6.0	5.5	1.9
FSB694	0.0	12.2	12.2	11.3	1.1
FSB695	0.0	11.4	11.4	5.4	2.8

Hole ID	From	To	Core Length (m)	Estimated True Width (m)	Average Grade (g/t Au)
FSB692	0.0	4.0	4.0	3.0	9.5
	11.4	13.0	1.6	1.2	1.8
FSB693	0.0	4.6	4.6	4.4	3.5
	11.0	13.9	2.9	2.7	1.3
PPL473	57.0	71.9	14.9	11.0	1.2
	81.7	87.8	6.1	4.7	1.5
	89.5	92.7	3	2	6.1
PPL474	14.9	17.6	2.7	0.9	2.6
PPL524	128.1	151.6	23.5	20.1	2.6
	155.4	194.1	38.7	34.3	3.3
	194.1	206.9	12.9	11.7	7.9
PPL523	42.7	46.1	3.4	3.0	3.1
	67.1	79.3	12.2	10.7	3.0
	81.7	93.3	11.6	10.3	2.8
FSB667	4.7	12.4	7.7	7.5	1.4
FSB666	0.0	8.5	8.5	8.4	1.8
FSB668	0.0	5.5	5.5	3.4	1.3
FSB695A	1.0	13.4	12.4	9.7	3.6
PPL525	73.4	82.5	9.1	8.0	4.6
	123.2	138.7	15.5	13.7	2.7
	144.7	147.6	2.9	2.6	7.1
FSB698	0.6	6.3	5.7	3.3	5.4
	8.7	17.6	9.0	5.4	5.4
FSB699	0.0	7.8	7.8	5.9	3.1
FSB713	9.1	13.9	4.8	4.3	1.9
FSB727	0.0	6.1	6.1	2.9	1.6
	12.7	18.7	6.1	3.0	5.4
PPL494	57.1	80.1	23.0	17.6	3.1
FSB525	0.0	8.3	8.3	8.2	5.7
	15.0	24.5	9.5	9.6	11.7
FSB681	0.0	10.1	10.1	8.9	2.6
FSB728	0.0	8.0	8.0	7.1	3.2
	27.7	30.3	2.6	2.6	3.3
FSB734	0.0	8.0	8.0	7.5	5.6
FSB734A	0.0	11.3	11.3	11.2	5.7
PPL493A	37.0	47.0	10.0	8.3	4.9
	50.0	67.1	17.1	14.5	4.9
FSB735	16.6	24.4	7.8	7.7	1.2
PPL452	55.0	74.0	19.0	15.1	3.2
PPL476	65.8	68.5	2.7	2.1	1.7
	92.7	123.7	31.0	24.6	4.5
	149.2	156.3	7.1	6.1	1.6
	164.6	167.7	3.1	2.7	3.1
	193.5	210.1	16.6	14.7	4.8
PPL526	123.0	137.0	14.0	9.2	2.0
	141.0	147.0	6.0	4.0	2.1
PPL527	141.3	143.8	2.5	2.3	1.2
PPL604	43	46	3.0	2.9	1.8
	65.0	73.0	8.0	7.7	1.2
	87.8	120.1	32.3	5.3	6.3

Hole ID	From	To	Core Length (m)	Estimated True Width (m)	Average Grade (g/t Au)
	151.1	153.0	1.9	1.8	3.1
	164.0	181.0	17.0	3.5	18.0
PPL602	69.4	76.0	6.6	6.2	7.0
	84.0	87.0	3.0	2.9	4.0
	119.4	123.5	4.1	3.9	1.8
PPL547	111.7	113.6	1.9	1.8	2.0
	124.8	127.1	2.3	2.2	2.4
	135.7	147.8	12.1	11.3	1.1
	178.7	186.9	8.3	7.7	7.7
	201.9	206.5	4.5	4.3	9.1
	222.8	226.0	3.2	3.0	7.1
FSB724	0.0	13.6	13.6	5.6	4.7
	27.7	34.0	6.3	2.7	2.1
FSB725	0.0	7.3	7.3	2.6	2.2
FSB740	3.5	5.9	2.4	1.3	3.6
	14.3	16.3	2.0	1.1	1.2
FSB750	1.1	9.2	8.1	8.0	1.7
	12.7	14.9	2.2	2.2	2.3
FSB751	7.6	12.5	4.9	3.2	6.3
FSB741	1.0	3.7	2.8	1.5	1.3
FSB756	11.9	16.1	4.2	4.0	1.9
FSB752	1.7	6.0	4.3	2.6	3.0
	20.8	24.2	3.4	2.0	8.6
FSB765	0.0	5.4	5.4	2.2	1.4
	16.6	21.8	5.3	2.8	1.7
FSB745	0.0	11.6	11.6	11.3	4.1
FSB771	8.1	12.0	4.0	3.8	3.3
FSB711	5.8	8.4	2.6	2.6	7.0
FSB782	5.7	8.5	2.8	1.9	1.6
FSB774	0.0	3.1	3.1	1.7	2.8
FSB774A	0.0	3.7	3.7	1.5	4.5
	6.2	11.0	4.8	1.7	5.8
FSB700	1.5	4.0	2.6	2.5	2.0
	12.6	18.9	6.3	6.2	8.4
FSB742	2.9	6.4	3.6	3.2	2.8
	2.9	12.5	9.7	9.0	3.1
FSB755	1.0	4.4	3.5	3.4	1.8
FSB754	0.0	4.4	4.4	4.2	2.5
FSB703	17.8	20.1	2.3	2.2	6.0
FSB763	0.0	11.5	11.5	9.7	3.3
FSB766	19.5	29.4	10.0	9.3	4.4
PPL549	117.0	119.0	2.0	1.8	2.0
	147.4	152.0	4.7	4.2	1.7
	164.0	190.0	26.0	3.0	6.8
	192.0	195.0	3.0	2.8	2.9
	197.4	201.5	4.2	3.7	1.1
	205.5	215.0	9.5	8.5	1.5
FSB769	1.0	4.0	3.0	2.2	2.0
	10.0	14.0	4.0	3.1	0.8
PPL550	162.5	186.3	23.8	4.5	7.8
	187.0	204.4	17.4	4.6	4.2

Hole ID	From	To	Core Length (m)	Estimated True Width (m)	Average Grade (g/t Au)
FSB787	41.1	44.5	3.4	3.3	3.2
PPL614	18.2	21.0	2.9	2.8	5.1
	44.8	62.4	17.6	4.5	4.6
	64.0	67.0	3.0	2.9	1.2
FSB785	2.2	8.4	6.2	2.4	2.5
FSB770	0.7	1.7	1.0	0.9	1.6
PPL606	102.5	124.9	22.4	3.5	2.8
	145.5	158.8	13.3	12.8	2.0
	176.1	181.4	5.3	5.3	6.9
PPL615	42.1	46.0	3.9	3.7	3.8
	87.2	91.1	3.9	3.8	4.9
PPL551	111.1	118.0	6.9	6.0	1.4
	162.2	194.2	32.0	4.6	8.6
	198.2	204.2	6.0	5.2	6.3
FSB789	7.9	11.2	3.3	3.3	1.1
PPL612	63.1	67.0	3.9	3.8	1.1
	86.5	88.0	1.6	1.5	1.7
PPL613	58.0	73.0	15.0	14.7	2.0
PPL616A	36.0	48.9	12.9	12.3	3.0
PPL553	135.1	139.5	4.5	4.2	3.5
	145.4	154.0	8.6	8.0	1.1
	159.0	219.0	60.0	9.6	5.4
PPL621	6.0	8.6	2.6	2.4	2.9
	16.4	23.4	7.0	6.8	4.6
	61.3	66.9	5.6	5.4	2.6
PPL554	173.7	184.1	10.5	3.2	4.1
	187.7	204.7	17.0	3.5	4.3
	207.9	212.4	4.6	4.5	1.4
	221.8	229.6	7.8	7.6	3.1
PPL552	172.0	193.0	21.0	5.5	3.8
	195.0	206.0	11.0	10.6	4.2
	212.0	217.5	5.5	5.1	2.8
PPL617	47.2	49.0	1.9	1.8	2.3
PPL622	11.0	21.2	10.2	9.3	4.5
	77.0	92.0	15.0	3.5	5.2
PPL555	128.5	145.1	16.6	2.7	8.0
FSB697A	0.0	6.6	6.6	3.9	1.1
	11.1	17.1	6.0	3.6	5.1
FSB729	2.8	5.4	2.7	2.4	7.8
	22.1	30.0	7.9	2.5	8.6
FSB759	2.1	6.6	4.5	3.0	6.2
FSB748	6.8	13.8	7.0	2.0	1.8
PPL618	44.0	49.0	5.0	4.5	3.9
FSB697	0.0	5.7	5.7	3.4	2.0
FSB739	0.0	7.6	7.6	1.9	8.1
PPL558	66.0	74.0	8.0	7.2	2.0
	137.0	148.0	11.0	10.1	5.4
FSB772	15.1	19.1	4.0	1.8	1.9
FSB773	5.2	7.7	2.6	0.7	2.6
	16.8	22.8	6.0	1.2	1.6
FSB775	10.3	13.3	3.0	1.2	5.2

Hole ID	From	To	Core Length (m)	Estimated True Width (m)	Average Grade (g/t Au)
FSB776	0.0	7.1	7.1	1.2	4.0
PPL623	16.0	19.6	3.6	3.4	7.2
	21.5	27.0	5.5	2.6	2.9
PPL555A	131.4	142.8	11.4	3.7	2.5
	149.0	158.1	9.1	2.6	3.1
	162.8	186.0	23.2	3.9	1.9
	192.0	198.0	6.0	2.0	2.4
	200.0	211.0	11.0	3.8	5.6
PPL557	186.0	193.0	7.0	1.1	2.4
	217.0	238.0	21.0	3.8	2.9
PPL619	13.0	15.0	2.0	1.9	10.3
	42.0	49.0	7.0	6.5	2.2
PPL624	20.0	32.0	12.0	10.0	6.2
FSB800	4.7	8.0	3.3	1.2	7.2
	14.5	21.3	6.9	1.9	8.5
FSB801	10.2	20.0	9.8	9.5	4.2
FSB802	0.0	12.1	12.1	2.2	3.7
FSB807	0.0	10.1	10.1	9.8	10.6
FSB808	2.0	13.4	11.5	8.3	4.3
FSB809	4.8	8.8	4.0	1.6	1.1
	13.4	16.4	3.0	1.0	2.2
	22.4	28.4	6.0	2.0	10.3
	37.4	42.8	5.5	1.9	1.7
FSB810	0.0	6.7	6.7	3.3	9.7
	9.5	13.7	4.3	2.2	4.0
	19.7	39.1	19.4	9.6	1.6
FSB811	0.0	4.6	4.6	3.3	3.8
FSB778	1.0	5.3	4.3	3.8	3.1
FSB803	0.0	6.8	6.8	4.6	3.5
PPL556	197.3	198.5	1.2	0.5	7.4
	237.4	242.5	5.0	1.7	4.7
FSB812	4.9	7.9	3.0	2.4	4.9
	21.0	24.9	3.9	3.1	2.7
FSB813	30.8	34.6	3.9	2.4	1.4
PPL650	22.0	24.0	2.0	1.7	13.7
	206.6	212.0	5.4	1.5	2.4
FSB847	0.0	2.2	2.2	1.6	13.8
	8.3	29.4	21.1	6.7	5.1
FSB848	0.0	2.3	2.3	2.2	23.9
	15.9	26.5	10.7	6.2	3.3
PPL593	6.3	10.9	4.6	4.0	3.9
	15.0	16.7	1.7	1.5	4.8
PPL594	16.6	20.1	3.5	3.0	2.7
	28.9	31.8	2.9	2.5	1.9
PPL652	49.0	60.0	11.0	8.8	1.6
PPL583	3.0	9.0	6.0	5.5	1.9
	17.6	21.8	4.2	3.9	9.9
	54.4	58.9	4.5	4.2	6.7
	114.2	118.0	3.8	3.5	4.8
PPL544	77.6	81.5	3.9	3.3	2.5
	88.5	89.6	1.1	1.0	2.4

Hole ID	From	To	Core Length (m)	Estimated True Width (m)	Average Grade (g/t Au)
PPL630	38.7	49.0	10.3	5.0	3.9
PPL625	14.8	18.0	3.2	2.6	3.1
	48.0	54.0	6.0	5.0	2.9
FSB844	4.6	11.5	6.9	3.9	2.2
	33.1	42.9	9.9	5.2	8.9
PPL584	4.1	7.4	3.3	3.1	3.5
	64.9	68.6	3.8	3.4	4.8
	82.0	87.1	5.1	4.6	7.6
	100.3	101.4	1.1	1.0	2.2
	124.7	126.9	2.1	1.9	1.5
PPL590	13.8	19.8	6.0	1.2	1.7
	37.2	41.7	4.5	3.9	5.7
	46.2	50.8	4.6	3.8	1.9
	62.2	65.2	3.0	2.5	3.2
PPL625B	21.1	24.8	3.7	3.3	8.3
	28.5	34.1	5.6	5.2	2.1
	44.0	48.0	4.0	3.7	2.4
FSB860	6.8	14.6	7.8	3.1	2.5
	23.4	32.8	9.5	3.3	5.7
PPL595	14.8	18.0	3.2	2.7	3.1
	48.0	54.0	6.0	5.8	2.9
FSB845	38.8	44.1	5.3	2.0	6.2
	52.8	55.9	3.1	1.6	9.2
	62.1	64.8	2.7	1.8	3.7
PPL560	140.4	144.5	4.1	1.4	2.1
	161.9	175.4	13.5	3.0	12.3
	176.9	205.5	28.7	6.0	6.4
	205.5	217.4	11.9	3.2	3.8
	218.9	226.4	7.5	2.4	3.2
PPL561	135.1	139.8	4.8	2.6	3.8
PPL563	167.3	171.0	3.7	1.6	15.8
	191.9	196.0	4.1	1.1	2.4
	230.0	235.0	5.0	1.4	6.6
FSB861	23.2	24.8	1.6	1.2	3.4
	31.9	35.4	3.6	2.7	4.0
FSB864	9.5	13.2	3.7	1.2	1.4
	15.3	20.4	5.2	4.9	3.6
FSB846	15.5	19.7	4.3	3.9	2.4
	27.6	35.8	8.2	2.3	8.2
	37.8	45.6	7.9	2.0	9.5
FSB873A	21.9	23.9	2.1	2.0	2.7
	26.7	33.5	6.8	2.3	3.2
	36.6	38.3	1.8	1.8	4.4
PPL582	15.0	20.5	5.5	3.1	4.3
	127.0	133.0	6.0	5.0	3.4
PPL559A	99.8	103.1	3.3	3.1	1.7
	104.9	107.3	2.5	2.4	2.5
	137.7	149.2	11.5	9.9	2.2
	166.4	168.7	2.3	2.2	2.6
	189.5	194.0	4.5	4.2	2.3
	204.5	207.5	3.0	2.9	2.3

Hole ID	From	To	Core Length (m)	Estimated True Width (m)	Average Grade (g/t Au)
FSB875	0.0	5.8	5.8	2.2	2.2
	8.2	19.5	11.3	3.9	3.9
	21.7	38.9	17.2	3.9	2.0
FSB876	21.3	25.0	3.7	1.7	1.9
	26.4	36.1	9.8	3.9	5.2
FSB859	6.3	13.5	7.2	6.0	4.7
	15.6	35.0	19.4	6.1	6.6
PPL627	41.8	46.0	4.2	3.2	1.2
	50.0	53.0	3.0	2.3	7.0
FSB878	1.8	6.0	4.2	2.0	2.4
	11.1	14.1	3.0	0.9	1.7
FSB857	27.9	29.9	2.0	1.7	3.0
PPL561	135.0	139.8	4.8	3.3	3.8
PPL598	20.7	25.4	4.8	1.6	3.0
	32.3	38.3	6.0	2.2	1.5
	70.9	73.9	3.0	2.5	2.6
	83.5	91.0	7.5	6.3	4.0
	193.5	196.5	3.0	2.3	3.1
	223.7	227.9	4.2	3.3	3.9
	258.4	264.3	5.9	4.6	2.1
PPL596	19.0	25.0	6.0	2.7	3.4
	41.0	53.1	12.1	9.3	2.1
	57.2	66.0	8.80	6.75	8.0
	70.0	72.0	2.0	1.6	3.8
	140.0	143.0	3.0	2.4	4.2
	145.0	152.2	7.2	5.7	1.9
	206.5	213.5	7.0	5.4	7.2
	279.0	282.0	3.0	2.5	3.1
	302.9	306.7	3.8	3.5	1.2
PPL663	187.4	194.4	7.0	2.3	1.4
	195.5	216.0	20.6	4.5	6.5
	229.5	238.5	9.0	3.1	3.3
PPL662	190.9	195.0	4.1	3.5	4.8
	218.0	227.0	9.0	7.3	1.5
	232.0	243.0	11.0	9.0	2.7
	278.0	280.0	2.0	1.7	5.7
PPL568	180.9	182.8	1.9	1.9	1.8
	183.5	186.5	3.0	2.0	1.7
	188.5	195.2	6.7	2.8	2.2
	210.0	217.7	7.7	2.4	2.3
	230.0	234.5	4.5	3.5	1.8
PPL661	169.0	172.6	3.6	3.3	4.8
	174.0	178.0	4.0	3.5	29.1
	194.0	199.8	5.8	2.3	2.2
	231.9	234.0	2.1	1.9	9.3
FSB858	11.3	12.4	1.1	0.9	9.6
	14.9	16.4	1.5	1.3	4.8
	18.6	20.2	1.6	1.3	12.5
	25.7	28.2	2.5	2.0	4.9
PPL640	7.4	13.1	5.7	3.2	3.8
	14.9	16.4	1.5	0.9	11.4

Hole ID	From	To	Core Length (m)	Estimated True Width (m)	Average Grade (g/t Au)
FSB842	5.8	8.2	2.4	2.3	1.4
	40.7	43.1	2.4	2.0	2.4
FSB886	17.5	22.0	4.5	3.5	5.4
	33.5	35.1	1.6	1.2	4.8
PPL579	185.0	218.4	33.4	9.6	4.8
	227.0	232.1	5.1	4.6	2.5
PPL566	227.9	229.9	2.0	1.9	2.2
PPL669	72.8	82.4	9.6	3.5	5.0
	76.8	85.5	8.7	8.2	3.5
PPL665	35.6	40.7	5.1	3.0	11.3
	52.4	58.4	6.0	2.8	4.4
	62.3	65.3	3.0	1.4	6.0
FSB887	24.4	29.4	5.0	4.3	9.4
FSB894	31.7	36.7	5.0	3.3	6.0
PPL644	32.7	41.1	8.4	7.7	12.4
	15.7	18.7	3.0	3.0	1.0
PPL670	175.4	179.6	4.2	2.5	1.6
PPL690	35.4	42.4	7.0	5.4	2.4
PPL562	52.0	56.0	4.0	3.4	1.7
	128.0	130.0	2.0	1.7	5.4
FSB831A	40.9	49.0	8.1	4.0	1.0
PPL664	183.4	193.0	9.6	4.2	2.9
	204.0	227.0	23.0	8.6	2.1
	231.0	237.0	6.0	3.4	10.7
PPL587	6.8	11.7	4.9	1.7	1.8
	90.0	91.0	1.0	0.9	1.0
PPL592	1.5	7.5	6.0	5.0	1.8
FSB838	21.2	22.7	1.5	1.3	8.8
PPL564	217.0	220.3	3.3	2.7	4.8
PPL687	39.0	42.1	3.1	2.4	2.9
	47.5	49.0	1.5	1.2	2.8
	56.9	65.0	8.1	6.2	5.7
	66.0	68.8	2.8	2.2	6.0
	187.0	192.0	5.0	4.3	1.6
	208.0	216.5	8.5	7.6	5.6
PPL580	0.0	3.0	3.0	2.8	6.8
	20.0	24.4	4.4	4.0	3.7
	29.3	34.0	4.7	4.3	3.7

Notes:
1. No capping values applied when calculating the weighted average grades.
2. The estimated true widths are calculated in consideration of the angle of intersection of the drill hole with the local interpreted geometry of the target mineralized zone.

The QP has not identified any drilling, sampling, or core recovery issues that could materially affect the accuracy or reliability of the core samples.

REGIONAL EXPLORATION DRILLING

During 2008 and 2009, Jaguar completed 92 (31,501 m) and 53 (8,650 m) drill holes, respectively, in the exploration concessions that are part of the Caeté Project.

During the third quarter of 2012, Jaguar completed a Phase 1 diamond drilling campaign at the Moita target, located four kilometres northwest of the Caeté processing plant. A total of 16 drill holes for 1,115 m were completed to test a 400 m by 50 m mineralized zone identified by soil sampling and trenching within hydrothermally altered meta-sediments hosted by a shear zone. Drilling results confirmed the southeast down plunge extension of the mineralization.

In 2017, Jaguar completed a small program of exploration drilling on the Pacheca target (nine diamond drill holes, totalling 2,032 m in length) and the Cubas target (three diamond drill holes, totalling 1,951.6 m in length). The results from the drilling at the Cubas target were generally negative, however, four of the drill holes completed at the Pacheca target intersected anomalous gold mineralization. A summary of the significant intersections from the 2017 drilling program at the Pacheca target is provided in Table 10-4.

TABLE 10-4 SUMMARY OF SIGNIFICANT DIAMOND DRILLING INTERSECTIONS, PACHECA TARGET
Jaguar Mining Inc. – Caeté Mining Complex

Hole ID	From	To	Core Length (m)	Average Grade (g/t Au)
FPCH001	45.35	55.05	9.70	0.34
	59.45	61.70	2.25	0.30
	63.50	65.50	2.00	2.81
	73.50	78.50	5.00	0.50
	86.05	89.05	3.00	0.15
	240.35	242.10	1.75	0.20
FPCH002	66.30	67.80	1.50	1.20
	72.25	73.00	0.75	0.96
	96.15	102.30	6.15	0.47
	108.60	110.60	3.30	0.49
FPCH003	85.05	85.50	0.45	0.50
FPCH004	224.10	228.10	4.00	0.28
	240.60	246.60	6.00	0.34

11 SAMPLE PREPARATION, ANALYSES, AND SECURITY

SAMPLING PROCEDURES

The sampling procedures used by Jaguar are as follows.

SURFACE/EXPLORATION CHANNEL SAMPLING

- Channel samples are collected from outcrops and trenches as needed.
- The sites to be sampled are cleaned with a hoe, exposing the material by scraping it.
- Structures are mapped and the lithologic contacts defined, and samples marked so that no sample has more than one lithology.
- Samples have a maximum length of one metre and are from one kilogram to two kilograms in weight.
- Each sample is collected manually in channels with average widths between five and ten centimetres, and about three centimetres deep, using a hammer and a chisel.
- Either an aluminum tray or a thick plastic canvas drop sheet is used to collect the material.
- The samples are then stored in a thick plastic bag and identified by a numbered label, which is protected by a thin plastic cover and placed with the sample.
- At the sampling site, samples are identified by small aluminum plates, labels, or small wooden poles.
- Sketches are drawn with lithological and structural information. The sample locations are surveyed.

DIAMOND DRILLING CORE SAMPLING

- Surface drilling is performed by contractors using either HQ or NQ equipment.
- Underground drilling is performed either by Jaguar or contractors using either BQ, NQ, or LTK equipment.
- Drill holes are accepted only if they have more than 85% of core recovery from the mineralized zone.
- All the drill holes have their deviations measured by Maxibor, Reflex™, or equivalent survey tools.
- The cores are stored in wooden or plastic boxes of one metre length with three metres of core per box (NQ and HQ diameters) or four metres of core per box (BQ or LTK diameters).

- The number, depth, and location of each hole are identified in the boxes by an aluminum plate or by a water-resistant ink mark in front of the box.
- The progress interval and core recovery are identified inside the boxes by small wooden plates.
- During logging, all of the geological information, progress, and recovery measures are verified and the significant intervals are defined for sampling.
- Samples are identified in the boxes by highlighting their side or by labels.
- Samples are cut lengthwise with the help of a diamond saw and a hammer into approximately equal halves.
- One half of the sample is placed in a highly resistant plastic bag, identified by a label, and the other half is kept in the box at a warehouse.
- The remaining drill core from the surface-based drill holes is stored at a dedicated core storage facility that is located at the Roça Grande Mine.
- For many of the underground-based drill holes, samples are cut lengthwise with the help of a diamond saw and a hammer into approximately equal halves.
- For the shorter-length, bazooka-type drill holes completed from underground set-ups, the whole core is sampled as the core diameter does not permit splitting into halves.

UNDERGROUND PRODUCTION CHANNEL SAMPLING

- The sector of the wall to be sampled is cleaned with pressurized water. Structures are mapped and lithologic contacts defined, and samples marked so that no sample has more than one lithology. Samples have a maximum length of one metre and are from two to three kilograms in weight.
- Channel samples are taken by manually opening the channels, using a hammer and a small steel pointer crowned by carbide or a small jackhammer.
- The channel samples have lengths ranging from 50 cm to 1.5 m, average widths between five and ten centimetres, and are approximately three centimetres deep.
- Two sets of channel samples are regularly collected on the face. One set of channel samples is taken approximately along the back once the work area has been secured. The second set of channel samples is taken at the grade height once the heading has been mucked clean and secured.
- Channel samples from the walls and back are collected at approximately five metre intervals. When the mineralization has very flat dips, the channel samples are collected starting at the floor level on one side and continuing over the drift back to the floor on the opposite side. In case of a steep dip, the channel samples are collected only at the roof.
- Either an aluminum tray or a thick plastic canvas placed on the floor of the drift is used to collect the material. The samples are then stored in a thick plastic bag and identified by a numbered label, which is protected by a thin plastic cover and placed with the sample.
- At the sampling site, samples are identified with paint.

- Sketches are drawn with lithological and structural information. The sample locations are surveyed.

SAMPLE PREPARATION AND ANALYSIS

For surface-based exploration drill holes completed prior to 2015, samples were prepared at the SGS laboratories in Belo Horizonte. For other drill holes and channels collected prior to 2015, samples were prepared at Jaguar's mine site laboratories by drying, crushing to 90% minus 2 mm, quartering with a Jones splitter to produce a 250 g sample, and pulverizing to 95% minus 150 mesh. Analysis for gold is by standard fire assay procedures, using a 50 g or 30 g sample and an AAS finish.

The SGS laboratory based in Belo Horizonte meets international analytical standards and ISO 17025 compliance protocols. Analytical results from the SGS laboratory were forwarded to Jaguar's Exploration or Mine Departments by e-mail, followed by a hard copy.

All samples from the 2015 to H1 2020 drilling programs executed at the Pilar and Roça Grande mines were analyzed for gold at either Jaguar's mine site laboratory, or by the ALS Chemex laboratory located in Belo Horizonte. A summary of the sample preparation and analytical packages used in 2019 and 2020 by ALS Chemex is presented in Table 11-1.

The ALS Chemex laboratory based in Belo Horizonte meets international analytical standards and ISO 17025 compliance protocols. The Jaguar mine site laboratory is not ISO 17025 certified.

TABLE 11-1 SUMMARY OF SAMPLE PREPARATION AND ANALYTICAL METHODS, ALS CHEMEX, 2019 AND H1 2020
Jaguar Mining Inc. – Caeté Mining Complex

Department	Section	Method Code	Number of Samples
Preparation	Pulverization	PUL-31: Pulverize split to 85% <75 µm	822
		PUL-QC: Testing procedure for ring pulverized material.	66
	Prep Miscellaneous	LOG-24: Pulp Login – Rcd w/o Barcode	34
		LOG 22d: Sample Login – Rcd w/o Barcode	788
	Crush	SPL-21d: Split Sample-duplicate	788
		CRU-31: Fine crushing of drill samples to better than 70% of the sample passing 2 mm	788
		CRU-QC: Crushing QC test	52
Fire Assay	FA-AAS	Au-AA26: Ore Grade Au 50 g FA AA finish	822
Spectroscopy	ICP-MS	ME-MS61: 48 element four acid ICP-MS	618
Package	Package	PREP-31: Crush, Split, Pulverize	822
QAQC	Dupl		291
	Standards		96
Total			**5,987**

At Jaguar's Caeté laboratory, samples from the Pilar Mine are dried and then crushed. A one kilogram sub-sample of the crushed material is selected for pulverization to approximately 70% minus 200 mesh. The ring-and-puck pulverizers are cleaned after each sample using compressed air and a polyester bristle brush. The analytical protocol for all samples employs a standard fire assay fusion using a standard 30 g aliquot, with the final gold content being determined by means of AAS. The detection limit for fire assay analyses is 0.05 g/t Au. A second cut from the pulps is taken and re-assayed for those drill core samples where the grade is found to be greater than 30 g/t Au. If the two assays are in good agreement, only the first assay is reported. The AAS unit is calibrated to directly read gold grades up to 3.3 g/t Au; samples with grades greater than this are re-assayed by diluting the solute until it falls within the direct-read range.

The QP has reviewed the field and underground sampling procedures and is of the opinion that they meet accepted industry standards. In the QP's opinion, the sample preparation, analysis, and security procedures at the Pilar Mine are adequate for use in the estimation of Mineral Resources.

QUALITY ASSURANCE AND QUALITY CONTROL

Jaguar carried out a program of Quality Assurance/Quality Control (QA/QC) for all samples collected in 2019 and 2020. The QA/QC protocol includes carrying out a duplicate analysis after every 20 samples, representing an insertion frequency of 5%.

Commercially sourced standard reference materials obtained from Rocklabs are inserted by the Pilar geological team into their sample stream at a frequency of every 20 samples. A list of the standard reference materials that were used for the channel sampling and the diamond drilling programs is provided in Tables 11-2 and 11-3, respectively.

TABLE 11-2 LIST OF CERTIFIED STANDARD REFERENCE MATERIALS, CHANNEL SAMPLE QA/QC PROGRAM
Jaguar Mining Inc. – Caeté Mining Complex

Standard No.	Recommended Value	Standard Deviation	Number Analyzed
2019 Channel Samples			
HiSilP3	12.240	0.246	22
SF85	0.848	0.018	18
SG84	1.026	0.025	30
SJ80	2.656	0.057	16
SN75	8.671	0.199	23
SN91	8.679	0.194	24
SP73	18.17	0.42	4
H1 2020 Channel Samples			
SF85	0.848	0.018	8
SG84	1.026	0.025	8
SN75	8.671	0.199	10
SN91	8.679	0.194	3
SI81	1.79	0.03	11

TABLE 11-3 LIST OF CERTIFIED STANDARD REFERENCE MATERIALS, DIAMOND DRILLING QA/QC PROGRAM
Jaguar Mining Inc. – Caeté Mining Complex

Standard No.	Recommended Value	Standard Deviation	Number Analyzed
2019 Drill Hole Samples			
HiSilK4	3.463	0.09	59
HiSilP3	12.240	0.246	12
SF85	0.848	0.018	63
SG84	1.026	0.025	10
SI81	1.79	0.03	82
SJ80	2.656	0.057	44
SL76	5.960	0.192	19
SN75	8.671	0.199	34
SN91	8.679	0.194	86
SP73	18.17	0.42	13
H1 2020 Drill Hole Samples			
HiSilK4	3.463	0.09	42
SF85	0.848	0.018	27
SG84	1.026	0.025	36
SI81	1.79	0.03	22
SJ80	2.656	0.057	40
SJ95	2.785	0.054	15
SL76	5.960	0.192	55
SK78	4.134	0.138	4
SN75	8.671	0.199	69
SN91	8.679	0.194	50

Blank samples are inserted at a rate of one in every 20 samples, representing an insertion frequency of 5%. Blank samples are composed of crushed, barren quartzite or gneiss and are used to check for contamination and carry-over during the crushing and pulverization stage.

A number of pulp samples from the channel sampling programs were forwarded to the ALS Chemex laboratory in Vespasiano, Minas Gerais, for third-party check analyses and the analytical results compared favourably with the Caeté analyses. No duplicate sample analyses were carried out for the 2019 and H1 2020 diamond drilling program.

RPA recommends that a selection of pulp samples from the 2019 and H1 2020 diamond drilling programs representing approximately 2% of the total samples analyzed be selected and assayed on a remedial basis.

The results of the blanks, duplicates, and standards are forwarded to Jaguar's head office on a monthly basis for insertion into the Jaguar's internal database (BDI). There, the results from the standards samples are scanned visually for out-of-range values on a regular basis. When failures are detected, a request for re-analysis is sent to the laboratory. Only those assays that have passed the validation tests are inserted into the main database.

RPA has reviewed the results from Jaguar's 2019 and H1 2020 blank and standard reference materials and notes that the results are within the acceptable limits. Sample control charts for the blank sample results are presented in Figures 11-1 and 11-2. Sample control charts for the standard reference materials are presented in Figures 11-3 and 11-4. Sample control charts for the duplicate samples taken from the channel sampling program are presented in Figures 11-5 and 11-6.

FIGURE 11-1 SAMPLE CONTROL CHART FOR 2019 BLANK SAMPLES, CHANNEL SAMPLES

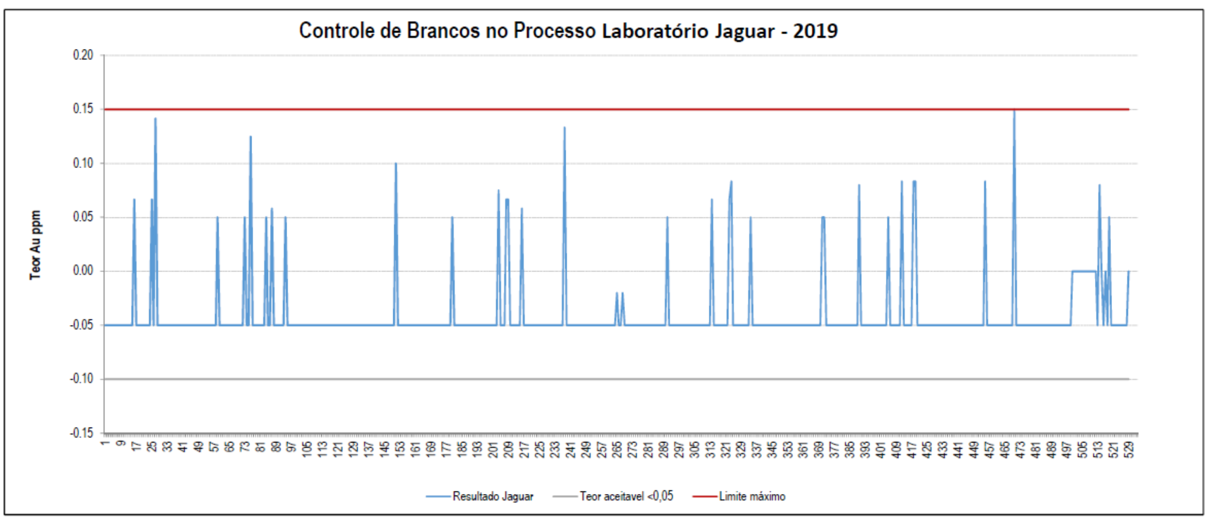


FIGURE 11-2 SAMPLE CONTROL CHART FOR 2020 BLANK SAMPLES, H1 DIAMOND DRILLING SAMPLES

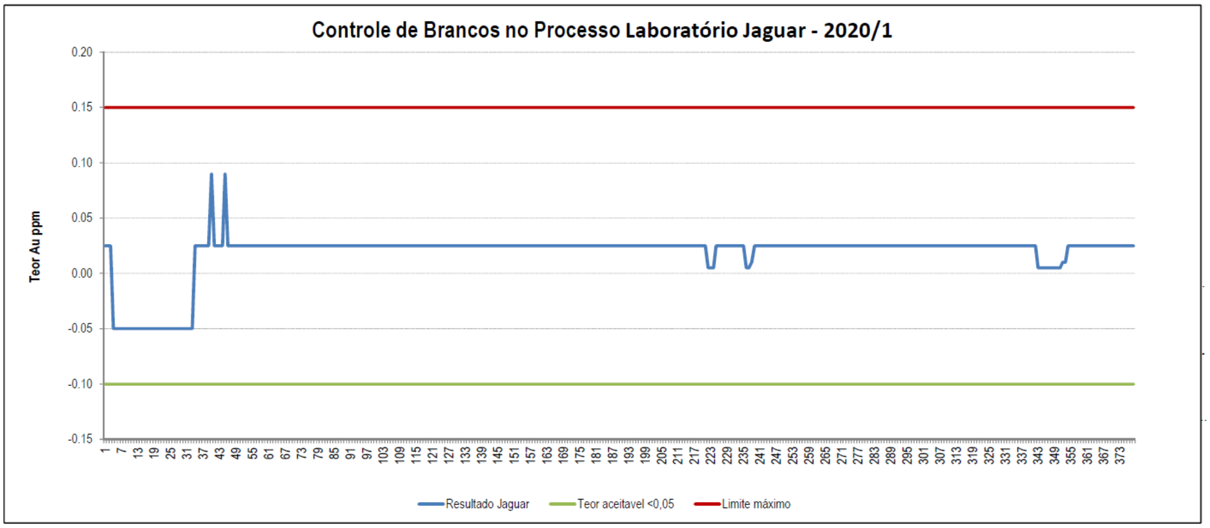


FIGURE 11-3 SAMPLE CONTROL CHART FOR STANDARD REFERENCE SG84, 2020 CHANNEL SAMPLES

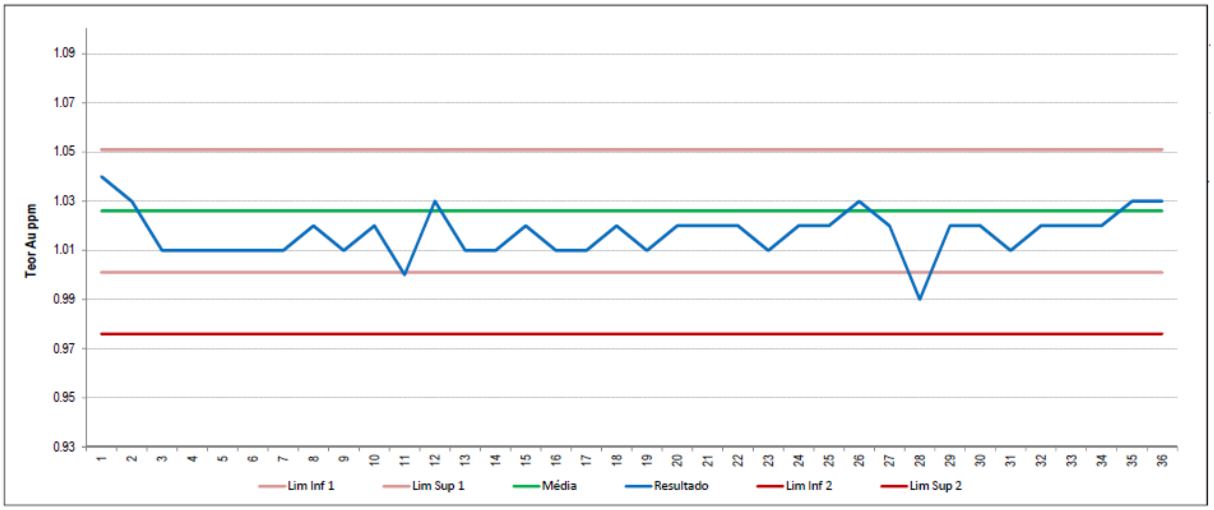


FIGURE 11-4 SAMPLE CONTROL CHART FOR STANDARD REFERENCE HISILK4, 2019 DIAMOND DRILL HOLE SAMPLES

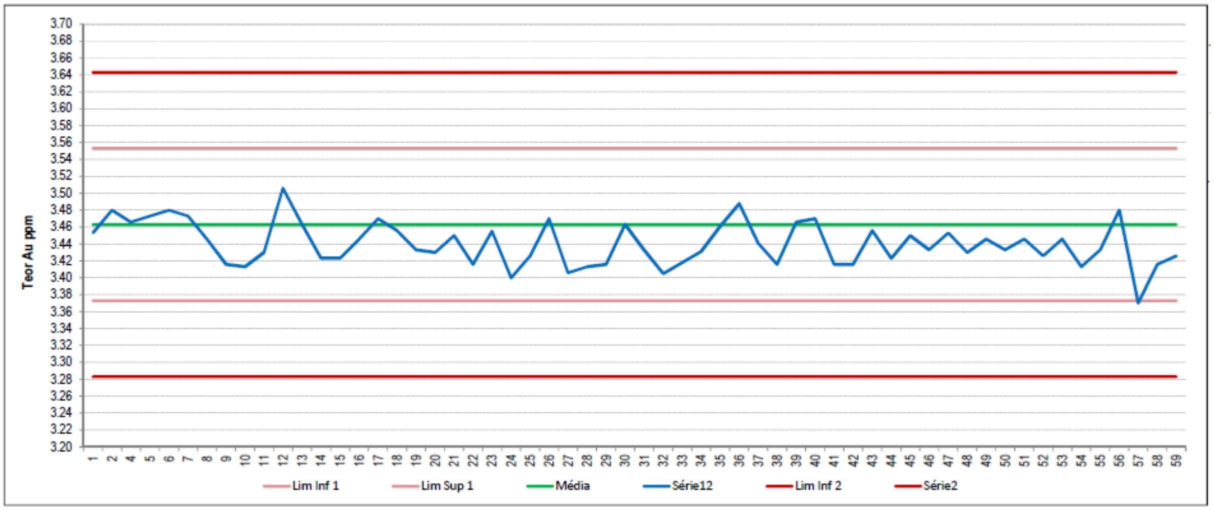


FIGURE 11-5 SAMPLE CONTROL CHART FOR DUPLICATE SAMPLES, 2019 CHANNEL SAMPLES

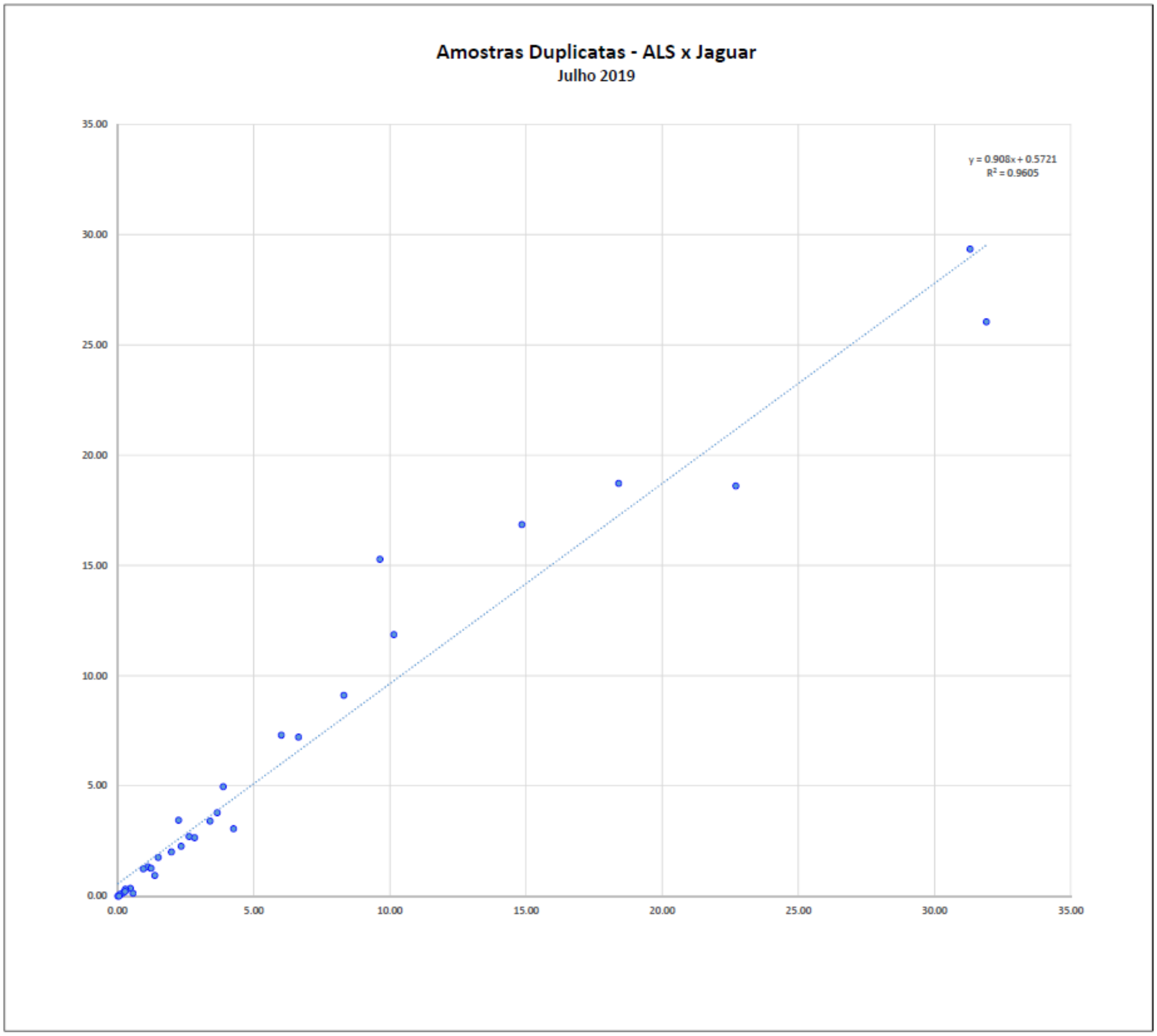
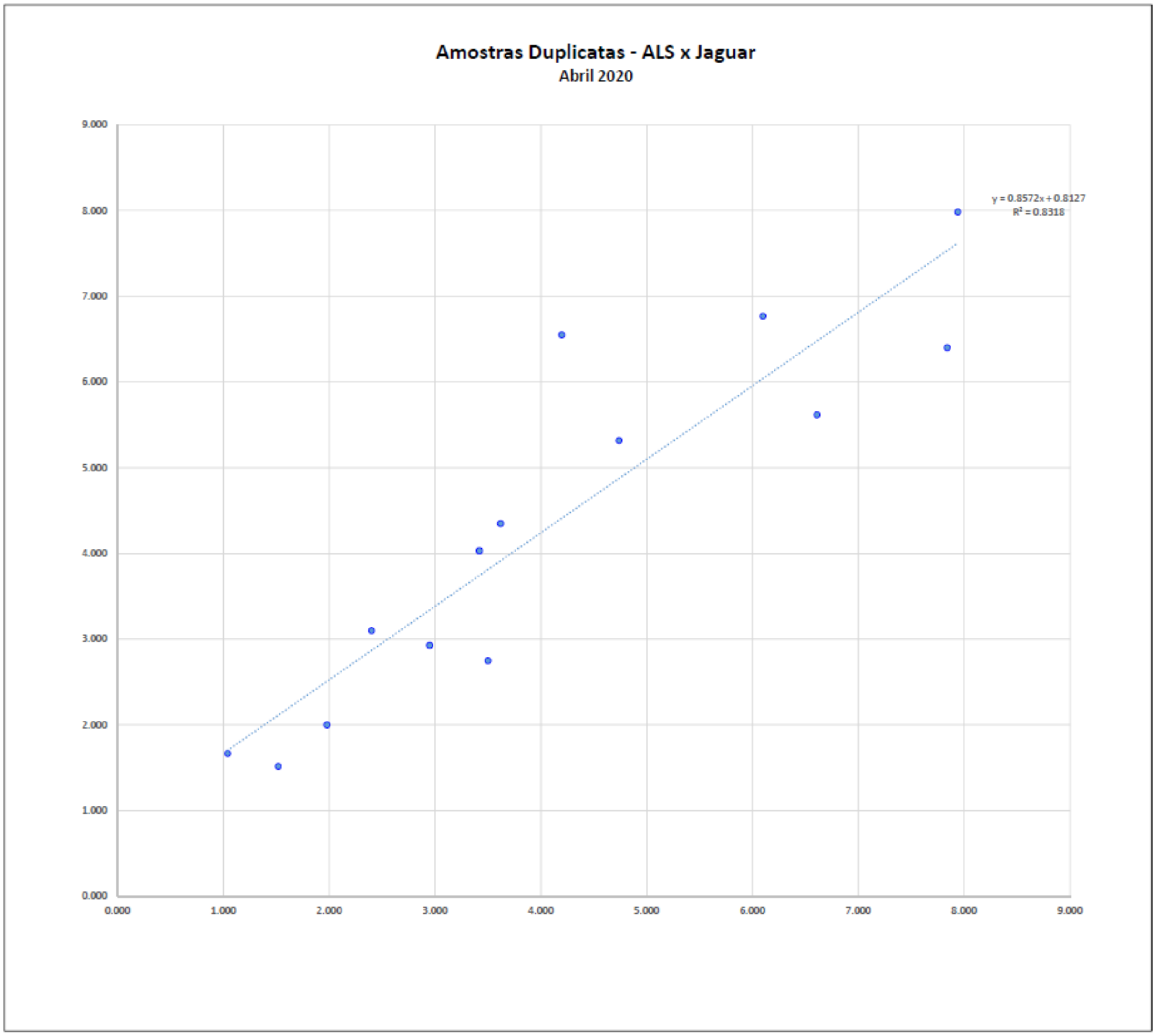


FIGURE 11-6 SAMPLE CONTROL CHART FOR DUPLICATE SAMPLES, 2020 CHANNEL SAMPLES



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

In light of the good performance and the results that have been achieved through 2019 and H1 2020, RPA recommends that the insertion frequency of the blank and standard reference materials be reduced to a frequency of approximately one blank and one standard reference material sample for every 50 sample assays.

12 DATA VERIFICATION

The QP's validation checks on the drilling and sampling database for the Roça Grande and Pilar mines provided by Jaguar included:

- Conducted site visits in 2014 and 2017 to personally inspect the style and structural complexity of the gold mineralization and its host rocks at the Roça Grande and Pilar mines.
- Carried out a site visit to the Jaguar assay laboratory where the sample preparation and analytical procedures and equipment were reviewed.
- Carried out independent validation of the Pilar Mine drill hole database by means of spot checking as described in RPA (2016 and 2018).
- Carried out independent validation of the Pilar Mine drill hole database by means of spot checking of 23 drill holes completed in the 2019 and H1 2020 drilling programs.
- Carried out independent validation of the Roça Grande Mine drill hole database by means of spot checking as described in RPA (2018).
- Checked collar locations relative to either the digital topographic surface or the location of the underground excavation digital model as appropriate.
- Reviewed drill hole and sample orientations (azimuth/dip) relative to the location of the mineralized zones.
- Completed validity checks for out-of-range values, overlapping intervals, and mismatched sample intervals.
- Reviewed the reasonableness of the geological interpretations relative to the nature of the previously extracted mineralization.
- Reviewed the mineralization wireframes to ensure that a minimum mining width was honoured.
- Reviewed the coding of the mined out material in the block model to ensure a reasonable match with the excavation model, and
- Carried out a small program of check assaying on 21 mineralized samples from drill hole PPL454B. The results were presented in RPA (2018).

No material errors were noted for the Collar, Survey, Lithology, or Assay records reviewed for the Pilar Mine. A small number of errors were noticed in the Downhole Survey records of the drill holes contained in the Roça Grande database. The QP did observe some minor discrepancies on the order of one metre between the location of the older collars of some underground-based drill holes and the excavation models. These discrepancies were likely due to survey errors in the determination of either the drill hole collars or the excavation models and may contribute to errors in the mine design and reconciliation phases of the mining operation.

The QP observes that the surface and underground drill hole collar locations are reasonable and channel samples are appropriately located with respect to the existing underground infrastructures. The QP is of the opinion that the drilling and sampling databases are appropriate to be used in the preparation of Mineral Resource and Mineral Reserve estimates.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

The following information on mineral processing and metallurgical testing on the Caeté Mining Complex, which includes Roça Grande and Pilar mines, was extracted from TechnoMine Services, LLC's (TechnoMine) Amended Feasibility Study (Amended FS) dated October 2010 (Machado, 2010).

MINERALIZATION

In the Pilar and Roça Grande deposits, the mineralized rocks occur within BIFs and shear zones, represented by disseminated gold-bearing sulphides associated with silica-sericitic-carbonatic solutions originating from hydrothermal activity. Gold is associated with sulphides (arsenopyrite, pyrite, and pyrrhotite) or occurs as free gold in the quartz veins or in the contact quartz/sericite schist.

MINERAL PROCESSING AND METALLURGICAL TEST WORK

Jaguar constructed a centralized leaching, carbon-in-pulp, adsorption/desorption/recovery (CIP-ADR) metallurgical plant to process the sulphide, transition, and oxide ore from Pilar and Roça Grande.

