

JAGUAR



MINING INC.

ANNUAL INFORMATION FORM

FOR THE YEAR ENDED DECEMBER 31, 2018

March 27, 2019

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CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Information Form (“AIF”) contains forward-looking statements and information within the meaning of applicable Canadian securities legislation (collectively, “forward-looking statements”). These forward-looking statements relate to, among other things, the objectives, goals, strategies, beliefs, intentions, plans, estimates and outlook of Jaguar Mining Inc. (“Jaguar” or the “Company”).

Forward-looking statements can generally be identified by the use of words such as “believe,” “anticipate,” “expect,” “intend,” “plan,” “goal,” “will,” “may,” “target,” “potential” and other similar expressions. In addition, any statements that refer to expectations, projections or other characterizations of future events or circumstances are forward-looking statements. Forward-looking statements are based on estimates and assumptions made by Jaguar in light of its experience and perception of historical trends, current conditions and expected future developments, as well as other factors Jaguar believes are appropriate in the circumstances. These estimates and assumptions are inherently subject to significant business, economic, competitive and other uncertainties and contingencies, many of which, with respect to future events, are subject to change. Although Jaguar believes that the expectations reflected in such forward-looking statements are reasonable, undue reliance should not be placed on such statements.

In making the forward-looking statements in this Annual Information Form, Jaguar has made several assumptions, including, but not limited to assumptions concerning: production costs; the geological interpretation and statistical inferences or assumptions drawn from drilling and sampling analysis that are involved in the calculation of Mineral Reserves and Mineral Resources; that there is no material deterioration in general business and economic conditions; that there is no unanticipated fluctuation of interest rates and foreign currency exchange rates; that the supply and demand for, deliveries of, and the level and volatility of prices of gold as well as oil and petroleum products develop as expected; that Jaguar receives regulatory and governmental approvals for its development projects and other operations on a timely basis; that Jaguar is able to obtain financing for its development projects on reasonable terms; that there is no unforeseen deterioration in Jaguar’s costs of production or Jaguar’s production and productivity levels; that Jaguar is able to procure mining equipment and operating supplies in sufficient quantities and on a timely basis; that engineering and construction timetables and capital costs for Jaguar’s development and expansion projects are not incorrectly estimated or affected by unforeseen circumstances; that costs of closure of various operations are accurately estimated; that unforeseen changes to the political stability or government regulation in the country in which Jaguar operates do not occur; that there are no unanticipated changes to market competition; that Jaguar’s mineral reserve estimates are within reasonable bounds of accuracy (including with respect to size, grade and recoverability) and that the geological, operational and price assumptions on which these are based are reasonable; that Jaguar realizes expected premiums over London Metal Exchange cash and other benchmark prices; and that Jaguar maintains its ongoing relations with its employees, affected communities, business partners and joint venturers.

Actual results may differ materially from those expressed or implied in the forward-looking statements contained in this Annual Information Form. The Company anticipates that subsequent events and developments may cause the Company’s views to change. Factors which could cause results or events to differ from current expectations include, among other things: Jaguar’s ability to maintain a listing of its common shares on a stock exchange; actions taken by the Company’s lenders, creditors, shareholders, and other stakeholders to enforce their rights; actions taken against the Company by governmental agencies and securities and other regulators; and other factors not currently viewed as material that could cause actual results to differ materially from those described in the forward-looking statements. Important factors that could cause actual results to differ materially from these expectations are discussed in greater detail under the heading “*Risk Factors*” in this Annual Information Form. When relying on forward-looking statements to make decisions with respect to Jaguar, carefully consider these risk factors and other uncertainties and potential events. Jaguar undertakes no obligation to update or revise any forward-looking statement, except as required by law.

REPORTING CURRENCY

In this Annual Information Form, unless otherwise stated, dollar amounts are reported in US dollars.

CORPORATE STRUCTURE

Jaguar Mining Inc. (“Jaguar” or the “Company”) was incorporated on March 1, 2002, pursuant to the *Business Corporations Act* (New Brunswick). On March 30, 2002, Jaguar issued initial common shares to Brazilian Resources, Inc. (“Brazilian”) and IMS Empreendimentos Ltda. (“IMS”) in exchange for property. In that transaction, Brazilian contributed to Jaguar all of the issued and outstanding shares in Mineração Serras do Oeste Ltda. (“MSOL”), a Brazilian mining company that controlled the mineral rights, concessions and licences to certain property located near the community of Sabará (the “Sabará Property”), east of Belo Horizonte in the state of Minas Gerais, Brazil, and IMS contributed to Jaguar a 1,000-tonne per day production facility also located east of Belo Horizonte near the community of Caeté and the mineral rights to a nearby property related to the National Department of Mineral Production (“DNPM”) Mineral Exploration Request no. 831.264/87 and DNPM Mineral Exploration Request nos. 830.590/83 and 830.592/83 (the “Rio de Peixe Property”). Jaguar was moved into Ontario in October 2003 pursuant to the *Business Corporations Act* (Ontario) and is a corporation existing under the laws of Ontario.