Jaguar carried out additional investigative metallurgical test work to assess the inclusion of a flotation plant before the CIP-ADR plant to reduce the mass of solids to be leached (flotation concentrate only). The flotation tailings would be cyanide-free and could then be directed to the underground mines as backfill material. Comprehensive testing was carried out by FLSmidth-Dawson Laboratories Inc (Dawson) in Salt Lake City, Utah, USA, which included gravity separation, flotation, leaching, and adsorption tests. The testing by Dawson was conducted on a representative sample of mill feed containing 40% Roça Grande, 40% Pilar, and 20% Roça Grande oxide ore (referred to as the Dawson sample). Test results reported in 2009 indicated that the CIP-ADR plant would need to treat only 10% of the solids mass contained in the mill feed, while 90% of the material would be available (fully cyanide-free and geotechnically appropriate) to feed the backfill plant.

Based on Dawson laboratory test work, TechnoMine estimated the overall gold recovery to be:

Recovery = 54% + (46% x 0.90 x 0.93 x 0.985) = 91.9%

- Gravity recovery = 54%
- Flotation recovery = 90%
- Leaching recovery = 93%
- ADR (Adsorption, Desorption, Electrowinning) recovery = 98.5%

This information was included as part of the process design criteria for the expansion of the Caeté processing plant. The plant expansion is based on increasing the bottleneck of tails filtration capacity, rather than upstream processing. Based on the Amended FS, the first phase of the plant is to produce is 0.7 million tonnes per year (Mtpa) and the second phase of the plant is to produce 1.1 Mtpa for the expansion.

FURTHER METALLURGICAL TEST WORK

TESTWORK DESENVOLVIMENTO DE PROCESSO LTDA

The following summary is taken from TESTWORK Desenvolvimento de Processo Ltda (TESTWORK, 2019). Laboratory tests were performed with samples of the orebodies within the Pilar Mine, designated: BF, BF2, BF3, TORRE, LPA1, LPA2, and LPA3. The tests were carried out in the laboratory of TESTWORK, located in the city of Nova Lima, Minas Gerais, Brazil.

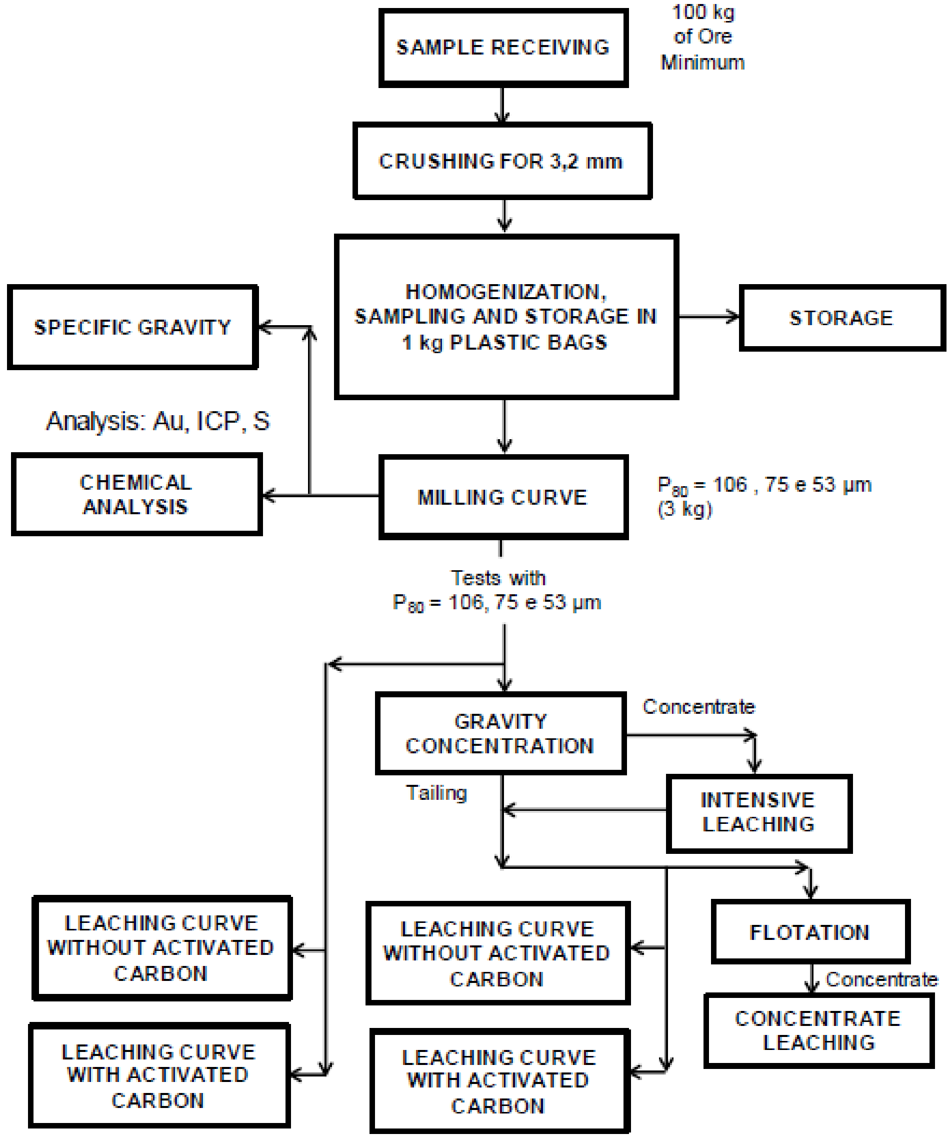
The objectives of the work were:

- Anticipating the behaviour of orebodies in the gold recovery circuits of the Caeté processing plant.
- Identifying the adequacy of these circuits, due to the new characteristics of the ores.
- Identifying the possibility of optimization of the existing processes.

The leaching tests were performed to determine the recovery of gold and to try to obtain a correlation with the results of the current plant process, i.e., gravimetric concentration followed by flotation and leaching of flotation concentrate. If this correlation is obtained, simple leaching tests may give a good indication of the overall recovery of the ore in the process circuit. The tests were carried out at 80% passing (P_{80}) 106 µm, 75 µm, and 53 µm.

The test flowsheet is shown below in Figure 13-1.

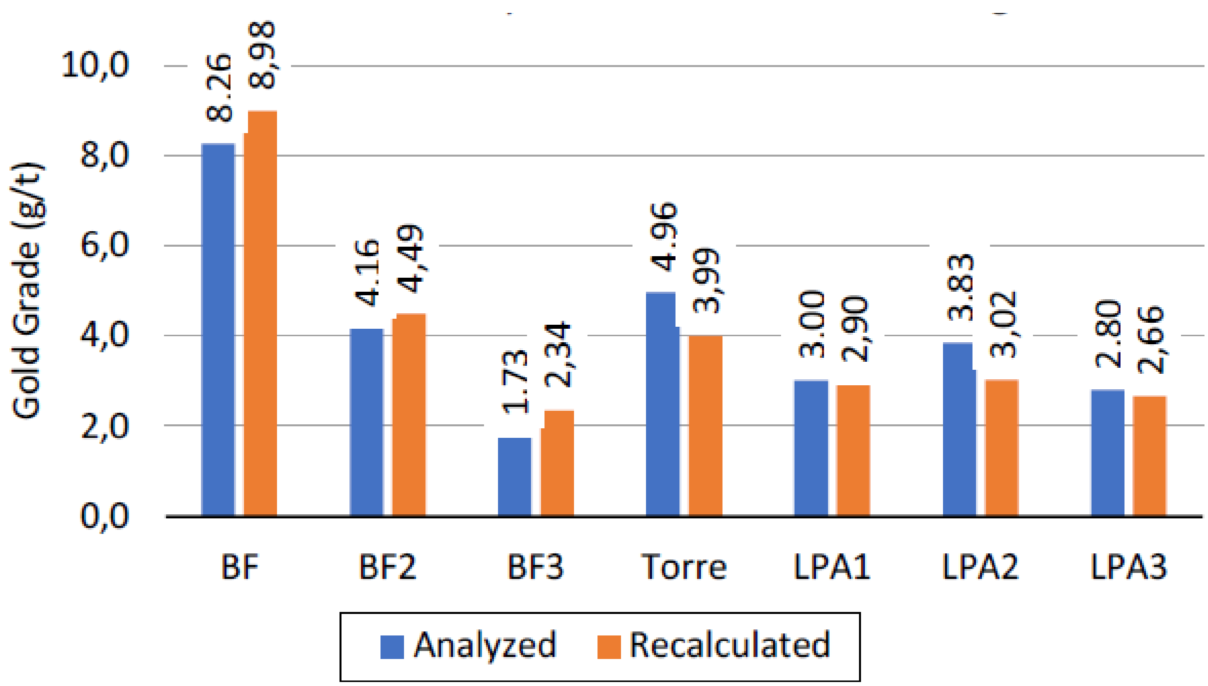
FIGURE 13-1 METALLURGICAL TEST WORK FLOWSHEET



TEST WORK RESULTS

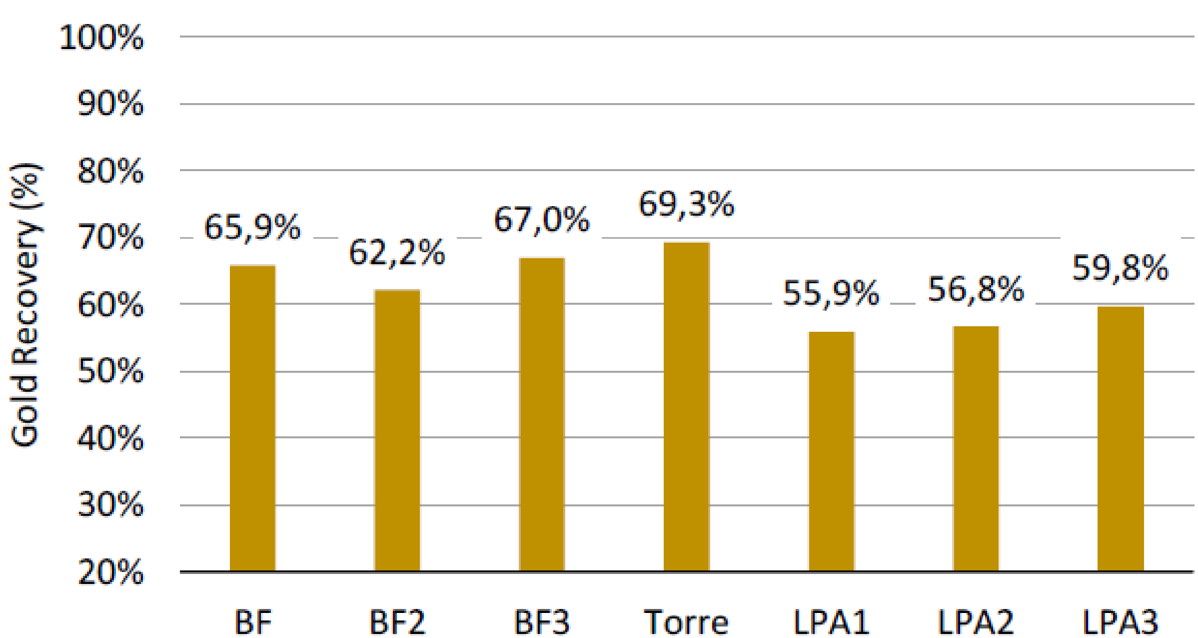
The assayed and calculated head gold contents of the analyzed samples is shown in Figure 13-2.

FIGURE 13-2 ASSAYED VERSUS CALCULATED HEAD CORRELATION



The averages of all the results of the gravimetric concentration tests, performed prior to the leaching and flotation tests showed similar results, independent of the grind. The results are shown below, in Figure 13-3.

FIGURE 13-3 OVERALL GRAVITY GOLD RECOVERIES



The high recoveries of free gold can justify the variation in the assayed versus calculated head gold content of the various tests performed shown earlier in Figure 13-2.

Figures 13-4 and 13-5 below show the overall recovery and gold tailings averages of leaching tests (direct, CIL, with and without gravimetric concentration).

FIGURE 13-4 LEACHING TEST RECOVERY

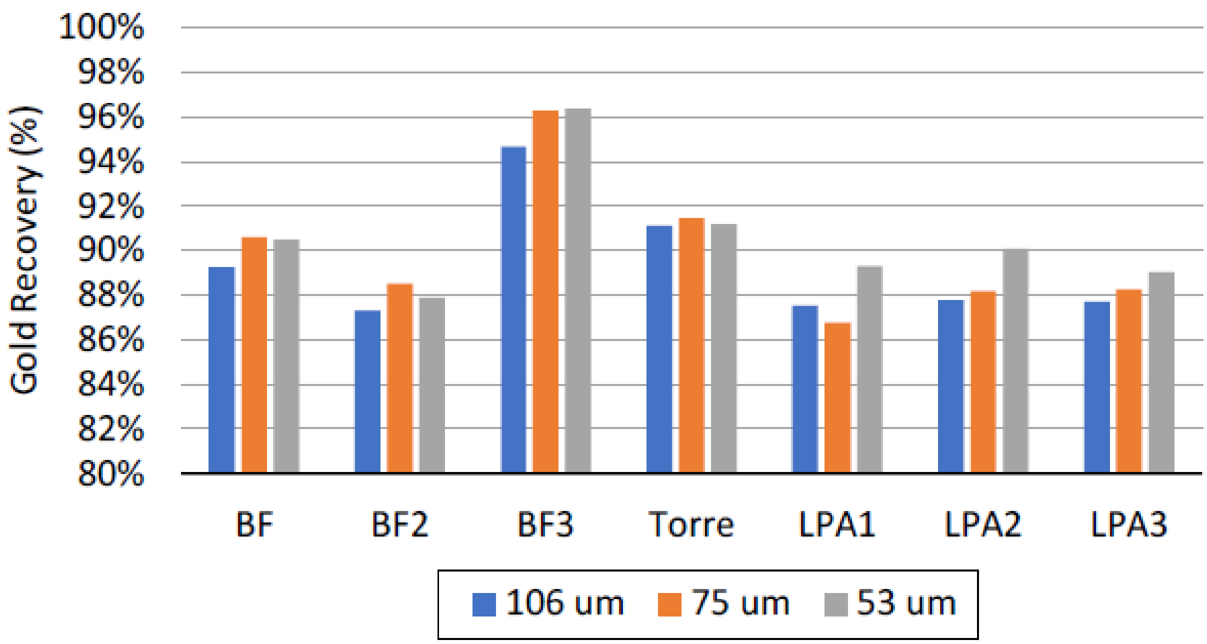
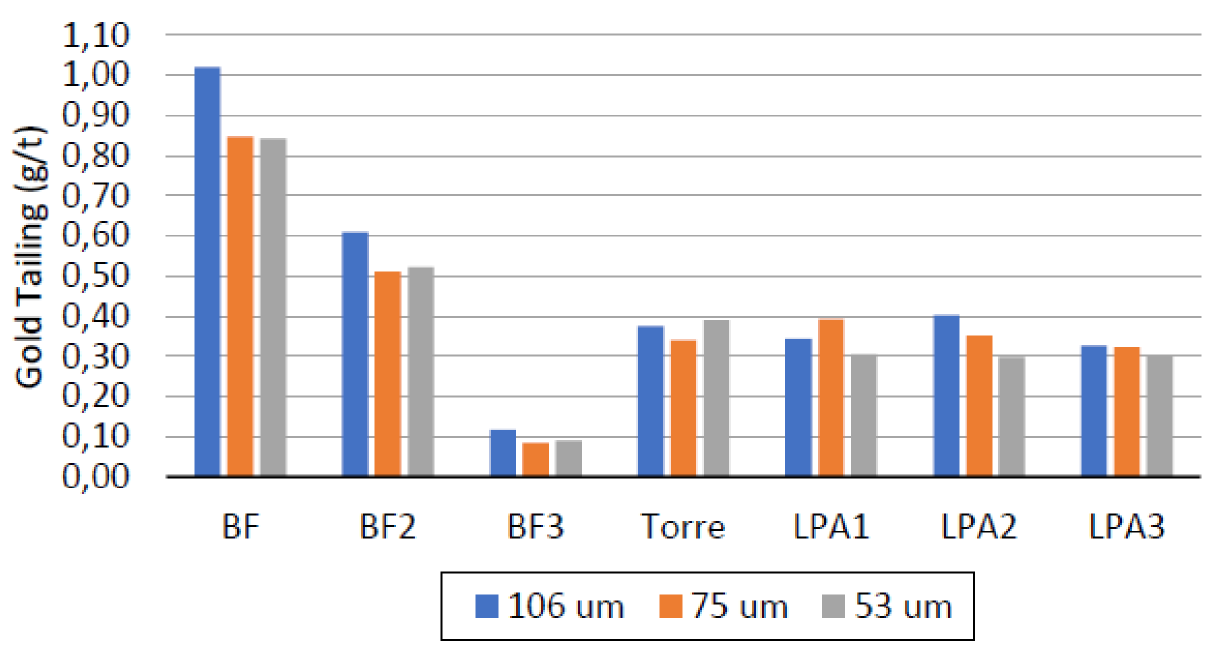


FIGURE 13-5 TAILS GOLD VALUES



The results show that grinding equal to or below P_{80} = 75 µm reduces tailings values. The final recovery is naturally influenced by the head content of the tests, showing that the assessment of the contents of the tailings is important.

Figures 13-6 and 13-7 show the gold recovery and gold tailings values in the flotation tests.

FIGURE 13-6 GOLD FLOTATION RECOVERY

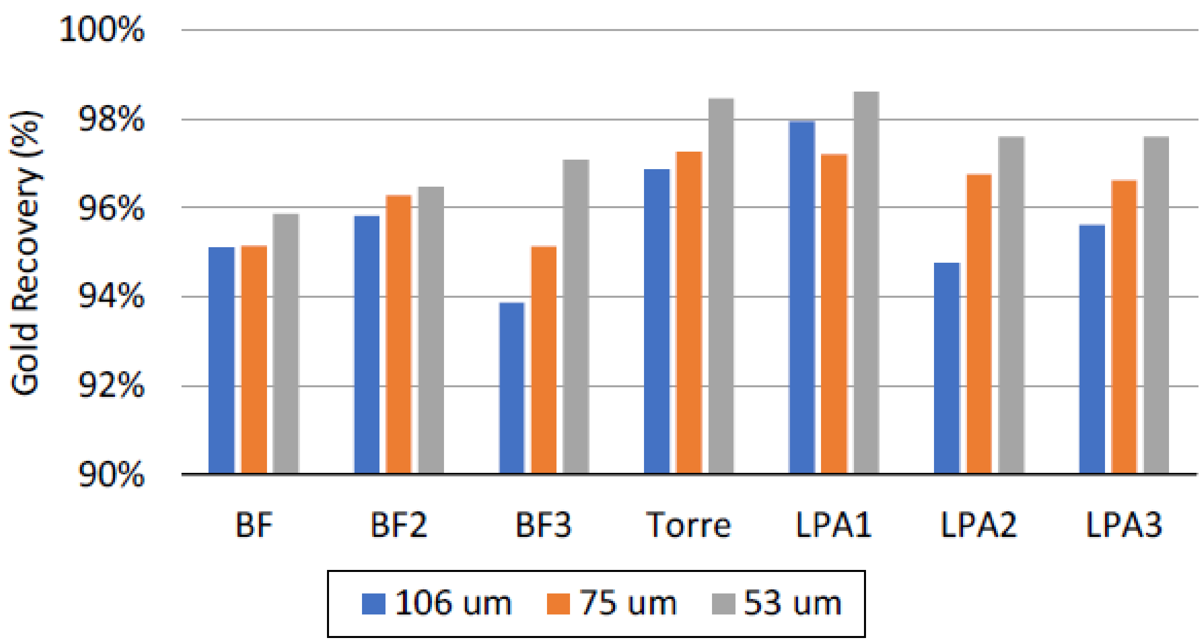
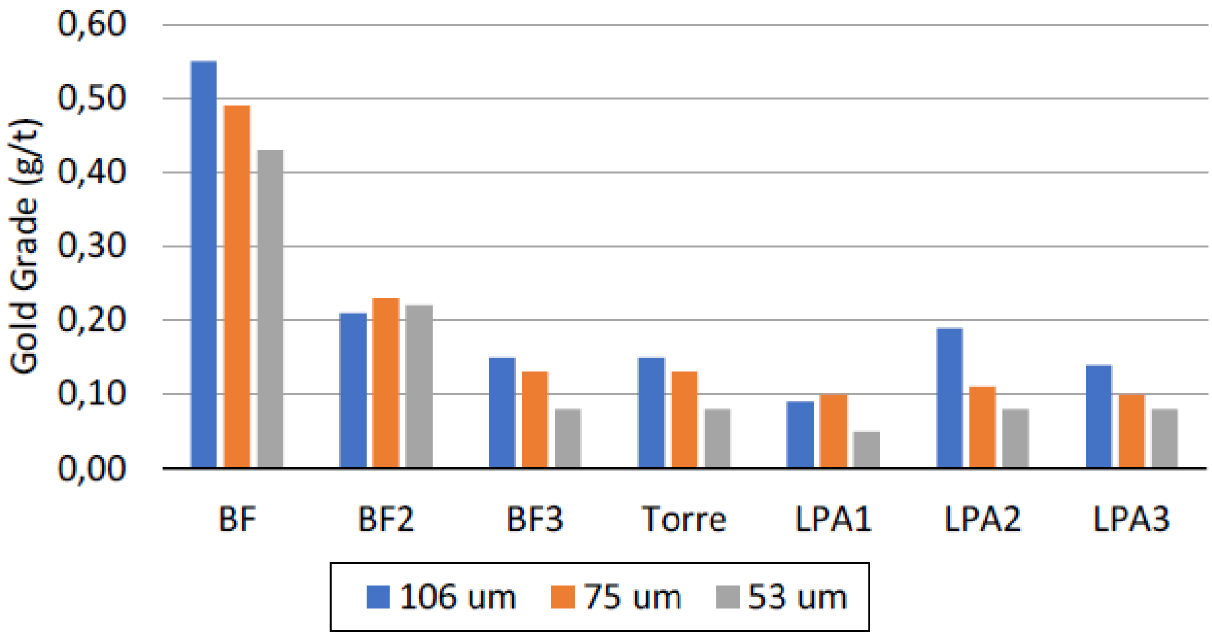


FIGURE 13-7 TAILS GOLD VALUES



The results show that a finer grind (P_{80} = 53 µm) reduces the values of gold content in tailings in flotation tests with consequent increase in overall recovery (gravimetric concentration + flotation).

Figures 13-8 and 13-9 show the gold recoveries and leach tails in leaching of flotation concentrates generated in flotation tests with P_{80} = 75 µm. Leaching was performed simulating the leaching circuit of the Caeté processing plant.

FIGURE 13-8 FLOTATION CONCENTRATE LEACH RECOVERY

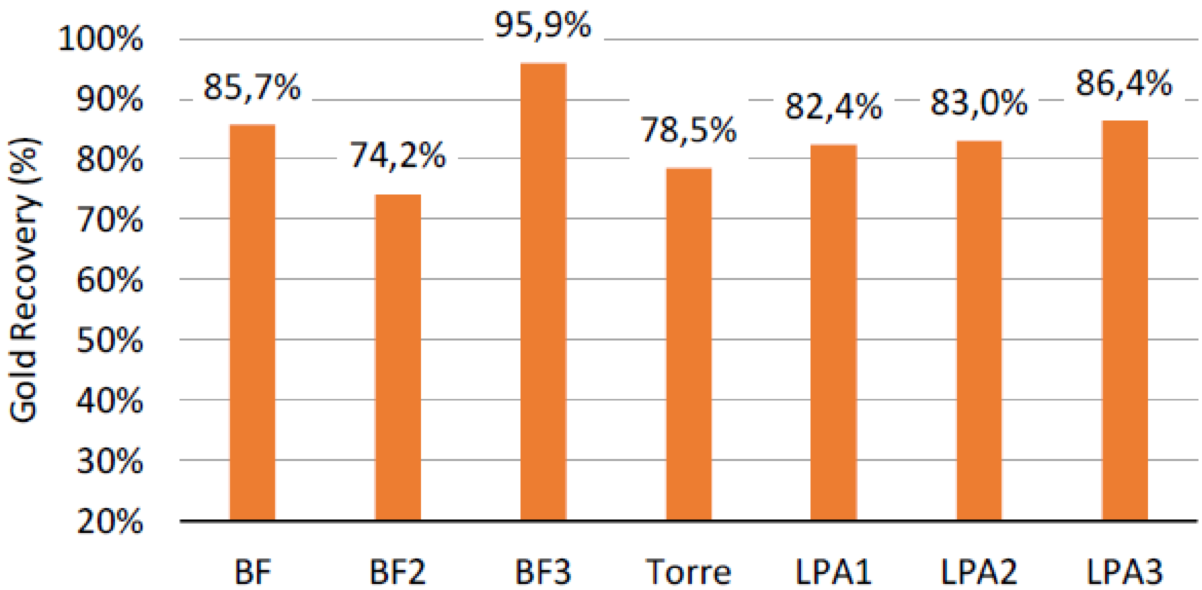
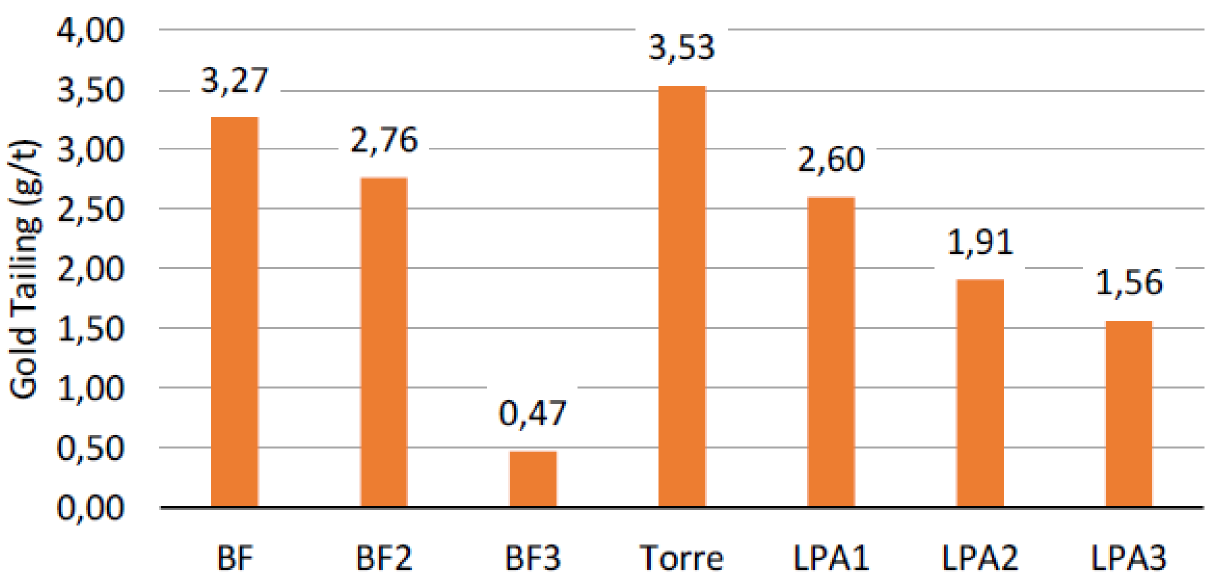


FIGURE 13-9 LEACH TAILS GOLD VALUES



Figures 13-10 and 13-11 show the calculated overall recoveries and the tailings assays, simulating the overall process circuit (gravity + flotation + leaching).

FIGURE 13-10 OVERALL GOLD RECOVERIES

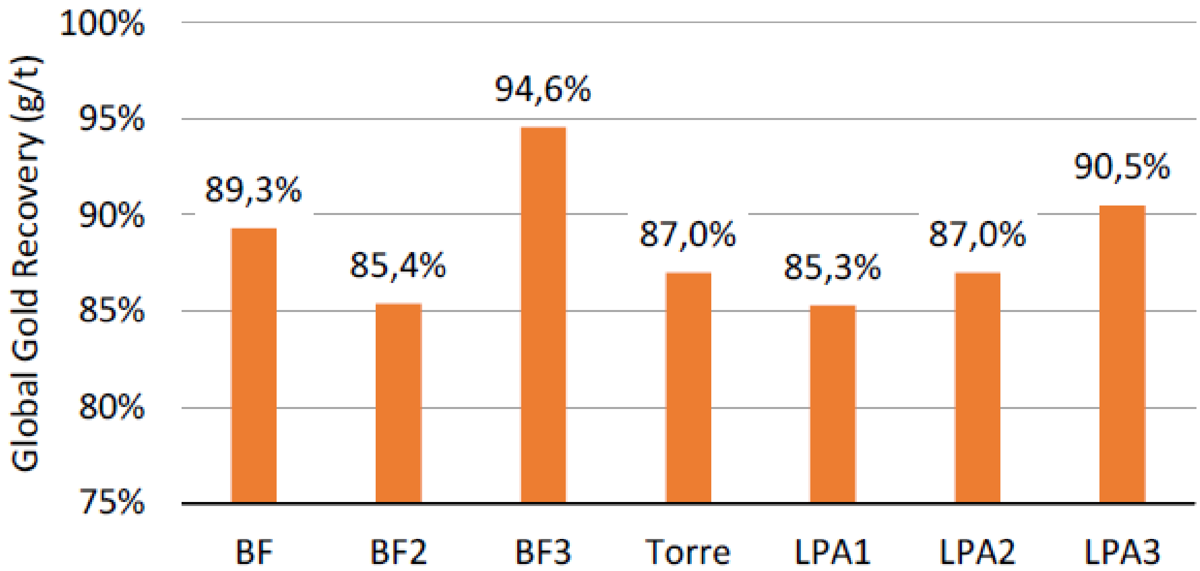


FIGURE 13-11 TAILS ASSAYS

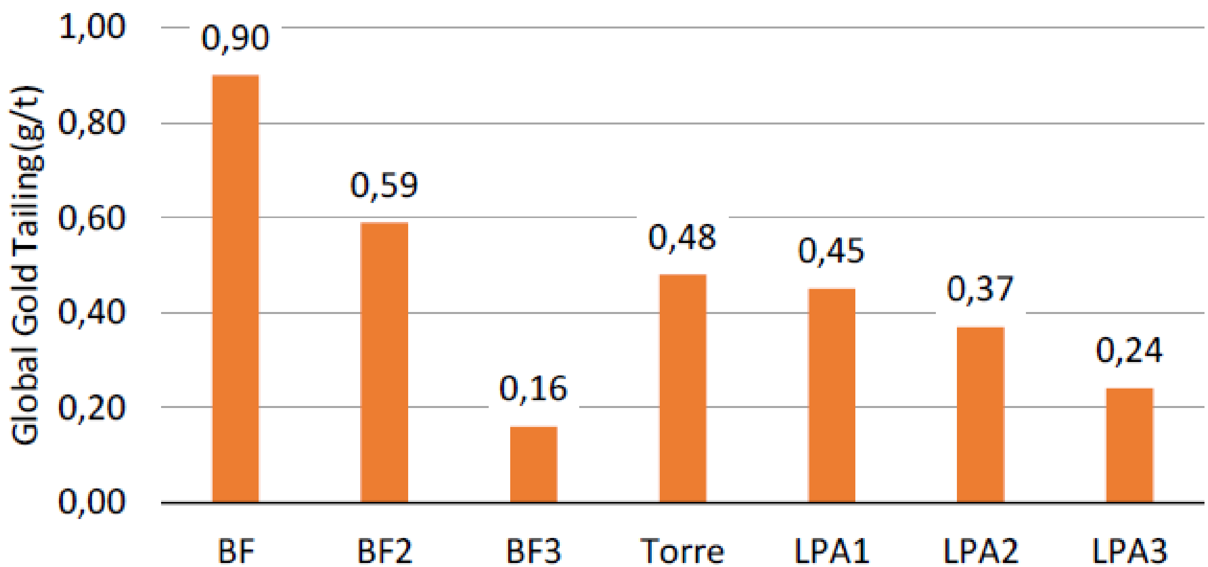
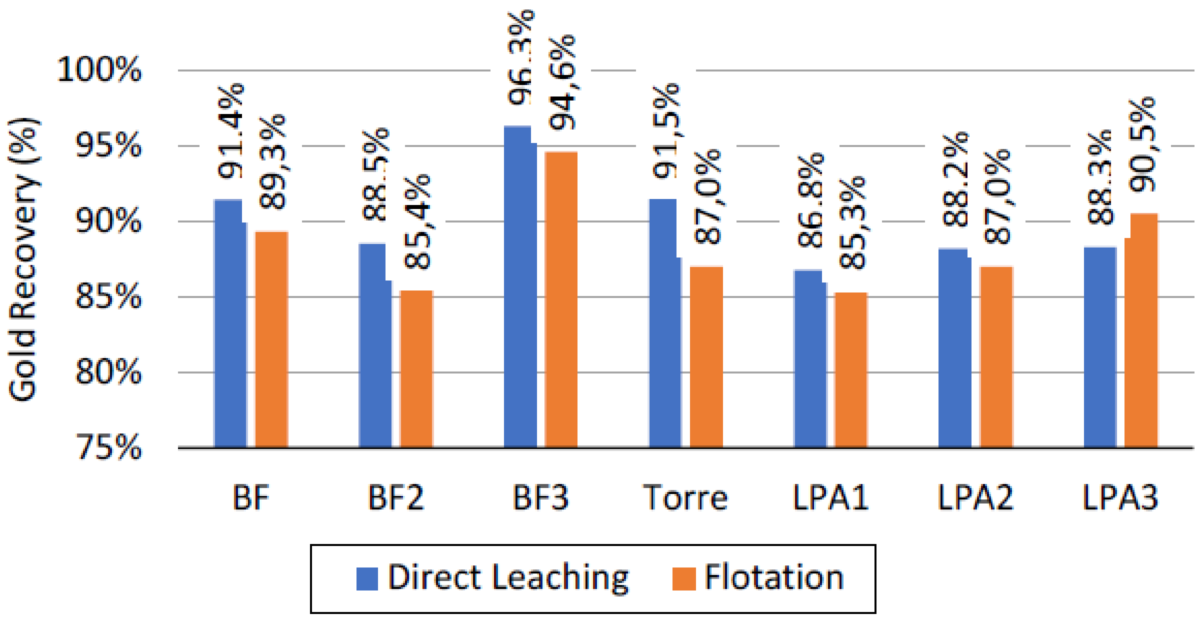


Figure 13-12 shows the comparison of overall recoveries of flotation tests with the overall recoveries of leaching tests, at a P_{80} grind of 75 µm.

FIGURE 13-12 FLOTATION GOLD RECOVERY



The graph above shows that there is a good correlation between direct leaching tests and flotation test results (gravimetric concentration + flotation + concentrate leaching). Further test work requiring more sampling may be warranted to confirm the correlation.

Figures 13-13 and 13-14 show the correlations between flotation and leach gold recovery and flotation and leach tails assays.

FIGURE 13-13 FLOTATION/LEACH RECOVERY CORRELATION

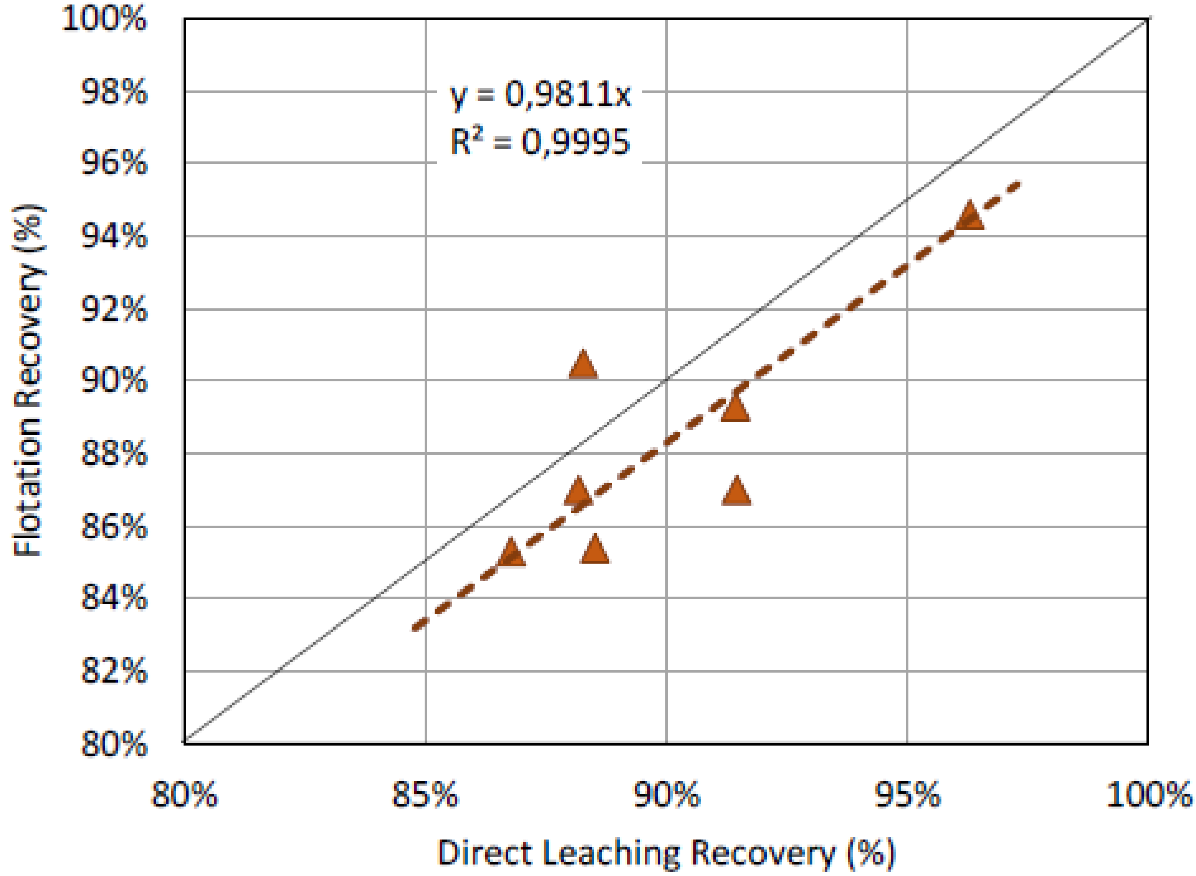
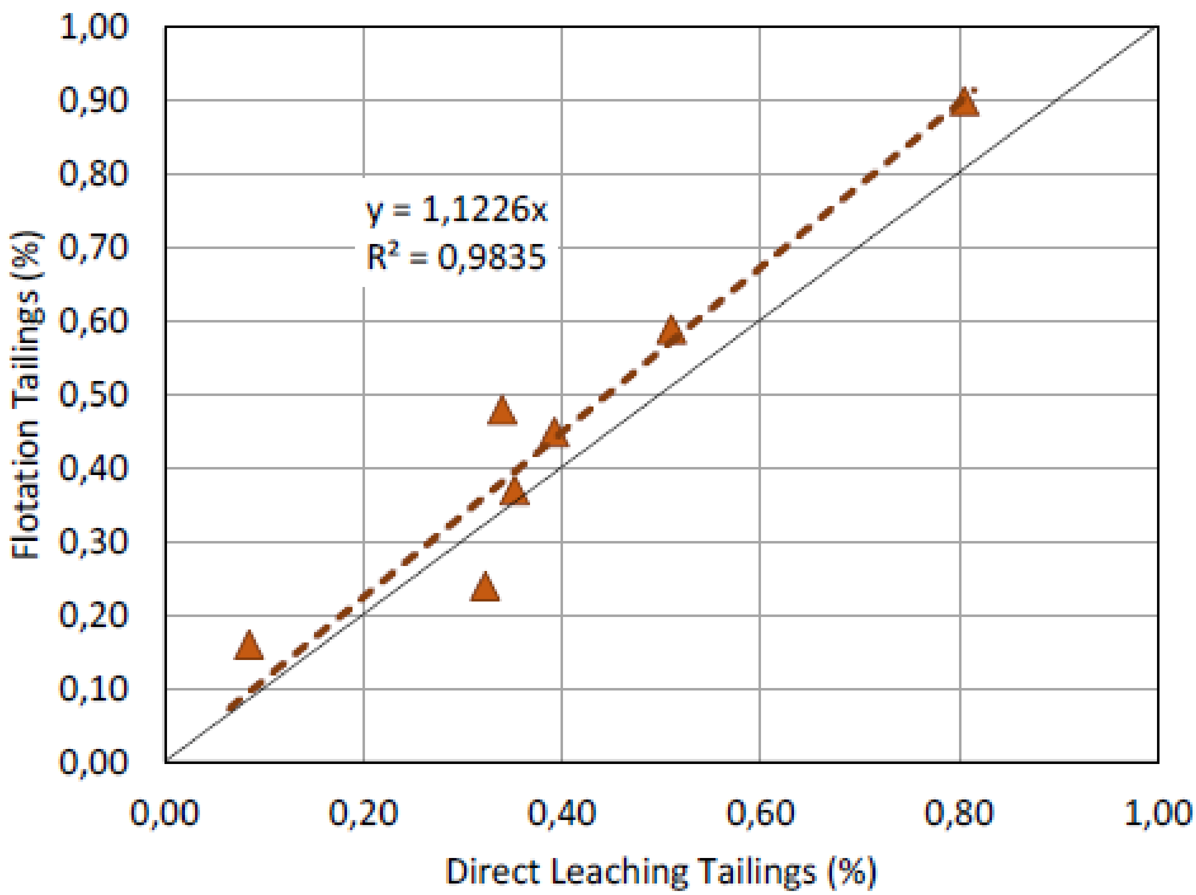


FIGURE 13-14 FLOTATION/LEACH TAILS ASSAY CORRELATION



- Final flotation circuit recoveries can be anticipated with simple leaching tests with approximately 2% less accuracy than leaching test results. This will be important for further geometallurgy of the Pilar Mine.
  - o **Plant Recovery = 0.9811 * Recovery in Direct Leaching (P_{80}=75µm)** (Equation 1)
- To escape the variation of the plant feed, the plant tailings value can also be estimated using the tailings value of the direct leaching test according to the equation.
  - o **Plant Tailings = 1.1226 * Direct Leaching Tailings (P_{80}=75µm**) (Equation 2)

TEST WORK CONCLUSIONS

Based on the objectives of the test work, the final conclusions were as follows:

Objective: Anticipate the behaviour of mineralization in the gold recovery circuits of the Caeté processing plant

- Tests showed that there is difference in the behaviour and recovery of gold within the same orebody, especially in the BF orebody.

- All orebodies had gold recoveries in gravimetric concentration above 55% reaching 69%.
- All orebodies had global gold recoveries above 85% reaching 95%.
- The anticipation of gold recoveries from the circuits of the Caeté processing plant can be made by simple direct leaching tests using equations 1 and 2.

Objective: Identify the adequacy of the circuits of the Caeté processing plant, due to the new characteristics of the ores

- The circuits are suitable for the treatment of the tested ores.
- Recovery variations are characteristic of the ores.
- Flotation tests indicated that there is the possibility of increased recovery using Sodium Xanthate Isobutyl (SIBX) or Potassium Amil Xantrate (PAX). Plant trials should be carried out.
- A slight increase in the flotation mass may also have a beneficial effect on the circuit.

Objective: Identify the possibility of optimizing existing processes

- Final tests of optimization of the circuit are in progress. The tests will be performed with samples from the BF, BF2, BF3 and Torre deposits; there is not enough sample of LPA.
- The tests are focused on leaching the flotation concentrate with the aim of:
  - Simplifying the circuit
  - Reducing reagent consumption by eliminating ferrocyanide formation in the leaching circuit. Tests done in parallel showed this possibility. This can reduce cyanide consumption and also reduce the consumption of reagents in the treatment of effluents.

AMTEL LTD.

In February 2020, AMTEL Ltd. (AMTEL) completed a gold deportment study on a CIP leach residue sample, labelled RCP (AMTEL, 2020), with the following results:

- General Mineralogy
  - The RCP residue is sulphide-rich containing 51 wt% pyrrhotite, 19.7 wt% arsenopyrite, and smaller quantities of sphalerite (0.8 wt%), chalcopyrite (0.4 wt%), and pyrite (0.3 wt%).
  - Two varieties of pyrrhotite are present: monoclinic (magnetic) and hexagonal (non-magnetic).
  - Monoclinic pyrrhotite is the more abundant, at nearly 2 to1 ratio of the monoclinic to hexagonal pyrrhotite. Pyrrhotite is a strong cyanicide (i.e., oxygen/cyanide consumer in leach), particularly the monoclinic variety, as it is more reactive.

  - Rock minerals comprise 28% of the RCP mass: carbonates (9 wt%), quartz (8 wt%), illite (8 wt%), feldspars (2 wt%), and carbonaceous material (1.4 wt%).
- Gold Mineralogy
  - Gold occurs in four forms:
    - Water soluble Au salts: solubilized gold not loaded onto activated carbon (i.e., dries out in the solids)
    - Gold grains: gold-silver alloys with an average composition of 90 wt% Au and10 wt% Ag. Gold grains were observed free, attached, and enclosed. Free and attached grains (=exposed) are directly cyanidable. Enclosed (locked) particles require finer grinding to be recovered.
    - Solid solution gold: atomically distributed gold in a mineral crystal structure. In the RCP residue, it is hosted by arsenopyrite. This gold is refractory to direct cyanidation.
    - Surface bound gold: gold adsorbed on the surface of carbonaceous matter present in the sample.

The gold deportment in the RCP residue is shown in Figures 13-15 and 13-16. The following assessment was made.

- Water soluble gold salts are insignificant, accounting for only 0.1% of the sample grade.
- Exposed gold grains (free + attached) contribute only 2% of the RCP residue grade; one half as free gold particles and one half attached to other minerals.
- Free gold grains are small with an average grain size of 6 µm.
- Free gold grains contain more silver compared to unliberated gold grains; silver likely prevented complete dissolution of these gold particles.
- Attached gold particles are associated with arsenopyrite, pyrrhotite, and rock.
- Enclosed gold grains carry 26% of the gold in RCP residue.
- Enclosed gold grains are primarily carried by arsenopyrite. These grains are tiny with an average grain size of 3.5 µm.
- Gold locked in arsenopyrite is grind-sensitive; however, significant liberation occurs only by very fine to ultra-fine grinding.
- Solid solution gold contributes 70% of the gold in RCP residue; and is essentially carried by arsenopyrite Arsenopyrite occurs in three morphological varieties; each contains gold in solid solution form. The overall concentration of solid solution gold in arsenopyrite is 15.3 ppm Au.
- Solid solution gold sets the absolute minimum residue grade after ultra-fine-grinding and cyanide leaching to approximately 3 g/t Au.
- Surface gold on carbonaceous matter contributes 2% of the RCP grade carbonaceous matter particles are one half free in the slimes fraction (<7 µm) and one half disseminated in rock. In either occurrence, carbonaceous matter did not preg-rob significant gold.

The report reached the following conclusions:

- The plant leach circuit performed adequately.
    - o There are insignificant water soluble Au salts in the RCP residue: this indicates that all the gold dissolved in cyanide was recovered onto the activated carbon.
    - o There is very minor exposed cyanidable gold (residual free and attached gold grains): this indicates that leach conditions are optimized.
- There is very minor preg-robbed gold onto the carbonaceous matter: this indicates that gold preg-robbing was controlled or carbonaceous matter in the ore is not the preg-robbing type.

Further reducing the RCP grade requires:

- Considerably finer grinding to expose more of the gold locked in arsenopyrite.
- Oxidative sulphide treatment (pressure oxidation, roasting, bio-oxidation) to recover the solid solution gold in arsenopyrite.

FIGURE 13-15 GOLD DEPORTMENT

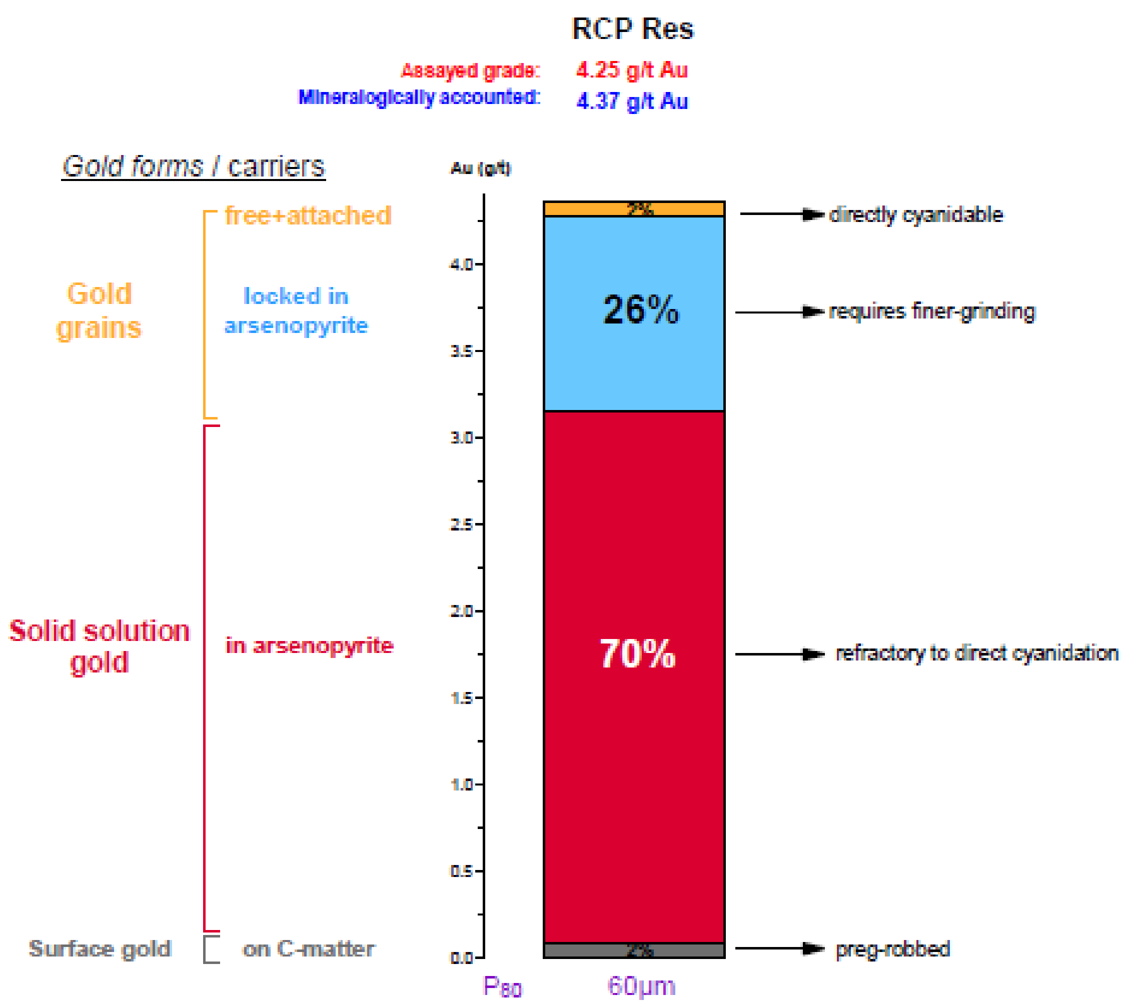
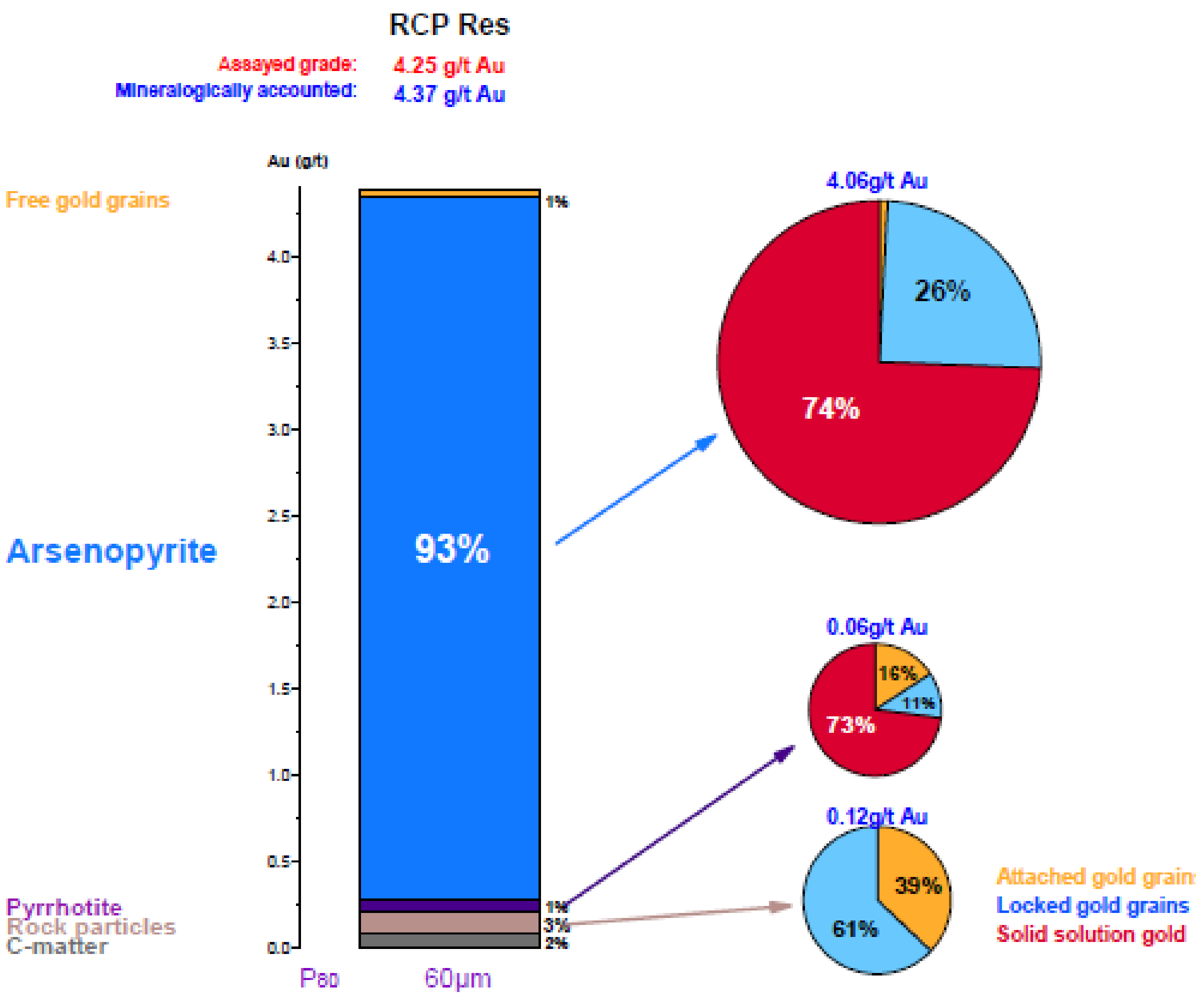


FIGURE 13-16 GOLD DISTRIBUTION BY MINERAL CARRIER



The QP finds that the test work was very comprehensive and encourages Jaguar to continue with it.

RPA CONCLUSIONS

In RPA's opinion, to the extent known, the test samples are representative of the various types and styles of mineralization and the mineral deposit as a whole.

In RPA's opinion, to the extent known, there are no processing factors or deleterious elements that could have a significant effect on potential economic extraction.

The QP finds that the test work was comprehensive and encourages Jaguar to continue with it.

14 MINERAL RESOURCE ESTIMATE

SUMMARY

RPA has audited and accepted the Mineral Resource estimates prepared by Jaguar for the Roça Grande and Pilar mines. Table 14-1 summarizes the Mineral Resources as of May 31, 2020 based on a US$1,400/oz gold price and exchange rate of R$2.50 : US$1.00 for the Roça Grande Mine and a US$1,500/oz gold price and exchange rate of R$4.50 : US$1.00 for the Pilar Mine. A cut-off grade of 1.46 g/t Au was used to report the Mineral Resources for both the Roça Grande and Pilar Mines. As the Roça Grande Mine is currently on a care and maintenance basis with no additional work completed since the previous disclosure of the Mineral Resources, no changes have been made to the block model.

TABLE 14-1 SUMMARY OF MINERAL RESOURCES AS OF MAY 31, 2020
Jaguar Mining Inc. – Caeté Mining Complex

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Roça Grande Mine:			
Measured	188	2.14	13
Indicated	889	2.91	83
Sub-total M&I	**1,077**	**2.77**	**96**
Inferred	1,759	3.48	197
Pilar Mine:			
Measured	2,266	4.39	319
Indicated	1,751	4.28	241
Sub-total M&I	**4,017**	**4.34**	**561**
Inferred	1,254	4.52	182
Total, Caeté Mining Complex:			
Measured	2,454	4.21	332
Indicated	2,640	3.82	324
Sub-total M&I	**5,094**	**4.01**	**657**
Inferred	3,013	3.91	379

Notes:

1. Canadian Institute of Mining, Metallurgy and Petroleum (CIM) for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM (2014) definitions) were followed for Mineral Resources.
2. Mineral Resources are estimated at a cut-off grade of 1.46 g/t Au for the Roça Grande and Pilar Mines.
3. Mineral Resources are estimated using a long-term gold price of US$1,400 per ounce for the Roça Grande Mine and US$1,500 per ounce for the Pilar Mine.
4. Mineral Resources are estimated using an average long-term foreign exchange rate of R$2.50 : US$1.00 for the Roça Grande Mine and R$4.50 : US$1.00 for the Pilar Mine.
5. Mineral Resources for the Roça Grande Mine are prepared by depletion of the 2015 resource block model by the excavation volumes as of May 31, 2020.
6. A minimum mining width of approximately two metres was used.

7. Gold grades are estimated using inverse distance cubed (ID^3) for the Roça Grande Mine and ordinary kriging (OK) for the Pilar Mine.
8. No Mineral Reserves are currently present at the Roça Grande Mine. Mineral Resources are inclusive of Mineral Reserves for the Pilar Mine.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not add due to rounding.

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

The QP is of the opinion that the Roça Grande and Pilar Mineral Resource estimates were prepared in a professional and diligent manner by qualified professionals and that the estimates comply with CIM (2014) definitions.

ROÇA GRANDE

The block model for the Roça Grande Mine is based on drilling and channel sample data using a data cut-off date of March 30, 2015 and June 30, 2015, respectively. The database comprises 649 drill holes and 6,517 channel samples. The estimate was generated from a block model constrained by three-dimensional (3D) wireframe models that were constructed using a minimum width of one metre. The purpose of the minimum width criteria was to attempt to identify any areas of high grade mineralization that could be candidates for extraction using highly selective underground mining methods. A two metre minimum width criteria were subsequently applied to the Mineral Resource reporting criteria by using a minimum grade times thickness product of 3.0 gram-metres.

Gold grades were estimated using the ID^3 interpolation algorithm using composited capped assays. A capping value of 30 g/t Au was applied for the RG01 and RG06 orebodies while a capping value of 50 g/t Au was applied for the RG02, RG03, and RG07 orebodies. The wireframe models of the mineralization and excavated material for the Roça Grande Mine were constructed using the excavation information as of December 31, 2018. The Roça Grande Mine was put on a care and maintenance basis in Q1 2018.

Mineralized material for each orebody was classified into the Measured, Indicated, or Inferred Mineral Resource categories on the basis of the search ellipse ranges obtained from the variography study, observed continuity of the mineralization, drill hole and channel sample density, and previous production experience with these orebodies. Reporting polygons were created to ensure that the "reasonable prospects for eventual economic extraction" requirement of the CIM (2014) definitions were met. These reporting polygons were used to appropriately code the block model and prepare the Mineral Resource reports.

PILAR

The updated block model for the Pilar Mine is based on drilling and channel sample data using a data cut-off date of May 19, 2020. The database comprises 1,941 drill holes and 22,716 channel samples. The estimate was generated from a block model constrained by 3D wireframe models that were constructed using a minimum width of two metres. Gold grades were estimated with OK interpolation and ID^3 algorithms using composited capped assays. Various capping values were applied to each of the different orebodies, ranging from 60 g/t Au for the BA Orebody to 20 g/t Au for the LPA Orebody. The wireframe models of the excavated material for the Pilar Mine were constructed using the information as of May 30, 2020.

Mineralized material for each orebody was classified into the Measured, Indicated, or Inferred Mineral Resource categories on the basis of the search ellipse ranges obtained from the variography study, observed continuity of the mineralization, drill hole and channel sample density, and previous production experience with this deposit. Reporting volumes were created using the Hexagon HxGN MinePlan 3Dv.15.30 mine modelling software package (Mine Plan 3D) or using the functions available through the Deswik mine modelling software package to ensure that the "reasonable prospects for eventual economic extraction" requirement of the CIM (2014) definitions were met. These reporting volumes were used to appropriately code the block model and prepare the Mineral Resource reports.

ROÇA GRANDE MINE

RESOURCE DATABASE

Drilling and sampling practices involved the initial delineation of the various mineralized lens locations using surface and underground drill holes at a nominal spacing of 25 m to 50 m. Underground drilling was then used to delineate the RG01 and RG07 mineralized lenses only, as no underground development has been carried out on the RG02, RG03, and RG06 lenses. As development of the underground access progressed on the RG01 and RG07 lenses, a series of channel samples were taken in two locales (one set on the face and one set along the back) for each round. The average sample spacing along development drifts was five metres. Channel samples that were taken during excavation of the open pit mines on the RG02, RG03, and RG06 lenses were also included into the drill hole database.

Jaguar maintains an internal database which is used to store and manage all of the digital information for all of its operations. The drill hole and channel sample information for the Roça Grande Mine was extracted from this internal database into separate files for use in preparation of the Mineral Resource estimates.

The cut-off date for the channel sample assays in the drill hole database is March 31, 2015, while the cut-off date for the drill core sample assays in the drill hole database is June 30, 2015. No further diamond drilling has been carried out at the Roça Grande property, however, collection of channel sample information in support of limited production activities was continued through to Q1 2018 when the mine was placed on a care and maintenance basis. The drill hole and channel sample information were grouped into five sets to reflect the known mineralized lenses at Roça Grande. Drilling and sampling was carried out using the UTM Datum Córrego Alegre, Zone 23S grid coordinate system.

A summary of the drilling and channel sampling information is provided in Table 14-2.

TABLE 14-2 DESCRIPTION OF THE ROÇA GRANDE DATABASE AS OF AUGUST 24, 2015
Jaguar Mining Inc. – Caeté Mining Complex

Data Type	Description
Collars, Drill Holes	649 (total 97,250 m)
Collars, Chip & Channel Samples	6,517 (total 74,041 m)
Survey, Drill Holes	23,694
Survey, Chip & Channel Samples	72,321
Lithology, Drill Holes	11,328
Lithology, Chip & Channel Samples	29,791
Assays, Drill Holes	33,327
Assays, Chip & Channel Samples	77,035

This drill hole information was modified slightly so as to be compatible with the format requirements of the MineSight v.7.60 mine planning software (MineSight) and was imported into that software package by Jaguar. A number of new tables and variables were created during the estimation process to capture such information as the intersectional information between the drill holes and the wireframe models, density readings, capped assays, and composites.

The database included a number of assay records which contained entries of negative values to represent intervals of no sampling, lost core, lost sample, or no core recovery, some of which are contained within the mineralized wireframes. Depending upon the specific local conditions, these null values can introduce an undesired positive bias upon the grade estimations. Jaguar therefore elected to pursue a conservative approach by inserting a very low gold value of 0.01 g/t Au for these intervals of null values. A total of 33,033 records were adjusted in this process.

The QP notes that the controls on the gold mineralization at the Roça Grande Mine are well understood and that the mineralized lenses are well drilled and sampled. The drilling and sampling protocols employed by Jaguar permit the identification and delineation of the mineralized areas with confidence. Drilling and sampling practices are carried out to a high standard. The QP is of the opinion that the drill hole and sampling database is suitable for use in preparation of Mineral Resource estimates.

GEOLOGICAL AND MINERALIZATION INTERPRETATIONS

The interpreted 3D wireframe models of the gold mineralization have been created using the geology information and assay values from surface and underground drill holes, and channel sample data as described in RPA (2016). Wireframe models of the gold distribution for the various mineralized zones were created using the Leapfrog Geo version 2.0.2 software package (Leapfrog). No changes have been made to the mineralized wireframes for this current Mineral Resource estimate.

Wireframe limits were drawn using a cut-off grade of 0.50 g/t Au and a nominal minimum width of one metre. The purpose of the minimum width criteria was to attempt to identify any areas of high grade mineralization that could be candidates for extraction using highly selective underground mining methods. A two metre minimum width criterion was subsequently applied to the Mineral Resource reporting criteria by using a minimum grade times thickness product of 3.0 gram-metres. The wireframe models were clipped to the original, pre-mining topography surface.

The main underground production of the Roça Grande Mine has been from the RG01 and RG07 lenses. The RG01 lens is a shallow dipping stratiform deposit that is generally associated with an iron formation assemblage comprised of carbonate, oxide and sulphide facies iron formation, chert, clastic sediments (including graphitic argillite), and fine-grained tuffaceous units. The average strike of the lens is to azimuth 075° and the average dip is 40° to 50° to the south (Figure 14-1).

The RG07 lens in contrast is composed predominately of vein quartz, which is oriented sub-parallel to the RG01 mineralized lens. Mineralization in the RG01 lens has been outlined along a strike length of approximately 500 m and along the down-dip direction of approximately 1,400 m to 1,500 m (approximately 400 m vertically below surface). The deposit is accessed via a ramp and a system of levels that provides access to a depth of approximately 230 m vertically from surface. The bottom of the ramp is currently located approximately 300 m vertically from surface. Mineralization in the RG01 lens has been defined by drilling below the lowest working level and good potential remains for discovering additional mineralization along the down-plunge projection with additional drilling.

Separate surfaces were also created to represent the bottom of the weathered material as well as representing the bottom of the transitional weathering zone. It is important to note that due to the presence of deeply penetrating fault structures, the bottom of the transition zone has been interpreted to penetrate deeper near the RG01 and RG02 lenses. This interpretation is supported by the rock quality information gained in the Vale railroad tunnel, the ramp access from the RG01 mine to the RG02 lens, and from drill holes that tested the RG02 lens which were collared from the RG02 decline.

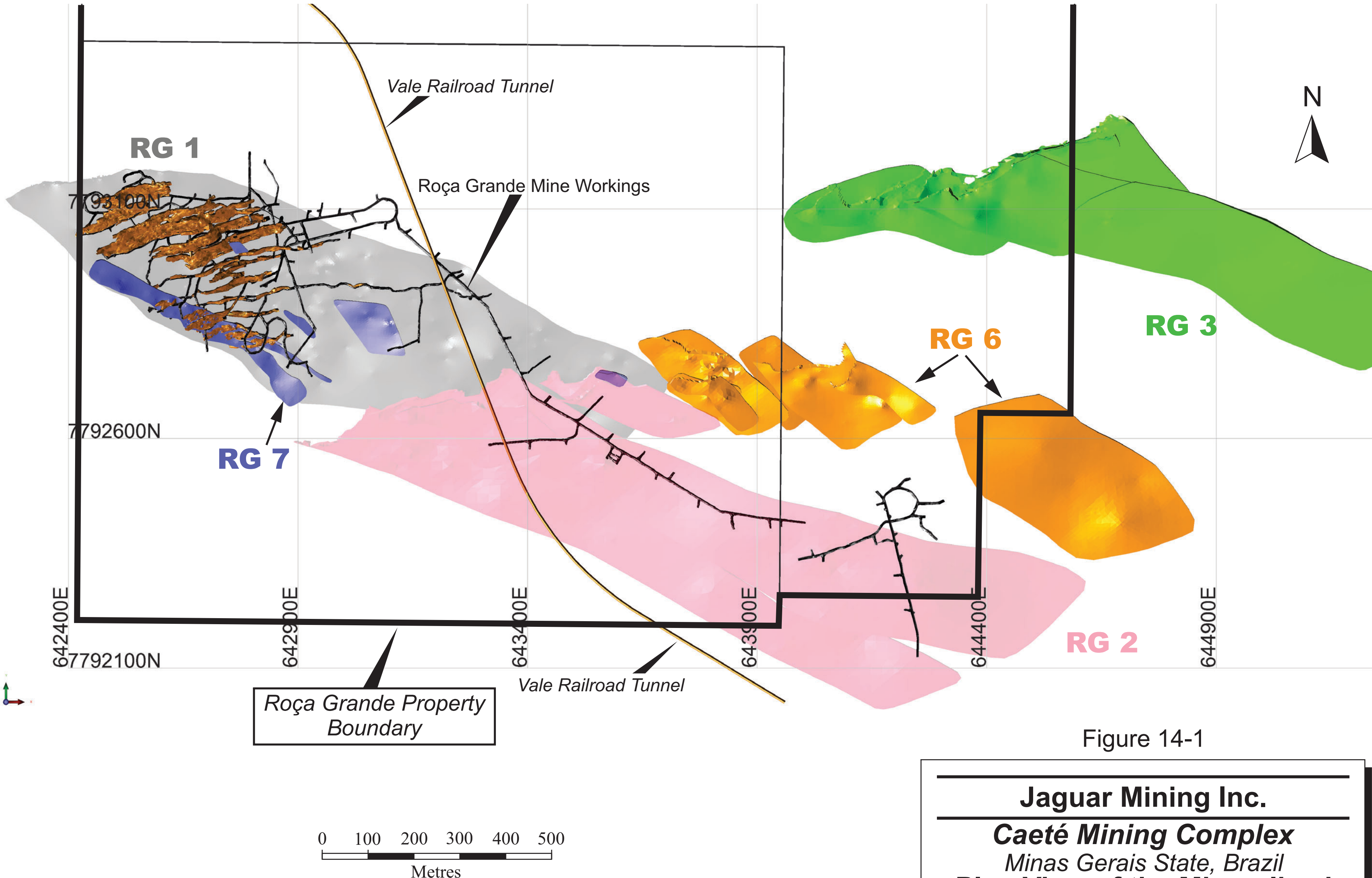


Figure 14-1

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Plan View of the Mineralized Wireframes and Underground Workings, Roça Grande Mine

August 2020

Source: RPA, 2016.

TOPOGRAPHY AND EXCAVATION MODELS

A topographic surface of the Roça Grande Mine area, current as of May 2015, was used to code the block model for the portions of the RG02, RG03, and RG06 lenses that have been excavated by means of open pit mining methods. A wireframe model of the completed underground excavations as of December 31, 2018 was prepared and was used to code the block model for the portions of the RG01 and RG07 lenses that have been mined out as of that date. No changes have been made to either the topographic surface model or the model of the underground excavations for this current Mineral Resource estimate.

Mineralization at the Roça Grande Mine is accessed via a ramp with a collar elevation at approximately 1,110 MASL. The bottom of the ramp is currently at an elevation of approximately 915 MASL. Due to the dip of the mineralization, the primary mining method that has been employed to date has been the drift and fill method. In all, five levels have been developed to access the RG01 and RG07 lenses (Table 14-3). An attempt was made to access the RG02 lens by deepening and extending the RG01 ramp, however, the attempt was stopped due to poor ground conditions. A second ramp has been excavated with the portal located in the hanging wall of the RG02 lens at an elevation of approximately 1,035 MASL. The bottom of this ramp is currently at an elevation of approximately 945 MASL, and has not penetrated the RG02 mineralized lens.

A railroad tunnel has been constructed by Vale in support of its mining operations in the area. A digital model of this tunnel has been prepared, which shows that it penetrates the mineralized wireframe of the RG02 lens (Figure 14-1).

TABLE 14-3 DESCRIPTION OF THE ROÇA GRANDE MINE LEVELS
Jaguar Mining Inc. – Caeté Mining Complex

Level	Floor Elevation (m)
Crown Pillar	1,220
1	1,160
2	1,120
3	1,044
4	970
5	922

RESOURCE ASSAYS

The mineralization wireframe models were used to code the drill hole database and identify the raw assay samples, or resource assays, that are contained within the mineralized wireframes. These samples were extracted from the database into their respective domains, and then subjected to statistical analyses by means of histograms, probability plots, and decile analyses. A total of 65,964 samples were contained within the mineralized wireframes, of which approximately 3% comprised samples with null values which had been replaced by near-zero values. The resource assay statistics are summarized in Table 14-4. Selected histograms are provided in Figures 14-2 and 14-3.

TABLE 14-4 RESOURCE ASSAY DESCRIPTIVE STATISTICS, ROÇA GRANDE MINE
Jaguar Mining Inc. – Caeté Mining Complex

Item	RG01		RG07		RG02		RG03		RG06	
	Au Raw	Au Cap	Au Raw	Au Cap	Au Raw	Au Cap	Au Raw	Au Cap	Au Raw	Au Cap
Length-Weighted Mean (g/t Au)	2.17	2.16	5.40	4.99	3.04	2.98	1.51	1.48	1.66	1.59
Median (g/t Au)	0.89	0.89	0.34	0.34	1.17	1.17	0.36	0.36	0.31	0.31
Mode (g/t Au)	0.01	0.01	0.01	0.01	0.01	0.01	0.07	0.07	0.01	0.01
Standard Deviation	3.60	3.41	13.84	9.46	6.14	5.44	4.15	3.62	4.71	3.49
CV	1.66	1.58	2.56	1.90	2.02	1.83	2.76	2.44	2.85	2.20
Sample Variance	12.96	11.64	191.45	89.57	37.67	29.61	17.24	13.09	22.23	12.21
Minimum (g/t Au)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Maximum (g/t Au)	88.17	30.00	385.00	50.00	165.03	50.00	196.00	50.00	115.80	30.00
Count	22,834	22,834	3,060	3,060	13,386	13,386	22,307	22,307	2,299	2,299
Capping Value (g/t Au)	30	-	50	-	50	-	50	-	30	-

FIGURE 14-2 RG01 RESOURCE ASSAY FREQUENCY HISTOGRAM

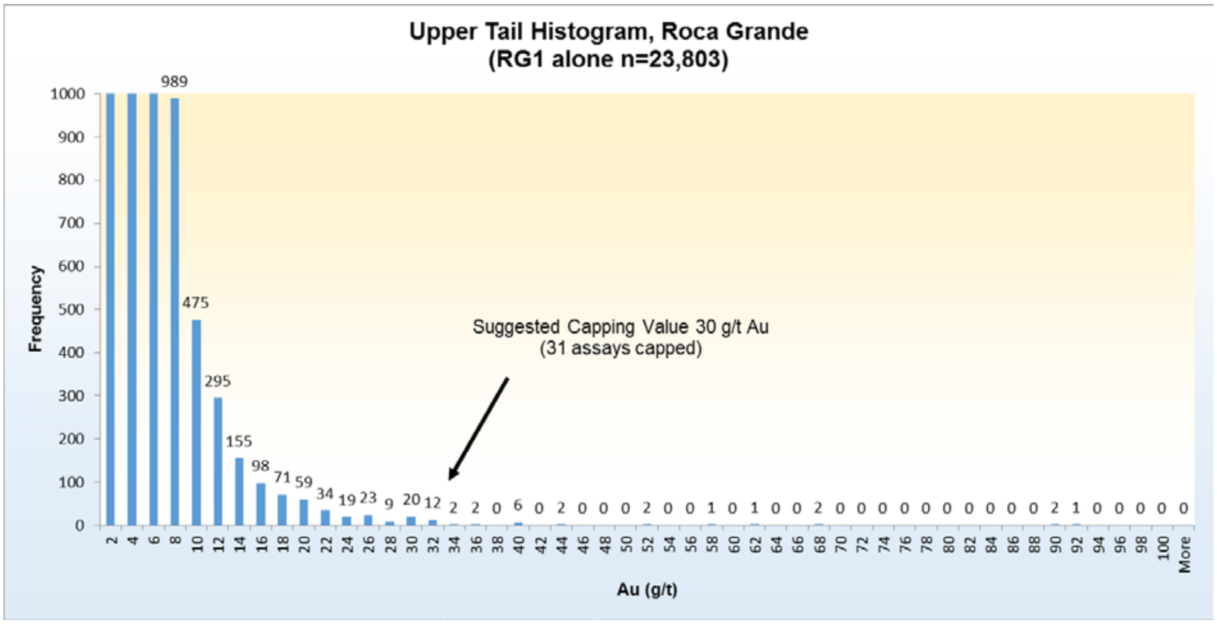
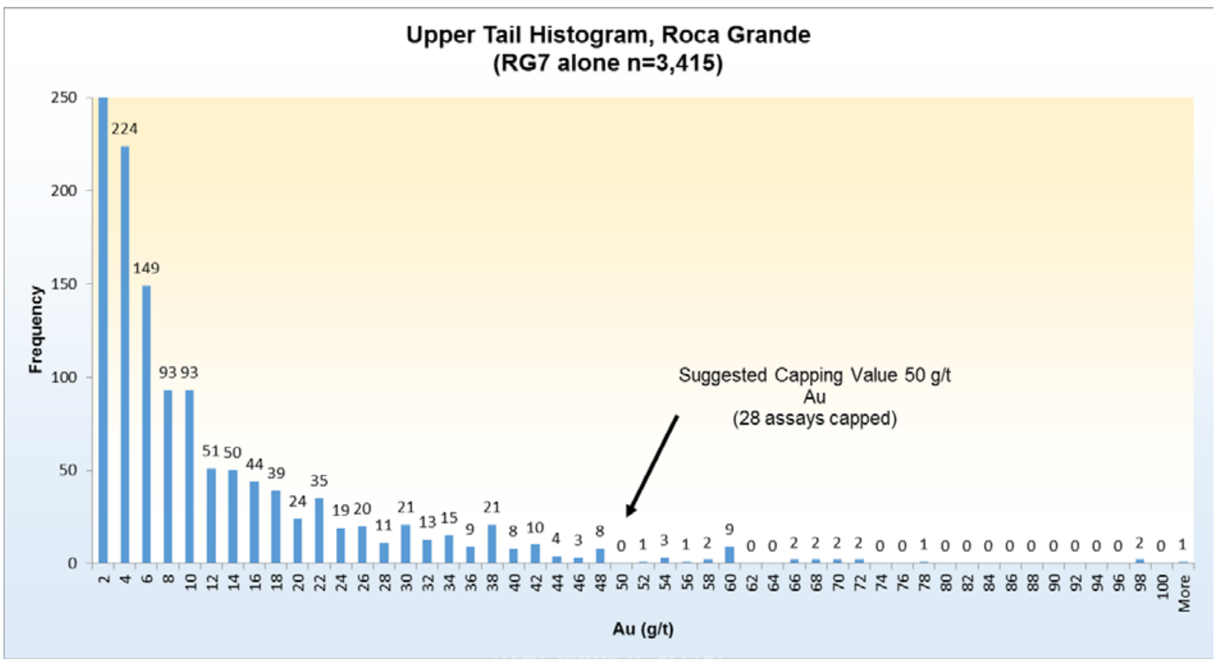


FIGURE 14-3 RG07 RESOURCE ASSAY FREQUENCY HISTOGRAM



TREATMENT OF HIGH GRADE ASSAYS

On the basis of its review of the resource assay statistics, RPA believes that a capping value of 30 g/t Au is appropriate for the RG01 and RG06 mineralized lenses and a capping value of 50 g/t Au is appropriate for the RG02, RG03, and RG07 mineralized lenses. The selection of capping values can be re-examined in light of grade reconciliation information and adjusted accordingly as necessary.

Capping values were applied to the raw assay samples in the appropriate mineralized domains prior to compositing.

COMPOSITING

Selection of an appropriate composite length began with examination of the descriptive statistics of the resource assays and preparation of sample length frequency histograms. Consideration was also given to the size of the blocks in the model.

Many of the sample lengths in the various mineralized wireframes were found to be approximately one metre in length. Consequently, on the basis of the available information, RPA believes that a composite length of one metre for all samples is reasonable. Resource assays were composited to a nominal one metre length using the MineSight best-fit function. The descriptive statistics of the composites are provided in Table 14-5.

TABLE 14-5 COMPOSITE DESCRIPTIVE STATISTICS, ROÇA GRANDE MINE
Jaguar Mining Inc. – Caeté Mining Complex

Item	RG01		RG07		RG02		RG03		RG06	
	Comp Raw	Comp Cap	Comp Raw	Comp Cap	Comp Raw	Comp Cap	Comp Raw	Comp Cap	Comp Raw	Comp Cap
Length-Weighted Mean (g/t Au)	2.17	2.16	5.39	4.99	3.04	2.98	1.51	1.49	1.66	1.59
Median (g/t Au)	1.15	1.15	0.98	0.98	1.19	1.19	0.45	0.45	0.40	0.40
Mode (g/t Au)	0.01	0.01	0.01	0.01	0.07	0.07	0.07	0.07	0.01	0.01
Standard Deviation	3.07	2.94	14.33	8.96	6.06	5.33	3.84	3.32	3.82	3.06
CV	1.41	1.36	2.66	1.80	1.99	1.79	2.55	2.23	2.31	1.92
Sample Variance	9.39	8.67	205.3	80.25	36.75	28.38	14.76	10.99	14.62	9.35
Minimum (g/t Au)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Maximum (g/t Au)	59.99	30.00	385.0	50.00	165.03	50.00	196.00	50.00	89.33	30.00
Count	11,500	11,500	1,541	1,541	7,091	7,091	12,103	12,103	1,817	1,817

TREND ANALYSIS

GRADE CONTOURING

As an aid in conducting variography studies of the continuity of the gold grades in the mineralized domain models, a short study to examine the overall trends was conducted. For this exercise, a data file was prepared that contained the gold values for each drill hole and channel sample contained within the respective mineralized domain model. The resulting gold grade times thickness (GT) product were digitally contoured using Leapfrog and the results are shown in Figures 14-4 and 14-5.

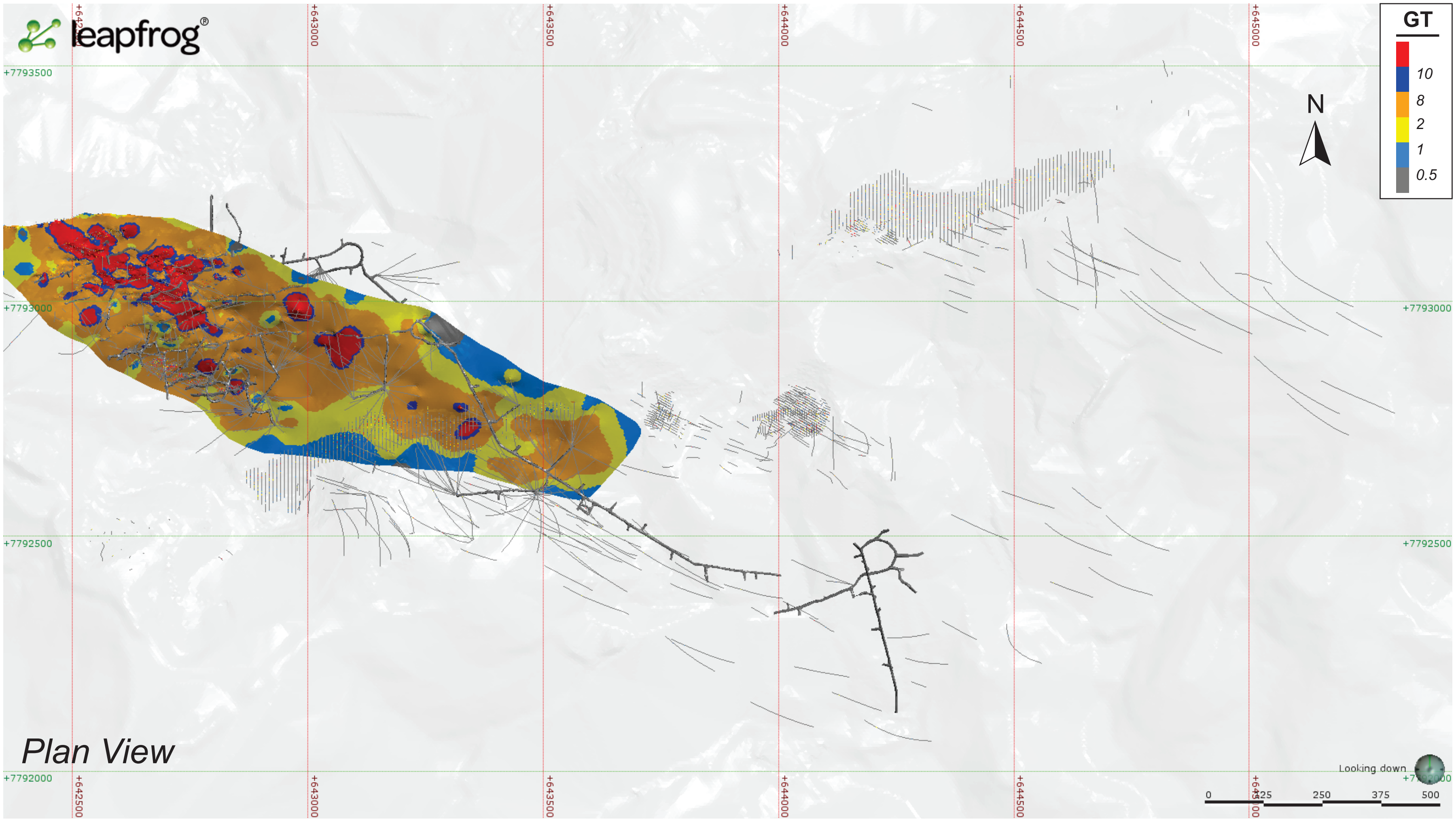


Figure 14-4

0 100 200 300 400 500
Metres

Jaguar Mining Inc.

Caeté Mining Complex
Mina Gerais State, Brazil
Grade x Thickness
Product RG1 Orebody

August 2020

Source: RPA, 2016.

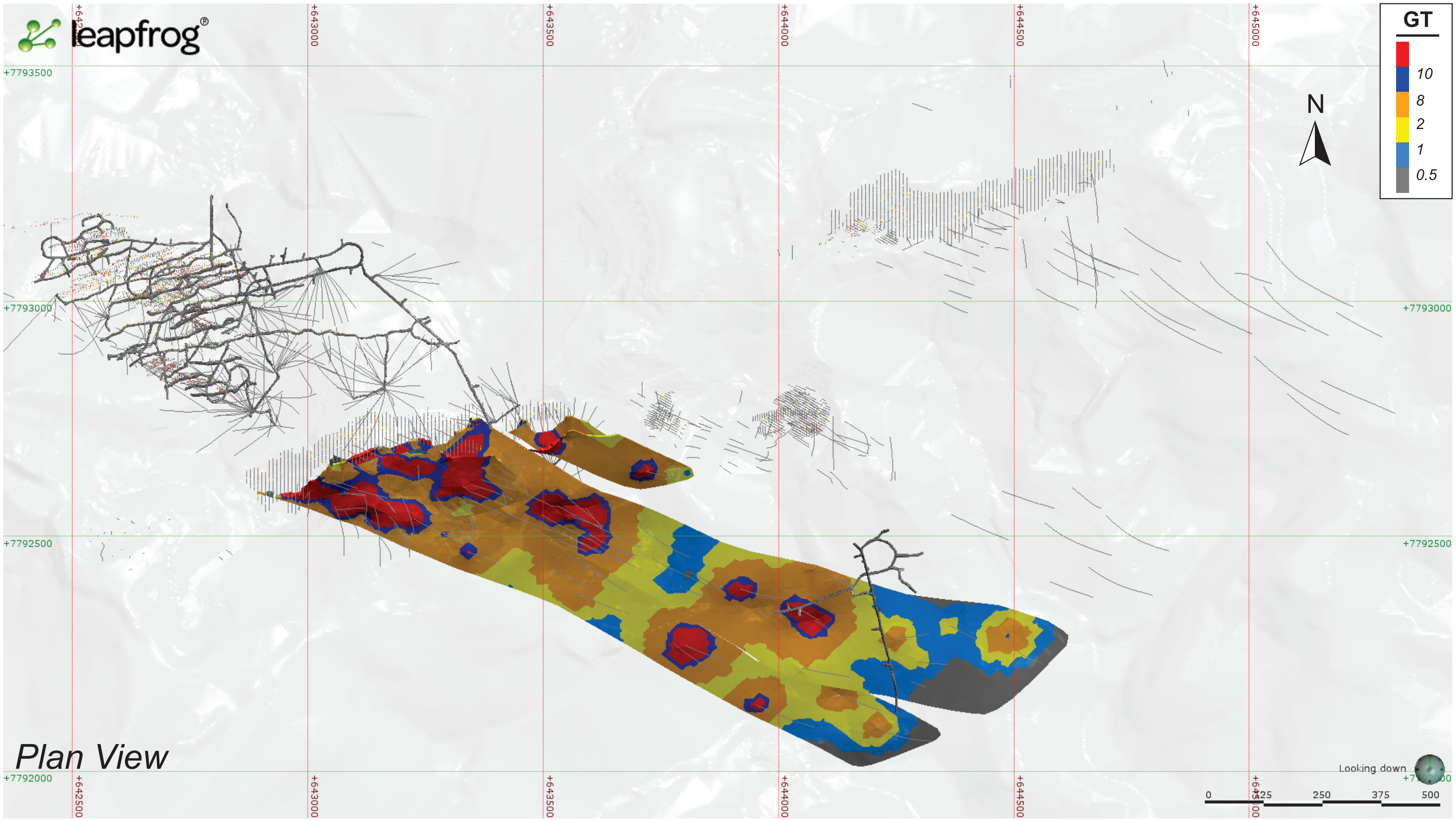


Figure 14-5

0 100 200 300 400 500
Metres

Jaguar Mining Inc.

Caeté Mining Complex

Mina Gerais State, Brazil

Grade x Thickness
Product RG2 Orebody

August 2020

Source: RPA, 2016.

As is demonstrated in Figures 14-4 and 14-5, an overall down-plunge of the gold grade-thickness product is present for the RG01 and RG02 orebodies. The trends further along the down-plunge projection are not as well defined, as the density of drill hole and channel sample information is lower in these areas.

VARIOGRAPHY

Jaguar began its analysis of the spatial continuity by constructing separate downhole and omnidirectional variograms using the composite data for each of the orebodies, with the objective of determining an appropriate value for the global nugget (C0). The analysis proceeded with the evaluation of any anisotropies that may be present in the data, which resulted in successful variograms with reasonably good model fits. The MineSight variography package was used to construct the variograms. A summary of the variogram parameters derived for each of the five orebodies is presented in Table 14-6. MineSight uses the azimuth/dip/plunge rotation convention (Figure 14-6).

TABLE 14-6 SUMMARY OF VARIOGRAPHY AND INTERPOLATION PARAMETERS, ROÇA GRANDE MINE
Jaguar Mining Inc. – Caeté Mining Complex

Orebody	RG01	RG02	RG03	RG06	RG07
Variography Parameters:					
Nugget	3	15	5	2	30
Sill, Major Axis C1	4.00 (8 m)	8.00 (22 m)	3.50 (12 m)	4.00 (6 m)	30.00 (5 m)
Sill, Major Axis C2	1.44 (26 m)	6.20 (38 m)	2.57 (20 m)	1.34 (26 m)	14.40 (20 m)
Model Type	Spherical	Spherical	Spherical	Spherical	Spherical
Orientation	110/-25/-30	110/-20/-40	110/-25/-40	130/-37/-40	115/-35/-30
Anisotropy Ratio (Major/Semi-Major)	3.25	1.27	1.67	1.30	1.67
Anisotropy Ratio (Major/Minor)	4.33	7.60	3.33	2.60	3.33
Minimum Number of Samples	3	3	3	3	3
Maximum Number of Samples	8	8	8	8	8
Max. No. of Samples per Hole	2	2	2	2	2
Max. No. of Samples per Quadrant	2	2	2	2	2
Search Ellipse Axis Ranges (m):					
Main	26	38	20	26	20
Secondary	8	30	12	20	12
Minor	6	5	6	10	6

BULK DENSITY

Jaguar initiated a program of bulk density measurements on the various lithologies that were present at the Roça Grande Mine in 2015. Density measurements were made on representative samples of drill core from intervals of iron formation and quartz vein that are located within the mineralized wireframes, along with measurements carried out on samples of adjoining waste rock units. Density measurements were carried out at the Jaguar analytical laboratory located at the Roça Grande Mine using the water displacement method. A total of 261 density measurements were completed in 2015. A summary of the results is presented in Table 14-7. A density of 2.00 t/m³ was applied to all material located above the oxidized surface and a density of 2.25 t/m³ was applied to all material located in the transition zone between the oxidized and fresh rock surfaces.

FIGURE 14-6 MINESIGHT ROTATION ANGLE CONVENTION

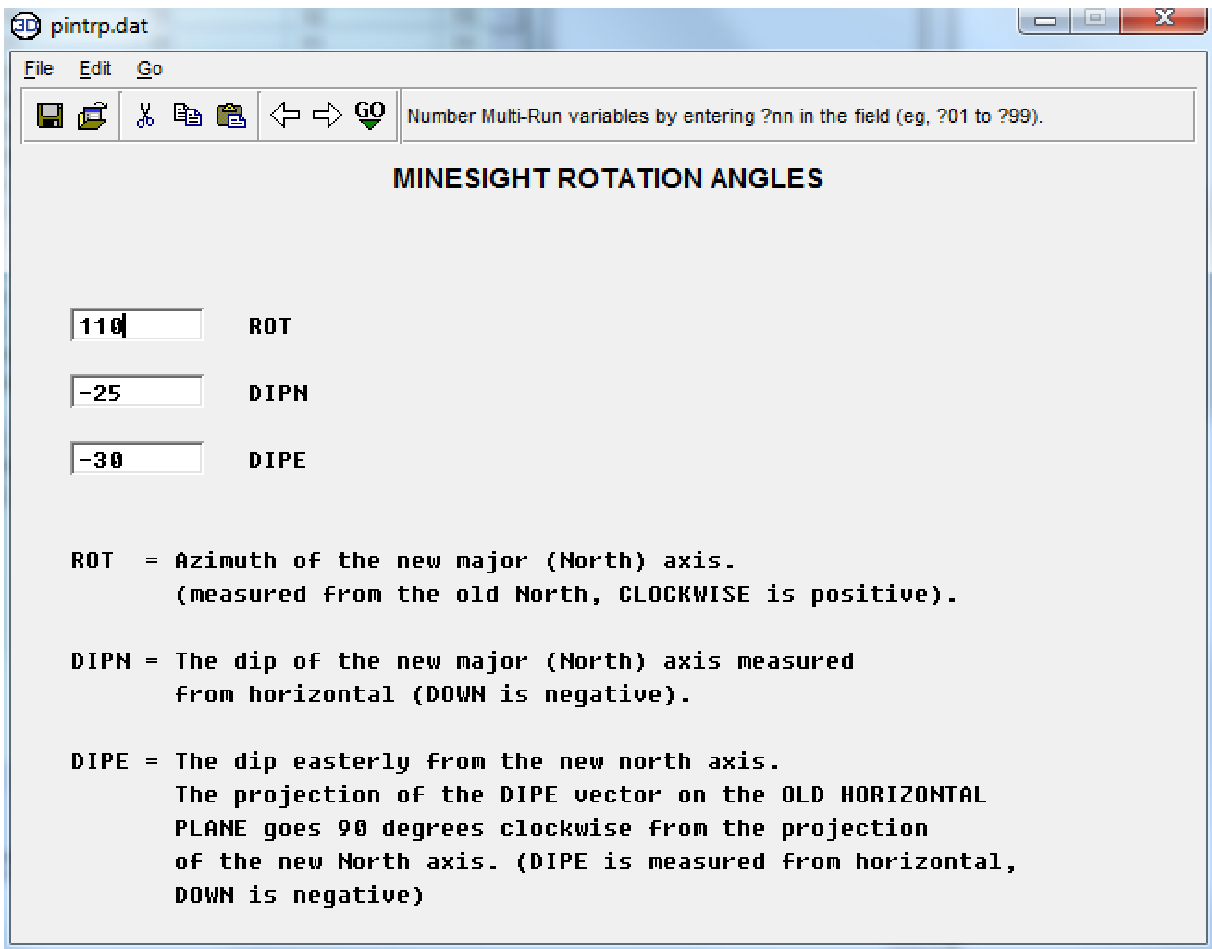


TABLE 14-7 SUMMARY OF 2015 DENSITY MEASUREMENTS, ROÇA GRANDE MINE
Jaguar Mining Inc. – Caeté Mining Complex

Item	Iron Formation RG01, 2, 3, & 6	Quartz Vein RG07	Waste Rock
Mean (t/m^3)	2.87	2.75	2.73
Median (t/m^3)	2.86	2.73	2.73
Mode (t/m^3)	2.75	N/A	2.60
Standard Deviation (t/m^3)	0.29	0.17	0.28
Sample Variance	0.08	0.03	0.08
Minimum (t/m^3)	2.24	2.45	2.00
Maximum (t/m^3)	4.13	3.19	3.88
Count	164	13	84

BLOCK MODEL CONSTRUCTION

The Roça Grande block model was constructed using MineSight and comprised an array of 2 m x 2 m x 2 m sized blocks using a partial percentage attribute. The Roça Grande block model is oriented parallel to the coordinate grid system (i.e., no rotation or tilt). The selection of the block size for this model was based upon the block sizes previously employed at the Roça Grande Mine. The Roça Grande block model origin, dimensions, and attribute list are provided in Table 14-8. A number of attributes were created to store such information as rock code, material densities, estimated gold grades, mineral resource classification, mined out material, and the like (Table 14-9).

TABLE 14-8 BLOCK MODEL DEFINITION, ROÇA GRANDE MINE
Jaguar Mining Inc. – Caeté Mining Complex

Type	Units	Y (Northing)	X (Easting)	Z (Elevation)
Minimum Coordinates	m	7,791,900	642,200	500
Maximum Coordinates	m	7,793,700	645,600	1,500
Block Size	m	2	2	2
Rotation	°	0.000	0.000	0.000

TABLE 14-9 BLOCK MODEL ATTRIBUTES, ROÇA GRANDE MINE
Jaguar Mining Inc. – Caeté Mining Complex

Attribute Name	Type	Decimals	Description
au_id3_c	Real	2	Gold by Inverse Distance Cubed
au_nn_c	Real	2	Gold by Nearest Neighbour
au_ok_c	Real	2	Gold by Ordinary Kriging
avd	Real	2	Average Distance of Informing Samples
class	Integer	-	Mineral Resource Classification (1=measured, 2=indicated, 3=inferred)
density	Real	2	Material Density
dm	Real	-	Code for Property Boundary (1=with RG claim boundary)
mined	Real	-	Mined Out (-1=Remaining Material, 1=Mined Out)
nsmp	Real	-	Number of Informing Samples
ore_pct	Real	2	Percent of Block Inside the Wireframe
rock	Integer	-	Material / Wireframe Code
rsrc	Integer	-	Resource/Reserve Reporting Flag (by wireframe)
topo_pct	Real	-	Percent of Block Below Topography Surface
vokc	Real	2	Kriging Variance
weath	Real	-	Weathering Code

SEARCH STRATEGY AND GRADE INTERPOLATION PARAMETERS

Gold grades were estimated into the blocks by means of ID^3, OK, and nearest neighbour (NN) interpolation algorithms (Table 14-10). A total of four interpolation passes were carried out using distances derived from the variography results and search ellipse parameters presented above.

TABLE 14-10 SUMMARY OF SEARCH STRATEGIES, ROÇA GRANDE MINE
Jaguar Mining Inc. – Caeté Mining Complex

	Search Parameter	Measured	Indicated	Inferred
	Minimum number of composites	3	3	2
	Maximum number of composites	4	4	4
	Maximum number of composites per drill hole	2	2	4
	Ellipse Type	Quadrant	Quadrant	Quadrant
	Minimum number of quadrants with samples	1	1	1
	Maximum number of composites per quadrant	2	2	8
Domain	**Ellipsoid Radius**	**Measured**	**Indicated**	**Inferred**
RG01	Major (m)	13	26	52
	Intermediate (m)	4	8	16
	Minor (m)	3	6	12
RG02	Major (m)	19	38	76
	Intermediate (m)	15	30	60
	Minor (m)	3	5	10
RG03	Major (m)	10	20	40
	Intermediate (m)	6	12	24
	Minor (m)	3	6	12
RG06	Major (m)	13	26	52
	Intermediate (m)	10	20	40
	Minor (m)	5	10	20
RG07	Major (m)	10	20	40
	Intermediate (m)	6	12	24
	Minor (m)	3	6	12

In general, "hard" domain boundaries were used along the contacts of the mineralized domain models. Only data contained within the respective wireframe model was allowed to estimate the grades of the blocks within the wireframe in question, and only those blocks within the wireframe limits were allowed to receive grade estimates.

Those portions of the mineralized wireframes that sit beyond the Roça Grande Mine property boundary were appropriately coded in the block model and omitted from the Mineral Resource statement.

MINERAL RESOURCE CLASSIFICATION

Definitions for resource categories used in this report are consistent with CIM (2014) definitions.

Mineralized material for each wireframe was initially classified into the Measured, Indicated, or Inferred Mineral Resource categories on the basis of the search ellipse ranges obtained from the variography study, demonstrated continuity of the gold mineralization, density of drill hole and chip sample information, and presence of underground access.

On the basis of these criteria, Measured Mineral Resources comprise material that has been estimated using Pass #1 and that is located between developed levels. Indicated Mineral Resources comprise material that has been estimated using Pass #2, and Inferred Mineral Resources comprise material that has been estimated using Pass #3. The initial classification step produces areas in the classification matrix where the classifications are not consistent and contiguous. Consequently, clipping polygons were used in a final stage of the process to edit the initial classification assignments to ensure continuity and consistency of the final classified blocks in the model. Jaguar employs an additional block model code to denote those areas considered to display good exploration potential for use in the decision process. These areas are used for exploration purposes only.

BLOCK MODEL VALIDATION

Block model validation consisted of comparing the volume of the coded blocks in the block model against the volume report of the respective wireframe models as a high level check that the block model has been correctly coded for each of the wireframes (Table 14-11). In general, the block model volumes compared well with the wireframe volumes for all domains except for the RG07 domain where the block model has been coded with slightly less volume.

A second validation exercise consisted of comparing the average grades from the capped composites against the average estimated gold grades block model as a comparison of the global average grades. In general, the block estimated mean grades compared well with the average of the capped composites for all domains except for the RG07 domain (Table 14-11). RPA attributes this difference to the clustering of the channel sample composites and to the relatively small number of composites that are used to interpolate some of the sub-domains for this wireframe.

A third validation exercise consisted of comparing the mill production statistics with the predicted volumes of diluted and recovered tonnes and grade from the block model for the period of January 2014 to March 2015 (Table 14-12). The reconciliation results demonstrate that there was a reasonable correlation between the block model predicted tonnages and grades against the mill production statistics for the period examined.

TABLE 14-11 BLOCK MODEL VALIDATION RESULTS, ROÇA GRANDE MINE
Jaguar Mining Inc. – Caeté Mining Complex

Orebody	RG01	RG02	RG03	RG06	RG07
Block Model:					
Volume (m^3)	1,147,049	1,482,279	1,661,810	833,864	75,097
Tonnes	3,220,488	3,387,371	4,184,455	1,919,079	195,646
Grade (g/t Au)	1.73	2.85	1.48	1.51	6.15
Wireframe:					
Volume (m^3)	1,170,422	1,512,104	1,694,232	850,421	79,948
Difference (BM-Wf)	-23,373	-29,825	-32,422	-16,557	-4,851
% Difference	-2%	-2%	-2%	-2%	-6%
Composites:					
Grade (g/t Au)	2.04	2.92	1.46	1.36	4.13

Note.
1. BM – block model, Wf - wireframe

TABLE 14-12 MODEL TO MILL COMPARISON, JANUARY 2014 TO MARCH 2015, ROÇA GRANDE MINE
Jaguar Mining Inc. – Caeté Mining Complex

Month	MODEL Tonnes (t)	MODEL Grade (g/t Au)	MODEL Ounces (oz Au)	MILL Tonnes (t)	MILL Grade (g/t Au)	MILL Ounces (oz Au)
2014						
January	16,407	2.25	1,186	14,916	2.29	1,096
February	11,007	2.26	801	12,030	3.16	1,223
March	12,390	1.59	632	14,155	2.17	988
April	16,426	1.74	920	15,563	1.88	942
May	10,079	1.56	506	12,032	2.19	846
June	14,624	2.18	1,027	12,617	2.50	1,015
July	15,416	2.15	1,063	14,702	2.74	1,295
August	15,045	2.12	1,024	14,174	2.59	1,180
September	17,511	2.28	1,284	15,589	2.40	1,203
October	14,650	2.01	948	16,296	2.41	1,263
November	14,182	1.90	867	14,857	2.30	1,097
December	11,566	1.64	611	15,043	2.24	1,083
Total - 2014	**169,303**	**2.00**	**10,868**	**171,975**	**2.39**	**13,231**
2015						
January	10,293	1.59	527	11,426	2.12	778
February	11,676	2.29	859	12,755	2.19	897
March	11,111	2.02	721	11,742	2.41	909
Total - 2015	**33,080**	**1.98**	**2,106**	**35,923**	**2.24**	**2,585**

Period	Variance Tonnes	Variance Grade	Variance Oz Au	Factors Tonnes	Factors Grade	Factors Oz
2014	+2,672	+0.39	+2,363	1.02	1.12	1.22
M-T-D 2015	+2,843	+0.26	+479	1.09	1.13	1.23

Note:
1. Numbers may not add due to rounding.

CUT-OFF GRADE

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 may be slightly higher than those for Mineral Reserves. A cut-off grade of 1.46 g/t Au is used for reporting of Mineral Resources. This cut-off grade was calculated using a gold price of US$1,400/oz, an average gold recovery of 88%, average exchange rate of R$2.50 : US$1.00, and 2014 actual cost data for the Roça Grande Mine.