On October 9, 2003, pursuant to an amalgamation agreement dated July 16, 2003, Jaguar amalgamated with Rainbow Gold Ltd. (“Rainbow”), a New Brunswick corporation and a then inactive reporting issuer listed on the TSX Venture Exchange (the “TSX-V”), through a reverse take-over. The amalgamated entity adopted the name “Jaguar Mining Inc.” Jaguar was approved for listing on the TSX-V on October 14, 2003, and began trading on October 16, 2003. Jaguar subsequently graduated from the TSX-V to the Toronto Stock Exchange (the “TSX”) and began trading on the TSX on February 17, 2004, under the symbol “JAG.” On July 23, 2007, trading of Jaguar’s common shares commenced on the NYSE Arca Exchange (“NYSE Arca”) under the symbol “JAG.” In July 2009, Jaguar received approval from the New York Stock Exchange (“NYSE”) to transfer the trading of its common shares from the NYSE Arca to the NYSE. Trading on the NYSE began on July 6, 2009, also under the symbol “JAG.” The common shares of the Company were delisted from the NYSE on June 7, 2013, and from the TSX on April 30, 2014, when the Company announced that the TSX-V had accepted its listing application. On July 29, 2016, the common shares of Jaguar and the Company’s outstanding convertible senior secured debentures (“Debentures”) were approved for listing on the TSX. The common shares and Debentures commenced trading on the TSX on August 3, 2016, and the common shares of Jaguar were simultaneously de-listed from the TSX-V.

As at December 31, 2016, Jaguar had three wholly owned direct subsidiaries: Mineração Serras do Oeste Ltda., Mineração Turmalina Ltda. (“MTL”) and Mineração Chega Tudo (MCT) Ltda. (“MCT”), each incorporated under the laws of the Federal Republic of Brazil (“Brazil”). In Q1 2017, MSOL completed a merger with MTL to centralize the assets and businesses into a single company, MSOL, providing greater efficiency and effectiveness in asset management, as well as greater synergy and significant reduction of operating costs. In Q4 2017, Jaguar completed the sale of its wholly owned subsidiary MCT to Avanco Resources Limited (“Avanco”) pursuant to an accelerated earn-in agreement. The registered and head office of MSOL is located at Rua Levindo Lopes 323, Funcionários, Belo Horizonte, Minas Gerais, CEP 30140-170, Brazil. Jaguar’s registered office is located at 100 King Street West, 56th Floor, Toronto, Ontario, Canada, M5X 1C9.

Jaguar Mining Inc. – Corporate Structure Chart (as at March XX, 2019)



GENERAL DEVELOPMENT OF THE BUSINESS

Overview of Business

Jaguar Mining Inc. is a Canadian-listed junior gold mining, development, and exploration company operating in Brazil with three gold mining complexes, and a large land package with significant upside exploration potential from mineral claims covering an area of approximately 64,000 hectares (ha). The Company’s principal operating assets are located in the Iron Quadrangle, a prolific greenstone belt in the state of Minas Gerais, and include the Turmalina Gold Mine Complex and Caeté Gold Mine Complex. The Company also owns the Paciência Gold Mine Complex, which has been on care and maintenance since 2012.

Potential for a significant increase in gold production exists through further exploration and development of the Company’s existing brownfield land package around its existing mines.

The Company is led by a proven executive management team with extensive gold operations and development experience in South America.

Recent History

The following is a description of Jaguar’s most significant events over the past three completed financial years.

Turmalina Mining Complex – Operational Review and Mineral Resources

Gold production at Turmalina was 33,261 oz. in 2018, 45,466 oz. in 2017 and 63,260 oz. in 2016.

Underground development at Turmalina totalled 3.8 km in 2018, 3.5 km in 2017 and 5.6 km in 2016. During 2018, a total of 29 km of underground delineation and exploration drilling was conducted at the mine.

The mining method utilized at the Turmalina underground mine is sublevel open stoping with backfill. Jaguar’s priority is to reduce costs by focusing on ore grade control, minimizing dilution and minimizing the extraction of non-profitable or marginal material.

On February 27, 2019, the Company reported drill results from the exploration campaign at Turmalina. Key highlights include:

- Drill results confirm the structure hosting Orebody C extends to depth beyond mine level 8, 500m down plunge (400m vertically) from current operations and remains open at depth
- Drill results confirm changes in the plunge direction of the higher-grade ore shoot as mapped structurally in mine development on levels 3 and 4 in Q3 2018

- 4 growth exploration holes intersected grade x thickness of > 10 GM including an intercept of 7.08 g/t Au over 3.85m (ETW 3.2m)
- Completed infill drilling on Orebody C to upgrade and covert mineral resources to mineral reserves between levels 3 and 5
- Key infill drilling intersections on Orebody C-SE include 5.76 g/t Au over 29.63m (ETW 22.69m), 6.40 g/t Au over 14.80m (ETW 12.56m) and 5.65 g/t Au over 26.54m (ETW 19.09m)
- Infill drilling continued to define wide; high-grade intercepts in 19 intersections with a grade x thickness of > 10 GM including 15 intersections with grade x thickness > 25 GM, 5 intersections with grade x thickness > 50 GM and 3 intersections with grade x thickness > 100 GM
- 8 infill holes targeting Orebody C-Central based on the new plunge interpretation include two higher grade intersections from the drilling in this area completed to date of 18.35 g/t Au over 8.76m (ETW 8.23m) and 9.95g/t Au over 2.29m (ETW 2.0m). Intersections appear to define a high-grade plunging mineralized shoot, which extends over a strike length of approximately 50m

Definitions: ETW - estimated true width, g/t Au - grams per tonne gold, m - metres, Grade (g/t Au) x Thickness (m) = GM (gram - meters)

Detailed Drill Results and Intercepts

Drill results reported are from 19 holes over 4,523m as part of its growth exploration drill program on Orebody C, and 46 holes over 4,708m from infill drilling (39 holes at C-SE and 7 holes at C-Central) completed since June 2018 (Refer News Release February 26 and June 18, 2018) at Turmalina Gold Mine (“Turmalina”). The growth drilling focused on targeting Orebody C extensions down plunge and laterally along strike, and to upgrade mineral resources to mineral reserves.