MINERAL RESOURCE REPORTING

There are no Mineral Reserves present at the Roça Grande Mine for the current reporting period. The Mineral Resource reports were prepared by creating reporting volumes that were used to ensure that the requirement for spatial continuity is met. The reporting volumes were prepared in either plan or longitudinal views, as appropriate, and were applied to the block model prepared in 2015. Reporting volumes were drawn to include continuous volumes of blocks whose estimated grades were above the stated cut-off grade. This included those blocks with grades that were below the stated cut-off grade to preserve spatial continuity, were located completely within the boundaries of Jaguar's mineral rights holdings at the Roça Grande Mine, possessed a grade times thickness product of at least 3.0 gram-metres, and were not located in mined out areas as of December 31, 2018. These reporting volumes were also used to exclude isolated blocks with limited to no spatial continuity, but containing grades above the nominated cut-off. These reporting volumes were used to appropriately code the block model and were used to report the Mineral Resources. RPA is of the opinion that these procedures, constraints, and reporting volumes are sufficient to satisfy the CIM (2014) definitions of "Reasonable prospects for eventual economic extraction".

The Mineral Resources are presented in Tables 14-13 and 14-14, while a plan view of the Mineral Resources for the RG01 and RG02 domains is presented in Figures 14-7 and 14-8.

TABLE 14-13 SUMMARY OF MINERAL RESOURCES AS OF MAY 31, 2020 – ROÇA GRANDE MINE
Jaguar Mining Inc. – Caeté Mining Complex

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Measured	188	2.14	13
Indicated	889	2.91	83
Sub-total M&I	**1,077**	**2.77**	**96**
Inferred	1,759	3.48	197

Notes:
1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are estimated at a cut-off grade of 1.46 g/t Au.
3. Mineral Resources are estimated using a long-term gold price of US$1,400 per ounce.
4. Mineral Resources are estimated using an average long-term foreign exchange rate of 2.5 Brazilian Reais: 1 US Dollar.
5. Mineral Resources are stated by depletion of the 2015 grade-block model with excavation volumes and production as of December 31, 2018.
6. A minimum mining width of approximately two metres was used.
7. Gold grades are estimated using ID^3 interpolation.
8. No Mineral Reserves are currently present at the Roça Grande Mine.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not add due to rounding.

TABLE 14-14 MINERAL RESOURCES BY OREBODY AS OF MAY 31, 2020 – ROÇA GRANDE MINE
Jaguar Mining Inc. – Caeté Mining Complex

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Orebody RG01:			
Measured	160	2.24	12
Indicated	383	2.08	26
Sub-total M&I	**543**	**2.13**	**37**
Inferred	300	2.92	28
Orebody RG02:			
Measured	-	-	-
Indicated	215	4.07	28
Sub-total M&I	**215**	**4.07**	**28**
Inferred	756	3.91	95
Orebody RG03:			
Measured	-	-	-
Indicated	74	1.66	4
Sub-total M&I	**74**	**1.66**	**4**
Inferred	365	2.58	30
Orebody RG06:			
Measured	29	1.63	2
Indicated	185	3.15	19
Sub-total M&I	**214**	**2.94**	**20**
Inferred	287	2.88	27
Orebody RG07:			
Measured	-	-	-
Indicated	39	5.75	7
Sub-total M&I	**39**	**5.75**	**7**
Inferred	51	10.34	17
Total Roça Grande Mine:			
Total, Measured	188	2.14	13
Total, Indicated	896	2.91	83
Total M&I	**1,085**	**2.77**	**96**
Total, Inferred	1,759	3.48	197

Notes:
1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are estimated at a cut-off grade of 1.46 g/t Au.
3. Mineral Resources are estimated using a long-term gold price of US$1,400 per ounce.
4. Mineral Resources are estimated using an average long-term foreign exchange rate of 2.5 Brazilian Reais: 1 US Dollar.
5. Mineral Resources are stated by depletion of the 2015 grade-block model with excavation volumes and production as of December 31, 2018.
6. A minimum mining width of approximately two metres was used.
7. Gold grades are estimated using ID^3 interpolation.
8. No Mineral Reserves are currently present at the Roça Grande Mine.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not add due to rounding.

The QP has considered the Mineral Resource estimates in light of known environmental, permitting, legal, title, taxation, socio-economic, marketing, political, and other relevant issues and has no reason to believe at this time that the Mineral Resources will be materially affected by these items. Studies are currently in progress that examine whether the Mineral Resources may be materially affected by mining, infrastructure, or other relevant factors. Considering the appreciation in the metal price and the change in the exchange rate, the QP believes that the Mineral Resources may increase by application of current metal prices and exchange rate.

RPA recommends that Jaguar review the Mineral Resource estimate for the Roça Grande Mine in light of the increased metal price and change in the exchange rate.

The QP is of the opinion that the Roça Grande Mineral Resource estimates were prepared in a professional and diligent manner by qualified professionals and that the estimates comply with CIM (2014) definitions.

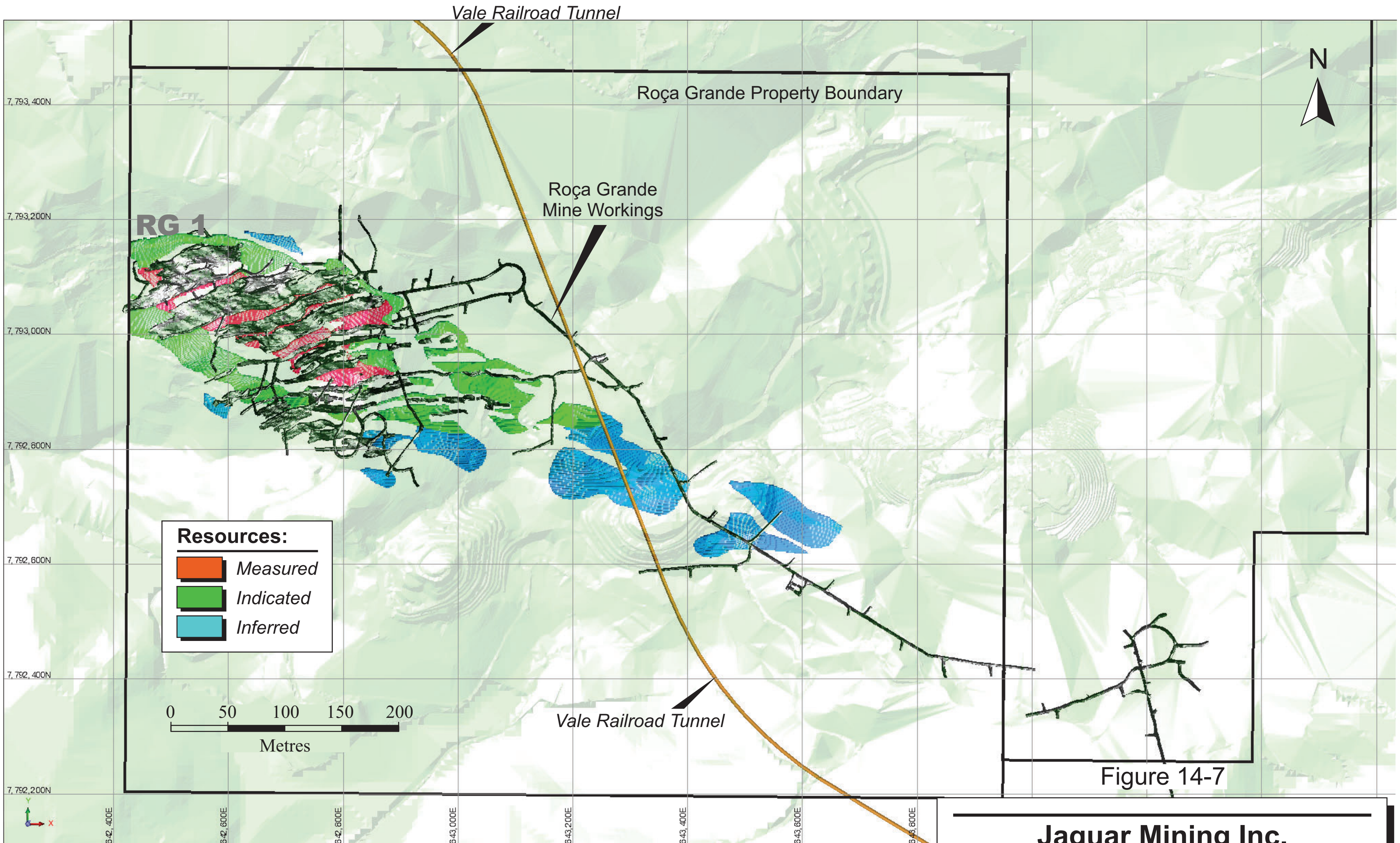


Figure 14-7

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Plan View of the

RG01 Mineral Resources

August 2020

Source: RPA, 2018.

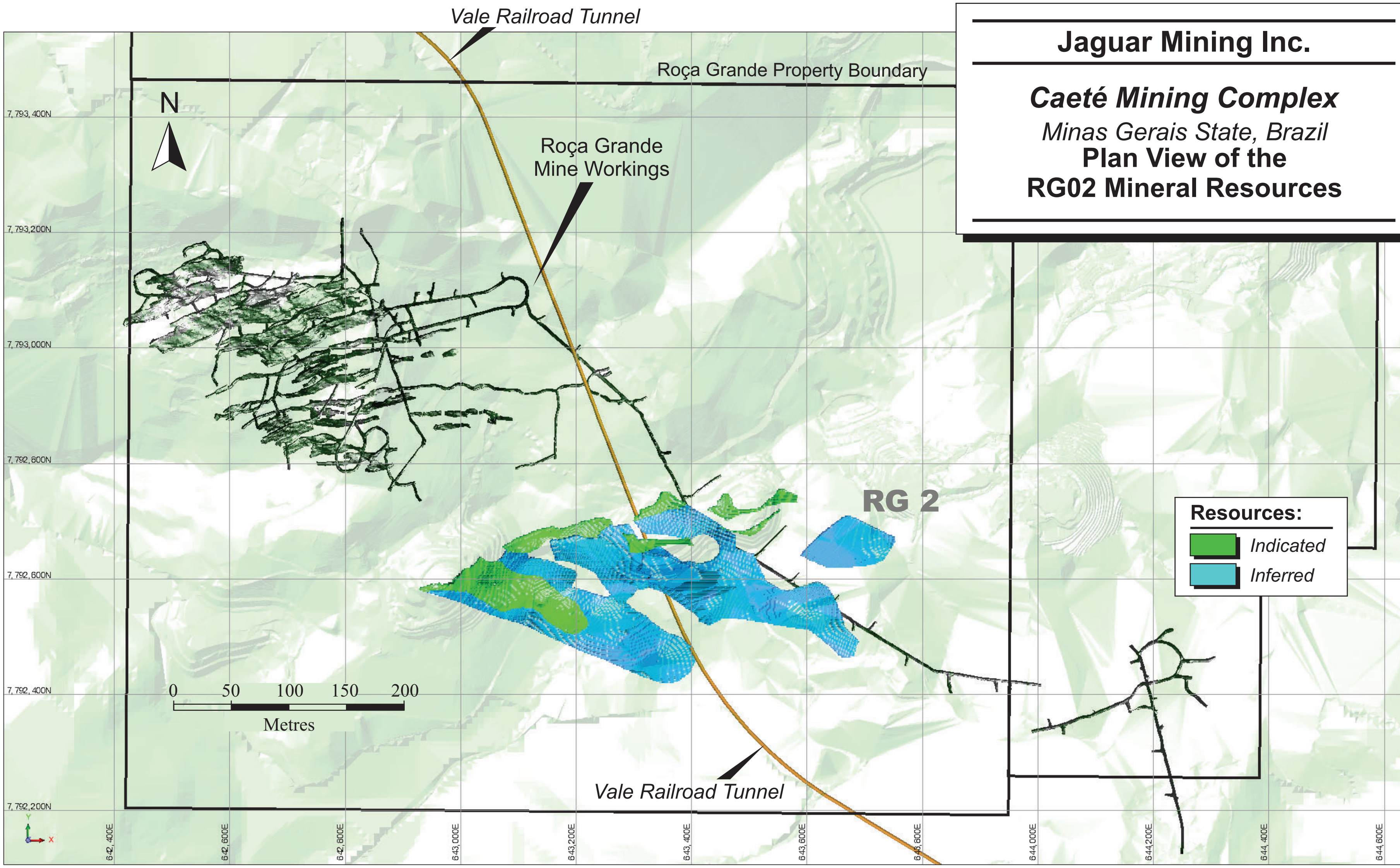
Figure 14-8

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Plan View of the
RG02 Mineral Resources



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August 2020

Source: RPA, 2018.

PILAR MINE

RESOURCE DATABASE

Current drilling and sampling practices employed by Jaguar involve the initial delineation of the location of the various mineralized lenses using surface and underground drill holes at a nominal spacing of 25 m to 50 m. Underground drilling is used to delineate the down-plunge projection of the Pilar mineralization. As development of the underground access progresses, a series of channel samples are taken in two locales (one set on the face and one set along the back) for each round. The average channel sample spacing along development drifts is five metres (Figure 14-9).

Jaguar currently maintains an internal database using the MX_Deposit database software package provided by the Geosoft group to store and manage all of the digital information for all of its operations. The internal databases were previously maintained using the BDI software package. The drill hole database contains drill hole and channel sample information that is coded according to the following conventions:

AUGER	Auger holes (Open pit mine)
CN	Channel samples
FSB	In-fill & definition drill holes
GSW	SW Orebody drift drill holes
PILF	Surface-based exploration drill holes (prior owners)
PMS	Surface-based exploration drill holes (completed by Jaguar)
PPL	Exploration and in-fill drill holes (underground)
RC	Reverse circulation drill holes
SBF	Face channel samples
SBJ	Jumbo drill holes

Legend:
- BF Domain
- BF II Domain
- LPA Domain

0 2 4 6 8 10
Metres

August 2020

Source: RPA, 2020.

Figure 14-9

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Grade Control Sampling Program, Pilar Mine Level 10 (118 M El)

www.rpacan.com

Drill hole and channel sample information for the Pilar Mine was extracted from this internal database into separate files for use in preparation of the Mineral Resource estimates. This drill hole information was modified slightly so as to be compatible with the format requirements of MinePlan 3D and was imported into that software package by Jaguar. A number of new tables and variables were created during the estimation process to capture such information as the intersection information between the drill holes and the wireframe models, density readings, capped assay values, and composite values.

The cut-off date for the assays in the drill hole database is May 19, 2020. Drilling and sampling was carried out using the UTM Datum Córrego Alegre, Zone 23S grid coordinate system.

A summary of the drilling and channel sampling information is provided in Table 14-15, while a comparison to the database used to prepare the previous Mineral Resource estimate is presented in Table 14-16. The location of the drill holes and channel samples is presented in Figures 10-2 to 10-7, inclusive.

TABLE 14-15 DESCRIPTION OF THE PILAR MINE DATABASE AS OF MAY 19, 2020
Jaguar Mining Inc. – Caeté Mining Complex

Data Type	Number of Records
Collars (1,941 Drill Holes & 22,716 Chip/Channel Samples)	24,657
Survey	130,670
Lithology	110,017
Assays	183,262
Composites (within wireframe boundaries)	63,277
Weathering code	72,288
Density (Inside wireframes: 1,518, Waste: 2,955)	4,473

TABLE 14-16 COMPARISON OF PILAR MINE DRILL HOLE DATABASES, DECEMBER 31, 2019 VERSUS MAY 19, 2020
Jaguar Mining Inc. – Caeté Mining Complex

Item	Count as at December 31, 2018	Count of Newly Collected Data	Count as at May 19, 2020
Drill Holes (DH)	1,658	283	1,941
FSB-series		123	
PPL-series		103	
SBJ-series		57	
Channel Samples (CH)	20,698	2,018	22,716
SBF/SBG-series		1,320	
SBL-series		698	
Total, DDH + CH	22,356	2,301	24,657

The database included a number of assay records which contained entries of negative values to represent intervals of no sampling, lost core, lost sample, or no core recovery. Some of these negative values can be located within the mineralized wireframes. Depending upon the specific local conditions, these unsampled intervals can introduce an undesired positive bias upon the grade estimations. Jaguar therefore elected to pursue a conservative approach by inserting a very low gold value of 0.01 g/t Au for these intervals of null values. A total of 7,318 records that were within a mineralized wireframe outline were adjusted in this process.

RPA recommends that a program of re-sampling be undertaken for those un-sampled intervals located within the mineralized wireframe boundaries if sufficient drill core is available.

Detailed review by the on-site geologists of the drill hole database revealed the presence of a number of older drill holes for which the collar, deviation, or downhole distances presented a poor correlation with the body of the surrounding drill hole and channel sample information or with newly acquired information. These drill holes and channel samples were identified by a unique flag code (Flag = 0) in the assay and composite tables and were not used in either preparation of the mineralization wireframes or estimation of the block gold grades. The assay table was also coded in such a manner that the jumbo drill holes (SBJ-series) were not used in the estimation process as the quality of the sample material is deemed to be unreliable for use in estimation of the Mineral Resources.

A summary of the erroneous and suspicious drill holes is presented in Table 14-17.

TABLE 14-17 SUMMARY OF DRILL HOLES EXCLUDED FROM ESTIMATION, PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Drill Hole Series	Number Excluded	Number Retained for Estimation
CN	5	22716
FSB	142	627
GSW	13	5
PILF	53	5
PMS	20	75
PPL	89	523
SBJ	321	0
Total	**643**	**23,951**

RPA recommends that all efforts be undertaken to carry out whatever remedial actions are available and appropriate to correct the erroneous or suspicious information for those suspect drill holes that are located in the as yet un-mined portions of the Pilar Mine. For those suspect drill holes for which remedial corrections are not possible, RPA recommends that those holes be transferred from the active database into a database that is dedicated specifically for these suspect records.

RPA notes that the understanding of the host stratigraphy, structural setting, and controls on the gold mineralization at the Pilar Mine by the mine geologists is increasing with time. This understanding permits an increased degree of success when designing exploration and in-fill drilling programs. The drilling and sampling protocols employed by Jaguar permit the identification and delineation of the mineralized areas with confidence. Drilling and sampling practices are carried out to an acceptable standard. The QP is of the opinion that the drill hole and sampling database is suitable for use in preparation of Mineral Resource estimates.

GEOLOGICAL AND MINERALIZATION INTERPRETATIONS

The Pilar geological team has initiated a mine-site program of detailed lithological, mineralization, and structural mapping program whose goal is to improve the understanding of the nature and distribution of the main lithological units, mineralization and structures, and their relationship to the mineralization. This program has been successful in demonstrating that the gold mineralization is hosted in a variety of host rock types such as BIF (e.g., BA, BF, BF II, and BF III deposits), mafic metavolcanics (LFW deposit), and mafic/ultramafic metavolcanics (e.g. Torre deposit). While the host rocks in the Pilar Mine have all been affected by an amphibolite-grade metamorphic event, the textures observed in the mineralized zones suggest that the gold mineralization has not been subjected to amphibolite-grade metamorphism and so represents a younger event.

In RPA's opinion, the geological work carried out for the Torre deposit has demonstrated that potentially economic mineralization can be hosted by lithologies other than the BIFs in the Pilar Mine. As past exploration activities have been largely focussed towards evaluating the gold-bearing potential of the BIF units, RPA believes that the potential for the remaining host rocks has been under-evaluated. RPA recommends that Jaguar consider evaluating the gold-bearing potential of the mafic metavolcanic and the ultramafic metavolcanic units within the Pilar Mine. A detailed understanding of the paragenetic history of the various phases of gold mineralization will be key in this undertaking.

The mapping programs have clearly demonstrated that the entire stratigraphic sequence and gold mineralized zones have been affected by a period of west-northwest to east-southeast compression (D1) that has transposed all of the host rocks and mineralized zones into a series of broad, open folds at surface, to a series of compact, tightly folded structural slices at depth.

The observation that the gold-bearing zones have been affected by this D1 folding event presents clear evidence that the gold mineralizing event took place prior to this deformation event. The observation that some of the mineralized zones (e.g. the LPA deposit) are approximately parallel to the D1 axial plane orientation suggests that a second gold mineralizing event may have occurred. All host rocks and mineralized zones are affected by a series of late-stage reverse faults.

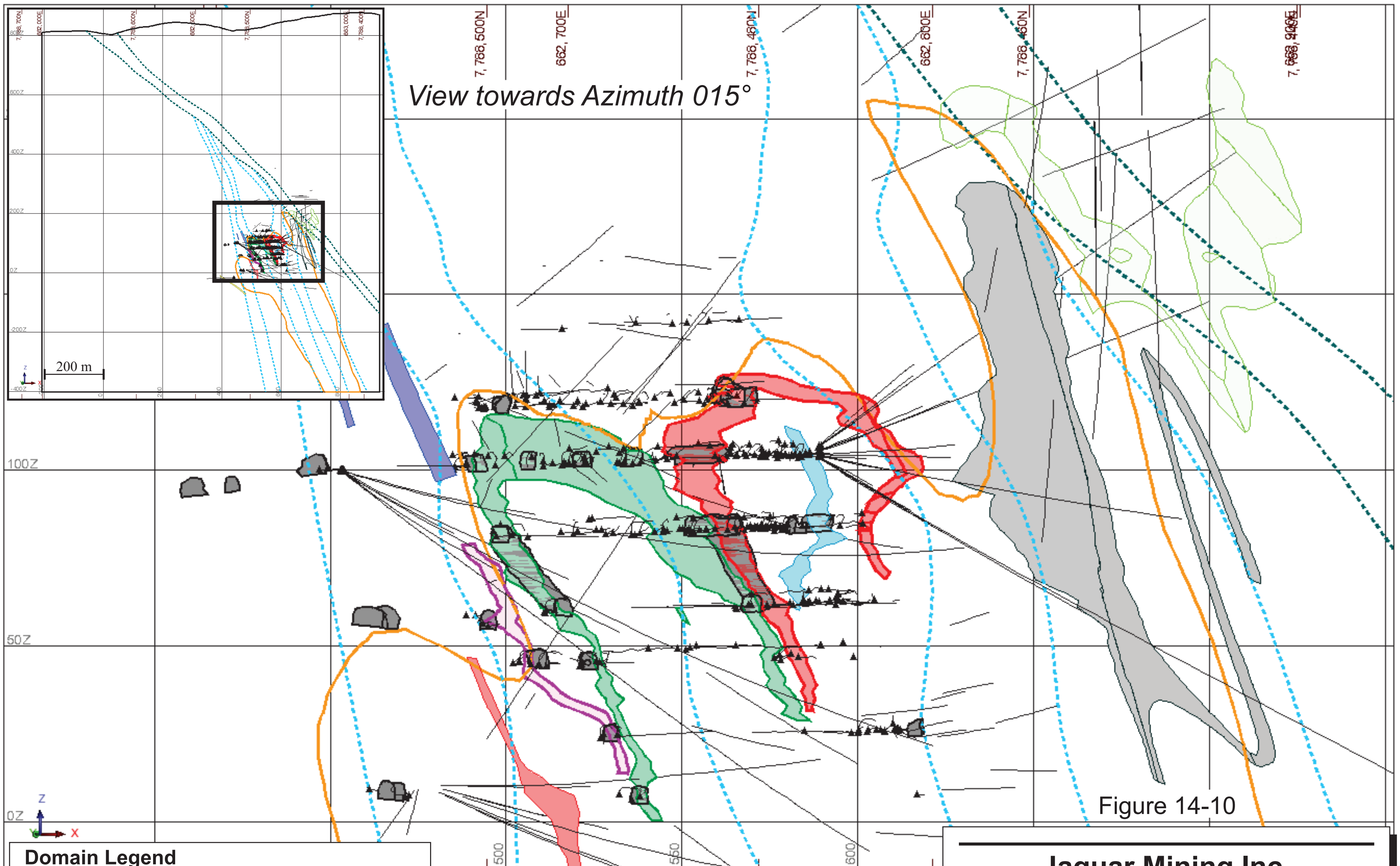
A series of 3D wireframe models were constructed of the various mineralized domains using the MinePlan 3D, geology information and assay values from surface and underground drill holes, and channel sample data as available. The mineralized wireframes were prepared from digital interpretations that were created on the computer screen in plan view at two metre intervals for those domains that have been affected by the D1 folding event. The pre-existing lithological and structural models were used as guides for creating the updated mineralization wireframes (Figure 14-10).

RPA recommends that the lithologic and structural models be updated to reflect the current information and level of understanding of the nature of the folding and faulting of the host rock units at the Pilar Mine.

A series of hanging wall and footwall surfaces were used for those domains that are less affected by the D1 folding event and exhibit more tabular forms. A total of 11 mineralized domains have been modelled using a nominal cut-off grade of 0.5 g/t Au across a nominal minimum width of two metres (Figure 14-11).

These mineralized wireframes reflect the current understanding of the spatial distribution and structural controls on the gold mineralization. The gold mineralization at the Pilar Mine has been traced by drilling and channel sampling from surface (elevation approximately 800 m AMSL) to elevation of approximately -200 m AMSL, a distance of approximately one kilometre.

All of the mineralized lenses, with the exception of the SW Orebody, are located to the east of the São Jorge fault. In general terms, the mineralized lenses are sub-parallel to each other, have an average strike of 015° to 030° at surface, and dip steeply to the east with an average dip of 65°. Available drill hole information suggests that the dip of the mineralized zones remains relatively constant, however, the strike of the domains gradually rotates through a northerly to north-northwesterly orientation with increasing depth. The current information indicates that many of the mineralized domains are folded to varying degrees into open to isoclinal folds with fold axes that plunge at approximately -40° to the southwest (approximately azimuth 210° to 225°). Some of the mineralized zones (LFW and the SW Orebody) are interpreted to be more tabular in overall form. The LPA zone resides in the axial plane of the folded BF zone and thus provides evidence for multiple ages of gold mineralization. Newly acquired drill hole information indicates that the orientation of the mineralization in the BF II domain and in the lower extensions of the Torre domain rotates into a more southwesterly orientation with increasing depth, suggesting the possibility of a second deforming event (D2).



Domain Legend

BA	LFW
BF	Torre
BF II	CSJ
BF III	Interpreted Faults
LPA	Limit of Iron Formation

0 20 40 60 80 100
Metres

Figure 14-10

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Example Cross Section
450 N, Pilar Mine

August 2020

Source: RPA, 2020.

View Looking North

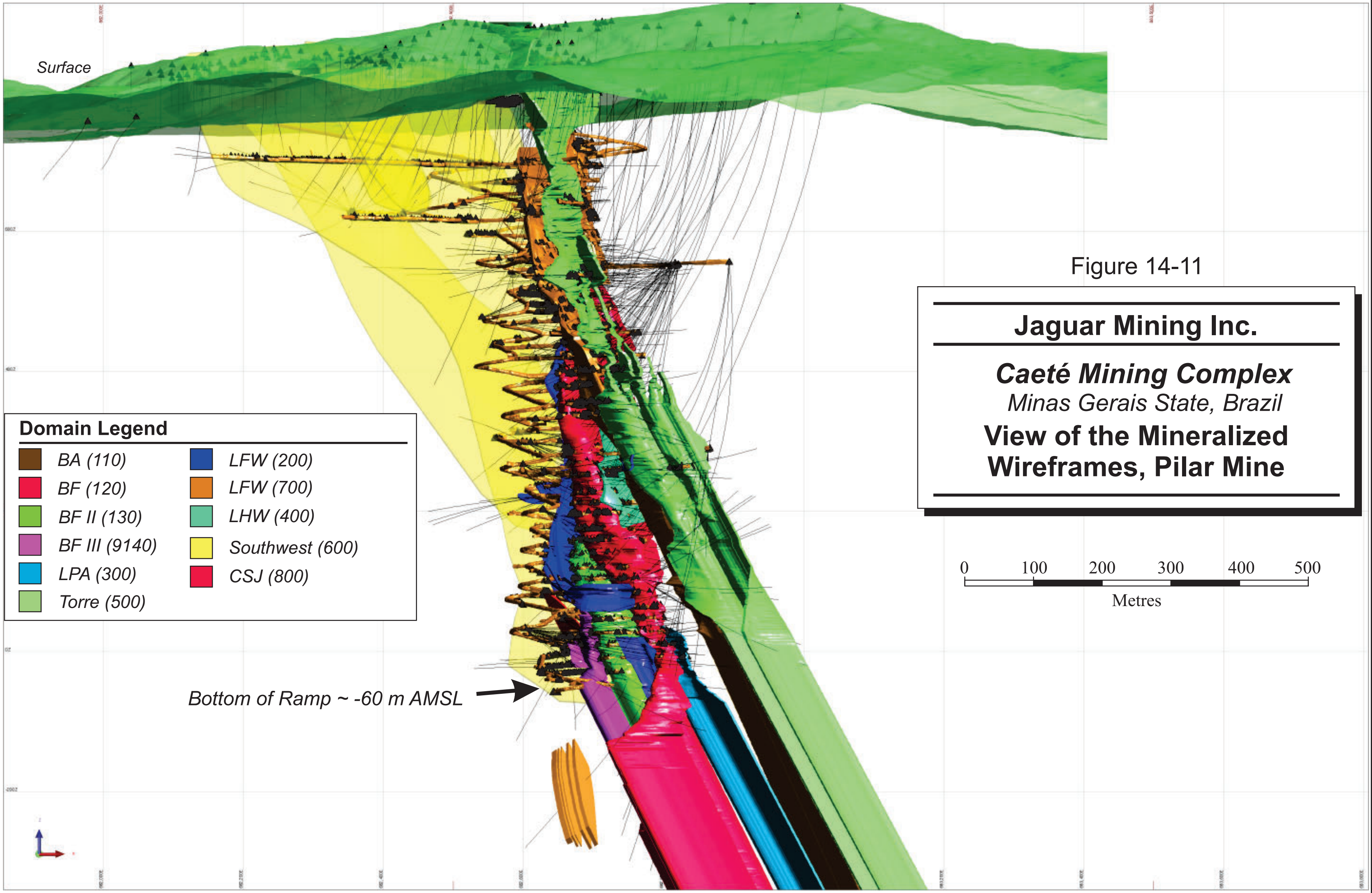


Figure 14-11

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

View of the Mineralized Wireframes, Pilar Mine

0 100 200 300 400 500

Metres

August 2020

Source: RPA, 2020.

Each of the domains were subdivided into a series of integer codes that were created in order to enable the use of soft boundaries for estimation of grades into the block model (Table 14-18). Of the 11 domains, the BA, BF, and BF II account for a significant portion of the remaining Mineral Resources.

TABLE 14-18 DESCRIPTION OF THE MINERALIZED DOMAINS, PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Domain	Block Model Codes
BA (110)	111 to 114
BF (120)	121 to 126
BF II (130)	131, 132, 136, and 137
BF III (140)	141, 142, and 143
LFW	201 to 210 700 to 704
LPA	301 to 305
LHW	401 to 403
Torre	501 to 506
SW Orebody	601 to 605
CSJ	801

RPA recommends that the cut-off grade strategy used for preparation of the mineralization wireframes be amended to better reflect the potentially economic in-situ gold grades. At a minimum, the mineralization wireframes should be created using a cut-off grade similar to the reporting cut-off grade. By adopting this strategy, it is anticipated that a lower number of below cut-off grade composite samples will be used in estimation of the block gold grades that will result in excessive dilution being included in the estimate.

TOPOGRAPHY AND EXCAVATION MODELS

A topographic surface of the Pilar Mine area, current as of May 2015, was used to code the block model. The topographic map includes two open pit mines that are now depleted. A wireframe model of the completed underground excavations (development and stopes) as of May 31, 2020 was prepared and was used to code the block model for the portions of the mineralized zones that have been mined out.

Mineralization at the Pilar Mine is accessed via a ramp with a collar elevation at approximately 750 MASL. As of May 31, 2020, the bottom of the ramp was at an elevation of approximately -60 MASL. There are two mining methods currently in use. Mechanical cut and fill mining is used when ore geometry does not favour longhole mining. In all, 13 levels have been developed to access the various mineralized zones (Table 14-19).

TABLE 14-19 DESCRIPTION OF THE PILAR MINE LEVELS
Jaguar Mining Inc. – Caeté Mining Complex

Level	Bottom Elevation (m)
1	690.5
2	615.2
3	544
4	485
5	417.3
6	330.5
7	263.5
8	220.3
9	168.6
10	114.7
11	59
12	4
13	-52
14 (planned)	-109
15 (planned)	-167
16 (planned)	-224
17 (planned)	-282
18 (planned)	-339
19 (planned)	-397

RESOURCE ASSAYS

Mineralization wireframe models were used to code the drill hole database and identify the raw assay samples, or resource assays, that are contained within the mineralized wireframes. These samples were extracted from the database into their respective domains, and then subjected to statistical analyses by means of histograms, probability plots, and decile analyses. A total of 67,152 samples were contained within the mineralized wireframes. The resource assay sample statistics and the selected capping values are summarized in Table 14-20. Selected histograms are provided in Figures 14-12 to 14-14.

TABLE 14-20 RESOURCE ASSAY DESCRIPTIVE STATISTICS, PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Item	BA		BF		BF II		BF III[1]	
	Au Raw	Au Cap	Au Raw	Au Cap	Au Raw	Au Cap	Au Raw	Au Cap
Length-Weighted Mean (g/t Au)	2.78	2.77	3.28	3.26	4.51	4.42	4.24	4.09
Median (g/t Au)	0.91	0.91	0.95	0.95	1.73	1.73	1.34	1.34
Mode (g/t Au)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Standard Deviation	6.90	6.69	7.44	7.18	8.33	7.52	8.98	6.95
CV	2.48	2.42	2.27	2.21	1.85	1.70	2.11	1.70
Sample Variance	47.64	44.80	55.39	51.57	69.38	56.61	80.57	48.24
Minimum (g/t Au)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Maximum (g/t Au)	109.00	60.00	115.17	60.00	159.65	45.00	133.38	45.00
Count	16,994	16,994	18,066	18,066	12,946	12,946	831	831
Capping Value (g/t Au)		**60**		**60**		**45**		**45**

Item	LFW		LPA		LHW		Torre	
	Au Raw	Au Cap	Au Raw	Au Cap	Au Raw	Au Cap	Au Raw	Au Cap
Length-Weighted Mean (g/t Au)	1.13	0.99	3.63	3.43	1.45	1.39	1.11	1.07
Median (g/t Au)	0.87	0.87	1.28	1.28	0.73	0.73	0.60	0.60
Mode (g/t Au)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Standard Deviation	9.67	3.14	7.41	6.07	4.45	3.03	5.99	4.82
CV	8.58	3.17	2.04	1.77	3.07	2.19	5.38	4.51
Sample Variance	93.41	9.87	54.88	36.90	19.78	9.21	35.92	23.19
Minimum (g/t Au)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Maximum (g/t Au)	507.50	20.00	120.50	30.00	116.00	20.00	153.00	40.00
Count	3,537	3,537	3,865	3,865	1,905	1,905	6,034	6,034
Capping Value (g/t Au)		**20**		**30**		**20**		**40**

Item	SW		São Jorge[2]	
	Au Raw	Au Cap	Au Raw	Au Cap
Length-Weighted Mean (g/t Au)	0.89	0.88	1.92	1.80
Median (g/t Au)	0.41	0.41	0.74	0.74
Mode (g/t Au)	0.01	0.01	0.01	0.01
Standard Deviation	4.75	4.25	2.81	2.23
CV	5.32	4.83	1.46	1.24
Sample Variance	22.54	18.09	7.87	4.96
Minimum (g/t Au)	0.01	0.01	0.01	0.01
Maximum (g/t Au)	106.00	40.00	18.73	10.00
Count	2,855	2,855	119	119
Capping Value (g/t Au)		**40**		**10**

Note:
1. Capping values for the BF III domain are preliminary.
2. Capping values for the São Jorge domain are preliminary.

FIGURE 14-12 OREBODY BA RESOURCE ASSAY FREQUENCY HISTOGRAM

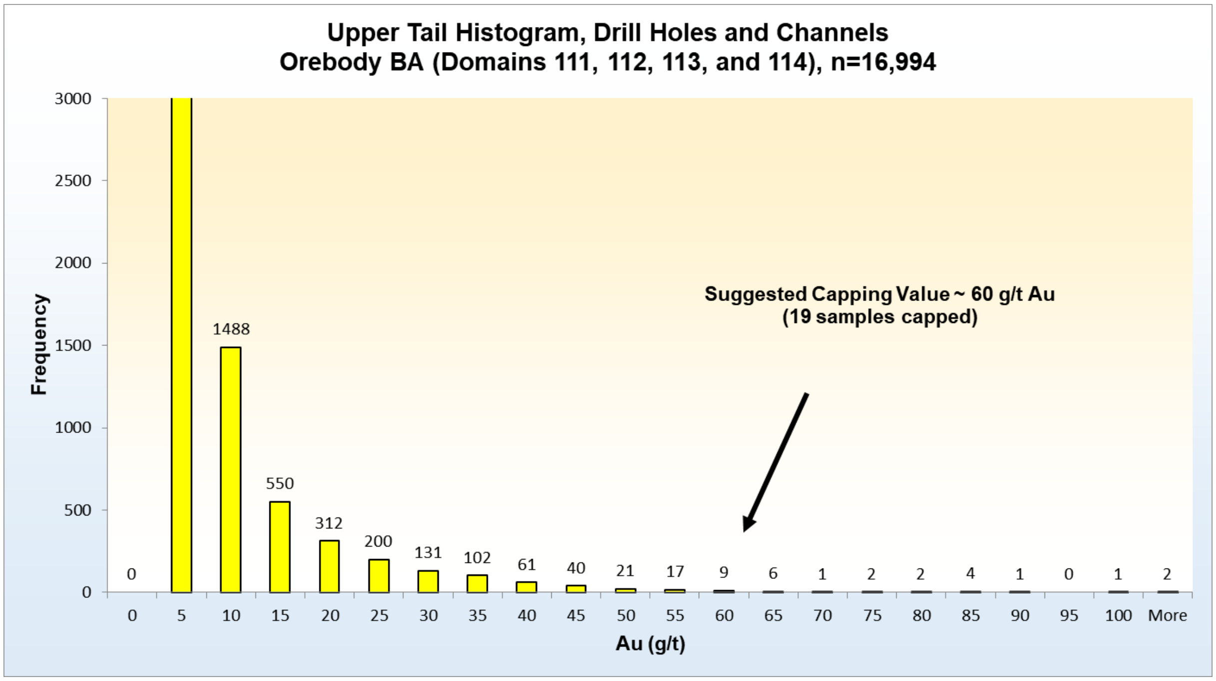


FIGURE 14-13 OREBODY BF RESOURCE ASSAY FREQUENCY HISTOGRAM

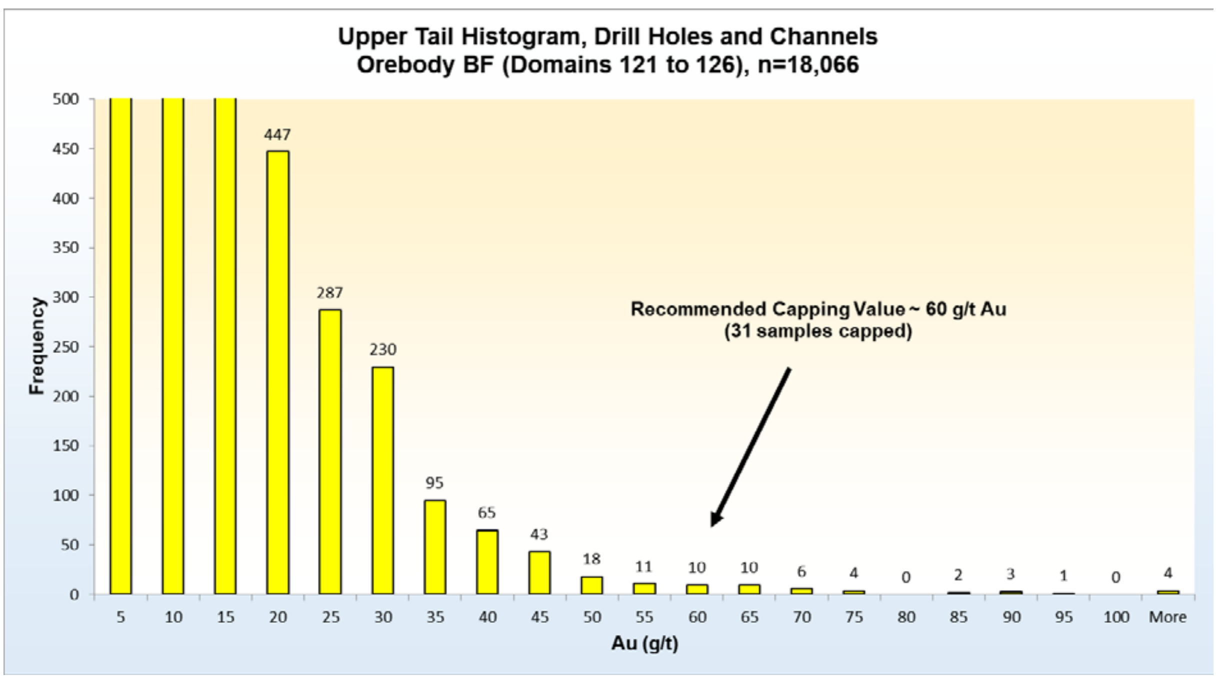
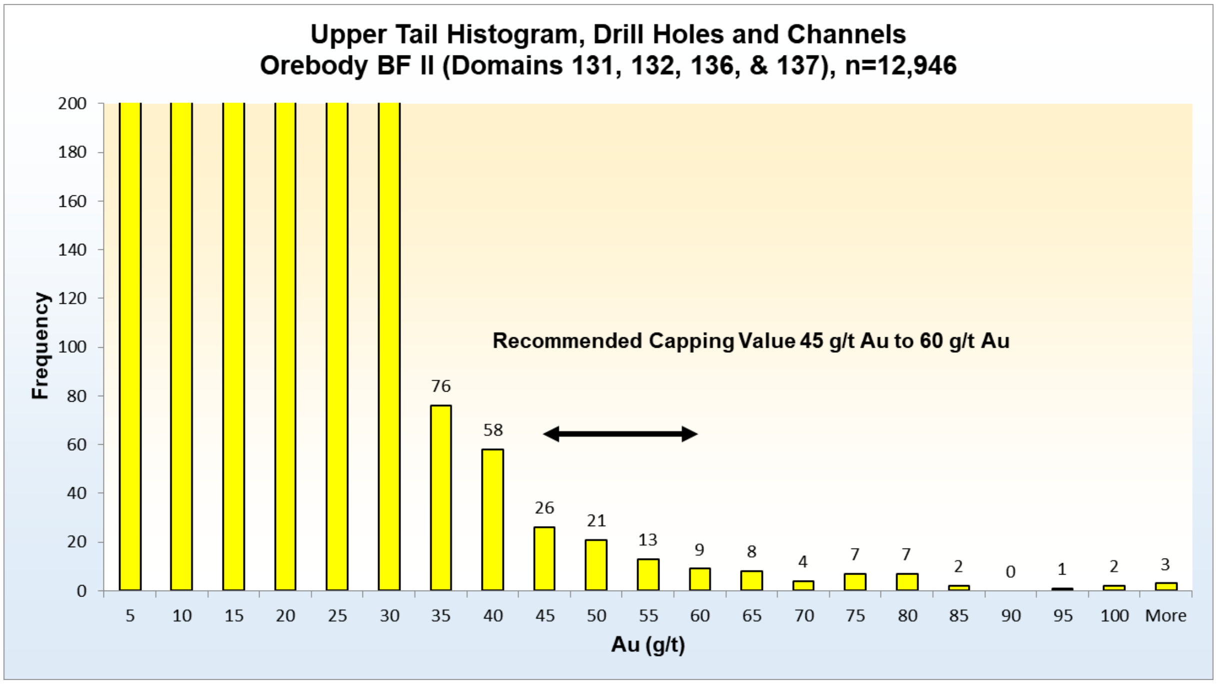


FIGURE 14-14 OREBODY BF II RESOURCE ASSAY FREQUENCY HISTOGRAM



TREATMENT OF HIGH GRADE ASSAYS

In order to reduce the influence of high grade sample values, a simple capping approach was applied. In this method, the grades of the resource assays contained within the respective mineralized wireframes that are deemed to represent anomalously high grades are reduced to a maximum value – the capping grade. A summary of the capping values, along with a summary of the descriptive statistics for the capped sample populations for each of the mineralized wireframes is presented in Table 14-20. These capping values remain relatively unchanged from those that have been applied at the mine in previous years. RPA notes that the proposed capping values for the BF III and the São Jorge domains are considered to be preliminary estimates, as this mineralization has only recently been discovered and thus little production reconciliation information is available for these domains.

COMPOSITING

The selection of an appropriate composite length began with an examination of the sample lengths for those channel, grade control, and diamond drill hole samples that were contained within the mineralized wireframe outlines (Figure 14-15). Many of the sample lengths in the various mineralized wireframes were found to range from 0.5 m to 1.5 m in length. Consequently, on the basis of the available information, RPA believes that a composite length of one metre for all samples is reasonable. All samples contained within the mineralized wireframes were composited to a nominal one metre length using the MineSight best-fit function. The descriptive statistics of the composite samples are provided in Table 14-21.

FIGURE 14-15 HISTOGRAM OF CHANNEL SAMPLE, GRADE CONTROL AND DIAMOND DRILL HOLES, PILAR MINE

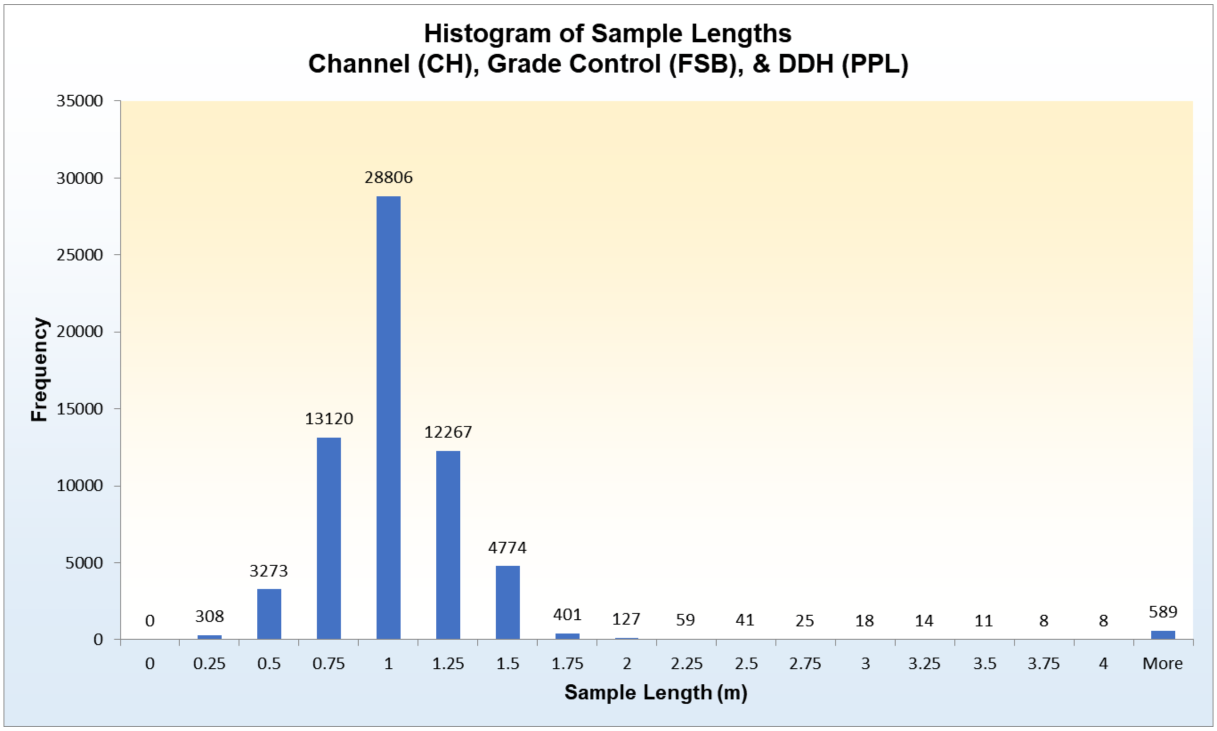


TABLE 14-21 DESCRIPTIVE STATISTICS OF THE COMPOSITE SAMPLES, PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Item	BA		BF		BF II		BF III	
	Comp Raw	Comp Cap	Comp Raw	Comp Cap	Comp Raw	Comp Cap	Comp Raw	Comp Cap
Mean (g/t Au)	3.43	3.40	3.90	3.87	4.96	4.86	4.31	4.16
Median (g/t Au)	1.20	1.20	1.41	1.41	2.23	2.23	1.68	1.68
Mode (g/t Au)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Standard Deviation	6.60	6.11	6.45	6.24	7.37	6.67	7.48	6.25
CV	1.92	1.79	1.66	1.61	1.48	1.37	1.73	1.50
Sample Variance	43.58	37.30	41.63	38.97	54.29	44.51	55.95	39.11
Minimum (g/t Au)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Maximum (g/t Au)	276.17	60.00	112.91	60.00	159.65	45.00	98.77	45.00
Count	17,558	17,558	15,895	15,895	11,603	11,603	730	730

Item	LFW		LPA		LHW		Torre	
	Comp Raw	Comp Cap	Comp Raw	Comp Cap	Comp Raw	Comp Cap	Comp Raw	Comp Cap
Mean (g/t Au)	2.19	1.94	4.12	3.89	2.08	1.99	1.89	1.82
Median (g/t Au)	0.92	0.92	1.64	1.64	0.94	0.94	0.57	0.57
Mode (g/t Au)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Standard Deviation	9.54	2.78	6.95	5.58	3.63	2.88	4.99	4.04
CV	4.36	1.43	1.69	1.43	1.75	1.45	2.64	2.22
Sample Variance	91.05	7.72	48.25	31.08	13.15	8.29	24.86	16.29
Minimum (g/t Au)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Maximum (g/t Au)	507.50	20.00	120.50	30.00	58.42	20.00	137.77	40.00
Count	3,304	3,304	3,365	3,365	1,659	1,659	6,664	6,664

Item	SW		São Jorge	
	Comp Raw	Comp Cap	Comp Raw	Comp Cap
Mean (g/t Au)	1.90	1.88	1.92	1.92
Median (g/t Au)	0.40	0.40	0.83	0.83
Mode (g/t Au)	0.01	0.01	0.01	0.01
Standard Deviation	4.21	3.91	2.58	2.58
CV	2.21	2.08	1.34	1.34
Sample Variance	17.73	15.25	6.64	6.64
Minimum (g/t Au)	0.01	0.01	0.01	0.01
Maximum (g/t Au)	77.31	40.00	17.44	17.44
Count	2,355	2,355	113	113

BULK DENSITY

Jaguar has continued its program of collecting bulk density measurements on the various lithologies present at the Pilar Mine through 2018. Density measurements were made on representative samples of drill core from intervals of iron formation and quartz vein that are located within the mineralized wireframes, along with measurements carried out on samples of adjoining waste rock units. Density measurements were carried out at the Jaguar analytical laboratory located at the Roça Grande Mine using the water displacement method. In all, the density database contains values for 4,470 density measurements, as of May 31, 2020. Of these, a total of 1,518 density measurements were used to prepare the Mineral Resource estimate. A summary of the average bulk densities used for the current Mineral Resource estimate is presented in Table 14-22, which also provides a comparison with the bulk densities used to prepare the December 31, 2018 Mineral Resource estimate for convenience. The average bulk densities for each of the mineralized wireframes were used to code the block model. The distribution of sample densities for selected mineralized wireframes are presented in Figures 14-16 to 14-19.

Review of the various histograms of the bulk density values contained within the mineralized wireframe outlines suggests that the rock types within these wireframes are composed of either a single, silicate-based rock type (e.g., Torre) or are composed of a mixture of silicate-based rock types and various iron formation facies (e.g. BA, BF, and BF II).

RPA recommends that Jaguar continue to collect bulk density values for those samples within the mineralized wireframe outlines, especially for those zones having a low number of density values.

RPA also recommends that Jaguar prepare wireframe models of the major lithological units as aides in coding the density values to the block model.

TABLE 14-22 SUMMARY OF THE DENSITY MEASUREMENTS AS OF MAY 31, 2020, PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Orebody	2019 Bulk Density (g/cm³)	2019 # data	2020 Bulk Density (g/cm³)	2020 # data
111/112_BA	2.97	113	3.04	142
113/114_BA	- -	0	2.92	30
121/122_BF	3.14	291	3.16	343
124/125_BF	- -	0	3.12	27
131/132_BFII	3.07	262	3.08	367
141/142_BFIII	- -	0	3.11	32
LFW	2.85	122	2.87	164
301_LPA	3.21	25	3.22	38
302 to 304_LPA	3.12	15	3.09	23
LHW	3.02	26	2.89	31
TORRE	2.84	95	2.82	243
601 & 603_SW	3.17	49	3.08	73
602, 604 & 605_SW	2.87	7	2.74	3
SJ	- -	0	2.78	2
WASTE	2.86		2.89	2,955

FIGURE 14-16 HISTOGRAM OF DENSITY VALUES, OREBODY BA

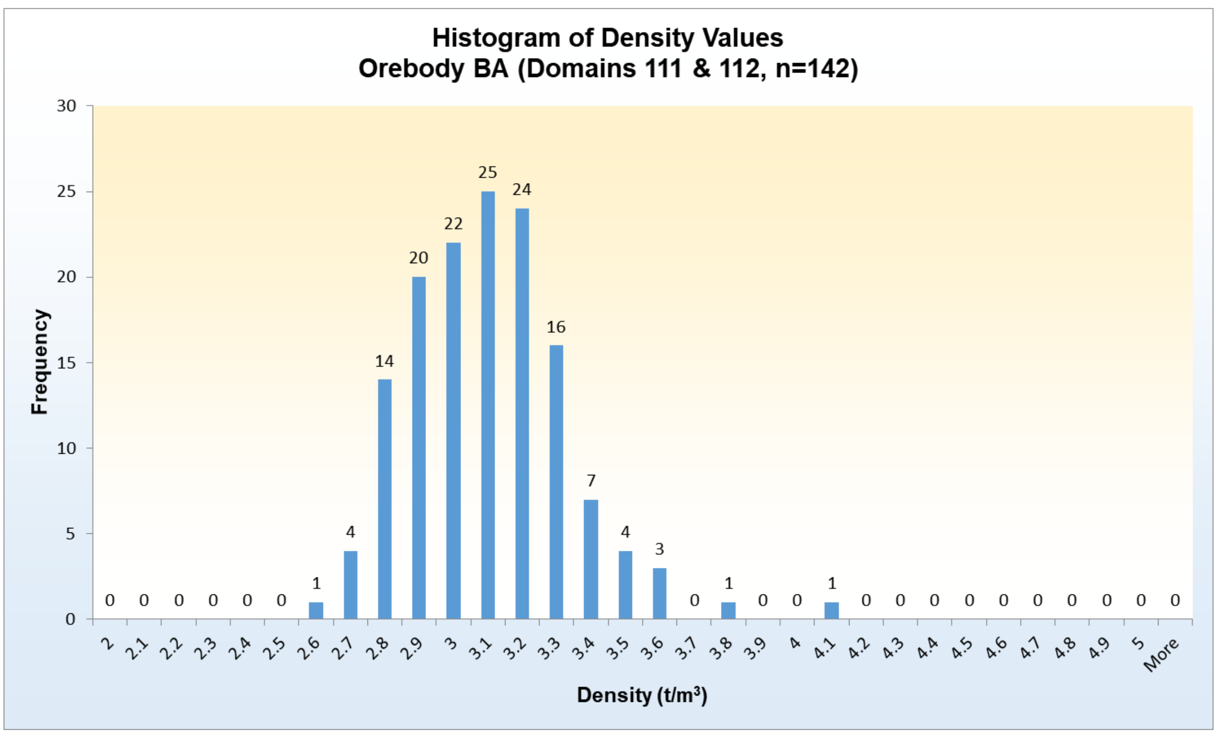


FIGURE 14-17 HISTOGRAM OF DENSITY VALUES, OREBODY BF

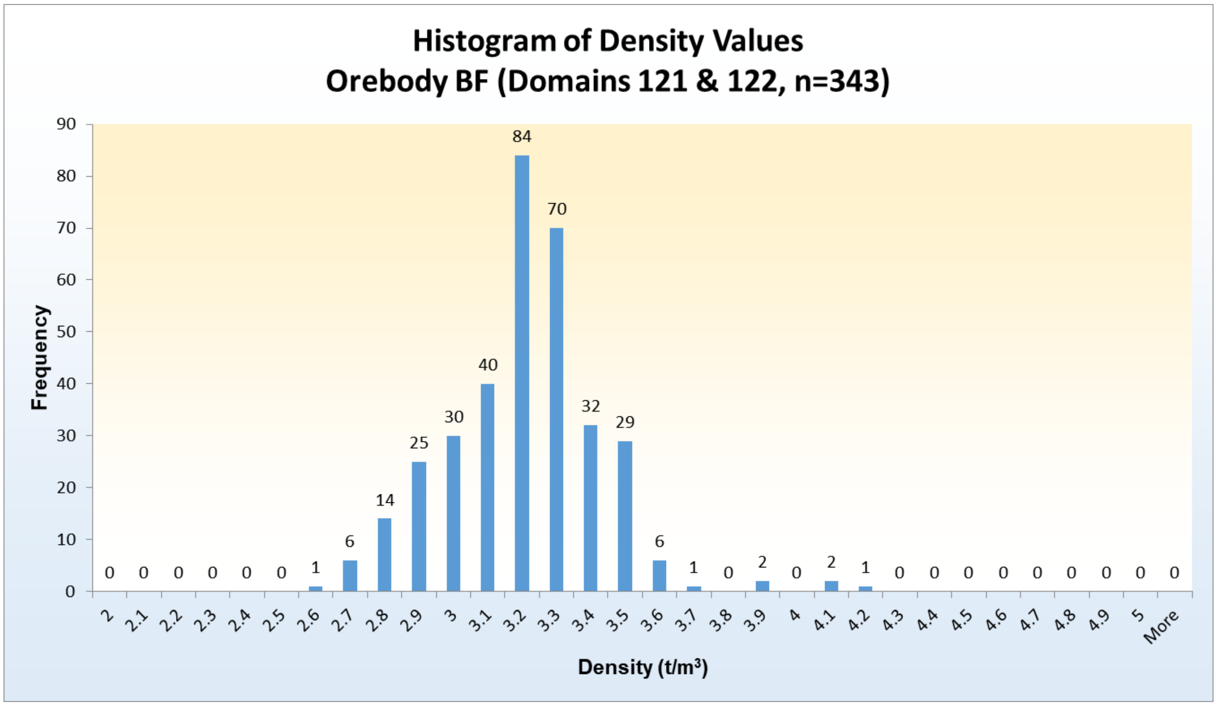


FIGURE 14-18 HISTOGRAM OF DENSITY VALUES, OREBODY BF II

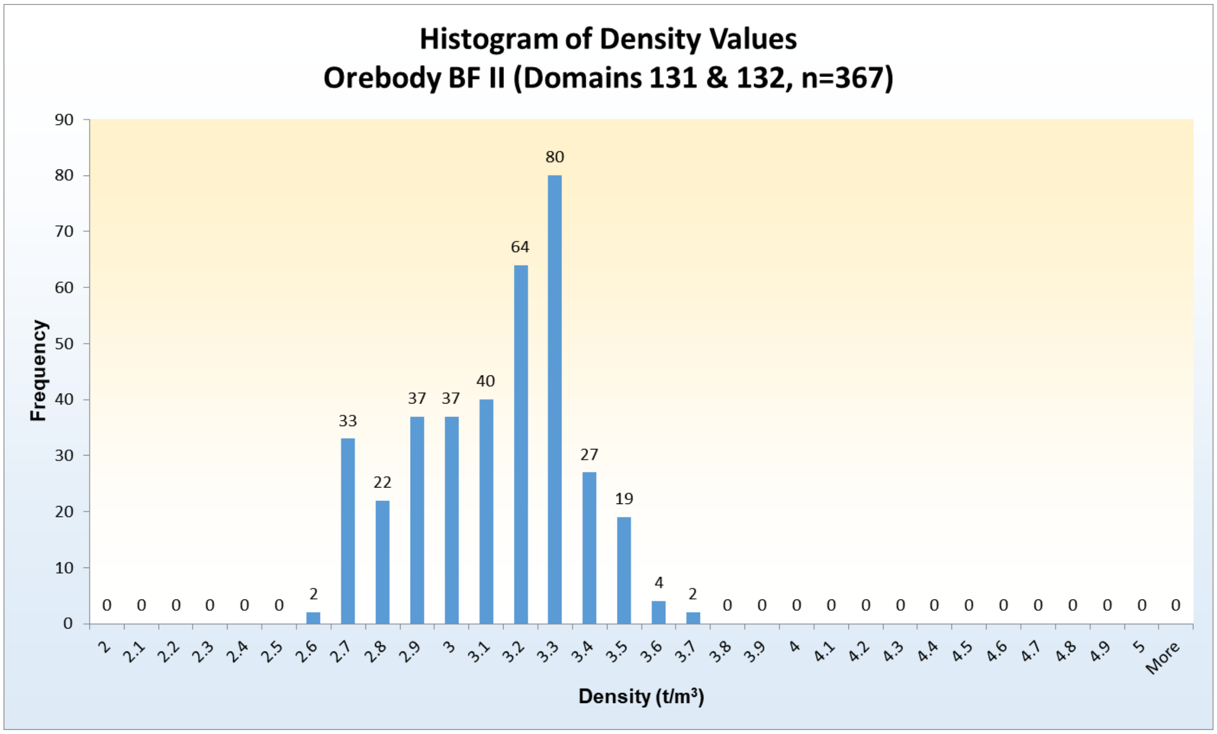
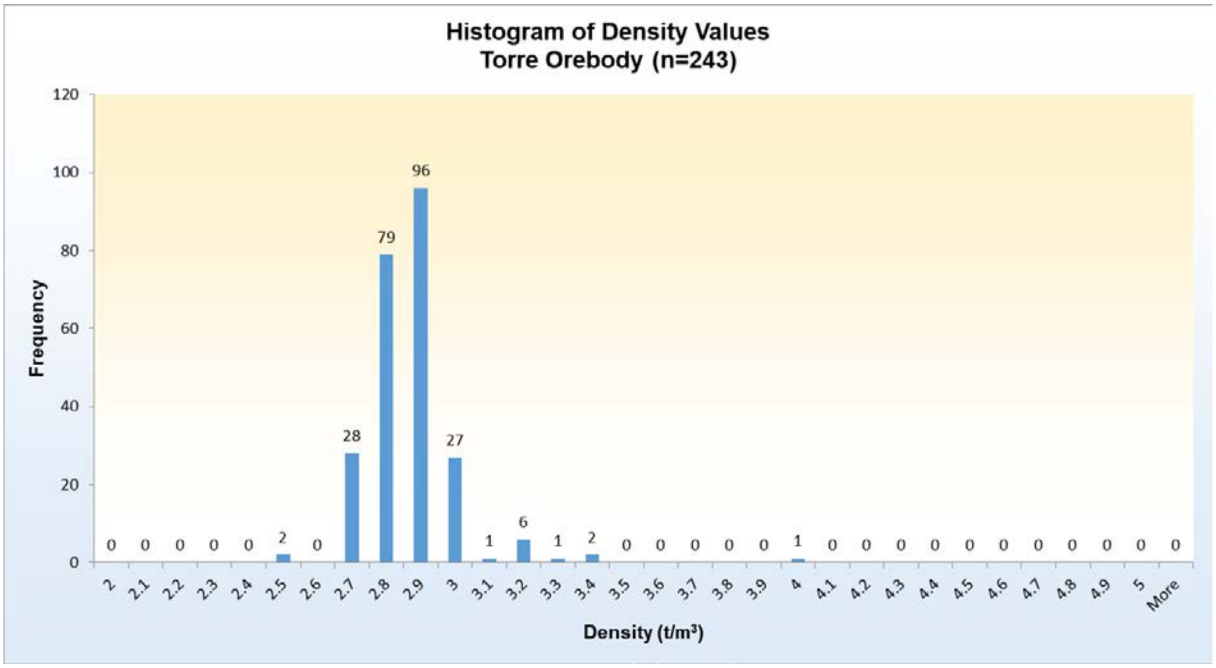


FIGURE 14-19 HISTOGRAM OF DENSITY VALUES, OREBODY TORRE



TREND ANALYSIS

GRADE CONTOURING

As an aid in understanding the distribution and continuity of the gold grades in the mineralized domain models, a short study to examine the overall trends was conducted. For this exercise, a selection of wireframe domains containing the greatest quantities of gold were chosen. The resulting gold grades were digitally contoured using Leapfrog and the results are shown in Figures 14-20 to 14-22.

Review of these longitudinal projections suggests that the samples with gold grades above the 3.0 g/t Au to 5.0 g/t Au range seem to occur as somewhat isolated pods measuring approximately 15 m to 30 m in size that have a slightly preferred elongation along the down-plunge orientation of the folded mineralized wireframes, possibly influenced by the F1 fold axes. Lower grade samples generally show a more pronounced preferred elongation along the down-plunge orientation of the folded mineralized wireframes.

VARIOGRAPHY

Overall, the analysis of the spatial continuity of the gold grades for the various mineralized wireframes remained unchanged from that presented in RPA (2018). New correlogram models were constructed by Jaguar for the BA 113 & 114, BF III, the Torre domains, as well as for the São Jorge domain. Example variograms for the BA, BF, and BF II domains were presented in

RPA (2018). Example correlograms for the newly created domains are presented in Figures 14-23 and 14-24. A summary of the variogram parameters derived for each of the mineralized domains is presented in Table 14-23. A summary of the Minesight rotation angle convention is presented in Figure 14-25.

Views Looking West

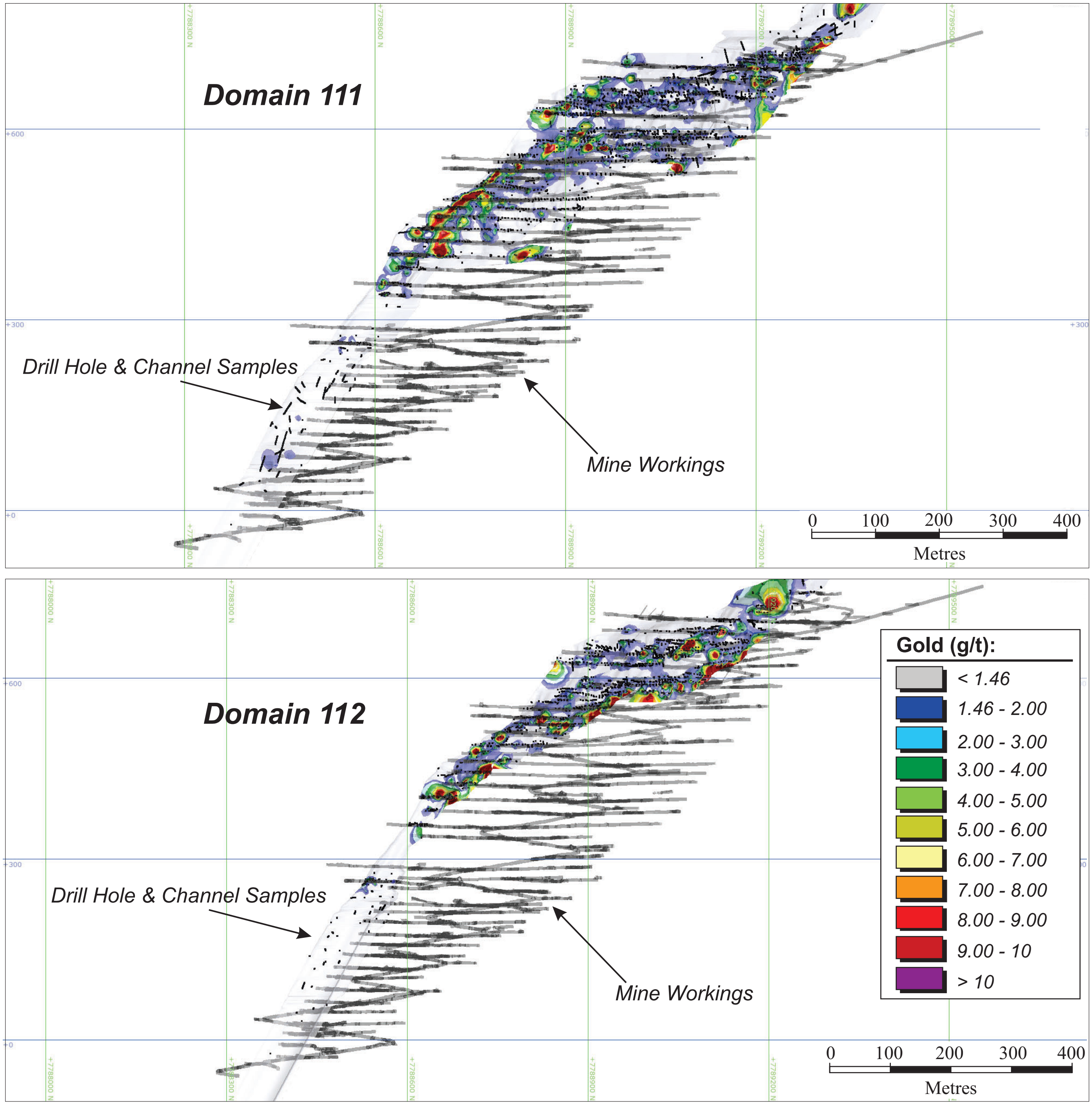


Figure 14-20

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Longitudinal Projection of Orebody BA

August 2020 ***Source: RPA, 2020.***

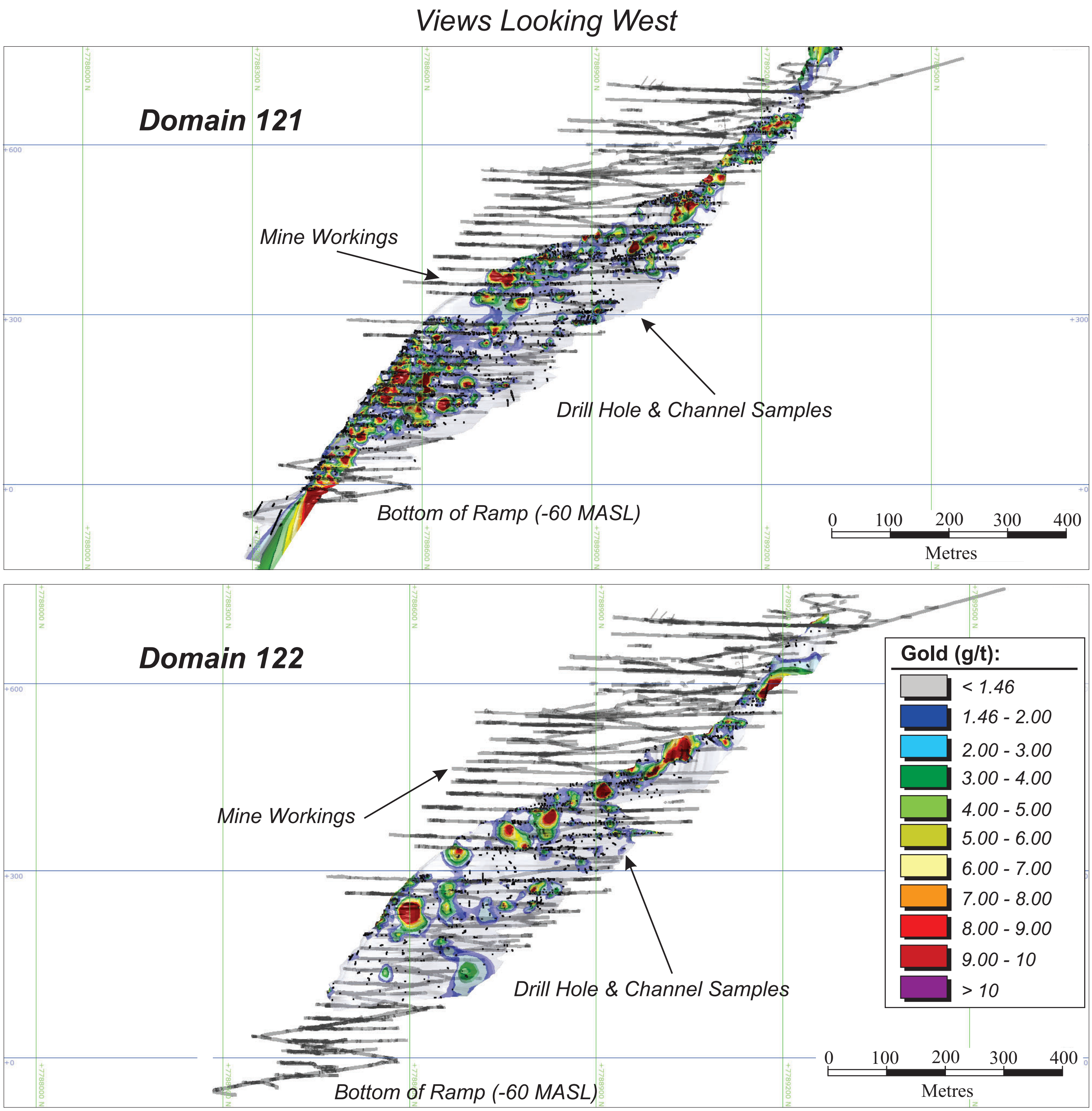


Figure 14-21

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Longitudinal Projection of Orebody BF

August 2020 ***Source: RPA, 2020.***

Views Looking West

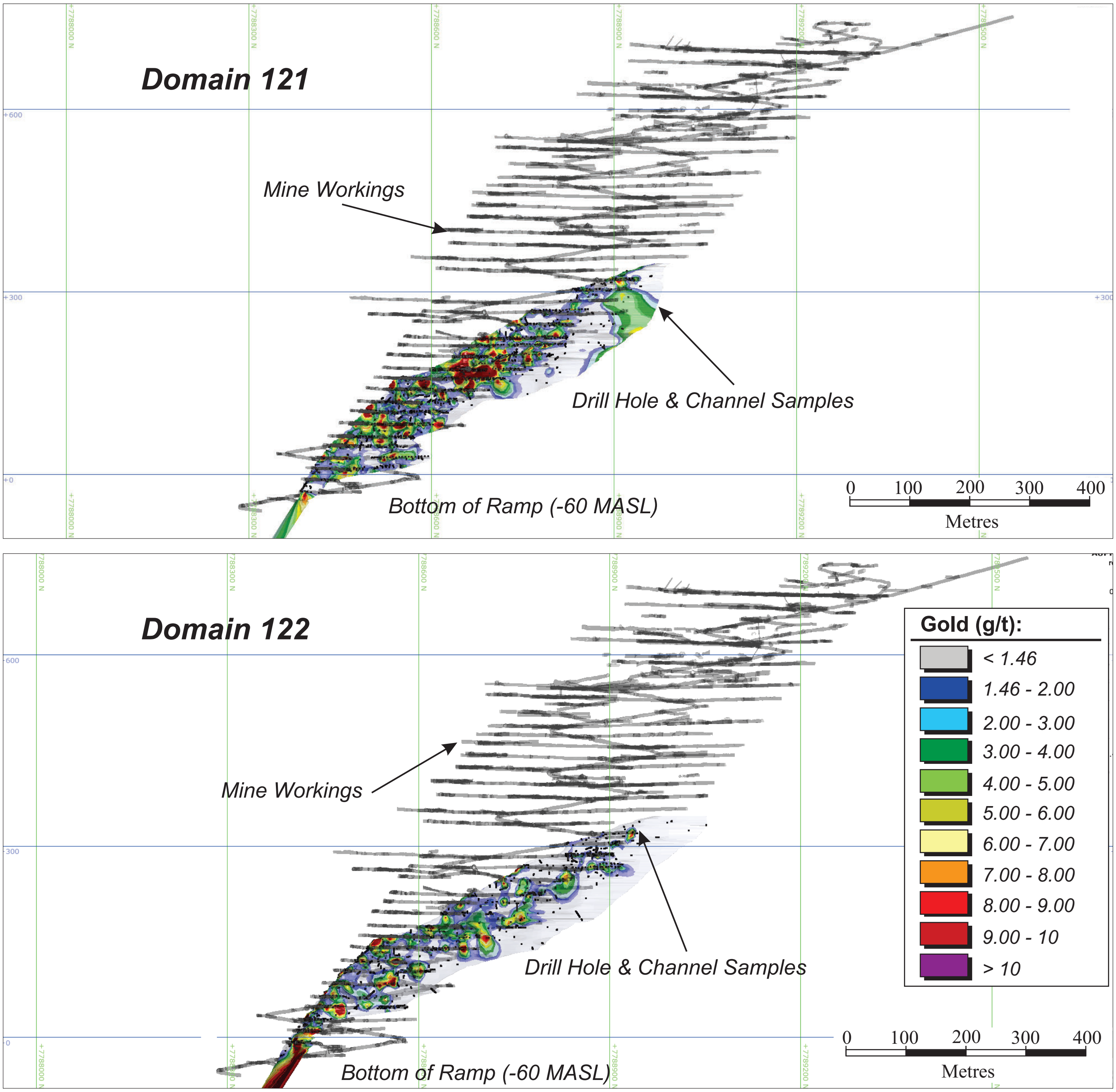


Figure 14-22

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Longitudinal Projection of the Gold Distribution, Orebody BF II

August 2020

Source: RPA, 2020.

FIGURE 14-23 CORRELOGRAM MODELS FOR THE BF III DOMAIN

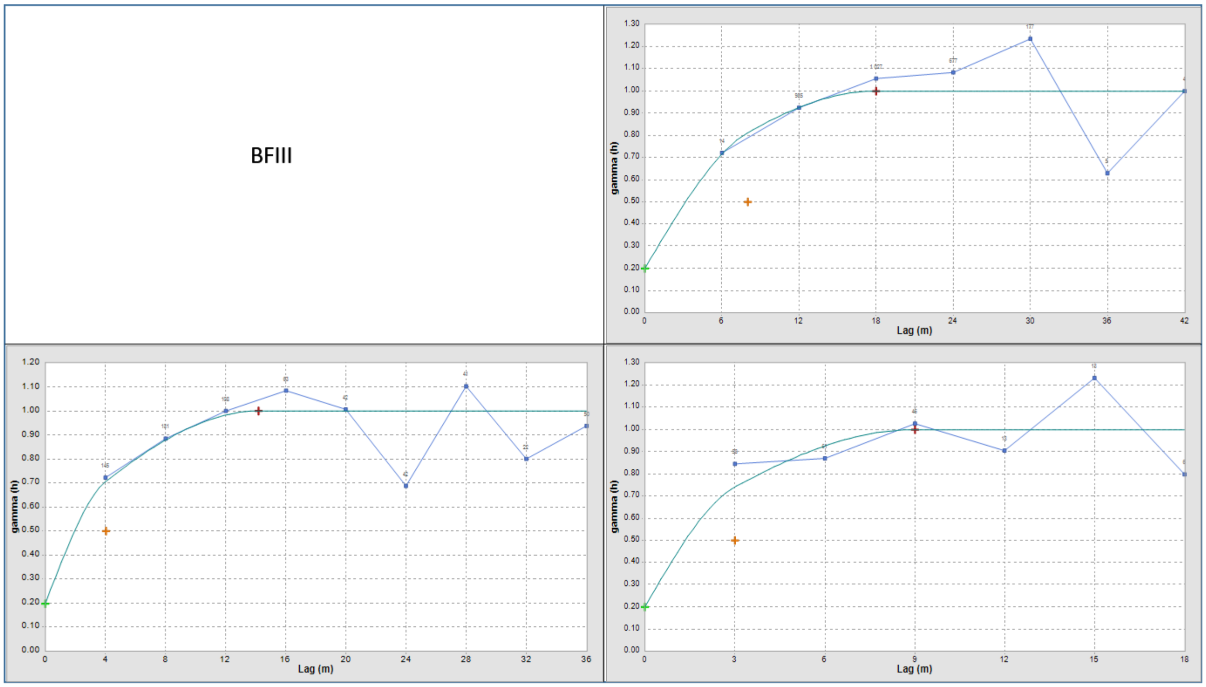


FIGURE 14-24 CORRELOGRAM MODELS FOR THE TORRE 506 DOMAIN

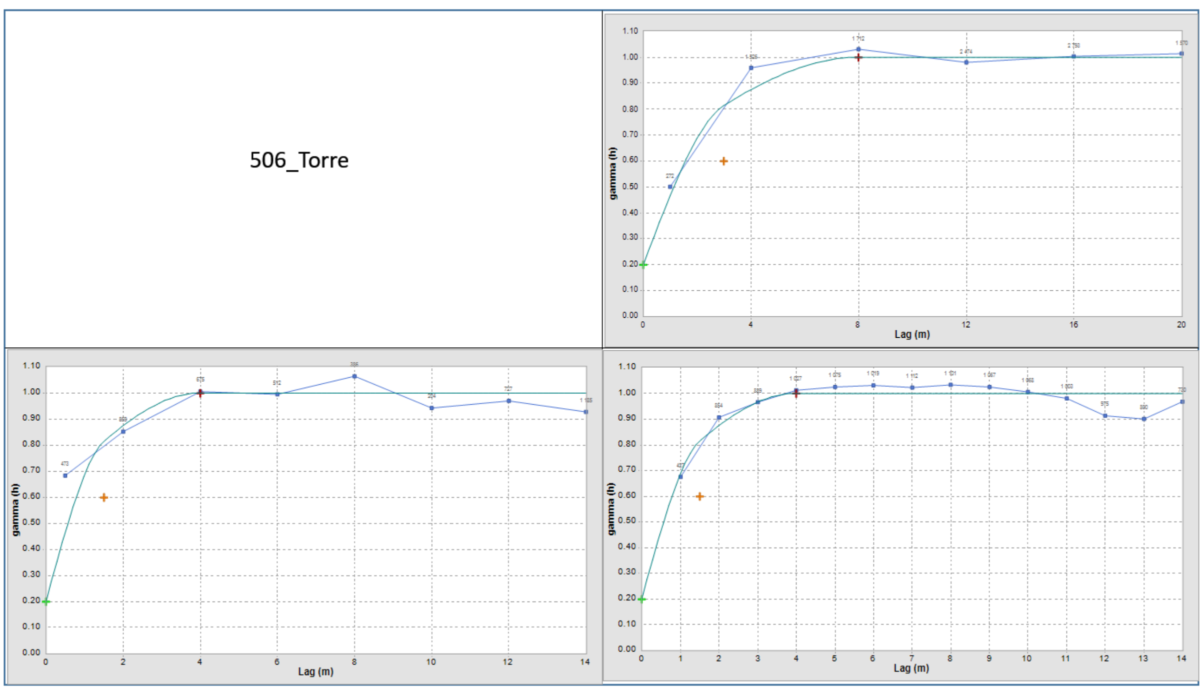
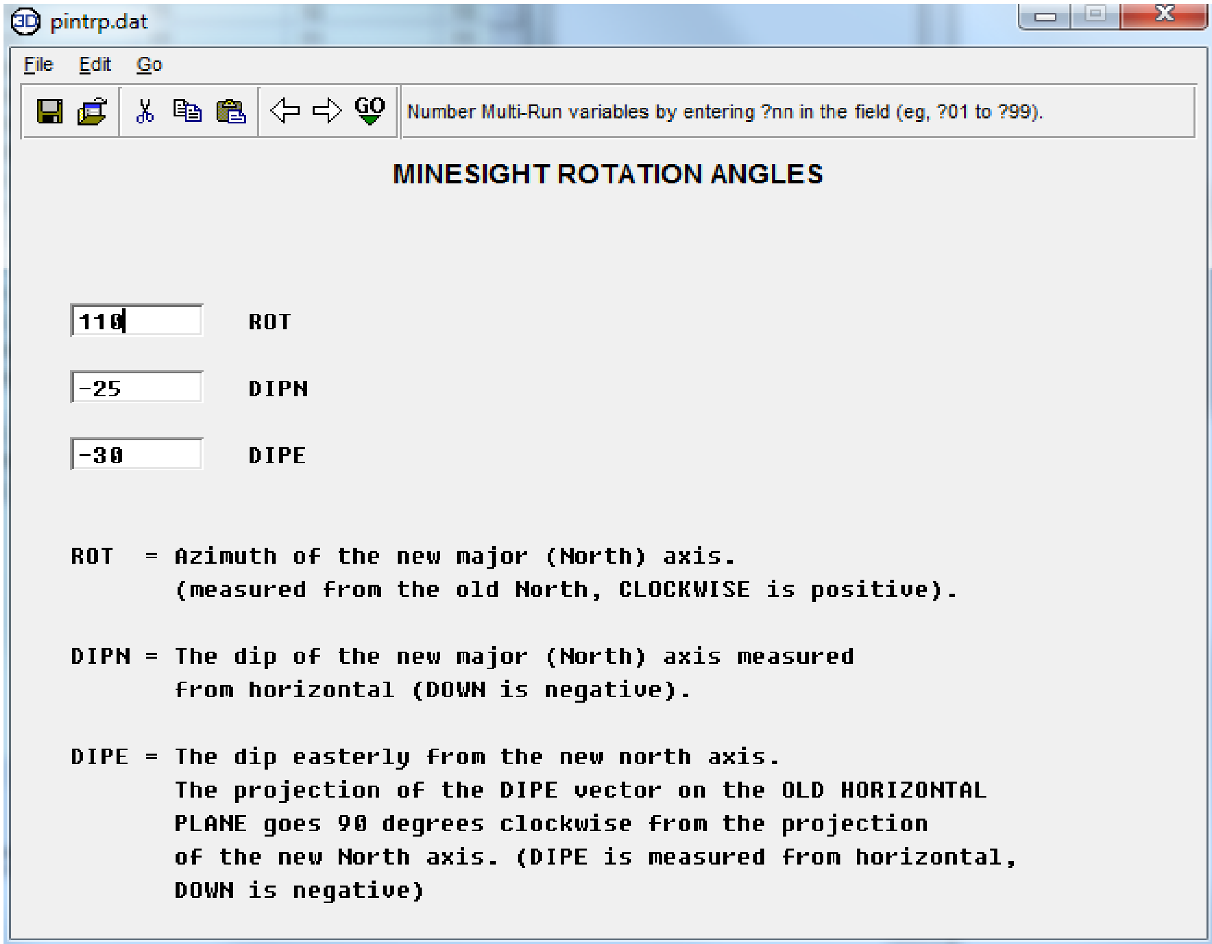


TABLE 14-23 SUMMARY OF VARIOGRAPHY AND INTERPOLATION PARAMETERS, PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Item	BA (111&112)	BA (113&114)	BF	BFII	LPA	LFW	LHW	SW
Nugget (C0)	0.3	0.2	0.2	0.2	0.2	0.1	0.3	0.3
Sill Major Axis (C1)	0.5	0.4	0.4	0.5	0.5	0.5	0.3	0.4
Sill Major Axis (C2)	0.2	0.4	0.4	0.3	0.3	0.4	0.4	0.3
Model Type	Sph	Sph	Sph	Sph	Sph	Sph	Sph	Sph
Orientation	080/-65/-40	080/-65/-40	350/50/-65	350/50/-65	350/40/-60	110/-60/35	090/-65/-60	135/-55/00
Anisotropy Ratio (Major/Semi-Major)	2.5	2.3	1.7	1.8	5.8	3.5	1.3	1.5
Anisotropy Ratio (Major/Minor)	7.0	5	5.0	2.3	7.0	17.5	2.0	3.8
Distances:								
Structure1 Major (m)	50	21	30	20	56	60	5	36
Structure1 Semi-Major (m)	21	11	20	12	8	12	2	15
Structure1 Minor (m)	5	3	3	8	5	1.1	1.3	8
Structure2 Major (m)	70	30	50	35	70	70	8	45
Structure2 Semi-Major (m)	28	13	30	20	12	20	6	30
Structure2 Minor (m)	10	6	10	15	10	4	4	12

Item	BF III	Torre (501)	Torre (502)	Torre (503)	Torre (504)	Torre (505)	Torre (506)	CSJ (801)
Nugget (C0)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Sill Major Axis (C1)	0.3	0.5	0.4	0.4	0.5	0.5	0.4	0.3
Sill Major Axis (C2)	0.5	0.3	0.4	0.4	0.3	0.3	0.4	0.5
Model Type	Sph	Sph	Sph	Sph	Sph	Sph	Sph	Sph
Orientation	0/30/-40	10/60/0	0/60/0	340/40/-70	310/70/0	330/0/-10	120/0/-60	240/-20/30
Anisotropy Ratio (Major/Semi-Major)	1.2	1.3	2.0	3.1	5.7	1.25	2.0	1.1
Anisotropy Ratio (Major/Minor)	2.0	4.0	2.2	4.2	6.7	2.5	2.0	1.8
Distances:								
Structure1 Major (m)	8	5	12	42	22	18	3	10
Structure1 Semi-Major (m)	4	6	7	4	3.5	4	1.5	3
Structure1 Minor (m)	3	1.5	3	4	3.5	3	1.5	3
Structure2 Major (m)	18	20	40	50	40	20	8	22
Structure2 Semi-Major (m)	14	15	20	16	7	16	4	20
Structure2 Minor (m)	9	5	18	12	6	8	4	12

FIGURE 14-25 MINESIGHT ROTATION ANGLE CONVENTION



BLOCK MODEL CONSTRUCTION

The Pilar block model was constructed by Jaguar using MinePlan 3D and comprised an array of 4 m x 4 m x 4 m sized blocks using sub-blocking with a minimum block size of 1 m x 1 m x 1 m. The Pilar block model is oriented parallel to the coordinate grid system (i.e., no rotation or tilt). The selection of the block sizes for this model were carefully selected so as to minimize the variation when compared with the block model strategy previously employed at the Pilar Mine. The Pilar block model origin, dimensions, and attribute list are provided in Table 14-24. A number of attributes were created to store such information as rock code, material densities, estimated gold grades, final mineral resource classification, mined out material, resource polygons, and the like (Table 14-25).

TABLE 14-24 BLOCK MODEL DEFINITION, PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Type	Units	Y (Northing)	X (Easting)	Z (Elevation)
Minimum Coordinates	m	7,787,900	662,000	-400
Maximum Coordinates	m	7,789,396	663,104	896
Parent Block Size	m	4	4	4
Sub-block Size	m	1	1	1
Rotation	°	0.000	0.000	0.000

TABLE 14-25 BLOCK MODEL ATTRIBUTES, PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Attribute Name	Type	Decimals	Description
auokc	Real	2	Estimated grade by Ordinary Kriging
avd	Real	2	Average distance of informing samples
class	Real	0	Initial classification (1=Meas, 2=Ind, 3=Inf)
clod	Real	2	Distance to closest informing sample
dens	Real	2	Density
fthd	Real	2	Distance to farthest informing sample
mined	Real	0	Mined out code (-1=in-situ, 1=development, 2=stopes)
ndh	Real	0	Number of drill holes for grade estimate
nq	Real	0	Number of quadrants
nsmp	Real	0	Number of samples for grade estimate
rclas	Real	0	Reclassified Mineral Resource classification
rock	Real	0	Domain code (See Table 14-18)
rsrc	Real	0	Mineral Resource flag (1=Meas, 2=Ind, 3=Inf)
rsrv	Real	0	Mineral Reserve flag (1=Proven, 2=Probable)
topo%	Real	0	% of block below topography surface
var	Real	2	Kriging variance

SEARCH STRATEGY AND GRADE INTERPOLATION PARAMETERS

Gold grades were estimated into the blocks by means of the OK interpolation algorithm. A total of four interpolation passes at different ranges were carried out for each of the mineralized wireframes using distances derived from the variogram results and the search ellipse parameters presented above (Table 14-26). In general, all search ellipses were oriented along the overall down-plunge direction of the mineralized domains (Figures 14-26 to 14-28).

In general, "hard" domain boundaries were used along the contacts of the mineralized domain models. Only data contained within the respective wireframe model was allowed to be used to estimate the grades of the blocks within the wireframe in question, and only those blocks within the wireframe limits were allowed to receive grade estimates. Soft boundaries were used to estimate the grades within the various mineralized wireframe domains. Mineralized wireframes were partitioned into sub-domains so as to represent the spatial orientation of the specific segment of the target mineralized wireframe (Figure 14-29). Composite grades from adjoining sub-domains were allowed to be considered for estimation of grades within the specific sub-domain being estimated so as to avoid the creation of step-change type artifacts in the estimated grades at the sub-domain boundaries. Care was taken to avoid smearing of gold grades across the limbs of isoclinally folded domains.

In addition to the use of soft domain boundaries, RPA recommends that Jaguar consider the use of a dynamic anisotropy method for estimation of grades so as to more accurately reflect the gold grade variations at the local scale.

TABLE 14-26 SUMMARY OF THE ESTIMATION STRATEGY, PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

	Range/2 PASS1	Rangex1 PASS2	Rangex2 PASS3	Extrapolation PASS4
Parameters	**Measured**	**Indicated**	**Inferred**	**Potential**
# min composites	3	2	1	1
# max composites	16	16	16	16
# max composites by DH	2	2	4	8
especial selection	split quadrant	split quadrant	split quadrant	split quadrant
# max composites por quad/oct	2	2	4	8
# empty quad/oct adjacent	-	-	-	-
min quad/oct with value	2	2	1	1

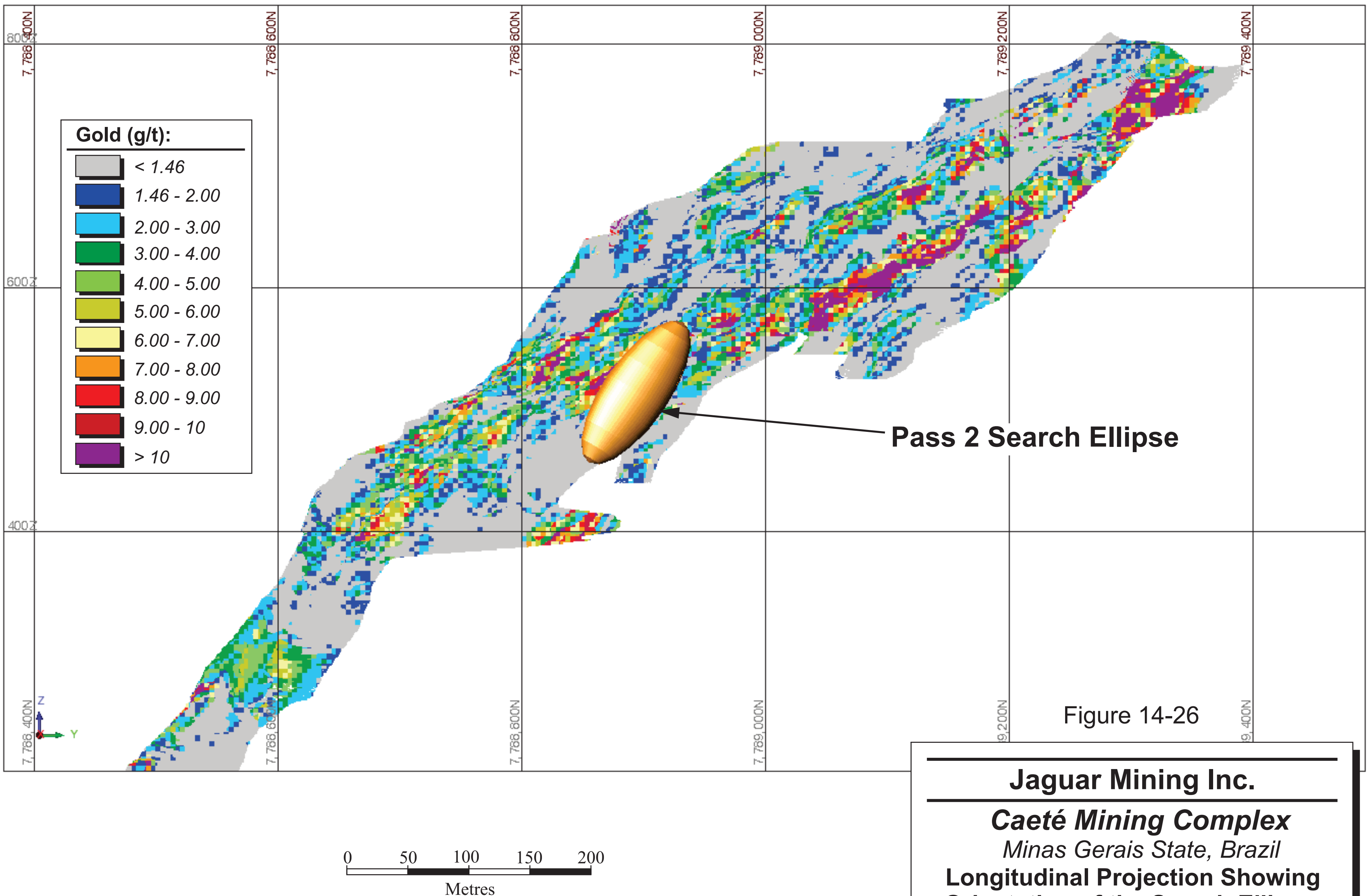


Figure 14-26

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Longitudinal Projection Showing Orientation of the Search Ellipse, Orebody BA

August 2020

Source: RPA, 2020.

View Looking West

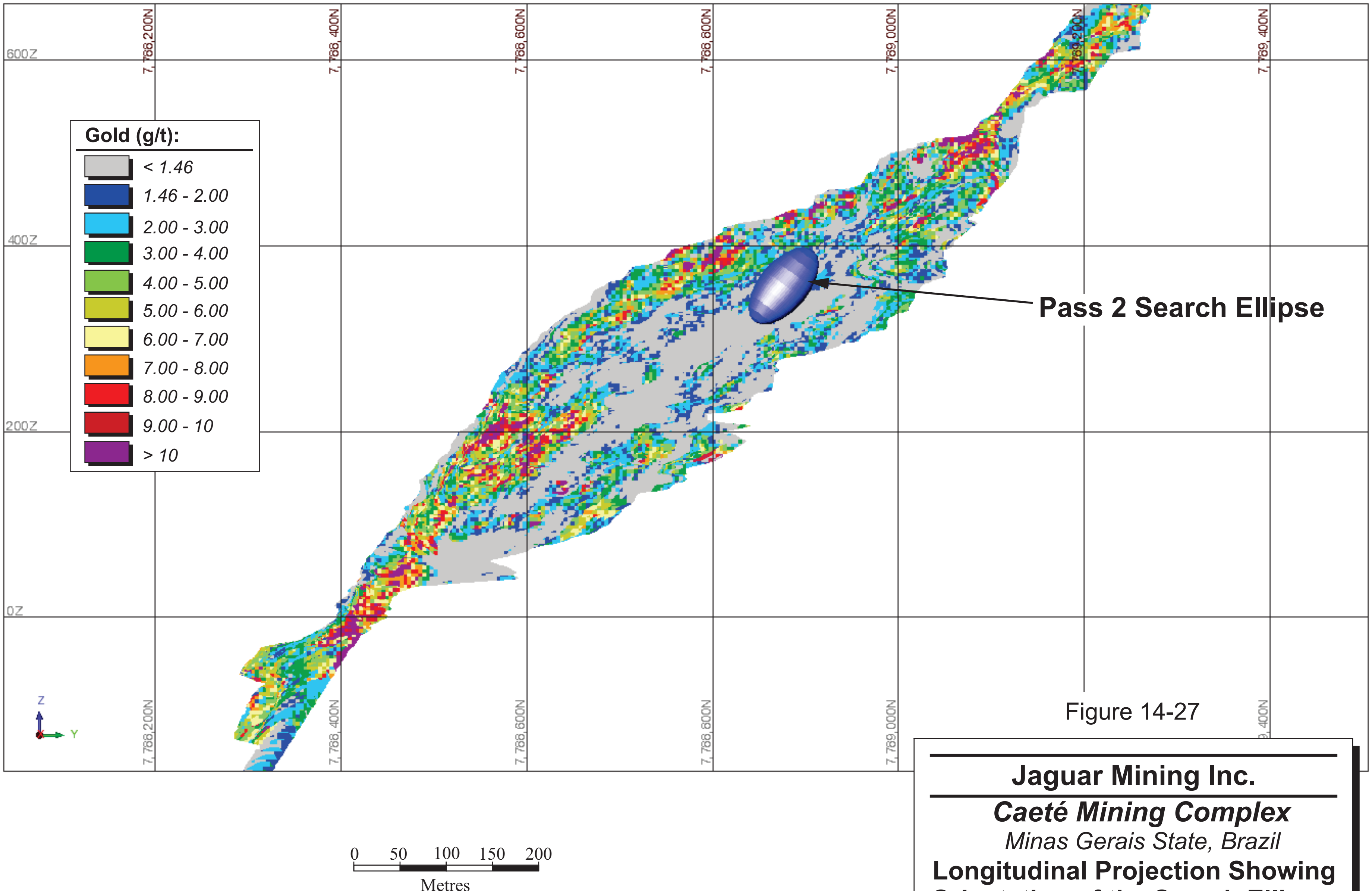


Figure 14-27

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Longitudinal Projection Showing Orientation of the Search Ellipse, Orebody BF

August 2020

Source: RPA, 2020.

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View Looking West

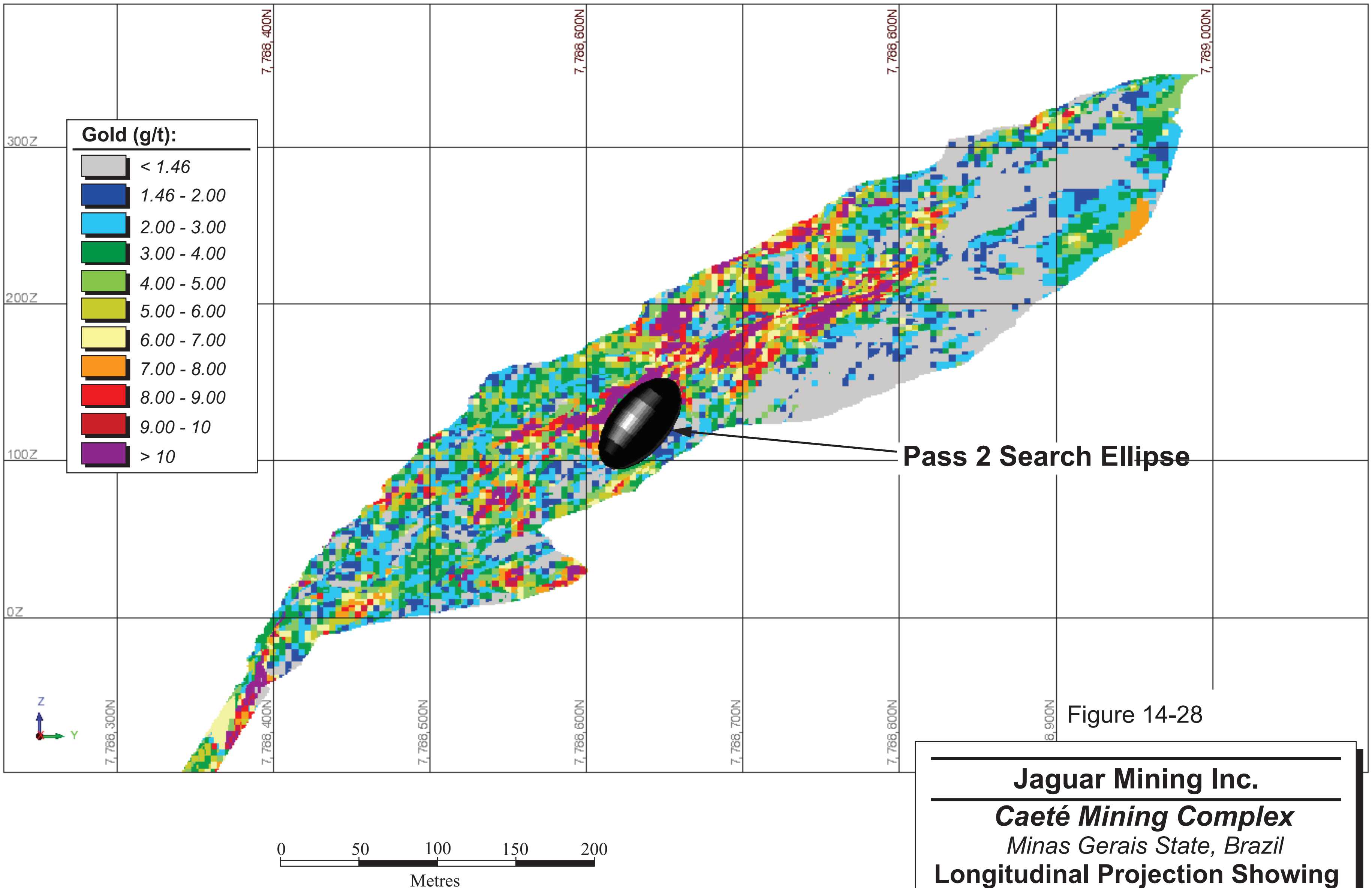


Figure 14-28

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Longitudinal Projection Showing Orientation of the Search Ellipse, Orebody BF II

August 2020

Source: RPA, 2020.