Drill results reported below have been included in an updated geology/resource model. These added resources were included in updated resources for Turmalina reported in March 2019:

Orebody A

- FTS1580 intercepted 10.94 g/t Au over 17.29m (ETW 17.22m)
- FTS1584 intercepted 17.23 g/t Au over 5.42m (ETW 5.35m)
- FTS1586 intercepted 8.90 g/t over 4.02m (ETW 3.94m)

Orebody C

- FTS1482 intercepted 9.22 g/t Au over 5.85m (ETW 5.11m)
- FTS1486 intercepted 4.91 g/t Au over 15.10m (ETW 14.65m)
- FTS1515 intercepted 12.61 g/t Au x 4.16m (ETW 3.52m)
- FTS1518 intercepted 3.36 g/t Au over 14.27m (ETW 14.27m)
- FTS1519 intercepted 3.47 g/t over 13.62m (ETW 11.55m)
- FTS1557 intercepted 7.77 g/t Au over 4.50m (ETW 4.25m)

Orebody A results from infill drilling and access development from the main ramp on Levels 11.3 and 11.4 confirmed the high grades and thickness profiles as predicted from the geological-resource models.

Orebody C drilling is being undertaken from development located on levels 3 and 4. The drilling is confirming that the structure hosting Orebody C extends to depth beyond mine level 8 approximately 500m down plunge and 400m vertically from the current underground excavations.

Further drilling is planned for Q2 and Q3 2019 to fully test this ore-shoot between level 4 and level 8 once a new drilling platform has been prepared for this purpose from the C-ramp on level 5.

Orebody A Drilling Summary

- Orebody A infill and grade control drilling between levels 11 and 12 confirms and enhances the wide, high grade ore shoot targeted by ramp development, which is currently at level 11 sub level 1. The marked increase in grades observed – once close spaced infill drilling and channel sampling of primary ore-development has been included in the modelling process– has been a consistent occurrence in Orebody A. This supports confidence for potential increases in grade, tonnage and ounces-per-vertical-metre with depth over and above current modelling that is based on widely spaced, growth exploration drilling information.

Orebody C Drilling Summary

- Growth exploration drilling, targeting down dip extensions from level 4, continues to confirm the structure hosting Orebody C extends to depth beyond mine level 8 approximately 500m down plunge and 400m vertically from the current underground excavations.
- Importantly, this drilling successfully tested and confirmed the changes in the plunge direction of the higher-grade ore shoot highlighted by earlier drilling and subsequently geologically - structurally mapped in the mine development on levels 3 and 4 in Q3-2018.
- The new plunge direction assumed is N75/48 (azimuth / dip) (previous N45/55). This high-grade plunge direction approximates the observed Orebody A high-grade zone plunge of N65/48.
- The observed change in the plunge control of the higher grade and wider parts of the Orebody Host Structure has positive implications for interpreting and targeting additional shallow mineralization further along the strike of the Orebody C structure where clear potential exists for the identification and delineation of additional high grade shoots below the C-Central and C-NW open pits.
- Infill drilling on Orebody C focused on conversion of Mineral Resources to Mineral Reserves between levels 3 and 5 for inclusion in the Mineral Resources and Mineral Reserves update (March 2019).
- Further drilling is planned for Q2 and Q3 2019 to fully test this ore-shoot between level 4 and level 8 once a new drilling platform has been prepared for this purpose from the C-ramp on level 5.

Processing

Ore produced at Turmalina is transported to the adjacent Carbon-In-Leach (“CIL”) processing plant. The Turmalina plant consists of three ball mills, of which two were operating since January 2016 (Mills #1 and #2) at a capacity of 1,500–1,600 tonnes per day (“tpd”). During Q4 2018, the plant processed 75,000 tonnes (t) at an average grade of 3.56 g/t, as compared to Q4 2017, the plant processed 95,000 tonnes at an average grade of 4.41 g/t, and 122,000 tonnes at 4.39 g/t in Q4 2016.

Overall, the processing plant maintained a recovery rate of 89% during Q4 2018, 91.2% during Q4 2017 and 92.5% recovery rate for Q4 2016. On 2017, the Company announced the successful recommissioning of Mill #3 with an estimated installed capacity of 1,600 tpd. Using only Mill #3, Turmalina will be able to achieve the entire throughput of the plant with a lower operating cost, through electricity consumption savings, compared to using both Mills #1 and #2 in 2016. Mills #1 and #2 have been taken off-line for maintenance and will be kept on standby mode. The reconstruction of Mill #3 is expected to allow the processing plant to be run at a full capacity of 2,000 tpd or approximately 720,000 t per year in future years using a combination of mills.

Mineral Reserves and Resources Update

The majority of the diamond drilling in 2018 was programmed to upgrade the classification of the Mineral Resources estimated from the previous year’s exploration results for Orebodies A and C. An additional goal was to increase the amount of Mineral Resources in the inferred category along the down-plunge extensions of these two orebodies. In 2018, 8.6 km of growth exploration drilling was completed that targeted the down-plunge depth extensions of

both Orebodies A and C.