FIGURE 14-29 EXAMPLE OF WIREFRAME SUB-BOUNDARIES FOR SOFT DOMAIN ESTIMATION, PILAR MINE

BLOCK MODEL VALIDATION

GLOBAL ESTIMATE

Block model validation exercises consisted of comparing the volume of the coded blocks in the block model against the volume report of the respective wireframe models as a high level check that the block model has been correctly coded for each of the wireframes (Table 14-27). The discrepancy in the volumes for the Torre wireframe can be attributed to the observation that the wireframe models have not been clipped to the topographic surface, and so the volume for this wireframe model is slightly over-stated.

TABLE 14-27 COMPARISON OF BLOCK MODEL AND WIREFRAME VOLUMES, PILAR MINE

Jaguar Mining Inc. – Caeté Mining Complex

Orebody ID	Wf Volume (m^3)	Block Model Volume (m^3)	Difference (BM-Wf)	% Difference	Remarks
BA_110	1,920,913	1,917,095	-3,818	0	
BF_120	1,933,006	1,932,171	-835	0	
BF II_130	922,490	922,544	54	0	
BF3_140	257,495	257,171	-324	0	
LFW_200	598,875	597,173	-1,702	0	
LPA_300	432,802	432,354	-448	0	
LHW_400	201,309	200,880	-429	0	
Torre_500	1,892,288	1,752,739	-139,549	-7	Wireframe not clipped to topo. Blocks are trimmed to topo
SW_600	1,807,334	1,805,415	-1,919	0	
LFW_700	186,423	186,082	-341	0	
CSJ_800	34,808	34,725	-83	0	

A second validation exercise consisted of evaluating the accuracy of the global estimate by comparing the descriptive statistics from the composites against the block model gold grades (Table 14-28). In general, the block estimated mean grades for some of the mineralized domains were lower than the composites.

TABLE 14-28 COMPARISON OF BLOCK MODEL AND COMPOSITE SAMPLE AVERAGE GRADES, PILAR MINE

Jaguar Mining Inc. – Caeté Mining Complex

Wireframe ID	Capped Comp Average (g/t Au)	Block Average (g/t Au)	Difference (BM-comps)	% Difference
BA_110	3.4	2.43	-0.97	-29
BF_120	3.87	3.27	-0.60	-16
BF II_130	4.86	3.86	-1.00	-21
BF3_140	4.16	3.38	-0.78	-19
LFW_200	1.94	1.55	-0.39	-20
LPA_300	3.89	2.90	-0.99	-25
LHW_400	1.99	1.46	-0.53	-27
Torre_500	1.82	1.68	-0.14	-8
SW_600	1.88	1.72	-0.16	-9
CSJ_800	1.92	1.27	-0.65	-34

LOCAL ESTIMATE

Evaluation of the accuracy of the local estimate was carried out by construction of a series of swath plots that compared the average composite grades to the average estimated block model grades in plan and section. Swath plots for selected wireframes are presented in Figure 14-30 to 14-33. The accuracy of the local estimate was also examined visually by comparing the contoured grade distributions from the drill hole and channel sample information to the estimated block grades (Figures 14-34 and 14-35).

FIGURE 14-30 SWATH PLOT BY ELEVATION, OREBODY BA

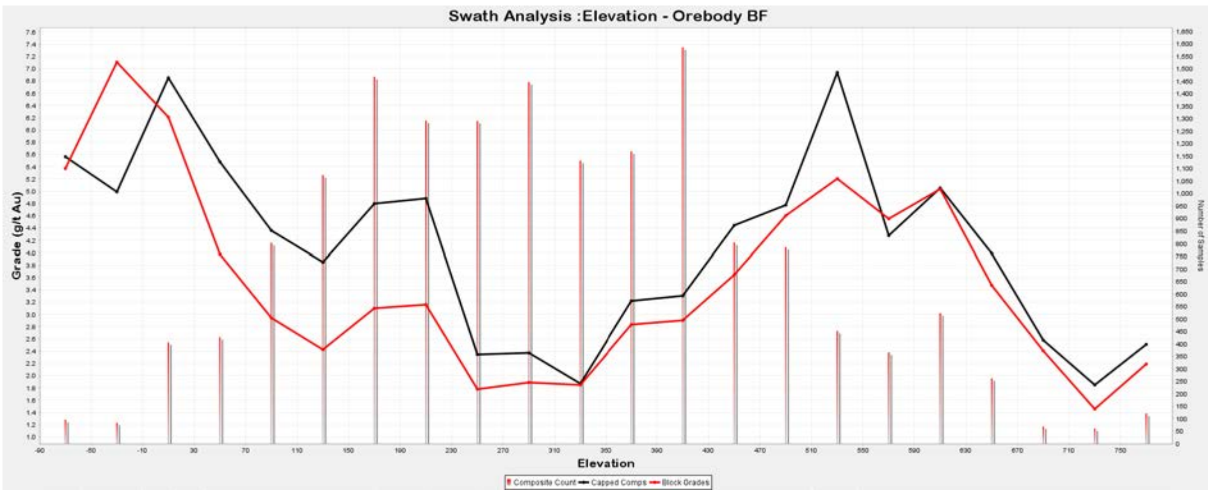


FIGURE 14-31 SWATH PLOT BY ELEVATION, OREBODY BF

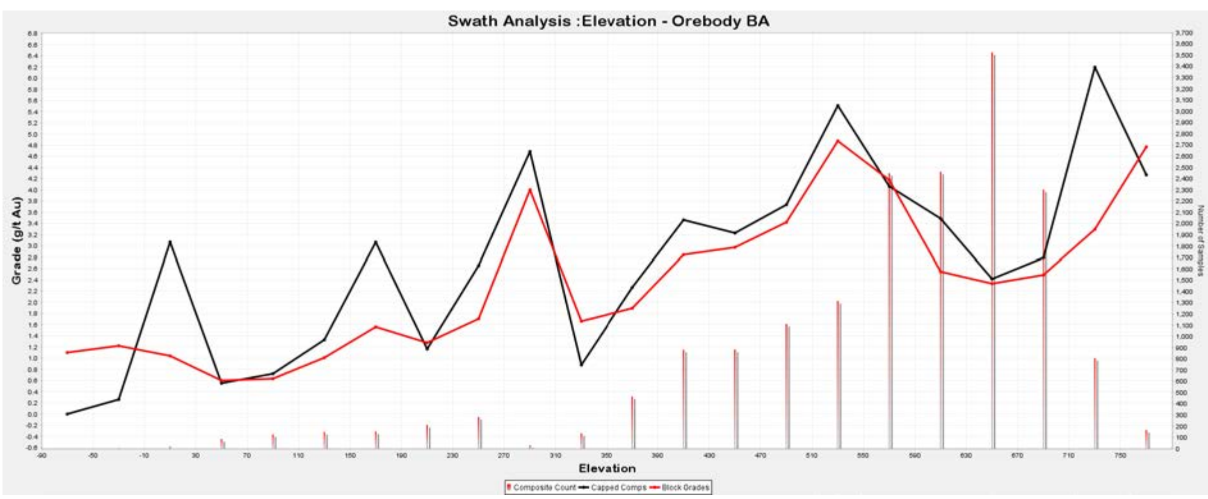


FIGURE 14-32 SWATH PLOT BY ELEVATION, OREBODY BF II

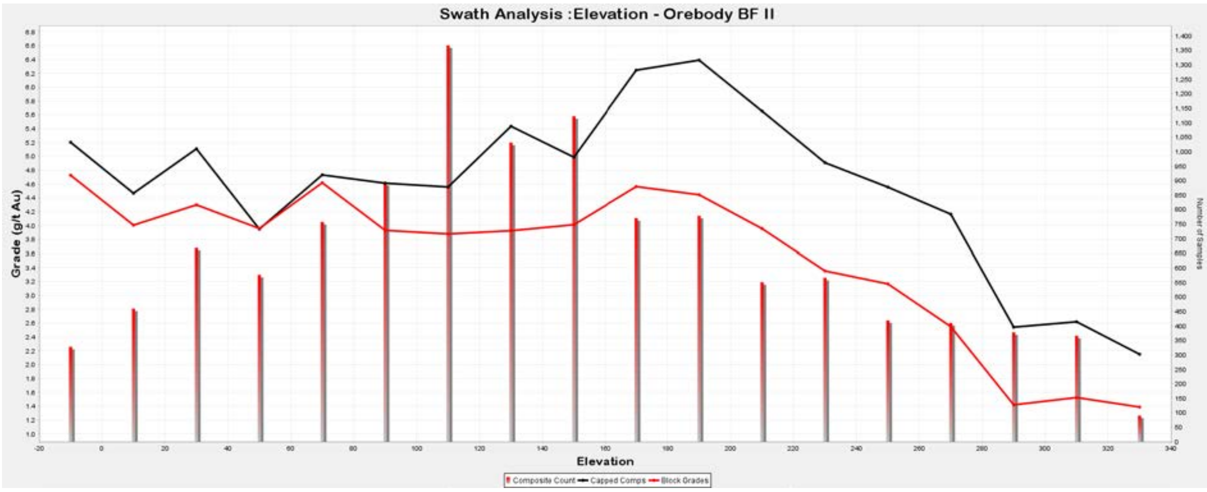
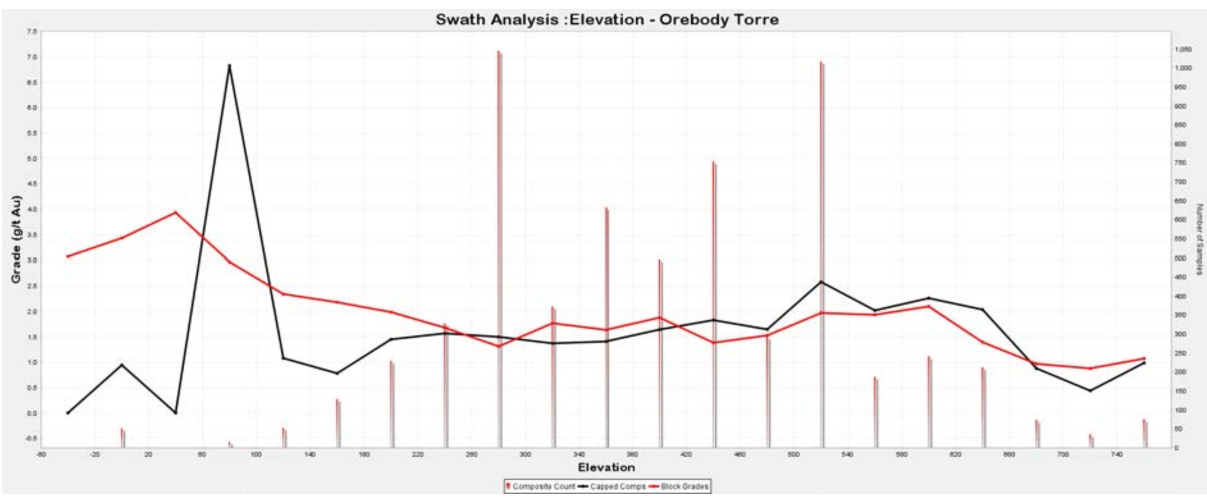


FIGURE 14-33 SWATH PLOT BY ELEVATION, OREBODY TORRE



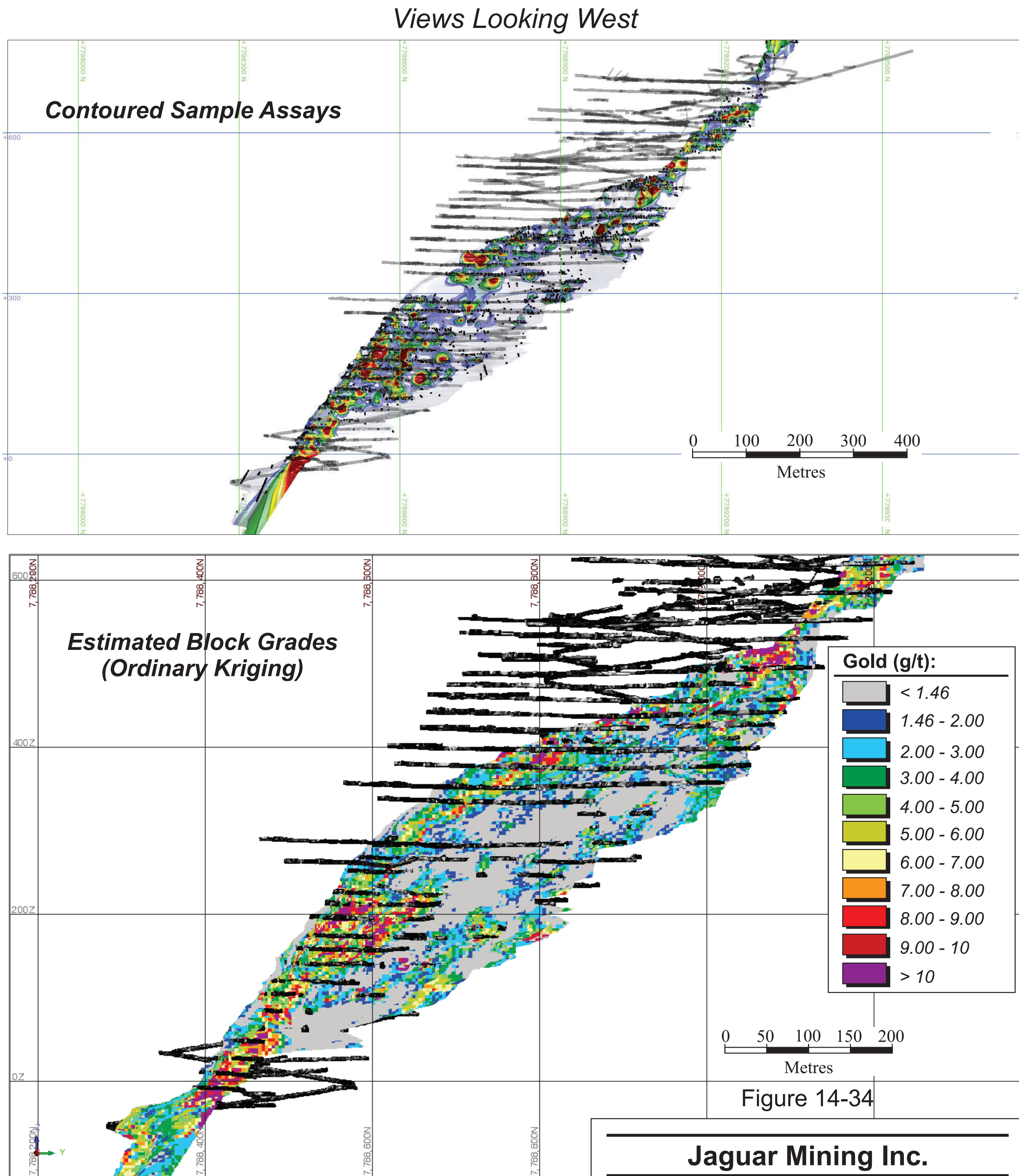


Figure 14-34

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Comparison of Contoured Sample Grades to Estimated Block Grades, Domain 121, Orebody BF

August 2020 **Source: RPA, 2020.**

Views Looking West

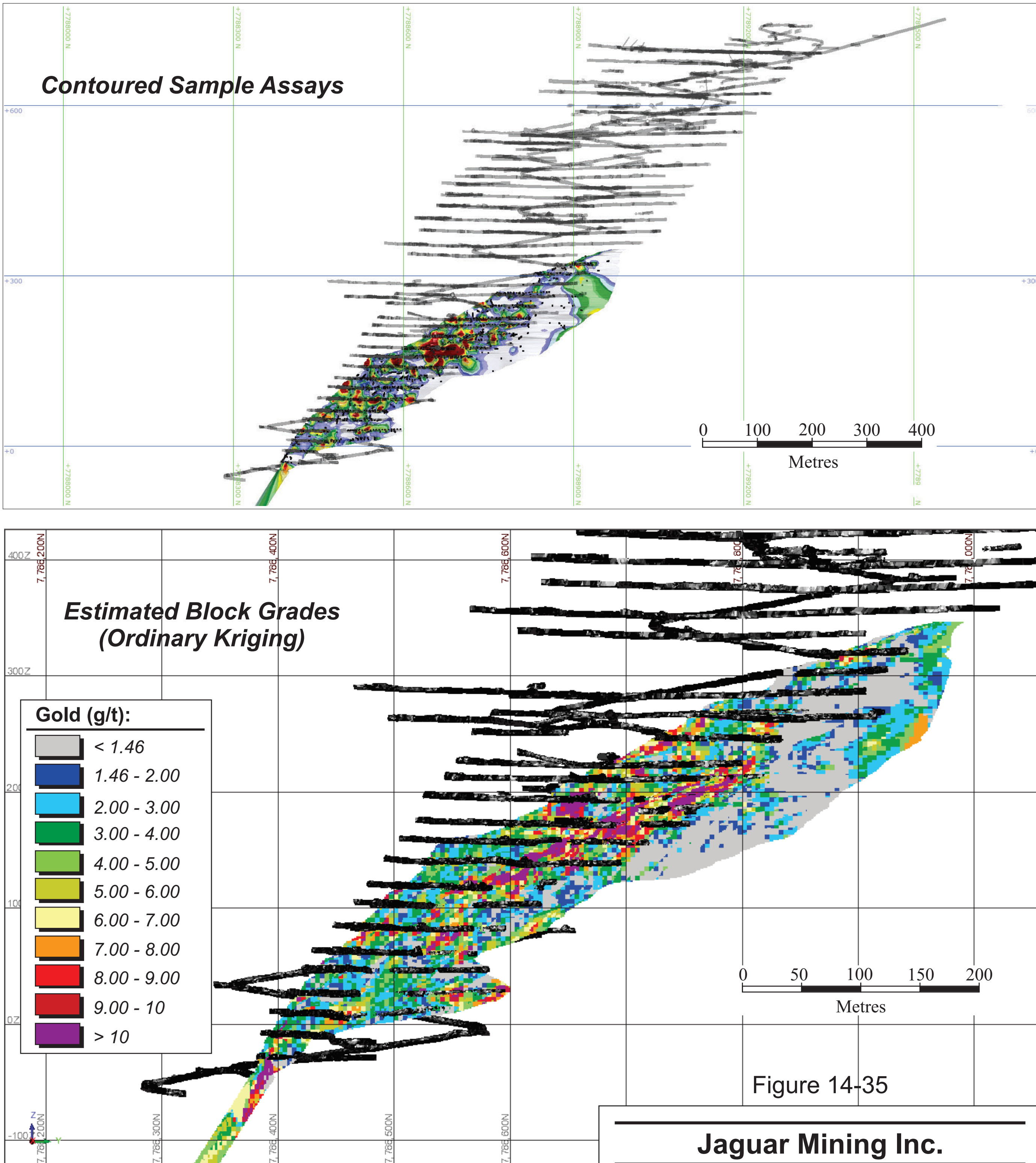


Figure 14-35

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Comparison of Contoured Sample Grades to Estimated Block Grades, Domain 121, Orebody BF II

August 2020 ***Source: RPA, 2020.***

RECONCILIATION TO PRODUCTION

Further validation of the accuracy of the estimated block model grades consisted of comparing the mill production statistics with the predicted volumes of diluted and recovered tonnes and grade from the block model for the period of January 2018 to May 2020 (Table 14-29). The material flow for the Pilar Mine begins with the transportation of the broken development muck and stope tonnes to the surface, where the material is placed in a temporary laydown area for sampling. The material is then transported overland by truck to the processing plant.

The monthly tonnage and grade figures derived from the block models utilized the as-mined excavation solids models for the development and stopes completed in 2018, 2019 and Q2 2020 to constrain the reports. The mined out volumes were created using data collected using a Cavity Monitoring Survey (CMS) and/or total station survey equipment. In a small number of cases, the shape and size of the excavated volumes could not be picked up due to equipment failures, timing, or safety issues. RPA recommends that in the events where no CMS model is available for a given excavation volume, the design shape for the excavations in question (suitably modified for the estimated amount of overbreak) be used as a proxy when preparing the reconciliation reports.

The grade of all blocks that are located outside of the mineralized wireframe models (ostensibly the waste materials) has been set to a value of zero for the 2018 and Q2 2020 block models. This approach results in the inclusion of all waste tonnes (both planned and unplanned dilution) along with the recovered ore tonnes. The data represents the fully diluted, recovered tonnes and grade as predicted from the block model and is appropriate for comparison with plant feed grade.

Considering that Jaguar incorporates all grade control drilling and channel sampling data into the workflow for estimation of the Mineral Resources, accomplishing a reconciliation study according to the methods presented in Parker (2004) is not possible. To address this situation, Jaguar has adopted a slightly modified workflow as suggested in RPA (2017, 2019, and 2019b) when carrying out reconciliation studies. In this approach, the excavation volumes from the January 2019 to May 2020 period are applied against the block model completed at year-end 2018 and the resulting data is compared against the plant production data for the January 2019 to May 2020 period. As these excavation volumes are querying areas in the year-end 2018 block model for which no grade control data were available, RPA considers that this approach is examining the predictive capabilities as well as the accuracy of the estimation procedures and parameters that were in place as of year-end 2018. RPA considers this approach of using the year-end 2018 block model for reconciliation reporting similar to an F3 reconciliation study as presented by Parker (2004). RPA is of the opinion that this approach can provide a means of measuring the accuracy of the data, sample density, workflows, and estimation parameters that Jaguar uses to prepare its Mineral Resource estimates for the period under examination (17 months in this case). This approach also allows the formation of an opinion on the forward accuracy of the current block model, as the procedures and parameters are similar to those used for the previous block model. A summary of the predicted versus actual gold production for the January 2019 to May 2020 period is presented in Figure 14-36 and a summary of the F3 reconciliation factors is presented in Figure 14-37.

It is evident that the year-end 2018 block model has performed well for the period reviewed in regard to predicted tonnages. The predicted grades are generally in good agreement as well, apart from Q2 2020 where the block model grades were significantly less than the plant feed grades. This good performance suggests that the sampling procedures and Mineral Resource estimation workflows and parameters are satisfactory.

TABLE 14-29 RECONCILIATION DATA BY QUARTER, JANUARY 2018 TO MAY 2020, PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Period	Mine Report			Plant Feed			Block Model Q2 2020			Block Model YE2018		
	Mass (tonnes)	Au (ppm)	Ounces (oz Au)	Mass (tonnes)	Au (ppm)	Ounces (oz Au)	Mass (tonnes)	Au (ppm)	Ounces (oz Au)	Mass (tonnes)	Au (ppm)	Ounces (oz Au)
2018												
Q1	77,642	4.37	10,905	80,728	4.17	10,821	69,756	5.02	11,253	0	0.00	0
Q2	94,051	3.90	11,799	94,377	4.13	12,538	85,221	4.19	11,489	0	0.00	0
Q3	87,476	4.93	13,856	87,394	5.04	14,155	82,842	5.53	14,726	0	0.00	0
Q4	94,233	3.82	11,583	92,541	4.40	13,083	95,545	4.37	13,426	0	0.00	0
2019												
Q1	90,644	3.79	11,049	91,175	4.13	12,120	92,418	3.72	11,045	92,020	3.33	9,840
Q2	107,910	3.78	13,127	109,335	3.66	12,859	99,807	4.04	12,952	96,836	3.45	10,730
Q3	114,767	3.97	14,657	113,813	3.55	13,005	118,520	3.84	14,618	117,587	3.59	13,575
Q4	113,505	3.84	13,999	114,506	3.41	12,555	114,981	3.87	14,305	114,360	3.85	14,150
2020												
Q1	104,110	3.63	12,156	101,151	3.46	11,243	102,812	3.60	11,903	102,670	3.43	11,328
April & May	73,794	3.73	8,852	75,453	4.52	10,955	70,562	3.35	7,601	70,614	3.34	7,583
Annual Totals												
2018	**353,402**	**4.24**	**48,142**	**355,039**	**4.43**	**50,597**	**333,364**	**4.75**	**50,894**	**0**	**0.00**	**0**
2019	**426,826**	**3.85**	**52,833**	**428,830**	**3.67**	**50,539**	**425,726**	**3.87**	**52,919**	**420,803**	**3.57**	**48,295**
2020 year to May	**177,904**	**3.67**	**21,008**	**176,605**	**3.91**	**22,199**	**173,374**	**3.50**	**19,503**	**173,284**	**3.39**	**18,911**

FIGURE 14-36 COMPARISON OF PREDICTED VERSUS ACTUAL GOLD PRODUCTION, PILAR MINE, JANUARY 2019 TO MAY 2020

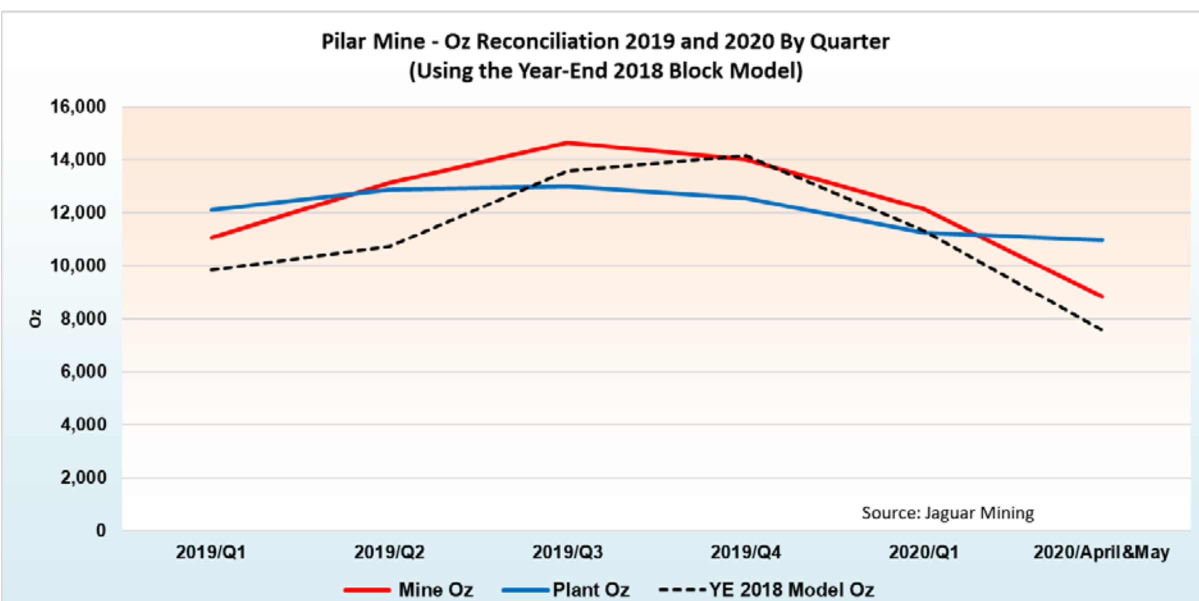
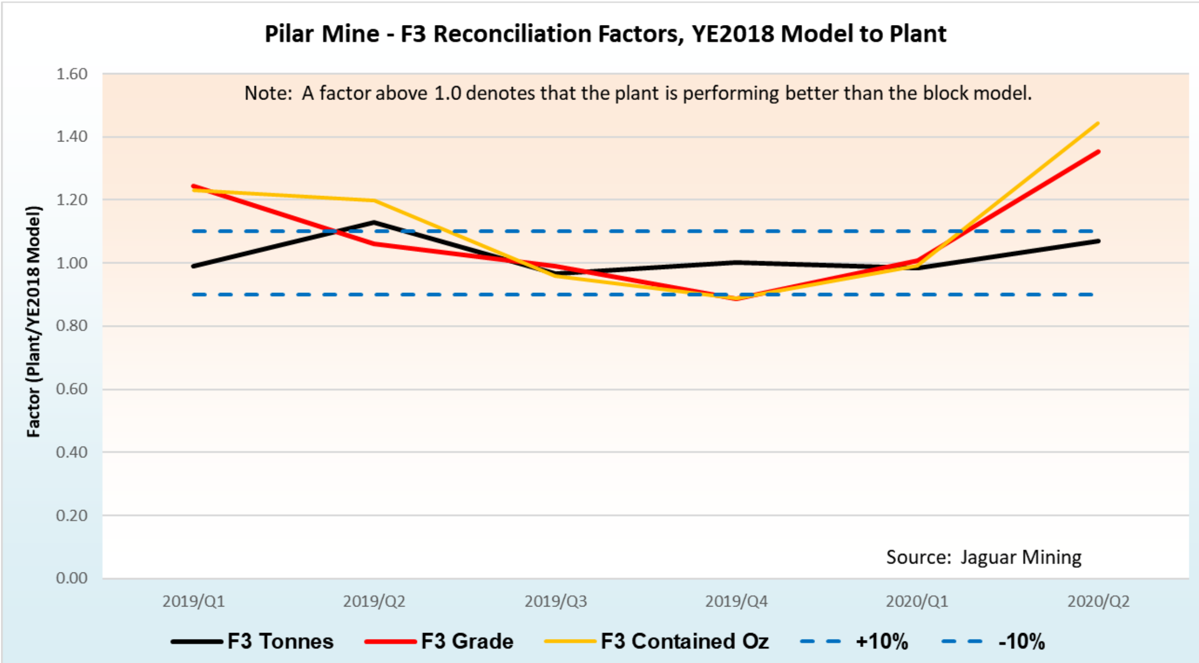


FIGURE 14-37 F3 RECONCILIATION FACTORS, PILAR MINE, JANUARY 2019 TO MAY 2020



Jaguar has carried out a second reconciliation study which now uses the recently completed block model for Q2 2020 to compare against the plant production data. In this study, the excavation volumes from the January 2018 to May 2020 period are applied against the current block model completed at Q2 2020 and the resulting data are compared against the plant production data for the January 2018 to May 2020 period. In this manner, the accuracy of the mine grade control programs and reporting procedures are examined against the plant production data for a period of 29 months. RPA considers this approach to be comparable to the F2 reconciliation as presented by Parker (2004). A summary of the predicted versus actual gold production for the January 2018 to May 2020 period is presented in Figure 14-38 and a summary of the F2 reconciliation factors is presented in Figure 14-39.

FIGURE 14-38 COMPARISON OF PREDICTED VERSUS ACTUAL GOLD PRODUCTION, PILAR MINE JANUARY 2018 TO MAY 2020

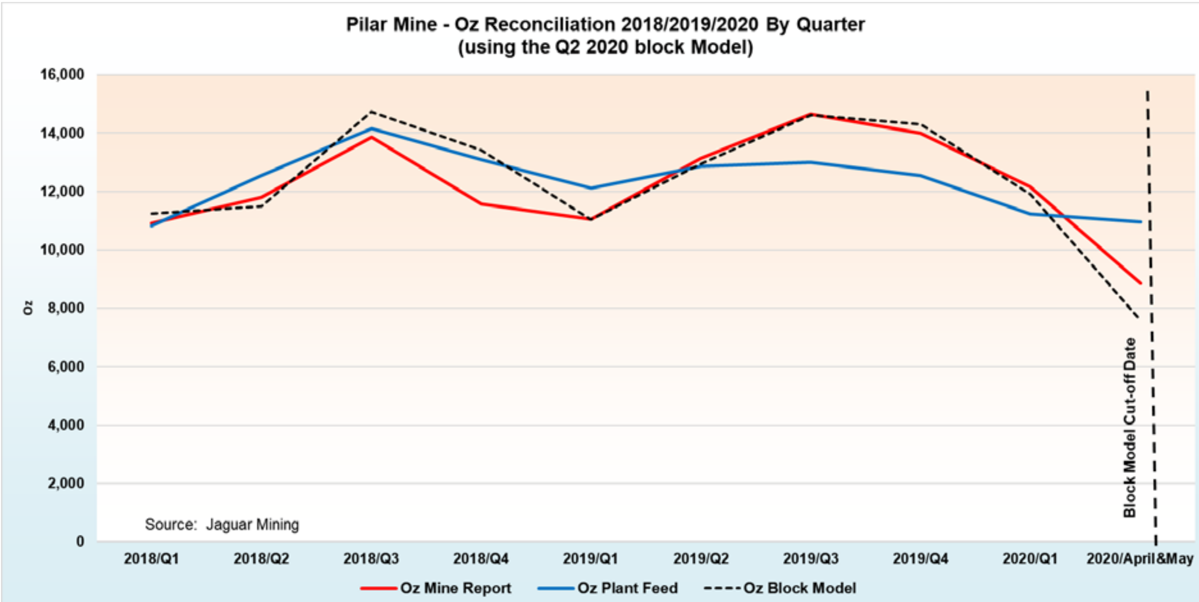
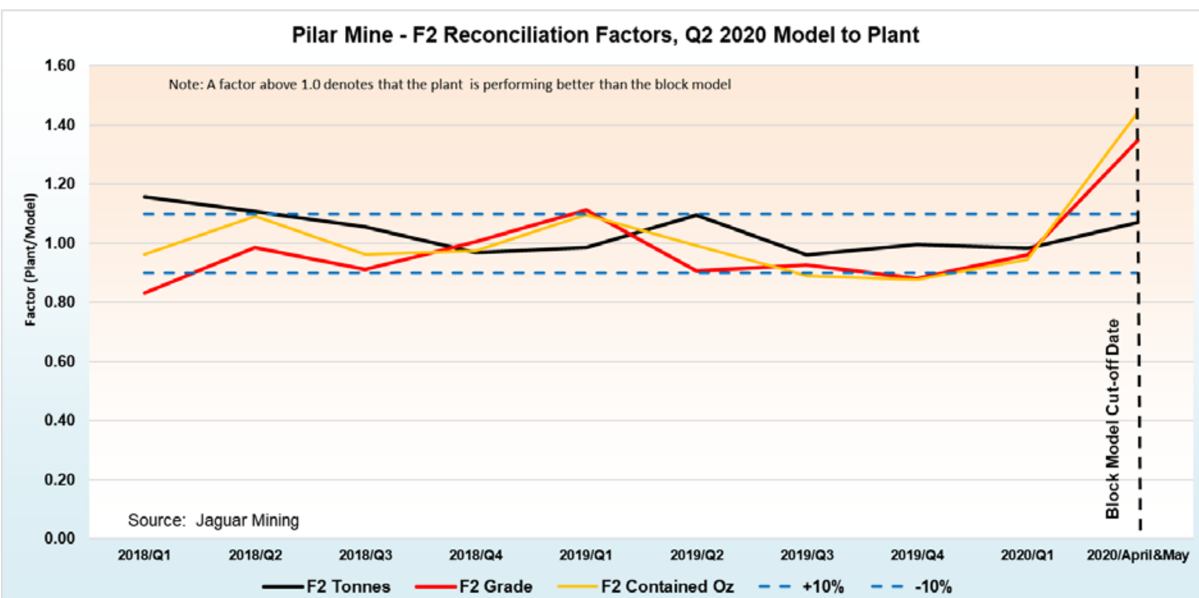


FIGURE 14-39 F2 RECONCILIATION FACTORS, PILAR MINE JANUARY 2018 TO MAY 2020



As has been demonstrated, the Q2 2020 block model has performed well for the period reviewed in regard to predicted tonnages. The predicted grades are generally in good agreement as well, apart from Q2 2020 where the block model grades were significantly less than the plant feed grades.

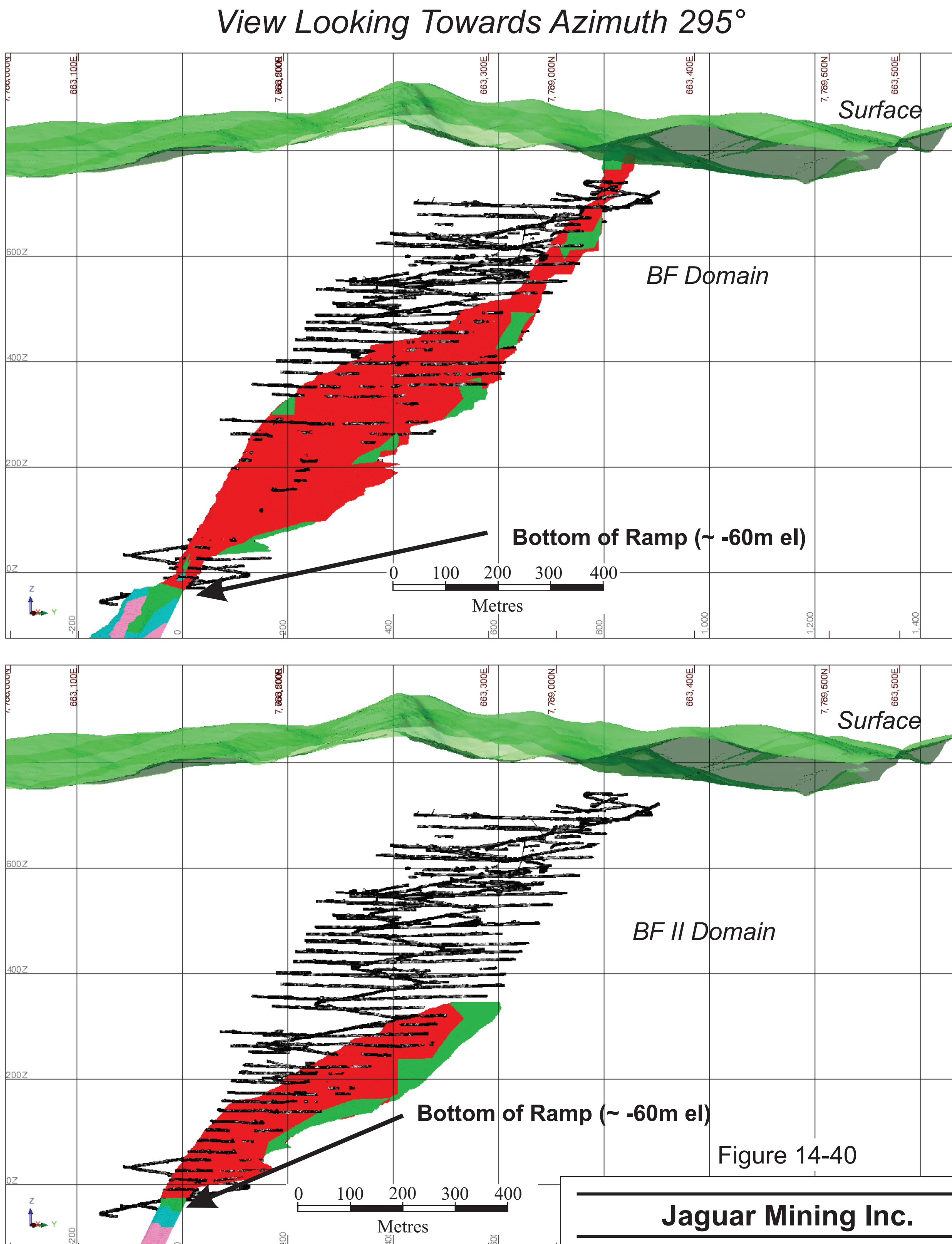
MINERAL RESOURCE CLASSIFICATION

Definitions for resource categories used in this report are consistent with CIM (2014) definitions.

Mineralized material for each wireframe was initially classified into the Measured, Indicated, or Inferred Mineral Resource categories on the basis of the search ellipse ranges obtained from the variography study, demonstrated continuity of the gold mineralization, density of drill hole and chip sample information, and presence of underground access.

On the basis of these criteria, Measured Mineral Resources initially comprised material which has been estimated using Pass #1 and are located between developed levels. Indicated Mineral Resources initially comprised material that has been estimated using Pass #2, and Inferred Mineral Resources initially comprised material that has been estimated using Pass #3. Jaguar employs an additional block model code to denote those areas considered to display good exploration potential for use in the decision process, and this material was defined by those grades that were estimated with Pass 4.

Following the initial classification, a clean-up step was applied to arrive at a final classification stage so as to ensure continuity and consistency of the classified blocks in the model. This clean up step was applied by manually creating a series of clipping polygons, which were subsequently used to assign the final classification codes into the block model. Figure 14-40 presents an example of the final classification layouts for the BF and BF II Domain.



Classification:

- *Measured*
- *Indicated*
- *Inferred*

August 2020

Source: RPA, 2020.

Figure 14-40

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Example of the Mineral Resource Classification, BF and BF II Domains

CUT-OFF GRADE

A cut-off grade of 1.46 g/t Au is used for reporting of Mineral Resources. This cut-off grade was calculated using a gold price of US$1,500/oz, average gold recovery of 90%, average exchange rate of R$4.50 : US$1.00, and a total cost of R$266/t for the Pilar Mine.

Considering the current metal price environment and outlook, RPA recommends that Jaguar evaluate the impact of a higher metal price on the cut-off grade and the resulting estimated Mineral Resources.

MINERAL RESOURCE REPORTING

The Mineral Resources are inclusive of Mineral Reserves. The Mineral Resources are located as remnants above Level 12 (the limit of the current development) or as additional mineralized areas located below or beyond the current underground development. Three-dimensional reporting volumes were prepared to aid in the reporting of the Mineral Resources to ensure that the requirement for spatial continuity is met. These reporting volumes were prepared using either the native functions and workflows of MinePlan 3D or using the functions available through the Deswik mine modelling software package. Reporting volumes were prepared in either plan, section or longitudinal views, as appropriate. Reporting volumes were drawn to include continuous volumes of blocks whose estimated grades were above the stated cut-off grade and were not located in mined out areas. These reporting volumes were also used to exclude isolated blocks with limited to no spatial continuity but containing grades above the nominated cut-off. Blocks with estimated grades above the stated cut-off grade but located along either the hanging wall, footwall, or otherwise in close proximity to an excavated stope volume were also excluded. These reporting volumes were used to appropriately code the block model and were used to report the Mineral Resources (Figure 14-41).

RPA recommends that the reporting volumes for the remaining mineralization above Level 12 be reviewed and re-evaluated in consideration of the current metal price environment and short-range outlook.

View Looking Towards Azimuth 295°

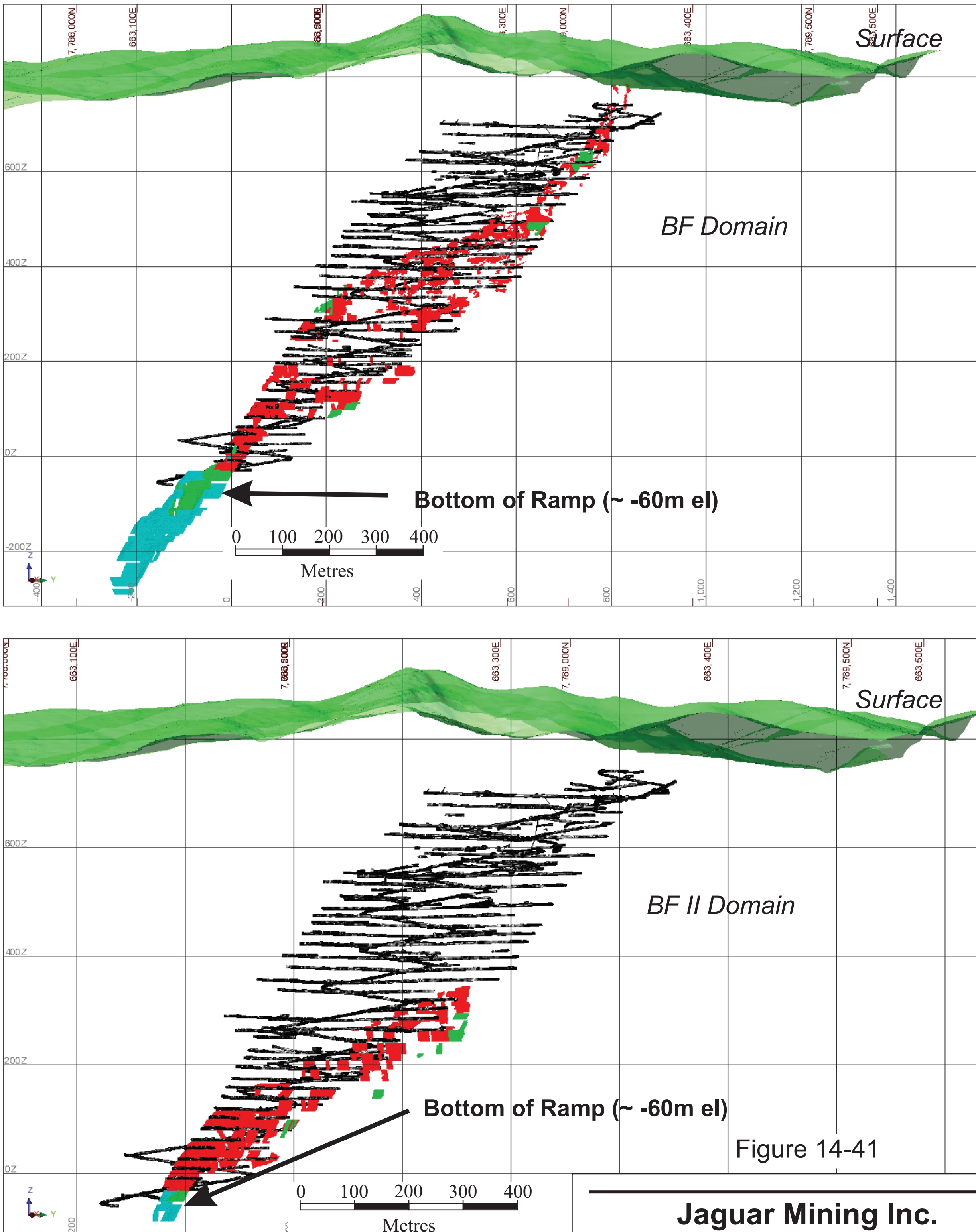


Figure 14-41

Classification:
- *Measured*
- *Indicated*
- *Inferred*

August 2020

Source: RPA, 2020.

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Example of the Mineral Resources, BF and BF II Domains

The QP is of the opinion that these procedures, constraints, and reporting volumes are sufficient to satisfy the CIM (2014) definitions of "Reasonable prospects for eventual economic extraction". The current Mineral Resources are presented in Tables 14-30 and 14-31. A comparison of the current Mineral Resources with the previous Mineral Resources effective as of December 31, 2018 is presented in Table 14-32.

The QP has considered the Mineral Resource estimates in light of known mining, infrastructure, environmental, permitting, legal, title, taxation, socio-economic, marketing, political, and other relevant issues and has no reason to believe at this time that the Mineral Resources will be materially affected by these items.

The QP is of the opinion that the Pilar Mineral Resource estimates were prepared in a professional and diligent manner by qualified professionals and that the estimates comply with CIM (2014) definitions.

TABLE 14-30 SUMMARY OF MINERAL RESOURCES AS OF MAY 31, 2020 – PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Measured	2,266	4.39	319
Indicated	1,751	4.28	241
Sub-total M&I	**4,017**	**4.34**	**561**
Inferred	1,254	4.52	182

Notes:
1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are estimated at a cut-off grade of 1.46 g/t Au.
3. Mineral Resources are estimated using a long-term gold price of US$1,500 per ounce.
4. Mineral Resources are estimated using an average long-term foreign exchange rate of 4.50 Brazilian Reais: 1 US Dollar.
5. Bulk densities used are variable for each mineralized wireframe.
6. A minimum mining width of approximately two metres was used.
7. Gold grades are estimated using OK.
8. Mineral Resources are inclusive of Mineral Reserves.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not add due to rounding.

TABLE 14-31 MINERAL RESOURCES BY DOMAIN AS OF MAY 31, 2020 – PILAR MINE

Jaguar Mining Inc. – Caeté Mining Complex

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
	Orebody BA:		
Measured	484	4.31	67
Indicated	123	4.36	17
Sub-total M&I	**607**	**4.32**	**84**
Inferred	25	4.67	4
	Orebody BF:		
Measured	572	4.57	84
Indicated	164	5.72	30
Sub-total M&I	**736**	**4.83**	**114**
Inferred	537	4.98	86
	Orebody BF II:		
Measured	629	4.48	91
Indicated	39	4.94	6
Sub-total M&I	**668**	**4.51**	**97**
Inferred	51	7.11	12
	Orebody BF III:		
Measured	51	5.24	9
Indicated	16	4.88	3
Sub-total M&I	**67**	**5.15**	**11**
Inferred	44	4.90	7
	Orebody Torre:		
Measured	245	3.86	30
Indicated	269	3.73	32
Sub-total M&I	**514**	**3.79**	**63**
Inferred	314	3.50	35
	Orebody SW:		
Measured	0	0	0
Indicated	1,050	4.20	142
Sub-total M&I	**1,050**	**4.20**	**142**
Inferred	221	4.28	30
	Remaining Domains:		
Measured	285	4.23	39
Indicated	90	3.77	11
Sub-total M&I	**375**	**4.12**	**50**
Inferred	62	4.07	8
	Total Pilar Mine:		
Total, Measured	2,266	4.39	319
Total, Indicated	1,751	4.28	241
Total Measured & Indicated	**4,017**	**4.34**	**561**
Total, Inferred	1,254	4.52	182

Notes:
1. CIM (2014) definitions were followed for Mineral Resources.

2. Mineral Resources are estimated at a cut-off grade of 1.46 g/t Au.
3. Mineral Resources are estimated using a long-term gold price of US$1,500 per ounce.
4. Mineral Resources are estimated using an average long-term foreign exchange rate of 4.50 Brazilian Reais: 1 US Dollar.
5. Bulk densities used are variable for each mineralized wireframe.
6. A minimum mining width of approximately two metres was used.
7. Gold grades are estimated using OK.
8. Mineral Resources are inclusive of Mineral Reserves.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not add due to rounding.

TABLE 14-32 COMPARISON OF MINERAL RESOURCES, DECEMBER 31, 2018 VERSUS MAY 31, 2020 – PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Mineral Resources as at December 31, 2018			
Measured	3,079	4.40	435
Indicated	1,855	3.87	231
Sub-total M&I	**4,934**	**4.20**	**666**
Inferred	1,385	3.61	161
Mineral Resources as at May 31, 2020			
Measured	2,266	4.39	319
Indicated	1,751	4.28	241
Sub-total M&I	**4,017**	**4.34**	**561**
Inferred	1,254	4.52	182

Notes:
1. CIM (2014) definitions were followed for Mineral Resources.
2. 2018 Mineral Resources were estimated at a cut-off grade of 1.81 g/t Au.
3. 2020 Mineral Resources were estimated at a cut-off grade of 1.46 g/t Au.
4. 2018 and 2020 Mineral Resources are estimated using a long-term gold price of US$1,500 per ounce.
5. 2018 Mineral Resources are estimated using an average long-term foreign exchange rate of 3.70 Brazilian Reais: 1 US Dollar.
6. 2020 Mineral Resources are estimated using an average long-term foreign exchange rate of 4.50 Brazilian Reais: 1 US Dollar.
7. Bulk densities used are variable for each mineralized wireframe.
8. A minimum mining width of approximately two metres was used.
9. Gold grades are estimated using OK
10. Mineral Resources are inclusive of Mineral Reserves.
11. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
12. Numbers may not add due to rounding.

15 MINERAL RESERVE ESTIMATE

SUMMARY

Table 15-1 summarizes the Mineral Reserves as of May 31, 2020 based on a gold price of US$1,300/oz Au for the Pilar Mine. A break-even cut-off grade of 2.14 g/t Au was used to report the Mineral Reserves for the Pilar Mine. There are no Mineral Reserves for Roça Grande Mine.

TABLE 15-1 SUMMARY OF MINERAL RESERVES AS OF MAY 31, 2020
Jaguar Mining Inc. – Caeté Mining Complex

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Proven	858	3.9	106
Probable	1,009	4.1	133
Total	**1,866**	**4.0**	**240**

Notes:
1. CIM (2014) definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated at a cut-off grade of 2.14 g/t Au.
3. Mineral Reserves are estimated using an average long-term gold price of US$1,300 per ounce and a foreign exchange rate of R$4.50:US$1.00.
4. A minimum mining width of 2.0 m was used.
5. Bulk density is 2.89 t/m^3.
6. Numbers may not add due to rounding.

The QP is not aware of any mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

The Mineral Reserves consist of selected portions of the Measured and Indicated Mineral Resources that are within designed stopes and associated development. The stope design was completed by Deswik Brazil. In the QP's opinion, the Pilar Mineral Reserve estimates were prepared in a professional and diligent manner and comply with CIM (2014) definitions.