Measured and Indicated Mineral Resources (as at December 31, 2018) at Turmalina alone total 577,000 oz. of gold (3,253,000 t grading 5.52 g/t Au). Inferred Resources as at December 31, 2018 at Turmalina total 148,000 oz. of gold (1,066,000 t grading 4.31 g/t Au). Additional Mineral Resources are located at the Faina and Pontal deposits, located to the northwest of the Turmalina Mine.

Turmalina Mine Mineral Reserves are reported as 228,000 oz. of gold, which represent the depletion of the mined ore from the previously reported reserves. Depletion by mining activity considers the period January 1 to December 31, 2018.

The Mineral Resource and Mineral Reserve estimates are based on the information provided in the Technical Report titled "Technical Report on the Turmalina Mine, Minas Gerais State, Brazil," to be filed on SEDAR on or before April 15, 2019 (the "Turmalina Technical Report").

The geological drilling database cut-off date used to prepare the estimates was December 31st, 2018.

Depletion from mine activity was considered through December 31, 2018.

Caeté Mining Complex – Production, Added Mineral Resources, Operational Review

The Caeté Gold Mine Complex has two underground mines: Pilar Gold Mine ("Pilar") and Roça Grande Gold Mine ("RG"). Pilar primarily uses sublevel open stoping with backfill. On March 22, 2018, the Roça Grande mine was placed on care and maintenance.

Ore produced from Pilar is transported to the 2,200 tpd gravity, flotation and CIL treatment of flotation concentrate processing plant adjacent to RG, a total distance of approximately 40 km by road. During Q4 2018, the Caeté plant achieved gold recovery of 86.9% utilizing gravity, flotation, and CIL treatment of flotation concentrate. Optimization of the plant offers opportunities for both increased gold extraction and reduced unit processing costs. Various options are being explored and evaluated to better use the currently underutilized processing facility.

Mining - Pilar

Pilar continued to focus on improvements on continuing with the initiatives to reduce dilution from overbreak which impact the mined grade and reduce profitability. The Pilar's geological team attention was focused predominantly on infill and exploration drilling in 2017 and 2018, with the goal of trying to improve the percentage of ore mined from the measured category on a monthly basis. A new wireframe model is being completed to better reflect the geology and lithology at Pilar, which will improve the estimation process. Based on the strong exploration drilling results and increases in the Mineral Reserves and Mineral Resources, primary and secondary development that had been suspended during Q4 2014 was resumed at Pilar during 2016. A specialized development contractor arrived on site in 2016 to accelerate the main ramp below Level 10 to open up additional resources. The contractor continued to assist with primary and secondary development at Pilar in 2017 and 2018.

During 2018, Pilar successfully completed an infill drilling and underground development on level 10 exposing wider and materially higher-grade mineralization in principal Orebodies. Highlights of the results include:

- PPL537 intercepted 22.8 g/t Au over 6.3m (ETW 5.5m)
- PPL498 intercepted 12.2 g/t Au over 13m (ETW 12.7m)
- PPL472 intercepted 6.5 g/t Au over 29.7m (ETW 28.8m)
- PPL495 intercepted 12.9 g/t Au over 8.4m (ETW 8.2m)

Ore Transport - Pilar

The improvements to the haulage route to the Caete processing plant achieved in 2016 and 2017 have continued to be successful. Jaguar welcomes the support from the landowners and the City of Caete in achieving this success.

Mining - Roça Grande

The Roça Grande mining activity has historically focused on surface exposures of gold deposits, where the orebody outcropped. The outcrops were mined using open-pit mining techniques, with exploration focused solely on the immediate down-dip projection of gold mineralization, and minimal exploration along strike between the outcrops. Underground, the RG operations team continues to evaluate more effective methods to mine the 1–2 m wide veins without excessive dilution, using a frontal-attack mechanized cut-and-fill mining method.

In March 2018, as part of refocusing its attention on improvements to the Turmalina and Pilar mines, and exploration growth activities, the Company made a strategic decision to temporarily suspend its Roça Grande mine operations. This temporary suspension is expected to continue for an unspecified future period.

Processing

Gold production at Caeté was 41,788 oz. in 2018, 38,686 oz. in 2017 and 33,350 oz. in 2016. Underground development at Pilar totalled 3.3 km in 2018, 4.3 km in 2017 and 4.6 km in 2016. During 2018, a total of 12.5 km of underground delineation and exploration drilling was conducted at the mine.

During 2018, the average head grade processed at Caeté significantly improved compared to the prior year, primarily due to the discontinuation of mining ore below the marginal cut-off grade and accessing BFII orebody at Pilar, in addition to the positive impact of suspending operations from RG which was a lower grade operation. Additional improvement in grade at Pilar was achieved through modifying the shape of the sub-level open stopes to minimize the inclusion of waste at the edge of the plunging ore shoots. Previous initiatives to reduce dilution from overbreak had proven successful and there were some gains from the update of the geological model.

During 2018, the Caeté plant achieved gold recovery of approximately 89% utilizing gravity, flotation, and CIL treatment of flotation concentrate. Optimization of the plant offers opportunities for both increased gold extraction and reduced unit processing costs. Various options are being explored and evaluated to better use the currently underutilized processing facility.