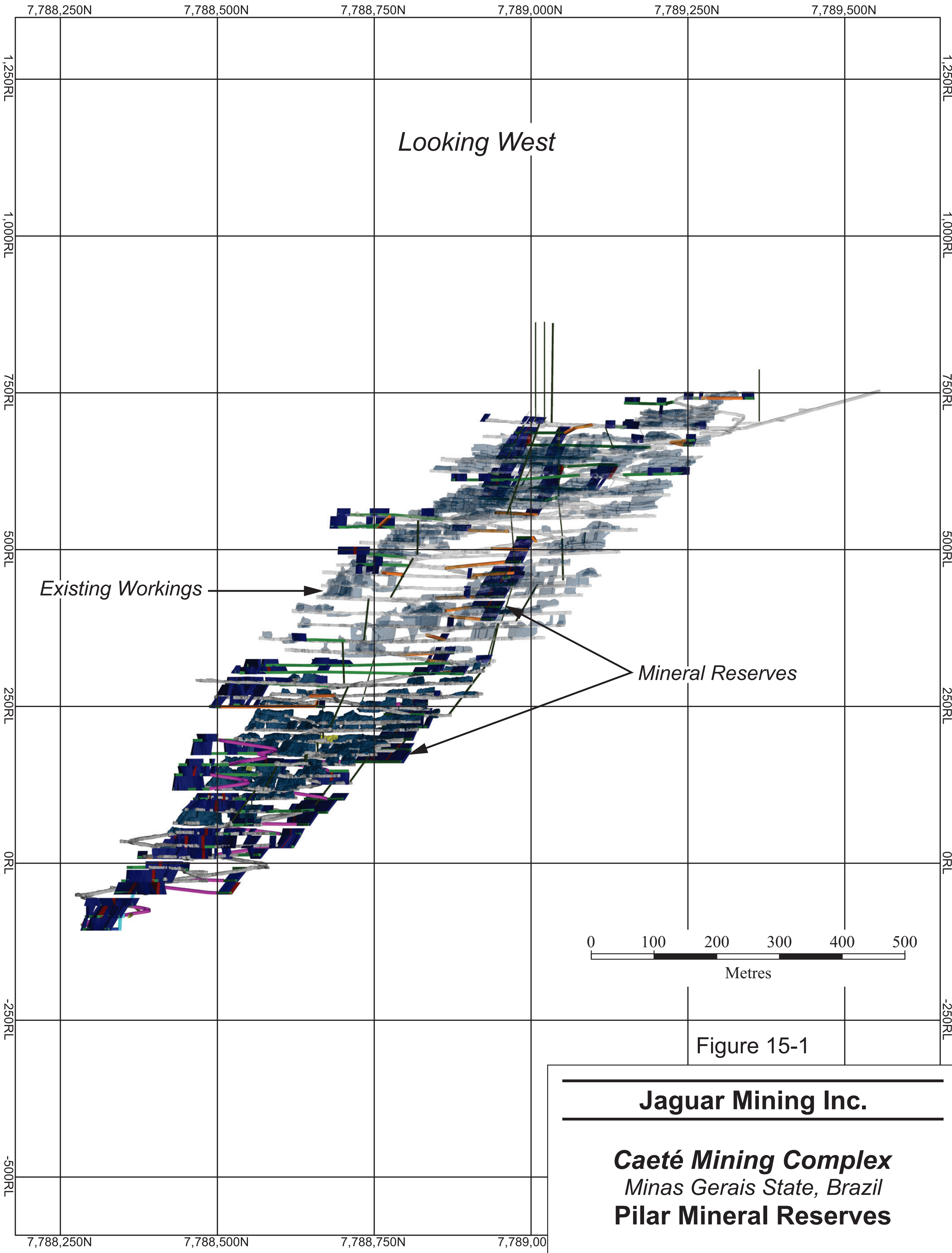


Figure 15-1

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Pilar Mineral Reserves

August 2020 ***Source: RPA, 2020.***

MINERAL RESERVES BY DOMAIN

Table 15-2 presents the Mineral Reserves by domain as of May 31, 2020.

TABLE 15-2 MINERAL RESERVES BY DOMAIN AS OF MAY 31, 2020 – PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Orebody	Proven Reserves			Probable Reserves			Proven & Probable Reserves		
	ROM (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	ROM (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	ROM (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
BA	129	3.80	16	59	4.27	8	188	3.95	24
BF	153	4.45	22	149	4.55	22	302	4.50	44
BFII	385	3.77	47	33	5.12	5	417	3.88	52
BFIII	18	3.34	2	31	3.06	3	49	3.16	5
Torre	73	3.18	8	75	3.29	8	148	3.23	15
SW	-	-	-	617	4.17	83	617	4.17	83
Others	100	3.94	13	45	3.06	4	145	3.67	17
Total	858	3.86	106	1,009	4.11	133	1,866	3.99	240

Notes:
1. CIM (2014) definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated at a cut-off grade of 2.14 g/t Au.
3. Mineral Reserves are estimated using an average long-term gold price of US$1,300 per ounce and a foreign exchange rate of R$4.50:US$1.00.
4. A minimum mining width of 2.0 m was used.
5. Bulk density is 2.89 t/m^3.
6. Numbers may not add due to rounding.

DILUTION

Dilution is addressed in two ways, internal to mine designs and external factoring. Internal, or planned, dilution is included in the mining shapes where they extend beyond the resource wireframe. Mining shapes are designed to be operationally achievable and respect minimum mining widths. Additional volume included in this manner averages approximately 15% across the Mineral Reserves.

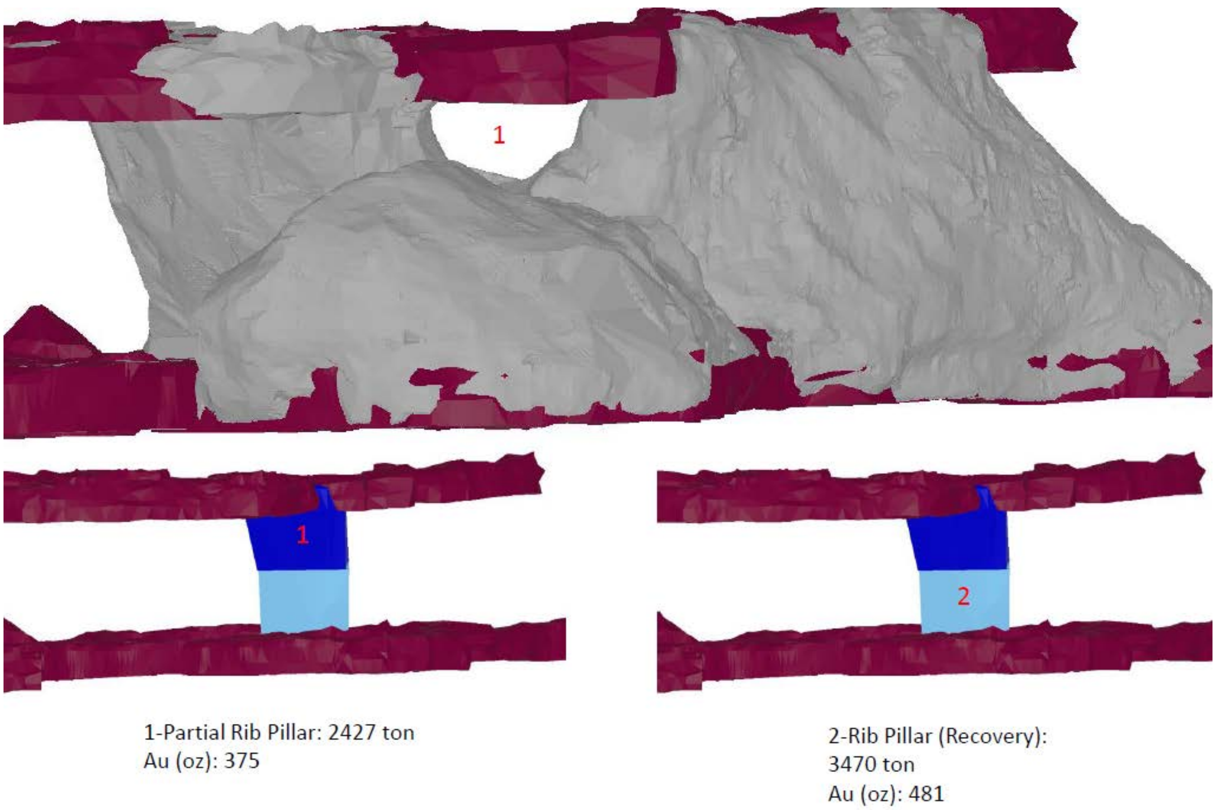
External, or unplanned, dilution accounts for overbreak during blasting, minor ground failures in open stopes, and backfill mucked from the floor of stopes.

The dilution for the stopes is 0.5 m for the hanging wall and footwall. For ore development, a dilution of 10% is added.

Total dilution included in Mineral Reserves averages approximately 25%, which reflects the measured results from mining over the last two years.

Efforts to reduce dilution have been implemented over the last two years. The principal change is the addition of stope pillars in low grade areas. An example (taken from Jaguar's Turmalina Mine) is shown in Figure 15-2.

FIGURE 15-2 TYPICAL STOPE PILLAR



In order to reduce external dilution, stope pillars (1) are added in low grade areas as shown in Figure 15-2. A rib pillar is initially planned between the two stopes. Once the stope on the left is mined, the lower portion (2) of the rib pillar is recovered by drilling from the lower drill horizon, and then the next stope is mined

Previously, stope drilling was carried out from the upper and lower drill drifts. This caused excess dilution where the two patterns intersected. Currently, the procedure is to only drill with down holes from the upper drill drift, except where the stope pillar is used.

EXTRACTION

A mining extraction of 95% is used based on historical values from site.

CUT-OFF GRADE

Mineral Reserves were estimated using a break-even cut-off grade of 2.14 g/t Au, calculated using the following inputs, as well as the data from Table 15-3:

- Gold price of US$1,300/oz Au
- Exchange rate of R$4.50:US$1.00
- Metallurgical recovery of 90%

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 for Mineral Reserves. Exchange rates are based on bank forecasts. Metallurgical recovery is in line with recent operating results, as are operating costs. The values in Table 15-3 are based on 2019 actuals. The exchange rate was increased from R$3.70 to R$4.50 in the current Life of Mine Plan (LOMP). This has affected the value of the costs in US dollars, however, most of Jaguar's costs are in Brazilian Reais.

TABLE 15-3 CUT-OFF GRADE INPUTS
Jaguar Mining Inc. – Pilar Mine

Item	Value (US$/t)
Mining	30.87
Processing	25.19
G&A	2.90
Refining	0.16
Total Cost	**59.12**
Sustaining Mine Development Cost	**21.20**
Total Unit Cost	**80.32**

$$\text{Break-even Cut-off Grade} = \frac{\text{Total Unit Cost}}{\text{Gold price} * 0.03215 * \text{Gold Recovery}}$$

$$= \frac{\text{US\$80.32/t}}{\text{US\$1,300/oz} * 0.03215 * 90\%}$$

$$= 2.14 \text{ g/t Au}$$

16 MINING METHODS

The Caeté Mining Complex includes a processing plant at the Roça Grande Mine with a nominal capacity of 2,050 tpd, with separate tailings disposal areas for both fine flotation tailings and CIP tailings. Following a multi-year trend of increasing production rates, the Pilar Mine is currently producing at a rate of 1,300 tpd. Ore from the Pilar Mine is transported by truck 45 km to the Caeté Mining Complex for processing.

The Roça Grande Mine is currently inactive.

Gold mineralization at the Pilar Mine is contained within a shear zone with an average 50° to 60° dip. Mineralization is structurally complex due to intense folding and displacements (up to one metre) as a result of local faulting. This results in direction changes, pinching, and swelling of the vein over relatively short distances. The ore zone hanging wall and footwall contacts are visible by eye, however, sampling indicates that there is, on occasion, an assay wall within the formation. The orebody is approximately 250 m to 350 m along strike and is mined along the strike access drive via crosscuts perpendicular to the orebody.

MINING METHODS

There are two mining methods in use. The current LOMP forecasts longhole mining with delayed backfill for the majority of the Mineral Reserves. Mechanical cut and fill mining is used when ore geometry does not favour longhole mining.

Ventilation for the Pilar Mine is a pull system. Air is drawn down through the ramp and up an exhaust raise near the ramp. Ventilation on the levels uses auxiliary fans and vent ducting.

Water is pumped to surface using submersible pumps, pumped from level to level, then to surface.

The Pilar Mine is accessed from a five metre by five metre primary decline located in the footwall of the deposit. The portal is located at an elevation of 760 MASL. The Pilar Mine is divided into levels with Level 01 established at elevation 690 MASL. All ore is hauled to surface via the ramp using both contractors and company personnel. From this point, the level spacing is 75 m vertical, i.e., Level 02 is at elevation 615 MASL, Level 03 at elevation 540 MASL, etc. A three-metre thick sill pillar is left between levels. Sublevels are excavated from the main ramp at 20 m vertical intervals to provide for intermediate access to the mining panels. The decline has reached Level 07, a vertical depth of approximately -150 MASL (Figure 16-1).

At each level and sublevel, drifts are developed near the centre of the mineralized zone to expose the footwall and hanging wall contacts. The drift is extended in both directions along strike, under geological control for alignment, continuing to expose the contacts until the limits of the deposit are reached. This provides for two working faces per sublevel.

Production at the Pilar Mine is predominantly achieved by the longhole mining method, which is carried out on a longitudinal retreat sequence, towards the central access. Stopes are up 50 m in length are separated by three metre to five metre wide pillars, depending on the thickness of the zone. In order to reduce external dilution, five metre high by five metre long pillars are strategically left in the stope when there are adjacent stopes in parallel. The stope is then drilled from the lower drift underneath the pillar. When the mining of each longhole stope has been completed, the excavation is filled using development waste. Development waste volume is well matched to the backfill volume needed. There are times when development waste rock is either hauled to surface or hauled from surface to an underground stope being filled due to timing. The mine has potential to use hydraulically placed cemented classified flotation tailings backfilling. Mining then proceeds upward to the next sublevel and the sequence is repeated until the sill pillar is reached. Stopes are mined from several sublevels simultaneously in order to provide the required number of active workplaces needed to meet production targets.

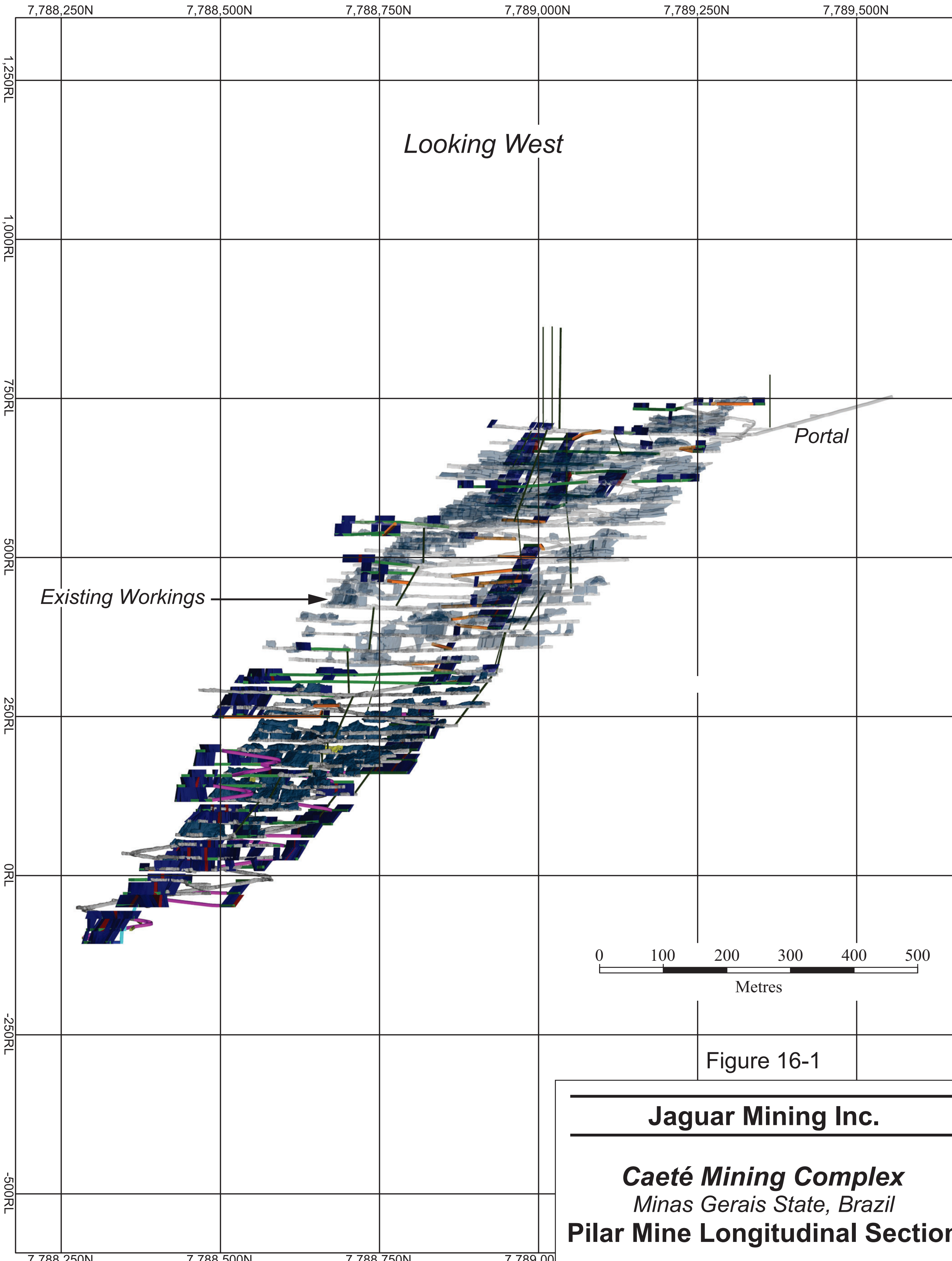


Figure 16-1

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Pilar Mine Longitudinal Section

August 2020

Source: RPA, 2020.

MINE EQUIPMENT

The Pilar Mine is highly mechanized. Development and mining activities are accomplished with a fleet of two two-boom and two one-boom electric-hydraulic jumbos. Longhole drilling is completed with three Sandvik production drills. Four 10t Sandvik LH410 LHD units are used for mucking. A fleet of four Volvo A30 articulated trucks and one Iveco 25 t truck and are used to haul broken rock to surface. Contractors are used for haulage, as well, and the fleet is adjusted to meet the demand. A complete fleet list is shown in Table 16-1.

TABLE 16-1 PILAR FLEET
Jaguar Mining Inc. – Caeté Mining Complex

Item	Units
LHD	4
Jumbo	4
Fan Drill	3
Trucks	5
Rockbolter	1
Platform	4
Backhoe	3
Grader	1
Service Trucks	6

MANPOWER

Government regulations limit workers to six hours per day underground. As a result, Jaguar has decided to implement a four by six hour shift daily schedule to increase labour utilization and productivity. This new schedule is similar to what other mines are doing in the region. This is reflected in the current LOMP.

GROUND CONDITIONS

Ground conditions were observed by RPA to be good. The main decline, portions of which were developed up to ten to fifteen years ago, did not exhibit any roof or wall deterioration. Primary support in the Pilar Mine is provided by the use of split sets, grouted rebar and, in the wider areas, grouted cable bolts. Two single-boom electric-hydraulic jumbos are used for rock bolting.

The addition of ground control engineers to Jaguar's workforce has resulted in improved quality of backfill and overall ground support at the mines. As mentioned previously, changes to the stope designs with strategic pillars have reduced dilution and increased stability. Regular ground support maintenance (QA/QC testing) has been implemented at the mines on the main infrastructure. Maintenance includes bolt testing, proper cable bolt designs, and empirical stope design analysis.

LIFE OF MINE PLAN

Stope and development designs, and production scheduling were carried out by Deswik Brazil using Deswik mine design software, and modified by Jaguar to deplete for stopes mined out as of May 31, 2020.

The LOMP production schedule covers a mine life of 4.5 years based on Mineral Reserves, and is summarized in Table 16-2. In 2025, there is not a full year's production.

TABLE 16-2 PILAR LOMP PRODUCTION SCHEDULE
Jaguar Mining Inc. – Caeté Mining Complex

Item	Units	June-Dec. 2020	2021	2022	2023	2024	2025*	Total
Ore Tonnes	000 t	300	498	506	342	147	74	1,866
	g/t Au	3.68	3.81	3.75	3.72	3.92	9.64	3.99
Total Mill Feed	000 t	300	498	506	342	147	74	1,866
	g/t Au	3.68	3.81	3.75	3.72	3.92	9.64	3.99
	000 oz	35	61	61	41	19	23	240
Recovery	%	90	90	90	90	90	90	90
Gold Produced	000 oz	32	55	55	37	17	21	216

Note.* three months' production

Production rates in the LOMP are forecast to be 1,300 tpd. The increase of production is based on the addition of a fourth shift and haulage equipment to move the ore to surface. The mining sequence provides two active stopes per sublevel, with simultaneous access to multiple sublevels, as shown in Figure 16-2.

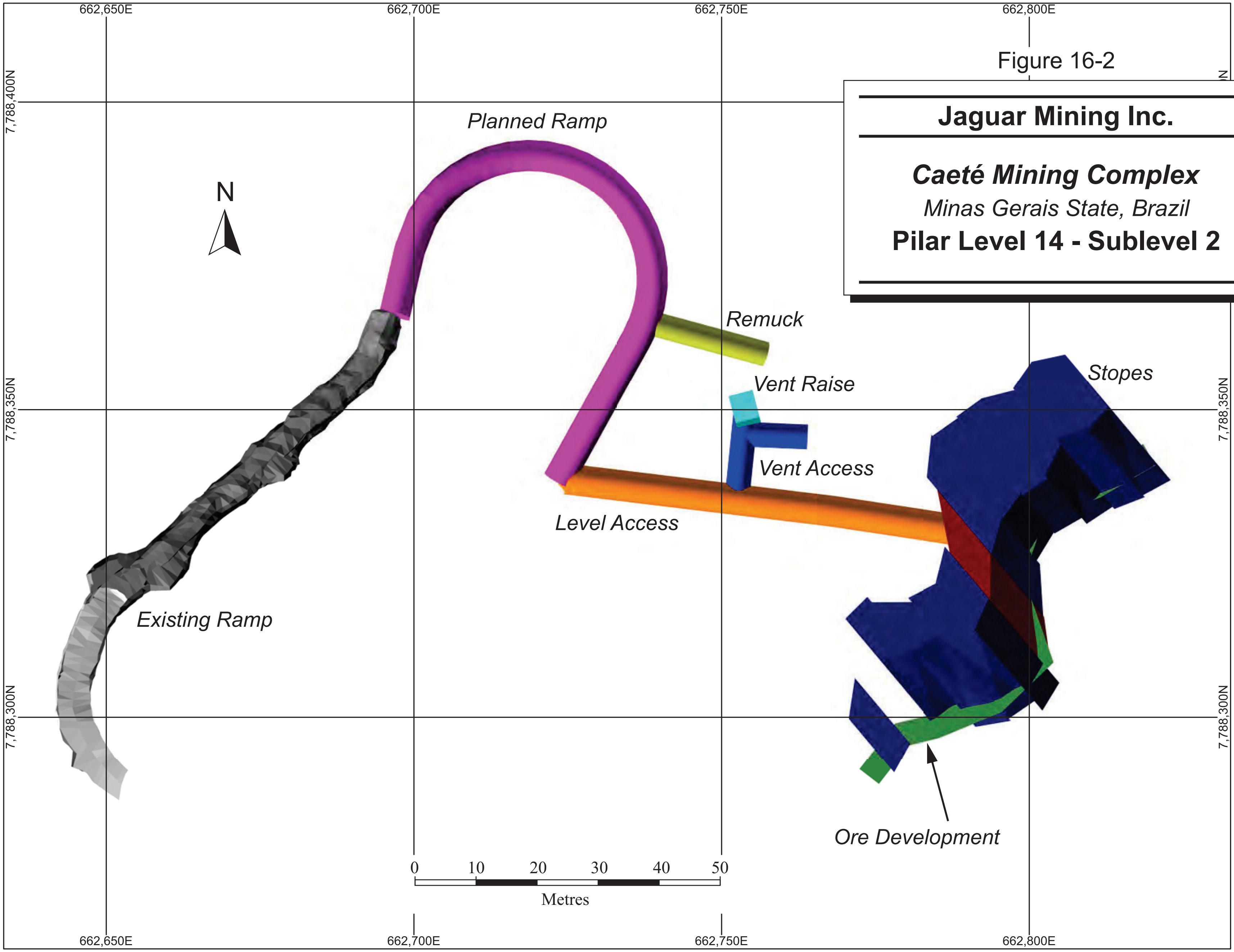
Figure 16-2

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Pilar Level 14 - Sublevel 2



August 2020

Source: RPA, 2020.

The excavation quantities scheduled in the LOMP limit the development for a crew to 60 m/month. There is approximately 11,800 m of development required for the LOMP. RPA is of the opinion that the scheduled development rates are reasonable.

In 2019, the Pilar Mine produced 427,000 t and 53,000 oz Au. In the first half of 2020, the Pilar Mine produced 178,000 t and 21,000 oz Au, as presented in Table 16-3. Production in 2020 was interrupted due to the COVID 19 pandemic. With a fourth shift, and more headings to mine, it is plausible to increase production from 1,000 tpd to 1,300 tpd. The current production of 1,300 tpd has been demonstrated to be achievable in the short-term and, in RPA's opinion, this rate can be maintained over the LOMP time period.

TABLE 16-3 QUARTERLY MINE PRODUCTION RECONCILIATION, PILAR MINE 2017 AND 2018
Jaguar Mining Inc. – Caeté Mining Complex

Period	Mine Report		
	Tonnes	Grade (g/t Au)	Oz Au
2019/Q1	107,910	3.79	11,049
2019/Q2	144,767	3.78	13,127
2019/Q3	113,505	3.97	14,657
2019/Q4	104,110	3.84	13,999
2020/Q1	104,110	3.63	12,156
2020/Q2	73,794	3.73	8,852
Total 2019	**426,826**	**3.85**	**52,833**
Total 2020	**177,904**	**3.67**	**21,008**

As mining advances at depth, the Pilar Mine will approach its maximum output due to truck haulage cycle times and ventilation limitations. In order to increase production, alternative workplaces (such as remnant mining or new orebodies) or material handling changes (such as a winze or shaft) will be required.

Even with increased production, the Caeté processing plant is still under capacity, leaving the possibility of cost savings through batch processing and toll milling.

17 RECOVERY METHODS

The Caeté processing plant has a design capacity of 720,000 tpa of ROM ore.

The process flowsheet consists primarily of the following unit operations (Figure 17-1):

- Crushing
- Grinding
- Gravity Gold Recovery
- Flotation
- Leaching and CIP
- Gold Recovery
- Detoxification
- Tailings Disposal

CRUSHING

The ore from the Pilar and Roça Grande mines is transported by trucks to the crushing circuit and placed in the ROM stockpile. The crushing circuit is made up of a CJ411 - 111 kW primary jaw crusher in open circuit, and secondary (CH440-223 kW) and tertiary (CH440 223 kW) cone crushers operating in closed circuit.

The ROM stockpile ore is fed to the jaw crusher with a front end loader though a grizzly and vibrating feeder. The jaw crusher discharge feeds a multi deck screen (3,500 mm x 1,800 mm – with three panel decks consisting of apertures of 75 mm, 35 mm, and 16 mm respectively top to bottom), the undersize of each deck feeds secondary crushing, tertiary crushing, or the final product conveyor respectively. The secondary cone crusher operates in closed circuit with a double deck screen (5,700 mm x 2,400 mm – with two panel decks consisting of 35 mm and 16 mm apertures). Product from the double deck screen either recirculates back to the secondary crusher, feeds the tertiary crusher, or goes to the final product conveyor. The tertiary cone crusher operates in closed circuit with a single deck screen (3,500 mm x 1,800 mm – with a panel deck aperture of 16 mm), with the oversize recycling to the crusher and undersize product going to the final product conveyor, which discharges onto the crushed ore stockpile. The final particle top size of the crushing process is 16 mm.

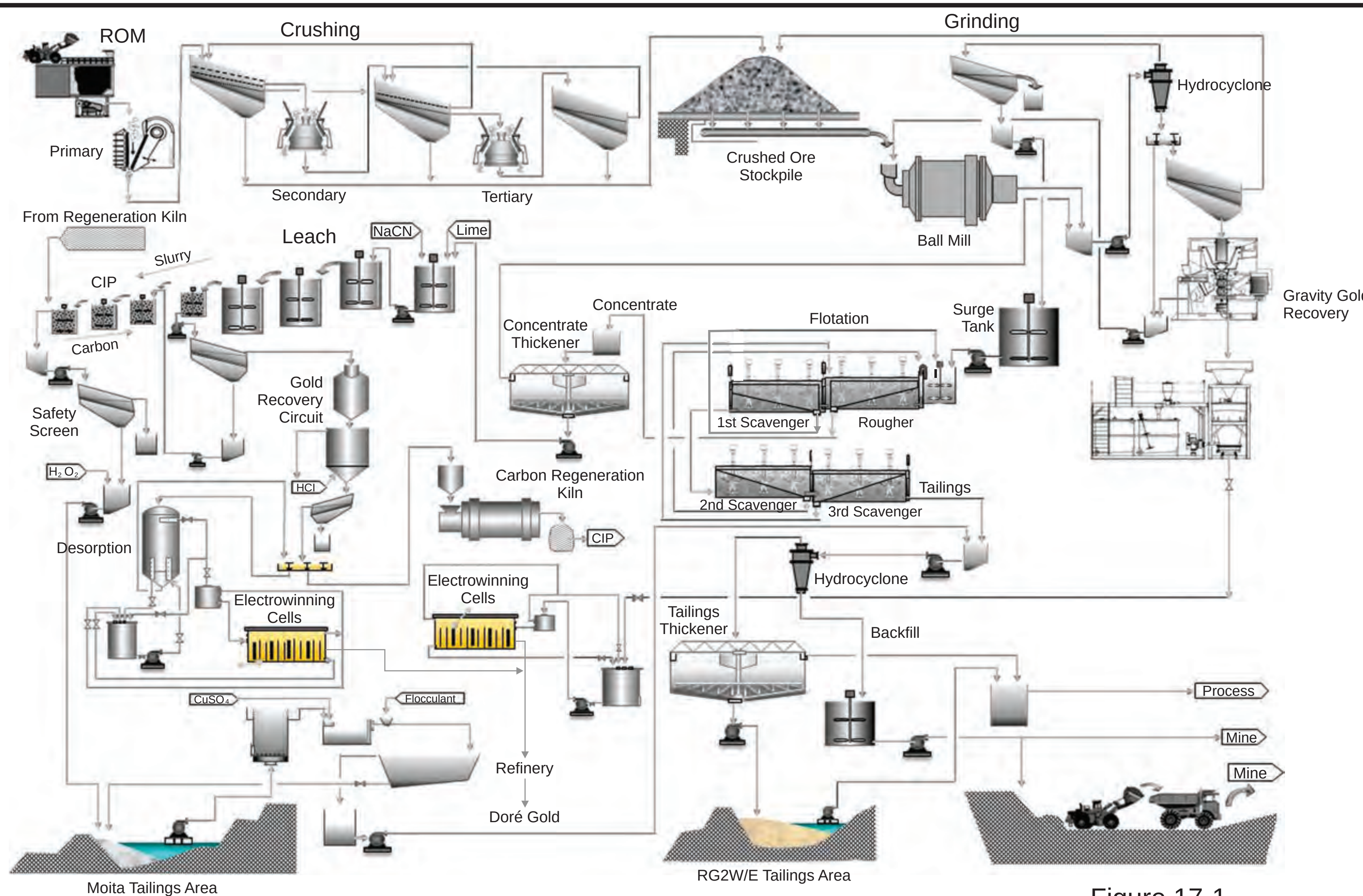


Figure 17-1

Jaguar Mining Inc.

Caeté Mining Complex
Minas Gerais State, Brazil
Plant Flowsheet

August 2020

Source: Jaguar Mining Inc., 2020.

GRINDING AND GRAVITY GOLD RECOVERY

The grinding circuit consists of a 2240 kW ball mill (5 m x 6 m EGL) with a capacity of up to 100 tonnes per hour, operating in closed circuit with a series of hydrocyclones. The overflow from the hydrocyclones (-200 mesh or -74 µm) proceeds to the flotation circuit, and the underflow (+200 mesh or +74 µm) either feeds the gravity concentration circuit (75%) or is recycled to the ball mill feed (25%).

Gravity concentration uses a Knelson centrifugal gravity concentrator to recover fine particles of free gold. The gravity concentrate proceeds to an Acacia intensive cyanidation reactor (Acacia), from which the gold bearing solution is pumped directly to a dedicated set of electrolytic cells. The precipitate from the cells is processed into doré bars in the refinery.

FLOTATION

The flotation circuit consists of a series of twelve 14.1 m^3 (500 ft^3) flotation cells, the first three operating as roughers, three operating as primary scavengers, three operating as secondary scavengers, and the last three operating as tertiary scavenger cells. The concentrate produced by the primary scavenger cells is returned to the roughers, and the secondary and tertiary scavenger concentrate is recirculated to the primary scavenger circuit. The final gold bearing concentrate (82-87% -325 mesh or -45 µm), from the rougher concentrate is sent to a concentrate thickener to achieve an underflow density of approximately 40% solids (w/w). The thickener overflow is recycled for use as process water.

The tailings from the tertiary scavenger cells is sent to a series of hydrocyclones for separation. The cyclone underflow is sent back to the mine to be used as backfill, and the cyclone overflow is sent to a tailings thickener, with the thickened underflow pumped to the RG02 West or East tailings area. The thickener overflow is recycled for use as process water.

LEACHING AND CARBON-IN-PULP GOLD RECOVERY

LEACHING

The concentrate thickener underflow slurry (40% solids w/w) is pumped to an agitated conditioning tank, where lime and cyanide are added, and then further pumped to a set of three agitated leach tanks operating by gravity, in series.

The lime is used to keep the pH above 10.0 to 10.5, in order to minimize the generation of hydrogen cyanide gas. Cyanide is used to dissolve the gold from the solids in the slurry. Cyanide can be added to any of the leach tanks as required.

Oxygen, is introduced through spargers to enhance the dissolution of gold and the oxidation of unstable sulphides (e.g., pyrrhotite). This oxidation reduces cyanide consumption and increases gold recovery.

The slurry from the last leach tank flows by gravity to a series of four agitated CIP tanks that are arranged in series.

CARBON IN PULP

The four CIP tanks allow slurry to flow from tank to tank, while retaining activated carbon in each tank. The carbon adsorbs the gold cyanide complex created in the leach tanks.

The slurry flows downstream from Tank 1 to Tank 4, while the carbon is pumped counter currently from Tank 4 to Tank 1. The pumping frequency is determined by the loading of gold on the carbon. The highest loaded carbon from Tank 1 is pumped over a screen, with the slurry returning to the tank and the loaded carbon going to gold desorption. For 1.1 Mtpa, two additional CIP tanks will be required.

The slurry exiting the last CIP tank passes through a safety screen that recovers any carbon that may have left the tank, and then to a detoxification circuit to partially destroy residual cyanide.

GOLD RECOVERY

The loaded carbon is transferred to a desorption column. A hot solution (approximately 98°C) of 1.5% caustic soda and 0.5% cyanide concentration is pumped upwardly through the elution column to desorb the gold cyanide complex from the carbon.

The gold-bearing solution leaves the top of the column and feeds an electrolytic cell(s), where the gold is deposited onto steel wool and stainless steel cathodes. The solution from the electrolytic cell is pumped back to the heating tank and reused. The solution is recirculated through the electrolytic cell for approximately 24 hours to remove most of the gold from solution.

After the desorption cycle, the sludge is washed from the stainless steel wool cathodes and pumped to a pressure filter. The cake is dried in an oven and sent to the refinery for production of doré bars containing about 80-90% gold. The doré bars are sent to a refinery for further refining.

The desorbed carbon goes through an acid wash step using a 5% hydrochloric acid solution to remove carbonates. The carbon is then regenerated at 700°C in a kiln to remove organic material and return the carbon's ability to adsorb gold. This regenerated carbon is pumped to the last tank in the CIP circuit. Periodically, fresh carbon is added to the tank, as some degradation of the carbon occurs, resulting in the need for replacement.

TAILINGS

The flotation tails are cycloned, thickened, and sent to the RG02 West or East(W/E) tailings area for decanting. Thickener overflow is pumped directly back to the plant. The decanted flotation tailings are dry stacked by loader and truck. The 10% CIP tailings is sent to the lined tailings facility that is an exhausted open pit where a dam was constructed to increase the storage capacity (the Moita tailings area). A CIP tailings filtration and water treatment plant is under construction with planned completion in the second half of 2020. The filtered and detoxified tailings will be dry stacked.

The tailings from the CIP circuit are treated for cyanide removal and piped to the Moita tailings area. Reclaim water from the tailings facility is treated to recover gold and further cyanide destruction, before being returned to the plant. The tailings capacity for the RG02W tailings area is 633,531 m^3, and the tailings capacity for the Moita tailings area is 366,181 m^3.

DETOXIFICATION

CURRENT DETOXIFOCATION PROCESS

The partial cyanide detoxification process consists of adding hydrogen peroxide into the slurry as it flows by pipeline to the Moita tailings area located approximately four kilometres from the plant. Mixing of the hydrogen peroxide and the slurry occurs in the pipe. Hydrogen peroxide and ambient air flow (weather) result in the destruction of free cyanide. Long residence time is beneficial to reduce total cyanide from 600-800 ppm to 200-300 ppm.

The water reclaimed from the ponded clear water passes initially through two activated carbon columns to recover any soluble gold left in solution. The activated carbon is periodically recovered and sent to the gold recovery circuit for gold removal. The water is then dosed with a copper sulphate solution and flocculant and allowed to settle in a decantation tank. The overflow is pumped back to the plant for use as process water, with the sludge drained back into the Moita tailings area.

PROPOSED DETOXIFICATION PROCESS

The detoxification step is being modified, and is expected to be in operation in September 2020. The new flowsheet is shown in Figure 17-2.

The new detoxification process will send the slurry from the carbon safety screen to a leaching tailings (LT) thickener. The LT thickener underflow will be sent to a set of pressure filters, from where the solids will be trucked to the Moita dam. The filtrate will be sent back to the LT thickener.

The LT thickener overflow will be pumped to a series of two pre-treatment ponds. Hydrogen peroxide will be added to this flow.

The pre-treatment ponds will be used to reduce the cyanide concentration through the use of ultraviolet radiation from the sun.

The water reclaimed from the pre-treatment ponds passes initially through a carbon filled tank to recover any soluble gold left in solution. The activated carbon is periodically recovered and sent to the gold recovery circuit for gold removal.

The overflow from this tank goes to a tank where ferrous chloride and lime are added, to reduce the arsenic content in the water. The reaction will form a ferric arsenate precipitate, contained in a slurry that is sent to a Lamella type thickener, where flocculant is added to help settle the precipitate. The underflow from this thickener is sent back to the LT thickener feed, where it mixes with the leach tailings.

The Lamella thickener overflow is treated with a copper sulphate solution and flocculant and allowed to settle in a series of decantation tanks. The overflow from the last tank is pumped to the flotation tailings thickener for use as required. The tanks will be cleaned periodically as required to remove any solids.

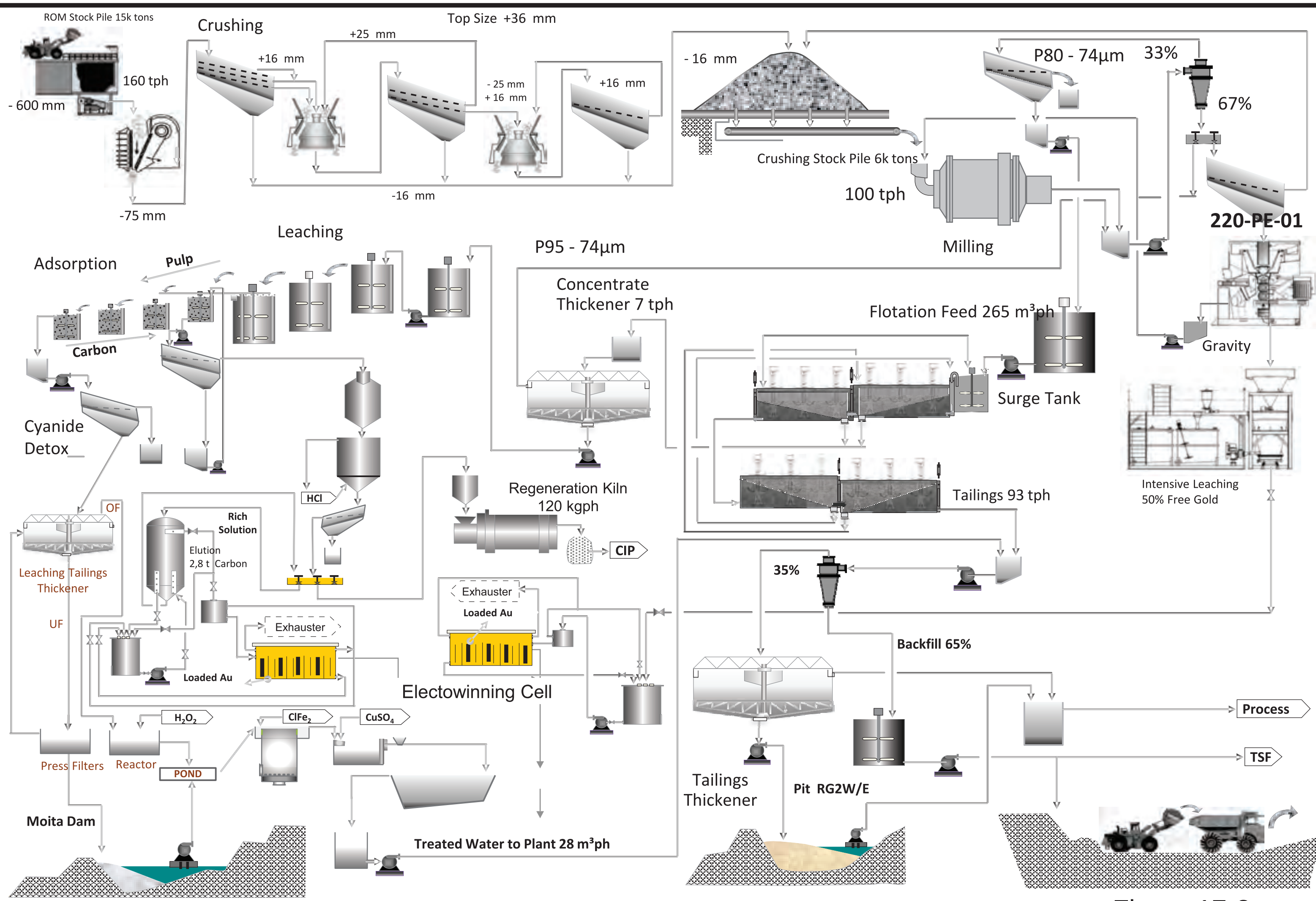


Figure 17-2

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

New Plant Flowsheet (Modified Detoxification)

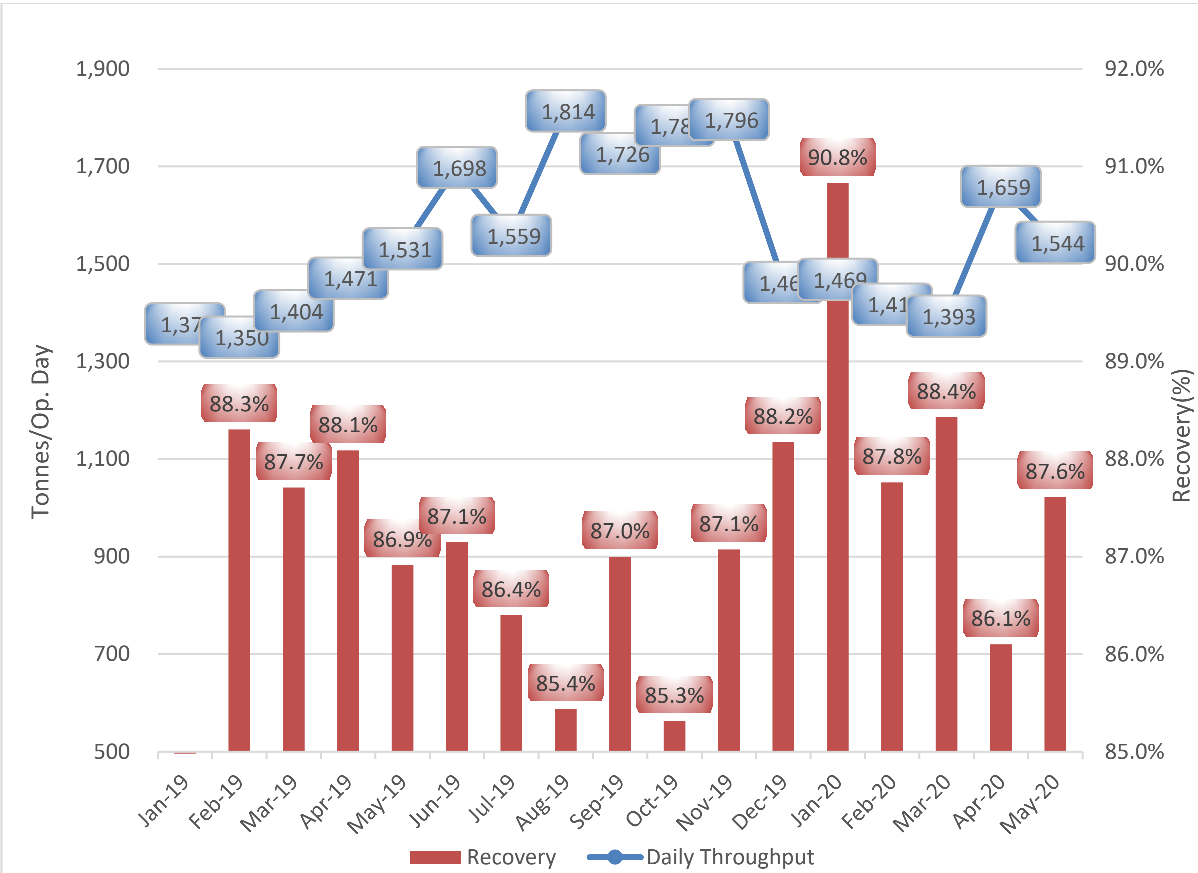
August 2020

Source: Jaguar Mining Inc., 2020.

RECOVERY AND PRODUCTION

Figure 17-3 shows the recovery and production for 2019 through to May 2020 (YTD 2020). Table 17-1 shows relevant production information for this time period.

FIGURE 17-3 DAILY PLANT THROUGHPUT AND RECOVERY



The plant capacity is more than current or planned production. Production is not plant constrained. The plant produced 40,682 ounces of gold at a recovery of 86.94% for 2019. For 2020 YTD, gold production was 20,690 ounces at a recovery of 88.06%.

In 2019 and 2020 YTD, the plant processed feed from the Pilar Mine. In 2019 and 2020 YTD, the Caeté processing plant operated at approximately 60% of its design capacity. Tailings filtration capacity could be expanded if future mine production exceeds filtration capacity of 720,000 tpa.

TABLE 17-1 PRODUCTION INFORMATION
Jaguar Mining Company – Roça Grande and Pilar Mine Project

Description	2019	2020 YTD (May)
Throughput (t)	432,887	176,604
Operating Days	274	118
Operating Rate (t/op.day)	1,580	1,497
Gold Production (oz)	40,682	20,690
Recovery (%)	86.94	88.06
Capacity (t/cal.day)*	1,973	1,973
Actual (t/cal.day)	1,186	1,162
Percentage of Capacity (%)	60	59

18 PROJECT INFRASTRUCTURE

The Caeté Mining Complex includes a nominal 2,050 tpd processing plant with separate tailings disposal areas for both fine flotation tailings and CIP tailings. Electrical power supply is provided through the national power grid. The process plant is located at the Roça Grande Mine at an elevation of approximately 1,250 MASL as shown in Figure 18-1.

An administration complex is located at the entrance to the plant site, with such ancillary buildings as offices, conference rooms, cafeteria, maintenance shops, compressors (mine and mill), a dry, a first aid station, warehouse, backfill preparation, and a water treatment plant, which is located near the process plant. The assay laboratory and process testing laboratory are also located near the process plant. The Roça Grande Mine (under care and maintenance since Q1 2018) is accessed by an adit that is located approximately 800 m to the southwest of the plant at an elevation of approximately 1,100 MASL.

The surface infrastructure at the Pilar Mine is limited to shops, offices, cafeteria, first aid, and warehouse facilities. The mine is accessed by an adit that is located at an elevation of approximately 750 MASL.

Trailers located at the mine adit provide local storage and office space. The explosives and blasting accessories warehouses are located 3.5 km away from the mine area, in compliance with the regulations set forth by the Brazilian Army.

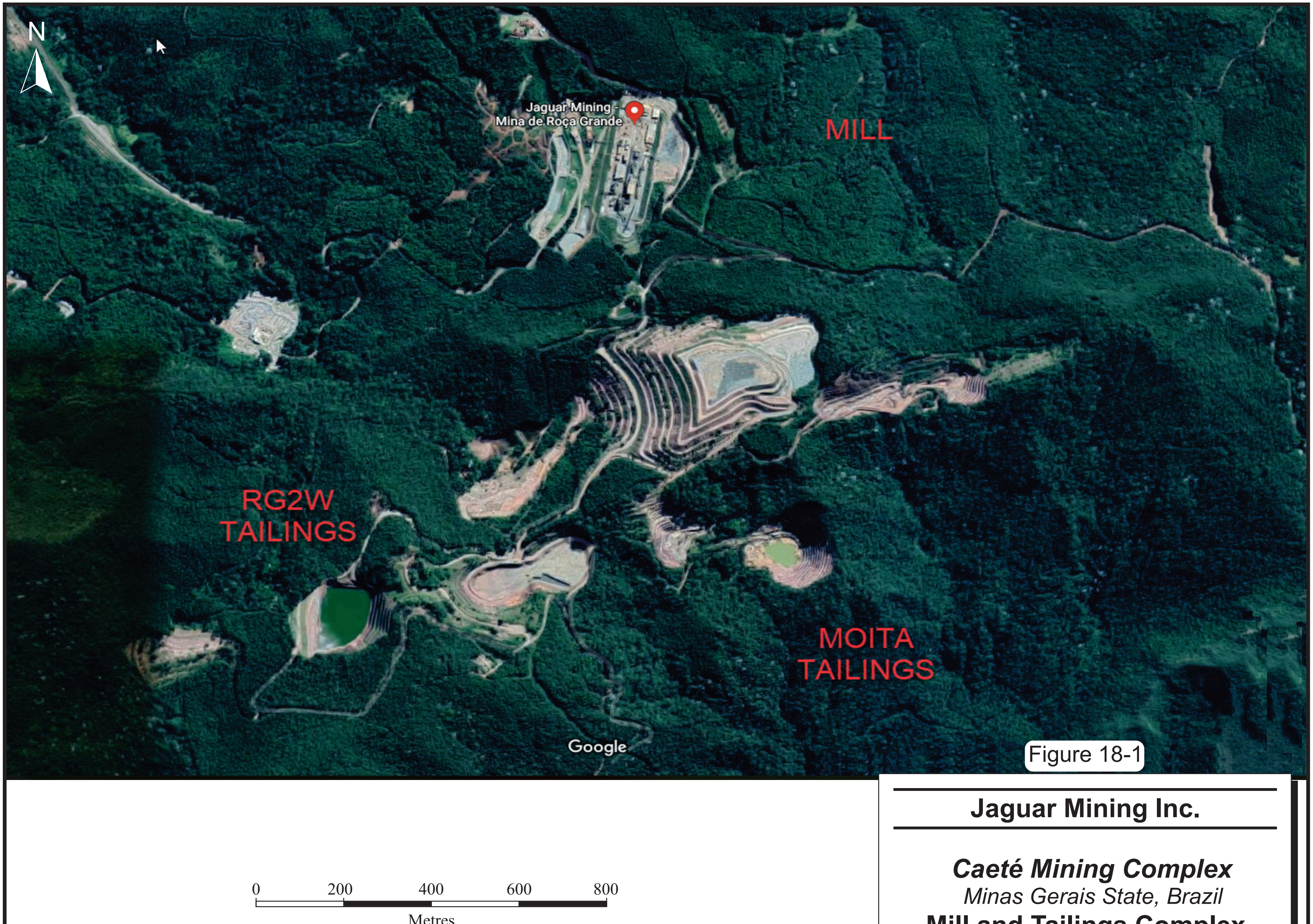


Figure 18-1

Jaguar Mining Inc.

Caeté Mining Complex

Minas Gerais State, Brazil

Mill and Tailings Complex

August 2020

Source: Google Earth, 2019.

19 MARKET STUDIES AND CONTRACTS

Gold trades freely at widely known prices; consequently, the prospects for the sale of any production of the metal are virtually assured. The Mineral Reserve estimate uses a gold price of US$1,300/oz. This price was used because it permits direct comparability between this Technical Report and the previous ones. The significant increase in the gold price at the time of writing will enable Jaguar to evaluate opportunities for incorporating lower grade material into mining and operation plans. However, it is not in the scope of this report to comment on the potential impacts of materially higher gold price scenarios.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

The information presented in this section is based on documentation provided by Jaguar and meetings with mine site personnel via teleconference. The meetings were held with Rayssa Garcia de Sousa (Environmental Coordinator) and Ana Thereza Nápoles Balbi (Administrative & Institutional Relations Coordinator).

ENVIRONMENTAL STUDIES

Environmental impact assessments (EIAs) were completed for the Pilar site in 2006 and for the Roça Grande site in 2007. Environmental management plans (Plano de Controle Ambientale or PCA for its acronym in Portuguese) were developed in 2008 for the Pilar and Roça Grande operations based on the EIAs. The PCAs outline the identified potential impacts on the physical, biological and social environments, mitigation measures applicable to construction and operations, and environmental monitoring programs to verify the effectiveness of the mitigation measures and the compliance with the applicable environmental standards.

Industrial effluents are pumped to Effluent Treatment Plants in order to adjust its quality for reuse in the ore processing and/or for discharge of treated effluent to the environment. Sanitary wastewater is collected and directed to septic tanks and anaerobic filter systems. The final sanitary wastewater treated effluent is directed to soil infiltration systems, when possible, or to natural drainage. According to meetings with Jaguar's staff, acid rock drainage and metal leaching are not an issue for the mine operation. Geochemical characterization involving kinetic testing is targeted for completion in 2021.

Environmental monitoring being carried out by Jaguar includes surface water quality, groundwater quality (at the Pilar site only), air quality, and ambient noise. Quarterly surface water quality monitoring reports are prepared for Roça Grande. Annual surface water quality and groundwater quality monitoring reports are prepared for Pilar. These reports are submitted to the National Environmental and Sustainable Development Agency (SUPRAM for its acronym in Portuguese).

Results of the environmental monitoring for air quality and ambient noise are reported internally only. Air quality monitoring is carried out at two stations, one located at the Pilar site and one located at the Roça Grande site. Ambient noise monitoring is carried out at seven stations, four located at the Pilar site and three located at the Roça Grande site. The most recent monitoring campaign was conducted and documented by MEAM Medicoes Ambientais Consultoria Ltda. (MEAM) in January 2020.

Water quality measured parameters are compared against maximum permissive limits from the Brazilian environmental legislation and any deviations are discussed in the reports. Observed exceedances are mostly related to dissolved iron, manganese, and dissolved oxygen.

MINE WASTE MANAGEMENT

CURRENT TAILINGS MANAGEMENT OPERATIONS

Flotation circuit tailings are classified into underflow (coarse) and overflow (fine) tailings at the process plant. Flotation tailings are thickened and deposited as a slurry in the historical open pits RG-2W and RG-2E. The storage capacity of RG-2W was enhanced with the construction of Dyke 1. Flotation tailings deposition alternates between RG-2W and RG-2E. After a period of deposition in one basin, tailings are drained and then excavated and moved to the tailings dry stack nearby. This process is repeated as tailings deposition alternates between basins.

Approximately 10% of the total tailings are from the CIP circuit and are hydraulically deposited and stored in the Moita tailings facility.

The tailings from the CIP circuit are treated for cyanide removal and piped to the Moita tailings area. Reclaim water from the tailings facility is treated to recover gold and further cyanide destruction, before being returned to the process plant.

PLANNED TAILINGS MANAGEMENT OPERATIONS

Proposed expansions and upgrades at the Roça Grande process plant include the installation of filter plates. After these upgrades are installed, all tailings will be filtered and stacked within the existing depleted open pits at the site.

Within a similar timeline, the Moita tailings facility will be covered and closed and the RG02 pits will be transitioned to use for filter stacks instead of alternating hydraulic deposition.

RG02 OPEN PIT TAILINGS STORAGE FACILITIES

RG-2W was built in two stages with the 2nd stage being built with the upstream dam construction method. In compliance with the new Brazilian regulations, Jaguar completed decharacterization of the upstream raise of the RG-2W structure in 2020. The decharacterization works included excavation of tailings and removal of the five metre tall upstream dam raise (Walm, 2020). The remaining RG-2W dam, referred to as Dyke 1, is a six metre tall soil embankment closing off the western perimeter of the depleted open pit. Dyke 1 has one piezometer for phreatic surface monitoring and is not equipped with an emergency spillway (Diefra, 2020).

The RG-2E open pit is also used for tailings management, however, the tailings are entirely contained within the depleted open pit and below the natural ground level. As a result, the facility has no containment dam and presents a low risk for the accidental release of tailings.

MOITA TAILINGS FACILITY

The Moita tailings facility is a lined slurry deposition tailings storage facility at the Roça Grande mine site. The facility occupies part of a depleted open pit with a containment dam on the southern perimeter referred to as the Moita dam. The Moita dam is up to 19 m tall and 388 m long with 2H:1V slopes (Tetra Tech, 2020a). The Moita dam was built in a single raise. The basin has underdrains to collect seepage from the facility and piezometers to monitor the phreatic surface in the dam.

A security report by Tetra Tech (2020a) raises a number of issues pertaining to maintenance and monitoring of the tailings facility. Tetra Tech also identified that the facility does not have an effective overflow control mechanism, however, by the end of 2020, hydraulic deposition of tailings in Moita will cease and the remainder of the facility will be infilled with filtered tailings (Tetra Tech, 2020b). After filling is completed, the Moita tailings facility will be covered with a geomembrane and closed. Closure plans for the facility also include installing a spillway to prevent overtopping of the dam.

FILTERED TAILINGS STACKS

Although not filtered, the existing tailings 'dry' stack is comprised of tailings that have been hydraulically placed, drained, excavated, and then stacked in a dump as is typical of filtered tailings facilities.

No deposition plans, designs, operation and maintenance, or governance documentation for the existing or proposed filtered tailings stacks were available for review.

PROJECT PERMITTING

ROÇA GRANDE MINE

TAILINGS DAMS

MSOL began its mining activities at the Roça Grande Mine in August 2006 under Corrective Operation Licence No. 333/2006 (COPAM process number 10022/2003/001/2005). This operating licence included the permit to operate a process plant to treat oxidized gold ore from the mines in the Sabará, Caeté, and Santa Barbara project areas, as well as feed from the RG02 open pit at the Roça Grande Mine.

The processing plant was decommissioned due to changes required in the mineral treatment process as the oxidized ore reserves were depleted. The processing of sulphide gold ores from the underground mines of the Caeté Project required construction of a new treatment plant that used the CIP-ADR process (Carbon in Pulp / Adsorption Desorption Recovery). This plant has been permitted through the process COPAM No. 10022/2003/002/2007.

As a result, an updated design was required for the tailings storage area. An application for the Preliminary Licence for proposed new tailings storage areas was accepted by SUPRAM on July 7, 2007. A site visit was subsequently carried out by SUPRAM on October 4, 2007. The operating licence was issued on November 29, 2007 (Certificate No. 029/2007, COPAM process 10022/2003/003/2007). This licence certified the environmental feasibility of storage of the process tailings in the previously excavated open pit mines at the RG02 deposit (RG02-W and RG02-E), referred to as the Moita tailings area.

Although the two old open pit mines were previously permitted for storage of process tailings from the first processing plant under the preliminary licence issued on November 29, 2007, MSOL required an updated licence for the construction of the tailings storage facilities.

The installation licence was issued on May 11, 2009 (Certificate No. 077/2009, COPAM process 10022/2003/004/2008).

The construction and commissioning of each of the separate tailings containment areas were carried out through a separate licensing process. After all construction was completed, an operating licence was requested on March 25, 2010 and Certificate No. 117/2010 was issued on April 31, 2010 (COPAM process 10022/2003/008/2010). A provisional operating licence (APO) for the new Moita tailings area was issued on April 15, 2010 and is currently being renewed.

RG02-W Storage Area

In previous environmental studies, it was proposed that the tailings from the new process plant would be returned to the mines for use as backfill material in the stopes, however, it was determined that the storage volume in the mines was insufficient to accept the full volume of tailings generated. Therefore, an additional storage area was required for the tailings from the flotation circuit which did not contain cyanide. A volume of approximately 418,000 m^3 was estimated to be required. The tailings were to be transported to the RG02-W containment area by means of pipelines. It is important to note that the RG02-W open pit does not have conventional characteristics of a tailings dam such as embankments, as it was excavated for the purposes of mining.

The application for the construction of the RG02-W first embankment was submitted on January 29, 2010. The construction licence was issued on May 31, 2010 under Certificate No. 114/2010 (COPAM process 10022/2003/007/2010). The licence process was formalized by MSOL on June 23, 2010. An APO for the site was issued on July 7, 2010 and the operating licence was issued on August 30, 2010 as Certificate No. 201/210 (COPAM process 10022/2003/010/2010). According to law, RG02W became a tailings dam after this first embankment. This operating licence is currently in the renewal process.

On May 16, 2013, MSOL initiated the licensing process for raising the RG02-W dam using upstream method. The regulatory agency granted concurrent preliminary and construction licences (LP + LI). This lift raised the height of the dam to an elevation of 1,296 m and increased the storage capacity of the facility by 354 m^3 to a total capacity of 884 m^3. The LP + LI was issued on October 29, 2013 under Certificate No. 170/2013 (COPAM process 10022/2003/016/2013). On July 14, 2015, MSOL requested an operating licence for the new lift to 1,296 m, however, this licence was not granted and the additional volume was not used. A new regulation from February 2019 prohibited upstream dams.

RG02-E Storage Area

On April 12, 2011, MSOL submitted an application for concurrent preliminary and construction licences for the expansion of the RG02-E tailings storage area, which is located within the former RG02 open pit mine.

In September 2011, SUPRAM surveyed the open pit and the licence was issued on April 10, 2012. The operating licence was requested on October 7, 2013 and since January 27, 2014, the storage area has operated through an APO.

PROCESS PLANT

Amended operation licence 333/2006 (COPAM process 10022/2003/001/2005) authorized the operation of the new decommissioned plant to process oxide gold ores. Due to the change of the process flowsheet to process the new feed stock from the underground mines, an application for a construction licence was filed with SUPRAM on April 17, 2007. SUPRAM surveyed the proposed plant site on July 2, 2007 and determined that the proposed new plant would occupy the same footprint as the previous plant and that there would be no further disturbance to either the surface or the vegetation.

The construction licence for the new processing plant was issued on January 4, 2008, under Certificate No. 097/2008 (COPAM process 1002/2003/002/2007). On March 25, 2010, MSOL made application for the operating licence which was subsequently issued on May 3, 2010, under Certificate number 090/2010 (COPAM process 10022/2003/009/2010). An application for renewal of the operating licence was submitted by MSOL in January 2014, which is currently under review by the environmental regulatory agency (COPAM process 1002/2003/020/2014).

UNDERGROUND MINE

The underground mining activity at the Roça Grande Mine was authorized through two operating licences: licence LO 035/2008 related to the RG01 deposit and licence LO 036/2008 relates to the development of the RG02 deposit.

Operating licence 035/2008 (COPAM process 10022/2003/012/2011) was issued on April 16, 2008 and authorized the execution of underground mining activities on claim 831.057/2010. Prior to this operating licence, MSOL had an Operation Environmental Authorization (AAF), No. 01109/2007, for the underground mining activity. The operating licence is currently in the renewal process through COPAM process 10022/2003/015/2012.

Operating licence 036/2008 (COPAM process 22352/2011/005/2011) was requested on February 11, 2008 and was issued on April 16, 2008. This licence authorized the execution of underground mining activities on claim number 831.056/2010. It is to be noted that prior to this operating licence, the company had AAF No. 01109/2007 for the underground mining activity. The operating licence is currently in the renewal process through COPAM process 22352/2011/006/2012, however, in May 2018, the environmental agency was officially informed about the temporary stoppage of the RG01 mine and its respective environmental licence.

OPEN PIT MINES

On April 9, 2010, MSOL formalized the previously issued concurrent open pit construction and operating licences (LP + LI) for the expansion of the existing open pit mines on claim 831.056/2010. This licence relates to open pit mining activity on the RG03 and RG06 deposits.

Both the LP + LI licences were administered under Certificate No. 173/2010 (COPAM process 22352/2011/003/2011) and the APO for the open pit expansions was issued on October 7, 2011. No activities are currently taking place at the open pit mines and the LP + LI request remains under review by the environmental agency.

WASTE ROCK STORAGE

The initial waste materials from the open pit mines were placed on waste piles previously constructed by Vale. The operating licence for that activity was issued on September 22, 2009.

SUPRAM issued the operating licence on November 30, 2009 under Certificate No. 298/2009 (COPAM process 1002/2003/005/2009). A renewal of the operating licence was requested by MSOL on August 23, 2013 (COPAM process 1002/2003/018/2013), and this renewal application is currently under review by SUPRAM.

On May 8, 2010, MSOL requested the LP + LI for the second expansion of the waste rock piles, as additional storage capacity was required after evaluation of the mining plans for the integrated operations. The LP + LI was issued on September 26, 2011 under Certificate No. 253/2011 (COPAM process 10022/2003/017/2013). An APO was issued on February 2017. The operating licence awaits the final decision from the environmental agency and an archeological search is being done in the area to complete the licensing process.

A summary of the environmental licences for the Roça Grande Mine is provided in Table 20-1.

TABLE 20-1 LIST OF EXISTING LICENCES, ROÇA GRANDE MINE
Jaguar Mining Inc. – Caeté Mining Complex

Enterprise	Certificate number	Process number (PA COPAM)	ANM	Issue Date	Expiry Date	Observation
Tailings Dam – “Cava do Moita”	LO 117/2010	10022/2003/008/2010	NA	31/05/2010	31/05/2014	This licence is being renewed since 2014, COPAM process 10022/2003/020/2014
Tailings Dam – “RG02-W”	LO 218/2010	10022/2003/010/2010	NA	30/08/2010	30/08/2014	This licence is being renewed since 2014, COPAM process 10022/2003/020/2014
Tailings Dam – “RG02-E”	LAS RAS 64/2020	10022/2003/019/2013	NA	25/05/2020	25/05/2030	Application for an operating licence under review by environmental agency
Plant	LO 090/2010	10022/2003/009/2010	NA	03/05/2010	03/05/2014	This licence is being renewed since 2014, COPAM process 10022/2003/020/2014
Underground mining – RG-01	LO 035/2008	10022/2003/012/2011	831.057/2010	16/04/2008	16/04/2012	This licence is being renewed since 2012, COPAM process 10022/2003/015/2012
Underground mining – RG-02	LO 036/2008	22352/2011/005/2011	831.056/2010	16/04/2008	16/04/2012	This licence is being renewed since 2012, COPAM process 22352/2011/006/2012
Open pit – ANM 831.056/2010	APO	22352/2011/004/2011	831.056/2010	07/10/2011	NA	Application for an operating licence under review by environmental agency. This licensing process refers to RG-03 and RG-06
Waste dump – First Expansion	LOC 298/2009	10022/2003/005/2009	NA	30/11/2009	30/11/2013	This licence is being renewed since 2013, COPAM process 10022/2003/018/2013
Waste dump – Second Expansion	LP+LI 253/2011	10022/2003/011/2010	NA	26/09/2011	26/09/2015	Operating licence requested on July 2013, COPAM process 10022/2003/017/2013
Surface water pumping	Outorga 02725/2010	07024/2007	NA	11/11/2010	27/10/2015	This licence is being renewed since 2015, process 31767/2015. “Captação túnel Marembá” or “Captação túnel do Andre´”

PILAR MINE

The mining title for the Pilar Mine (claim 830.463/1983) initially belonged to Vale, which initiated the environmental licensing process in 1999 and obtained a preliminary licence for the open-pit mining of the oxidized ore. Due to strategic changes of Vale, they decided at that time not to move forward with the mining project.

In 2003, Vale transferred the mineral rights to MSOL which resumed the environmental licensing process for the implementation of the open pit mining project. MSOL obtained the Preliminary Licence, Construction Licence, and finally, the Operating Licence on June 27, 2006, through the COPAM process 00132/1999/003/2005.

In preparation for permitting of the underground mine, MSOL acquired a preliminary licence for the activity through COPAM process 00132/1999/004/2007. SUPRAM issued the Preliminary Licence on August 16, 2007 under Certificate No. 021/2007.

MSOL subsequently carried out the required environmental studies and submitted an application for a construction licence under COPAM process number 00132/1999/006/2008. SUPRAM issued the construction licence for the mining and processing of sulphide ores by the CIP-ADR process flowsheet on August 25, 2008 under Certificate No. 152/2008.

On September 22, 2009, MSOL applied for an operating licence which was subsequently issued by SUPRAM on June 30, 2010 under Certificate No. 153/2010 (COPAM process 00132/1999/007/2009). On February 23, 2016, MSOL applied for a renewal of the operating licence, through COPAM process 00132/1999/009/2016, and the renewal application is currently under review.

Operating licence LO 153/2010 is currently the only licence relating to the Pilar Mine. A list of the water permits is presented in Table 20-2.

TABLE 20-2 LIST OF EXISTING WATER PERMITS, PILAR MINE
Jaguar Mining Inc. – Caeté Mining Complex

Ordinance	Issue Date	Expiration Date	Procedure number	Watercourse	Permitted Rates	Status
1500917/2018	24/11/2018	23/11/2023	01706/2013	Water well	1.4 m^3/h	Active Permit 1706/2013
01543/2006	19/10/2006	19/10/2011	02973/2006	Conceição River	100.8 m^3/h	In revalidation process (009155/2011)
02948/2011	07/10/2011	30/06/2016	05713/2010	Lowering water level for mining	98.08 m^3/h	In revalidation process (5804/2016)

SOCIAL OR COMMUNITY REQUIREMENTS

The Caeté Mining Complex includes two underground mines, Roça Grande and Pilar, located in Minas Gerais, Brazil. There are three main communities nearby these sites, including Caeté, Santa Barbara, and Barão de Cocais. This section presents the results of the social review based on a review of Jaguar's policies, programs, social risk management systems, and/or social performance against relevant International Finance Corporation (IFC) Performance Standards (PS). When possible, available documentation was reviewed and in order to supplement this, discussions with Jaguar staff were utilized to fill information gaps to the extent possible. This social review does not represent a detailed audit of Jaguar's compliance with IFC PSs or specific guidelines, but an overview of available information and is organized according to the following IFC 2012 PSs:

- **PS1: Social and Environmental Assessment and Management Systems** requires that companies identify, assess, and mitigate the social and environmental impacts and risks they generate throughout the lifecycle of their projects and operations. From a social perspective, the requirement includes: a comprehensive social assessment; identification of critical social impacts and risks; community consultation and engagement; information disclosure; mitigation plans to address impacts and risks; and development of an organizational structure with qualified staff and budgets to manage the overall social management system.

- **PS2: Labour and Working Conditions** incorporates the International Labour Organization conventions that seek to protect basic worker rights and promote effective worker/management relations.

- **PS4: Community Health and Safety** declares the project's duty to avoid or minimize risks and impacts to community health and safety and addresses priorities and measures to avoid and mitigate project related impacts and risks that might generate community exposure to risks of accidents and diseases.

- **PS5: Land Acquisition and Involuntary Resettlement** considers the need for land acquisition or involuntary resettlement of any individual, family or group; including the potential for economic displacement.

- **PS7: Indigenous Peoples** considers the presence of Indigenous groups, communities, or lands in the area that may be directly or indirectly affected by projects or operations.

- **PS8: Cultural Heritage**. This standard is based on the Convention on the Protection of the World Cultural and Natural Heritage. The objectives are to preserve and protect irreplaceable cultural heritage during a project's operations, whether or not it is legally protected or previously disturbed and promote the equitable sharing of benefits from the use of cultural heritage in business activities.

It is noted that **PS3 Resource Efficiency and Pollution Prevention** and **PS6 Biodiversity Conservation** correspond to environmental performance standards. Environmental management and performance are discussed at the beginning of Section 20.

PS1: SOCIAL AND ENVIRONMENTAL ASSESSMENT AND MANAGEMENT SYSTEMS

As a corporation, Jaguar has a strong commitment to sustainability, as documented in its 2018 Sustainability and Impact Report. Jaguar tracks and reports upon its corporate and site performance according to the 2015 United Nations Sustainable Development Goals, which are listed in Table 20-3.

TABLE 20-3 MOST IMPORTANT SUSTAINABLE DEVELOPMENT GOALS FOR JAGUAR MINING AND STAKEHOLDERS
Jaguar Mining Inc. – Caeté Mining Complex

1. No Poverty
2. Zero Hunger
3. Good Health and Well-Being
4. Quality Education
5. **Gender Equality**
6. **Clean Water and Sanitation**
7. Affordable and Clean Energy
8. **Decent Work and Economic Growth**
9. Industry Innovation and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. **Responsible Consumption and Production**
13. Climate Action
14. **Life Below Water**
15. **Life on Land**
16. **Peace Justice and Strong Institutions**
17. Partnership for the Goals

*Note: **Bold** items were marked as the most important themes for Jaguar and its Stakeholders in 2018

Through ongoing stakeholder mapping and engagement plus issues mapping, Jaguar reports that in 2018, the bolded themes in Table 20-3 were highlighted identified as the most important themes globally to Jaguar and its stakeholders.

At Roça Grande and Pilar, community questions, feedback, and complaints are tracked and monitored. Up to the time of writing this report, in 2020, most of the feedback received at the sites were positive, with most of the negative complaints focused on nuisance effects such as dust, vibration, and odour. Other questions were with regard to business and job opportunities. Jaguar has tracking systems and reports to demonstrate its commitment to stakeholder and issue management and measure performance.

PS2: LABOUR AND WORKING CONDITIONS

Jaguar has a commitment to support the local economy and its workforce. At Roça Grande and Pilar, most of its employees have been hired from the local communities (87% at Pilar and 75% at Roça Grande). In total, at the Caeté Mining Complex, 83% of its 465 direct employees are residents of local communities.

Corporately, Jaguar has a Safety Management System which includes:

1. Safety and Environment Committee
2. Emergency Brigade
3. SIPATMIN (Jaguar's Internal Mining Accident Prevention Week)
4. Ergonomics
5. Safety Inspections
6. Safety Campaigns

Health and Safety incidents tracked and reported in their 2018 Sustainability Report indicate that here were no fatalities reported for this time period. Most other incidents at Pilar and Roça Grande were minor injuries resulting in a leave of absence.

All employees at the Caeté Mining Complex are part of a collective bargaining agreement. The 2018 Sustainability Report indicates that the number of labour claims have declined by 85% since 2014. Jaguar staff indicate that recently, increased worker compensation has improved employee satisfaction. Jaguar staff state that there is a strong desire among employees to develop their careers. To this end, training and licensing opportunities are made available to staff to ensure the development of transferrable skills.

Employees at the Caeté Mining Complex work on a shift basis and there is no on-site labour camp. When asked about recent employee feedback or grievances at the Caeté Mining

Complex, Jaguar staff indicated that most employee issues are focused on the on-site restaurant and food, and conditions of the bathroom.

PS4: COMMUNITY HEALTH AND SAFETY

Jaguar works towards maintaining a strong relationship with the communities surrounding the Caeté Mining Complex aimed at keeping its “social license to operate” the project. Jaguar has made several commitments to help improve community life and the social environment. This is evident at the Caeté Mining Complex through the development of several community programs under the “Seeds of Sustainability” program. This program helps fund a variety of social and cultural projects, environmental education initiatives, annual social events, and career development opportunities. It is estimated that the “Seeds of Sustainability” program reaches approximately 1,500 people in the local communities through both large and small projects. In the 2018 Sustainability Report, some of these projects included:

- 81st Cavalcade of Brumal
- Weaving the Cavalhada Weaves / Pallets / Santa Barbara Multisectoral Fair
- Caminho Melhor and Projecto Dito sports equipment donation
- Road maintenance
- Genesis Project
- Launch of the movie Herança – A Cavalhada em Brumal
- Solidarity Christmas Social Action of the District São Vicente
- Caeté Women's / Mothers' Day
- Anniversary of the city / Cultural events
- Easter event and Children's Day
- Tire Park Project

PS5: LAND ACQUISITION AND INVOLUNTARY RESETTLEMENT

There have been no recent land acquisitions or mining operations that have required any community or family resettlement. Therefore, this criterion is not applicable.

PS7: INDIGENOUS PEOPLES

The Caeté Mining Complex is not located in or adjacent to any Indigenous People’s Territory. Therefore, this criterion is not applicable.

PS8: CULTURAL HERITAGE

According to RPA (2019), an archeological search was underway for licensing related to the waste rock facility. At the time of writing this report, the results of this search were not known. In addition, no information was available on Chance Find Procedures, which might be applicable as operations continue.

MINE CLOSURE REQUIREMENTS

Two years before the mine is exhausted, Jaguar must present a Mine Closure Plan ("Plano de Fechamento de Mina", or PAFEM) to SUPRAM for approval, according to the "Deliberação Normativa COPAM nº 127". This regulation enforces that all mining activities in the state of Minas Gerais must include the rehabilitation plan of disturbed areas and defines its Terms of Reference.

Jaguar commissioned an infilling and cover plan for the Moita tailings facility (Tetra Tech, 2020b), scheduled to commence implementation at the end of 2020. The technical report for the proposed cover presents the overall concept together with the geotechnical studies and analyses, and hydrological-hydraulic assessments developed to support the Moita cover project. The construction of the proposed cover involves filling the volumetric capacity of the tailings facility with filtered tailings, placing topsoil and carrying out re-vegetation on the final tailings surface. The plan also involves construction of an emergency spillway designed to safely manage the flood resulting from the 10,000-year storm event. It is understood that the execution of this plan will last approximately five years.

Progressive rehabilitation and closure activities have been scheduled for the LOMP. The total cost of closure is US$6.6 million. The breakdown of the cost is presented in Table 20-4.

TABLE 20-4 PROGRESSIVE REHABILITATION AND CLOSURE COST ESTIMATES

Jaguar Mining Inc. – Caeté Mining Complex

Progressive Rehabilitation Costs (US$000)

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Waste Pile	-	-	-	-	-	9	9	-	-	255	273
Pit	-	-	-	-	-	-	-	-	-	-	-
Dam	-	61	83	83	83	-	-	-	-	-	310
Infrastructure	-	521	47	81	-	-	-	510	255	-	1,414
Plant	-	625	46	-	-	-	-	-	-	-	671
G&A	-	143	122	163	17	100	100	-	-	255	900
Contingency	-	230	51	56	17	18	18	2	255	-	647
Total	**0**	**1,580**	**349**	**383**	**117**	**127**	**127**	**512**	**510**	**510**	**4,215**

Closure Costs (US$000)

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Waste Pile	-	73	-	-	-	-	-	-	-	-	73
Pit	-	-	-	-	-	-	-	-	-	-	-
Dam	-	-	-	-	-	-	-	-	-	-	-
Infrastructure	12	8	483	-	-	-	-	21	-	-	524
Plant	-	30	-	-	-	-	-	-	-	-	30
G&A	13	62	272	240	281	270	251	26	4	4	1,423
Contingency	-	29	128	41	48	46	43	8	-	-	343
Total	**25**	**202**	**883**	**281**	**329**	**316**	**294**	**55**	**4**	**4**	**2,393**

21 CAPITAL AND OPERATING COSTS

CAPITAL COSTS

Table 21-1 summarizes the capital cost estimate for the LOMP of the Caeté Mining Complex. It was prepared by Jaguar and includes primary access development, mine equipment replacement, plant equipment replacement, sustaining capital, tailings dam expansion, and mine closure.

TABLE 21-1 CAPITAL COSTS
Jaguar Mining Inc. – Caeté Mining Complex

Description	Units	June-Dec. 2020	2021	2022	2023	2024	2025	Total
Mining	US$000	3,249	1,637	1,637	1,637	1,637	1,637	11,434
Plant	US$000	3,121	450	450	450	450	450	5,373
Exploration	US$000	491	806	806	806	806	806	4,520
Closure	US$000	33	204	890	283	331	669	2,410
Total	**US$000**	**6,894**	**3,097**	**3,783**	**3,176**	**3,224**	**3,562**	**23,736**

OPERATING COSTS

Tables 21-2 and 21-3 present the unit operating costs and total operating costs respectively for the Caeté Mining Complex. These costs were prepared by Jaguar based on recent actual costs and include mining, process, and general and administration (G&A) expenses.

TABLE 21-2 UNIT OPERATING COSTS
Jaguar Mining Inc. – Caeté Mining Complex

Description	Units	2016	2017	2018	2019	2020 Budget
Mining	US$/t milled	107.99	57.71	48.06	39.87	39.63
Processing	US$/t milled	16.18	21.08	22.30	26.62	27.19
G&A	US$/t milled	8.32	11.52	12.86	5.33	7.63
Total	**US$/t milled**	**132.49**	**90.31**	**83.22**	**71.82**	**74.45**
Production	**000 t**	**296**	**335**	**380**	**433**	**470**

TABLE 21-3 OPERATING COSTS
Jaguar Mining Inc. – Caeté Mining Complex

Description	Unit	Type	2017	2018	2019	2020 Budget
Mining						
Labour	US$000	Fixed	8,868	5,650	5,865	6,473
Maintenance	US$000	Variable	3,394	2,702	3,103	3,106
Electricity	US$000	Variable	1,066	650	496	675
External Services	US$000	Variable	7,447	5,083	5,527	5,073
Mining Materials	US$000	Variable	2,815	1,934	2,322	3,309
Internal Services	US$000	Fixed	576	-	-	-
Accounting Adjustments	US$000	Variable	-142	-254	-153	-
Mining Taxes	US$000	Variable	760	1,176	1,226	1,519
Indirect Costs	US$000		846	1,039	52	-
Total Mining	**US$000**		**25,631**	**17,980**	**18,437**	**20,154**
Processing						
Labour	US$000	Fixed	2,211	2,649	2,570	2,724
Maintenance	US$000	Variable	753	817	1,110	1,328
Electricity	US$000	Variable	1,761	1,785	2,314	2,384
External Services	US$000	Variable	674	709	1,192	1,537
Plant Consumables	US$000	Variable	2,104	3,299	4,274	4,735
Internal Services	US$000	Fixed	1,062	-	-	-
Total Processing			**8,565**	**9,258**	**11,460**	**12,708**
G&A	US$000	Fixed	4,186	2,229	2,303	3,588
Belo G&A	US$000	Fixed	-	-	-	-
Refinery	US$000	Variable	83	81	76	78
Indirect Costs	US$000		-	-	-	-
Total G&A	**US$000**		**4,269**	**2,310**	**2,379**	**3,666**
Total Operating Costs	**US$000**		**38,465**	**29,548**	**32,276**	**36,528**

22 ECONOMIC ANALYSIS

This section is not required as Jaguar is a producing issuer, the property is currently in production, and there is no material expansion of current production. RPA reviewed a LOMP cash flow model that confirms the economic viability of the Mineral Reserves, at a gold price of US$1,300/oz and an exchange rate of US$1.00=R$4.50.

23 ADJACENT PROPERTIES

RPA is not aware of any relevant adjacent properties.

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's conclusions by area are summarized below.

GEOLOGY AND MINERAL RESOURCES

- In RPA's opinion, the Roça Grande and Pilar Mineral Resource estimates were prepared in a professional and diligent manner by qualified professionals and the estimates comply with CIM (2014) definitions.

ROÇA GRANDE MINE

- As the Roça Grande Mine is currently on a care-and-maintenance basis with no additional work completed since the previous disclosure of the Mineral Resources, the Mineral Resources remain unchanged.
- The Mineral Resource estimate for the Roça Grande Mine was prepared based on drilling and channel sample data using a data cut-off date of June 30, 2015. The wireframe models of the mineralization remained unchanged from 2015. The wireframe models of the excavated volumes for the Roça Grande Mine were constructed using the information available as of December 31, 2018.
- At a cut-off grade of 1.46 g/t Au, the Measured and Indicated Mineral Resources at the Roça Grande Mine total approximately 1.08 Mt, at a grade of 2.77 g/t Au, containing approximately 96,000 ounces of gold. In addition, Inferred Mineral Resources total approximately 1.76 Mt, at a grade of 3.48 g/t Au, containing approximately 197,000 ounces of gold.
- Surface-based exploration programs carried out in 2018 and 2019 were successful in locating gold mineralization at the Catita target and the Córrego Brandão target, both located in the vicinity of the Roça Grande Mine.

PILAR MINE

- The Pilar Mine has been in continuous production since 2008 and has produced a total of 446,431 oz of gold as of December 31, 2019.
- The Mineral Resource estimate for the Pilar Mine was prepared based on drilling and channel sample data using a data cut-off date of May 19, 2020. The wireframe models of the excavated volumes for the Pilar Mine were constructed using the information available as of May 31, 2020.
- At a cut-off grade of 1.46 g/t Au, the Measured and Indicated Mineral Resources at the Pilar Mine total approximately 4.02 Mt, at an average grade of 4.34 g/t Au, containing approximately 561,000 ounces of gold. In addition, Inferred Mineral Resources total approximately 1.26 Mt, at an average grade of 4.52 g/t Au, containing approximately 182,000 ounces of gold.
- Surface-based exploration activities carried out at surface at the Pilar Mine have been successful in locating gold mineralization at the Pilarzinho target and have also been successful in locating the surface location of the Torre mineralization.

- The underground diamond drilling campaigns carried out in 2019 and H1 2020 have been largely focussed on providing additional detailed information on the gold distribution of the known mineralized zones with the goal of improving the reliability of the Mineral Reserve estimates.
- A program of detailed lithological, mineralization, and structural mapping has been successful in demonstrating that the gold mineralization is hosted in a variety of rock types such as BIF (e.g. BA, BF, BF II, and BF III deposits), mafic metavolcanics (LFW deposit), and mafic/ultramafic metavolcanics (e.g., Torre deposit). As past exploration activities have been largely focussed towards evaluating the gold-bearing potential of the BIF units, RPA believes that the potential for the remaining host rocks has been under-evaluated.
- The mapping programs have clearly demonstrated that the entire stratigraphic sequence and gold mineralized zones have been affected by a period of west-northwest to east-southeast compression (D1) that has transposed all of the host rocks and mineralized zones into a series of broad, open folds at surface, to a series of compact, tightly folded structural slices at depth.
- The observation that the gold-bearing zones have been affected by this D1 folding event presents clear evidence that the gold mineralizing event took place prior to this deformation event. The observation that some of the mineralized zones (e.g., the LPA deposit) are approximately parallel to the D1 axial plane orientation suggests that a second gold mineralizing event may have occurred. All host rocks and mineralized zones are affected by a series of late-stage reverse faults.
- The continuity and distribution of the gold grades for selected mineralized wireframe domains were examined by means of contoured longitudinal projections. Review of the longitudinal projections for these selected domains suggests that the samples with gold grades above the 3 g/t Au to 5 g/t Au range seem to occur as somewhat isolated pods measuring approximately 15 m to 30 m in size that have a slightly preferred elongation along the down-plunge orientation of the folded mineralized wireframes, possibly influenced by the F1 fold axes. The lower grade samples generally show a more pronounced preferred elongation along the down-plunge orientation of the folded mineralized wireframes.
- The Jaguar team have adopted a slightly modified workflow when carrying out their reconciliation studies. In this approach, the excavation volumes from the January 2019 to May 2020 period are applied against the block model completed at year-end 2018 and the resulting data are compared against the plant production data for the January 2019 to May 2020 period. Considering that these excavation volumes are querying areas in the year-end 2018 block model for which no grade control data were available, RPA considers that this approach is examining the predictive capabilities as well as the accuracy of the estimation procedures and parameters that were in place as of year-end 2018. In this manner, RPA is of the opinion that this approach can provide a means for measuring the accuracy of the data, sample density, workflows and estimation parameters that Jaguar uses to prepare its Mineral Resource estimates for the period under examination. This approach also allows the formation of an opinion on the forward accuracy of the current block model, as the procedures and parameters are similar to those used for the previous block model.
- Examination of the results suggests that the year-end 2018 block model has performed well for the period reviewed in terms of the predicted tonnages. The predicted grades are generally in good agreement as well, apart from the second quarter of 2020 where the block model grades were significantly less than the plant feed grades. This good

performance suggests that the sampling procedures and Mineral Resource estimation workflows and parameters are satisfactory.

- Reconciliation of the current block model with plant production data from 2018, 2019 and H1 2020 suggests that the Q2 2020 block model has performed well for the period reviewed in terms of the predicted tonnages. The predicted grades are generally in good agreement as well, apart from the second quarter of 2020 where the block model grades were significantly less than the plant feed grades.

MINING AND MINERAL RESERVES

- The Pilar Mine is a well-run and professional operation currently producing at 1,300 tpd.
- The Pilar Mineral Reserve estimates were prepared in a professional and diligent manner by qualified professionals and the estimates comply with CIM (2014) definitions.
- At a cut-off grade of 2.14 g/t Au, the Proven and Probable Mineral Reserves at the Pilar Mine comprise 1.87 Mt at an average grade of 4.0 g/t Au containing 240,000 ounces of gold.
- Total dilution included in reserves averages approximately 25%, which is in agreement with results for 2019 mining.
- The LOMP for Pilar Mine forecasts 4.5 years of production, at a rate of 1,300 tpd. Gold production is forecast to average 55,000 ounces per year.
- The LOMP cash flow model confirms the economic viability of the Mineral Reserves, at a gold price of US$1,300/oz and an exchange rate of US$1.00=R$4.50.
- The Roça Grande Mine is presently on care and maintenance. Mineral Reserves are not currently estimated at the mine.

LIFE OF MINE PLAN

- The current LOMP leaves capacity for processing more material, should it become available. The plant schedule is adjusted to the available feed to reduce costs.
- At the current production rate of 1,300 tpd, the mine is approaching the maximum output for continuing at depth. In order to further increase production, a different haulage system would be required. Alternatively, other sustainable sources of ore would be required at the site in order to increase production.
- RPA reviewed capital and operating cost estimates prepared by Jaguar and found them to be reasonable.

MINERAL PROCESSING

- In RPA's opinion, the processing circuit unit operations are reasonable to recover gold as expected and provide for adequate throughput.
- A flowsheet modification to detoxify the process waters will have a positive effect on reducing raw water usage.

- Recent test work was aimed at identifying differences between the orebodies within the Pilar Mine, designated: BF, BF2, BF3, TORRE, LPA1, LPA2, and LPA3.
    - Minor variations by orebody were observed, with gold recoveries ranging from 85% to 95%. A weighted average recovery for the reserve orebodies is 89%.
    - Flotation tests indicated that there is the possibility of increased recovery using SIBX or PAX.
- Further test work is underway to identify the possibility of optimizing existing processes.

ENVIRONMENT

- RPA is not aware of any environmental liabilities on the property.
- No known environmental issues were identified from the documentation available for review to RPA. The Project complies with applicable Brazilian permitting requirements. The approved permits and the licence renewals address the authority's requirements for mining extraction and operation activities.
- There is an environmental monitoring program in place, which includes surface water quality, groundwater quality (at the Pilar site only), air quality and ambient noise.
- The review of social or community requirements indicates that, at present, Jaguar's operations at Pilar and Roça Grande represent a positive contribution to sustainability and community well-being. Jaguar continues to develop a strong relationship with the nearby communities and stakeholders. Their commitment to community development and programs is demonstrated through their ongoing investments in the "Seeds of Sustainability" program. Information on any existing or potential archeological resources was not provided at the time of this review, nor were any site-specific policies or guidelines. However, based on the information available and discussion with Jaguar staff, the operations at Pilar and Roça Grande appear to be aligned with IFC Performance Standards.

26 RECOMMENDATIONS

RPA's recommendations by area are summarized below.

GEOLOGICAL AND SAMPLING DATA

1. Select and assay on a remedial basis a selection of pulp samples from the 2019 and H1 2020 diamond drilling programs representing approximately 2% of the total samples analyzed.
2. Reduce the insertion frequency of the blank and standard reference materials to a frequency of approximately one blank for standard reference material sample for every 50 sample assays.

MINERAL RESOURCES

1. Review the Mineral Resource estimate for the Roça Grande Mine in light of the increased metal price and change in the exchange rate.
2. Undertake a program of re-sampling for those un-sampled intervals located within the Pilar mineralized wireframe boundaries if sufficient drill core is available.
3. Undertake all efforts to carry out whatever remedial actions are available and appropriate to correct the erroneous or suspicious information for those suspect drill holes that are located in the as-yet un-mined portions of the Pilar Mine. For those suspect drill holes for which remedial corrections are not possible, RPA recommends that those holes be transferred from the active database into a database that is dedicated specifically for these suspect records.
4. Evaluate the gold-bearing potential of the mafic metavolcanic and the ultramafic metavolcanic units within the Pilar Mine.
5. Update the lithologic and structural models to reflect the current information and level of understanding of the nature of the folding and faulting of the host rock units at the Pilar mine.
6. Amend the cut-off grade strategy used for preparation of the mineralization wireframes to better reflect the potentially economic in-situ gold grades. As a minimum, the mineralization wireframes should be created using a cut-off grade similar to the reporting cut-off grade.
7. Continue to collect bulk density values for those samples within the mineralized wireframe outlines, especially for those zones having a low number of density values.
8. Prepare wireframe models of the major lithological units as aides in coding the density values to the block model.
9. Consider the use of a dynamic anisotropy method for estimation of grades so as to more accurately reflect the gold grade variations at the local scale.
10. In those cases where no CMS model is available for a given excavation volume, use the design shape for the excavations in question (suitably modified for the estimated amount of overbreak) as a proxy when preparing the reconciliation reports.

11. Evaluate the impact of a higher metal price on the cut-off grade and the resulting estimated Mineral Resources.
12. Review and re-evaluate the reporting volumes for the remaining mineralization above Level 12 in consideration of the current metal price environment and short-range outlook.

MINING AND MINERAL RESERVES

1. Continue efforts to reduce dilution with cable bolts and stope pillars, and measurements using CMS should be used to analyze dilution by mining type. Measured results should be used to choose inputs to the reserve estimation process.
2. Continue with the plans and implementations put in place by the rock mechanics engineers should continue. The implementation of stope pillars, cable bolt designs, and regular maintenance of the main infrastructure should continue.

LIFE OF MINE PLAN

1. Review alternative feed sources to utilize unused capacity at the process plant. This is in progress regarding remnant mining in the upper levels, which has increased the Mineral Reserves. Toll milling from other properties is also another option.
2. Review alternatives for the plant operating schedule.
3. Continue efforts to exploit the opportunities in the upper areas of the mine to increase the LOMP. There are additional Mineral Resources in the old workings that can potentially be mined at reduced haulage distances. A detailed mining plan and costing is required.
4. Consider undertaking studies to explore the opportunities of an open pit at Pilar. There are Mineral Resources close to surface that may potentially be mined using surface mining methods.
5. The current LOMP has reached the extents of the resource limits at depth. Normally Jaguar has a buffer of one mining level (three sublevels). RPA recommends that buffer be established through drilling.

MINERAL PROCESSING

1. Plant trials to optimize flotation reagents should be carried out.
2. Metallurgical test work should continue, and should include samples from the SW orebody (which makes up one third of the Mineral Reserves) to assess variations in metallurgical performance.
3. The long term stability of ferric arsenate should be studied, in relation to the ongoing operation of the Moita dam.

ENVIRONMENT

1. Conduct geochemical sampling, testing, and characterization for waste rock and tailings to verify that acid rock drainage and metal leaching are not an issue that

requires management actions and implementation of specific environmental mitigation measures to meet applicable water quality standards.

2. Consider expanding the air quality monitoring program by adding stations given that only one station at Pilar and one station at Roça Grande are part of the current program.
3. Review management and mitigation corrective actions, as applicable, based on the data collected from the environmental monitoring programs.
4. Consider the implementation of a monitoring program for fauna and flora.
5. Install piezometers and displacement monitoring instrumentation for the existing and proposed filtered tailings stacks.
6. Monitor the long-term displacement and phreatic levels within filtered tailings stacks to observe trends and confirm physical stability.
7. Contract a third party to conduct regular safety reviews of the existing and proposed filtered tailings stacks.
8. Include ancillary water management structures to collect contact water in the design of the proposed filtered tailings stacks.
9. Monitor seepage from all tailings storage facilities to confirm chemical stability.
10. Make site specific corporate policies related to health and safety, community engagement, and employee relations readily available.
11. Make the results of the recent archeological survey and any Chance Find procedures readily available.

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28 DATE AND SIGNATURE PAGE

This report titled "Technical Report on the Caeté Mining Complex, Minas Gerais State, Brazil" dated August 31, 2020, with an effective date of May 31, 2020 was prepared and signed by the following authors:

(Signed and Sealed) ***Stephan R. Blaho***

Dated at Toronto, ON
August 31, 2020

Stephan R. Blaho, MBA, P.Eng.
Principal Mining Engineer

(Signed and Sealed) ***Reno Pressacco***

Dated at Toronto, ON
August 31, 2020

Reno Pressacco, M.Sc.(A), P.Geo.
Principal Geologist

(Signed and Sealed) ***Jeff Sepp***

Dated at Toronto, ON
August 31, 2020

Jeff Sepp, P.Eng.
Senior Mining Engineer

(Signed and Sealed) ***Holger Krutzelmann***

Dated at Toronto, ON
August 31, 2020

Holger Krutzelmann, P.Eng.
Associate Principal Metallurgist

(Signed and Sealed) ***Luis Vasquez***

Dated at Toronto, ON
August 31, 2020

Luis Vasquez, M.Sc., P.Eng.
Senior Hydrotechnical Engineer

29 CERTIFICATE OF QUALIFIED PERSON

STEPHAN R. BLAHO

I, Stephan R. Blaho, MBA, P.Eng., as an author of this report entitled "Technical Report on the Caeté Mining Complex, Minas Gerais State, Brazil" dated August 31, 2020, with an effective date of May 31, 2020, and prepared for Jaguar Mining Inc., do hereby certify that:

1. I am Principal Mining Engineer with Roscoe Postle Associates Inc., now part of SLR Consulting Ltd, of Suite 501, 55 University Ave., Toronto, ON M5J 2H7.

2. I am a graduate of the Queen's University, Kingston, Ontario, Canada, in 1980 with a Bachelor of Science degree in Mining Engineering, and Western University, London, Ontario, Canada in 1984 with a Master of Business Administration degree.

3. I am registered as a Professional Engineer in the Province of Ontario (Licence Number: 90252719). I have worked as a mining engineer for more than 35 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Managing underground mining operations with a variety of mining methods in Canada and internationally.
   - Planning and managing underground mining projects around the world.
   - Managing technical studies for underground mines and mining projects, including scoping, PFS, and FS studies.

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 Caeté Mining Complex.

6. I am responsible for the preparation of Sections 2, 3, 19, and 21 to 24 and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.

7. I am independent of Jaguar 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 part of the Technical Report for which I am responsible 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 part of the Technical Report for which I am responsible contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 31st day of August, 2020

(Signed and Sealed) *Stephan R. Blaho*

Stephan R. Blaho, MBA, P.Eng.

RENO PRESSACCO

I, Reno Pressacco, M.Sc(A)., P.Geo., as an author of this report entitled "Technical Report on the Caeté Mining Complex, Minas Gerais State, Brazil" dated August 31, 2020, with an effective date of May 31, 2020, and prepared for Jaguar Mining Inc., 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 Cambrian College of Applied Arts and Technology, Sudbury, Ontario, in 1982 with a CET Diploma in Geological Technology, Lake Superior State College, Sault Ste. Marie, Michigan, in 1984, with a B.Sc. degree in Geology and McGill University, Montreal, Québec, in 1986 with a M.Sc.(A) degree in Mineral Exploration.

3. I am registered as a Professional Geologist in the Province of Ontario (Reg. #939). I have worked as a geologist for a total of 34 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Review and report as a consultant on numerous exploration and mining projects around the world for due diligence and regulatory requirements, including preparation of Mineral Resource estimates and NI 43-101 Technical Reports.
   - Numerous assignments in North, Central and South America, Finland, Russia, Armenia and China in a variety of deposit types and in a variety of geological environments; commodities including Au, Ag, Cu, Zn, Pb, Ni, Mo, U, PGM and industrial minerals.
   - A senior position with an international consulting firm.

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 most recently visited the Roça Grande Mine on December 14, 2017 and the Pilar Mine on December 13, 2017. I had previously visited the Roça Grande Mine on November 22, 2014 and the Pilar Mine on November 21, 2014.

6. I am responsible for Sections 4 to 12, and 14 and relevant disclosure in Sections 1, 25, 26, and 27 of the Technical Report.

7. I am independent of Jaguar applying the test set out in Section 1.5 of NI 43-101.

8. I have previously prepared public domain Mineral Resource estimates and Technical Reports for the properties that are the subject of the Technical Report.

9. I have read NI 43-101, and the part of the Technical Report for which I am responsible 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 part of the Technical Report for which I am responsible contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 31st day of August, 2020

(Signed and Sealed) ***Reno Pressacco***

Reno Pressacco, M.Sc.(A)., P.Geo.

JEFF SEPP

I, Jeff Sepp, P.Eng., as an author of this report entitled “Technical Report on the Caeté Mining Complex, Minas Gerais State, Brazil” dated August 31, 2020, with an effective date of May 31, 2020, and prepared for Jaguar Mining Inc., do hereby certify that:

1. I am Senior Mining Engineer with Roscoe Postle Associates Inc., now part of SLR Consulting Ltd, of Suite 501, 55 University Ave., Toronto, ON M5J 2H7.

2. I am a graduate of Laurentian University, Sudbury, Ontario in 1997 with a B.Eng. degree in Mining.

3. I am registered as a Professional Engineer in the Province of Ontario (Reg.# 100139899). I have worked as a mining engineer for a total of 23 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Mine planning, open pit and underground mine design and scheduling, ventilation design and implementation for numerous projects in Canada, USA, Turkey, Saudi Arabia, United Kingdom, Mali, Tanzania, Ghana, and Sweden.
   - Senior mining consultant at MineRP Canada Limited.
   - Mining engineer/ventilation specialist for a number of Canadian mining companies, including CVRD Inco (now Vale) and Cameco Corp.

4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

5. I visited the Pilar Mine on December 10, 2018.

6. I am responsible for the preparation of Sections 15 and 16 and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.

7. I am independent of Jaguar applying the test set out in Section 1.5 of NI 43-101.

8. I have previously prepared public domain Mineral Reserve estimates and Technical Reports for the properties that are the subject of the Technical Report.

9. I have read NI 43-101, and the part of the Technical Report for which I am responsible 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 part of the Technical Report for which I am responsible contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 31st day of August, 2020

(Signed and Sealed) ***Jeff Sepp***

Jeff Sepp, P.Eng.

HOLGER KRUTZELMANN

I, Holger Krutzelmann, P.Eng., as an author of this report entitled “Technical Report on the Caeté Mining Complex, Minas Gerais State, Brazil” dated August 31, 2020, with an effective date of May 31, 2020, and prepared for Jaguar Mining Inc., do hereby certify that:

1. I am an Associate Principal Metallurgist with Roscoe Postle Associates Inc., now part of SLR Consulting Ltd, of Suite 501, 55 University Ave., Toronto, ON M5J 2H7.

2. I am a graduate of Queen’s University, Kingston, Ontario, Canada in 1978 with a B.Sc. degree in Mining Engineering (Mineral Processing).

3. I am registered as a Professional Engineer with Professional Engineers Ontario (Reg. #90455304). I have worked in the mineral processing field, in operating, metallurgical, managerial; and engineering functions, for a total of 42 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Review and report as a metallurgical consultant on numerous mining operations and projects for due diligence and financial monitoring requirements
   - Senior Metallurgist/Project Manager on numerous gold and base metal studies for a leading Canadian engineering company
   - Management and operational experience at several Canadian and U.S. milling operations treating various metals, including copper, zinc, gold, and silver

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 Caeté Mining Complex.

6. I am responsible for the preparation of Sections 13, 17, and 18 and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.

7. I am independent of Jaguar 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 part of the Technical Report for which I am responsible 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 part of the Technical Report for which I am responsible contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 31st day of August, 2020

(Signed and Sealed) ***Holger Krutzelmann***

Holger Krutzelmann, P.Eng.

LUIS VASQUEZ

I, Luis Vasquez, M.Sc., P.Eng., as an author of this report entitled "Technical Report on the Caeté Mining Complex, Minas Gerais State, Brazil" dated August 31, 2020, with an effective date of May 31, 2020, and prepared for Jaguar Mining Inc., do hereby certify that:

1. I am Senior Hydrotechnical Engineer with SLR Consulting (Canada) Ltd. at Suite 501, 55 University Ave., Toronto, ON M5J 2H7.

2. I am a graduate of Universidad de Los Andes, Bogotá, Colombia, in 1998 with a B.Sc. degree in Civil Engineering.

3. I am registered as a Professional Engineer in the Province of Ontario (Reg. #100210789). I have worked 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 numerous environmental impact assessments for mining projects located in Canada, and Perú for regulatory approval.
   - Preparation of multiple mine closure plans for mining projects in Canada and Perú.
   - 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 Caeté Mining Complex.

6. I am responsible for Section 20 and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.

7. I am independent of Jaguar 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 part of the Technical Report for which I am responsible 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 part of the Technical Report for which I am responsible contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 31st day of August, 2020

(Signed and Sealed) ***Luis Vasquez***

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