Mineral Reserves and Resource Update - Pilar

The database used to update the wireframe model for Pilar and to prepare the 2018 Mineral Resource and Mineral Reserves estimates included 1,658 drill holes and 20,698 channel samples.

Measured and Indicated Mineral Resources for Pilar totalled 666,000 oz. of gold (4,934,000 t grading 4.20 g/t Au). Inferred Resources for Pilar totalled 161,000 oz. (1,385,000 t grading 3.61 g/t Au).

Mineral Reserves for Pilar are 211,000 oz. of gold (1,784,000 t grading at 3.68 g/t Au) considering the depletion of the mined ore from the reserves.

Depletion from mine activity was considered through December 31, 2018.

Mineral Reserves and Resource Update - Roça Grande

At Roça Grande, the assessment of the available data geological models and resource estimations deposits included RG1, 2, 3, 6 and 7 deposits. RG currently has no Mineral Reserves and the mine remains under care and

maintenance.

At an assumed price of \$1,400 per ounce, the Measured and Indicated Mineral Resources of RG totalled 96,000 oz. (1,077,000 t at an average grade of 2.77 g/t Au) and 1,759,000 t at an average grade of 3.48 g/t Au of Inferred Resources, totalling 197,000 oz. of gold. Estimates are based on the 2015 grade-block model, and depletion of 2016, 2017 and 2018 mined ore from existing resources.

Gurupi Revised Earn-In Agreement with Avanco Resources Limited

On October 4, 2016, Jaguar entered into an earn-in agreement with Avanco Resources Limited (the "Avanco Agreement"), pursuant to which Avanco may earn up to a 100% interest in Gurupi. Avanco is a Brazilian focused mining exploration and development company, targeting exploration and near-term production from copper and gold projects. Avanco's Board of Directors and Management team have extensive global resource industry experience, particularly in Northern Brazil where they have recently commissioned the Antas coppergold mine on-schedule and under budget. Avanco has offices in Perth, Australia, and Rio de Janeiro and Parauapebas, Brazil.

On September 18, 2017, the Company announced that it had signed a revised accelerated earn-in agreement with Avanco for the sale of the Gurupi project. Under the terms of the revised Avanco Agreement, and following the satisfactory completion of certain closing conditions, Avanco earned 100% of Jaguar's equity interest in Gurupi by committing to pay to Jaguar \$9 million in aggregate cash payments. To date, Jaguar has received an initial aggregate cash payment of \$4 million, in two instalments of \$2 million each in September and October 2017. The additional \$5 million is expected to be paid to Jaguar in a series of 10 instalments of \$500,000 per month after lifting of the injunction. Jaguar completed the sale of the Gurupi Project to Avanco on October 31, 2017.

In addition, within 24 months of the initial \$4 million payment, Avanco will arrange to have published an Australian Joint Ore Reserve Committee ("JORC") code compliant technical report regarding Gurupi with mineral reserves in excess of 500,000 oz. of gold. Any delay in this milestone will result in a project delay fee payable to Jaguar of \$250,000 per six months of delayed period. Within 60 months of the initial \$4 million payment, Avanco will aim to commission the Gurupi mine and plant. Any delay in this commissioning milestone will result in a separate project delay fee payable to Jaguar of \$250,000 per six months of delayed period.

As part of the Agreement, Jaguar will retain a life of mine ("LOM") Net Smelter Return ("NSR") royalty ("Royalty") from production at Gurupi. The Royalty will be 1% NSR on the first 500,000 oz. of gold or gold ounce equivalents sold; 2% NSR on sales from 500,001 to 1,500,000 oz. of gold or gold ounce equivalents; and 1% NSR on gold sales exceeding 1,500,000 oz. of gold or gold ounce equivalents.

In Q1 2018, Avanco entered into an agreement with OZ Minerals Limited ("OZ Minerals" or "OZL") whereby OZ Minerals acquired all of the issued shares of Avanco, which includes the Gurupi asset.

Credit Agreement with Sprott Private Resource Lending (Collector) LP

On November 7, 2016, the Company entered into an agreement with Sprott Private Resource Lending (Collector) LP ("Sprott Lending") for a secured loan facility ("Sprott Facility") totalling \$10 million ("Tranche 1") to fund accelerated growth exploration initiatives. Tranche 1 of the Sprott Facility is payable over a term of 30 months, in equal monthly repayments of principal, plus interest, with an interest rate of 6.5% per annum, plus the greater of US dollar LIBOR or 1.25% per annum. In consideration for the structuring and syndication of Tranche 1, the Company has made a cash payment to Sprott Lending for structuring and legal fees. In consideration for providing the financing commitment, the Company issued an aggregate of 650,000 common shares of Jaguar to Sprott Lending and to Natural Resource Income Investing Limited Partnership.

On June 9, 2017, the Company completed a secured loan facility with Sprott Lending on terms substantially similar to those of Tranche 1, pursuant to an agreement for an additional tranche of the Sprott Facility totalling \$5 million

("Tranche 2"). Tranche 2 of the Sprott Facility is payable over a term of 36 months, in equal monthly repayments of principal, plus interest, with an interest rate of 6.5% per annum, plus the greater of US dollar LIBOR or 1.25%.

Sprott Lending is an indirectly wholly owned subsidiary of Sprott Inc., of which the Chairman is Mr. Eric Sprott. Mr. Sprott is a shareholder and held approximately 19% of the common shares as of November 8, 2016. The Agreement constitutes a "related party transaction" within the meaning of Multilateral Instrument 61-101 – Protection of Minority Security Holders in Special Transactions ("MI 61-101"). Since the value of the Sprott Facility and the consideration for the transaction was less than 25% of Jaguar's market capitalization, the Company was exempt from the formal valuation and minority shareholder approval requirements of MI 61-101.

In Q3 2018, the Company entered into an agreement for a new \$7 million unsecured customer advances (the "Auramet Advance") with Auramet to replace the Company's "secured" loan facility with Sprott Resource Lending effective June 30, 2018. The customer advances is in the form of a gold purchase and sale agreement whereby Auramet has extended up to \$7 million to Jaguar. As part of the agreement, the Company is required to maintain a \$3 million deposit with Auramet. Funds advanced under the Customer Advances are subject to interest at 1-month LIBOR + 7.5%, as well as a covenant to maintain a minimum net cash balance of \$5 million, including the deposit. On June 22, 2018, Jaguar collected \$7 million in proceeds pursuant to the Auramet Advance, and in July 2018, the Company made the \$2 million margin deposit.

DESCRIPTION OF THE BUSINESS

General

Jaguar is a gold mining company engaged in gold production and in the acquisition, exploration, development and operation of gold mineral properties in Brazil.

Jaguar's operating mining complexes, Turmalina and Caeté, and the Paciência Mine Complex (currently on care and maintenance) are located in or adjacent to the Iron Quadrangle region of Brazil, a greenstone belt located east of the city of Belo Horizonte in the state of Minas Gerais. Jaguar's portfolio also includes the Pedra Branca Project in the state of Ceará.

Through its wholly owned subsidiary, MSOL, Jaguar has interests in, and controls, the mineral rights, concessions and licences to the mineral resources and mineral reserves presented under the section entitled "*Mineral Resources and Mineral Reserves.*"

All of Jaguar's production facilities are, or will be, near Jaguar's mineral concessions and are accessible via existing roads. Jaguar believes it has an advantage over other gold mine operators due to the clustered nature of its mineral resource concessions and the proximity of its concessions to its processing facilities and existing infrastructure.

Gold Production and Sales

Gold production in 2018 totalled 75,048 oz. at cash operating cost of \$732 per ounce sold, compared to 2017 production of 84,151 oz. at a cash operating costs of \$837 per ounce sold, and in 2016 production of 96,608 oz. at a cash operating cost of \$719 per ounce sold.

Gold sales in 2018 totalled 74,530 oz., compared to 2017 sales of 83,750 oz. and 2016 sales of 97,277 oz.

Competitive Conditions

The gold exploration and mining business is an intensely competitive business. Jaguar competes with numerous companies and individuals in the search for, and the acquisition of, mineral licences, permits and other mineral interests, as well as for the acquisition of equipment and the recruitment and retention of qualified personnel. There

is also significant competition for the limited number of gold property acquisition opportunities. Jaguar's ability to acquire gold mineral properties in the future will depend not only on its ability to develop its present properties, but also on its ability to select and acquire suitable producing properties or prospects for gold development or mineral exploration.

Employees

As at December 31, 2018, Jaguar had 999 employees compared to 1,090 employees in 2017 and 1,180 employees in 2016. All, but 2 employees, are located in Brazil.

Foreign Operations

All of Jaguar's mineral projects are owned and operated through MSOL. Jaguar's wholly owned properties are located in the states of Minas Gerais and Ceará in Brazil. Jaguar is entirely dependent on its foreign operations for the exploration and development of gold properties and for production of gold.

Health, Safety, and Environmental

People are the most valuable asset of the Company. Jaguar sets the life and welfare of its employees, families and communities as a first priority. Jaguar's safety and healthcare procedures are focused on promoting health and quality of life in the work environment. Jaguar has an integrated management system in place that promotes open communication at all levels.

Over the past few years, the health and safety team has expanded in order to meet compliance and regulatory requirements, and also to improve the Company's operating standards. Jaguar's training program for new employees is extensive and includes the participation of experienced professionals who act as mentors, providing hands-on guidance and conducting periodical reviews.

Jaguar applies an extended maternity leave period in order to promote health for newborns and also offers social work assistance in order to support the Company's employees and families in challenging circumstances.

For every reported incident, Management identifies the likely causes and develops remediation plans to prevent future recurrences. The overall Lost Time Injury ("LTI") frequency rate is calculated as the number of lost-time injuries per million hours worked, including third party contractors. All accidents are analyzed, and the underlying causes are identified to implement corrective actions.

Technical Information

The estimated Mineral Reserves and Mineral Resources for Jaguar's mines and mineral projects set forth in this Annual Information Form have been estimated in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") Council definitions adopted by the CIM Council on May 10, 2014 (the "CIM Standards"). The following definitions are reproduced from the CIM Standards:

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

The term "*Inferred Mineral Resource*" is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Mineral Resource has a lower level of confidence

than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

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

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

The term “*Mineral Reserve*” means the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined.

The term “*Probable Mineral Reserve*” means the economically mineable part of an Indicated and, in some circumstances, a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified.

The term “*Proven Mineral Reserve*” means the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.

Mineral Resource and Mineral Reserve Estimates

In March 2019, Jaguar completed the estimation of its Mineral Resources and Mineral Reserves. The estimates were prepared by the Company’s technical services team under the supervision of Jonathan Victor Hill, BSc (Hons) (Economic Geology - UCT), who is a Qualified Person in accordance with the National Instrument 43-101 - *Standards of Disclosure for Mineral Projects* (“NI 43-101”). Based on the reconciliation, as of December 31, 2018, Jaguar’s Mineral Resources are (i) Measured and Indicated Mineral resources of 9,935,000 t with an average grade of 4.57 g/t Au containing 1,459,000 oz. of gold, and (ii) Inferred Mineral resources of 5,882,000 t with an average grade of 4.69 g/t Au containing 887,000 oz. of gold. Jaguar’s Proven and Probable Mineral Reserves, which are included in the Measured and Indicated Mineral Resource figure above, are 3,192,000 t with an average grade of 4.28 g/t Au containing 439,000 oz. of gold. The tables below set the Mineral Resource and Mineral Reserve estimates for the Turmalina and Caeté operations as indicated in the Notes below.

Table 1 Summary of Mineral Reserves as of December 31, 2018

	Proven Reserves			Probable Reserves			Proven & Probable Reserves		
	Tonnes	Grade	Gold oz	Tonnes	Grade	Gold oz	Tonnes	Grade	Gold oz
	(000's)	(g/t)	(000's)	(000's)	(g/t)	(000's)	(000's)	(g/t)	(000's)
Turmalina Gold Complex									
Ore Body A	345	5.23	58	257	5.78	47	602	5.47	105
Ore Body C	388	3.53	44	418	5.85	79	806	4.73	123
Total - Turmalina	733	4.33	102	675	5.82	126	1,408	5.05	228
Caeté Gold Complex									
Pilar									
Ore Body BA	81	5.16	13	23	2.89	2	104	4.66	15
Ore Body BF	383	3.72	46	239	3.98	31	622	3.82	77
Ore Body BFII	633	3.71	75	159	2.88	15	792	3.54	90
Ore Body Torre	43	3.72	5	42	4.58	6	85	4.15	11
Ore Body LFW	29	2.97	3	-	-	-	29	2.97	3
Ore Body LPA	7	3.35	1	-	-	-	7	3.35	1
Ore Body SW	-	-	-	144	3.11	14	144	3.11	14
Total - Pilar	1,176	3.79	143	608	3.47	68	1,784	3.68	211
Roça Grande	-	-	-	-	-	-	-	-	-
Total - Caeté	1,176	3.79	143	608	3.47	68	1,784	3.68	211
Total - Mineral Reserves	1,909	4.00	245	1,283	4.71	194	3,192	4.28	439

Notes:

1. CIM (2014) definitions are followed for Mineral Reserves.
2. Mineral Reserves at Turmalina were estimated at a break-even cut-off grade of 2.5 g/t Au. Mineral Reserves at Pilar are estimated at a cut-off grade of 1.90 g/t Au.
3. Mineral Reserves are estimated using an average long-term gold price of \$1,300 per ounce, and a US\$/BRL\$ exchange rate of 3.70.
4. A minimum mining width of 2 m was used.
5. Number may not add due to rounding.
6. There are no known environmental, permitting, legal, title, socio-economic, political or other risk factors which could materially affect the Mineral Reserve estimates.

Table 2: Summary of Mineral Resources as of December 31, 2018

	Measured Resources			Indicated Resources			Measured & Indicated Resources			Inferred Resources		
	Tonnes	Grade	Gold oz	Tonnes	Grade	Gold oz	Tonnes	Grade	Gold oz	Tonnes	Grade	Gold oz
	(000's)	(g/t)	(000's)	(000's)	(g/t)	(000's)	(000's)	(g/t)	(000's)	(000's)	(g/t)	(000's)
Turmalina Gold Complex												
Ore Body A	894	6.86	197	339	7.61	83	1,233	7.07	280	372	4.81	58
Ore Body B	353	3.34	38	192	4.26	26	545	3.66	64	18	6.46	4
Ore Body C	520	4.20	70	955	5.31	163	1,475	4.92	233	676	3.97	86
Sub-Total Turmalina	1,767	5.37	305	1,486	5.70	272	3,253	5.52	577	1,066	4.31	148
Faina	72	7.39	17	189	6.66	42	261	6.87	58	1,542	7.26	360
Pontal	251	5.00	40	159	4.28	22	410	4.72	62	130	5.03	21
Total - Turmalina	2,090	5.40	362	1,834	5.68	336	3,924	5.53	697	2,738	6.00	529
Caeté Gold Complex												
Pilar												
Ore Body BA	521	4.13	69	82	3.62	9	603	4.03	78	98	3.03	9
Ore Body BF	815	4.47	117	459	5.24	77	1,274	4.74	194	398	3.29	42
Ore Body BFII	969	4.94	154	186	3.46	21	1,155	4.71	175	538	4.42	77
Ore Body Torre	373	3.99	48	273	3.95	35	646	4.00	83	300	3.02	29
Ore Body LFW	185	2.93	17	18	2.84	2	203	2.91	19	10	3.08	1
Ore Body LHW	67	2.72	6	7	2.33	1	74	2.94	7	-	-	-
Ore Body LPA	149	4.96	24	-	-	-	149	4.96	24	-	-	-
Ore Body SW	-	-	-	830	3.23	86	830	3.23	86	42	2.02	3
Total - Pilar	3,079	4.40	435	1,855	3.87	231	4,934	4.20	666	1,385	3.61	161
Roça Grande	188	2.14	13	889	2.91	83	1,077	2.77	96	1,759	3.48	197
Total - Caeté	3,267	4.26	448	2,744	3.56	314	6,011	3.94	762	3,144	3.54	358
Total Mineral Resources	5,357	4.70	810	4,579	4.42	650	9,935	4.57	1,459	5,882	4.69	887

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources at the Turmalina Gold Complex include the Turmalina Mine, Faina deposit, and Pontal deposit.
3. Mineral Resources are estimated at a cut-off grade of 2.10 g/t Au at Turmalina, 3.8 g/t Au at Faina, and 2.9 g/t Au at Pontal. Mineral Resources are estimated at a cut-off grade of 1.46 g/t Au for RG and 1.8 g/t Au for Pilar.
4. Mineral Resources at Turmalina include all drill hole and channel sample data and mining excavations as of December 31, 2018.
5. Mineral Resources at the Faina and Pontal deposits remain unchanged from those stated as at December 31, 2015.
6. Mineral Resources are estimated using a long-term gold price of \$1,500 for Turmalina and Pilar. Mineral Resources for Faina Pontal and Roça Grande Deposits are estimated using a long-term gold price of \$ 1,400.
7. Mineral Resources are estimated using an average long-term foreign exchange rate of 3.70 Brazilian Reais: 1 US Dollar for Turmalina and Pilar. Mineral Resources are estimated using an average long-term foreign exchange rate of 2.5 Brazilian Reais: 1 US Dollar for Faina, Pontal and Roça Grande deposits.
8. A minimum mining width of approximately 2 m was used.
9. Mineral Resources are inclusive of Mineral Reserves at Turmalina. No Mineral Reserves are currently present at RG. Mineral Resources are inclusive of Mineral Reserves for Pilar.
10. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
11. Numbers may not add due to rounding.

Notes to Tables 1 and 2

Although Jaguar has carefully prepared and verified the Mineral Resource and Mineral Reserve figures presented herein, such figures are estimates, which are, in part, based on forward-looking information and no assurance can be given that the indicated amounts of gold will be produced. Estimated Mineral Reserves may have to be recalculated based on actual production experience. Market price fluctuations of gold as well as increased production costs or reduced recovery rates and other factors may render the present Proven and Probable Mineral Reserves unprofitable to develop at a particular site or sites for periods of time. See “Risk Factors” and “Cautionary Note Regarding Forward-Looking Statements.”

Mining Concessions and Environmental Licences

All of Jaguar’s mineral rights and mining concessions in connection with its operations in the state of Minas Gerais and mineral rights and exploration licences in connection with its Gurupi and Pedra Branca projects located in the states of Maranhão and Ceará, respectively, are in good standing. Through its wholly owned subsidiaries, Jaguar has all the necessary environmental licences that are material to the operation of its mines and processing plants in Minas Gerais. At this time, Gurupi remains in a stalled process awaiting a solution to the suspension of the environmental licence.

Material Mineral Properties

Turmalina, Caeté and Gurupi are material properties of Jaguar.

1. Turmalina Mining Complex

The scientific and technical information contained in this AIF relating to the Company’s Turmalina Mining Complex is derived from the Turmalina Technical Report, to be filed on SEDAR on or before April 15, 2019. The mineral resource numbers are updated considering the geological information obtained during 2018, depleted with areas mined during 2018. The Turmalina Technical Report were prepared under the supervision and reviewed by Jeff Sepp, P. Eng., and Reno Pressacco, P. Geo., from RPA, each of whom is a “qualified person” as that term is defined in NI 43-101. Portions of the following information are based on assumptions, qualifications and procedures that are not fully described herein. Reference should be made to the full text of the Turmalina Technical Report.

Property Description and Location

The Turmalina Mining Complex is located in the Conceição do Pará municipality in the state of Minas Gerais, approximately 130 km northwest of Belo Horizonte and 6 km south of Pitangui, the nearest important town.

The property comprises nine contiguous mineral rights concessions granted by the Agência Nacional de Mineração (ANM) that cover an area of 5,034 ha. The mine is centred at approximately 19°44’36” south latitude and 44°52’36” west longitude.

The Turmalina Mining Complex consists of an underground mine and a carbon-in-pulp (“CIP”) processing plant (the “Turmalina Plant”). The Turmalina Plant was commissioned in November 2006 and commercial production was declared in August 2007. Turmalina has a 3,000 tpd CIP process facility with three lines of grinding mills, only one of which is operated to cater to current production volumes of 1200 tpd. Studies are underway to find opportunities to fill the unused capacity via brownfield exploration and remnant mining.

Jaguar has 100% ownership subject to a 5% net revenue interest up to \$10 million and 3% thereafter, to an unrelated third party. In addition, there is a 0.5% net revenue interest payable to the surface landowner.

Accessibility, Climate, Local Resources, Infrastructure and Physiography

The Turmalina Mining Complex is accessed from Belo Horizonte by 120 km of paved highways (BR-262 and MG-423) to the town of Pitangui. The Turmalina deposits are 6 km south of Pitangui and less than 1 km from highway MG-423.

Belo Horizonte is the commercial centre for Brazil's mining industries and has excellent infrastructure to support world-class mining operations. This mining region has historically produced significant quantities of gold and iron from open pit and large-scale underground mining operations operated by AngloGold, Vale, CSN, and Eldorado. The city is a well-developed urban metropolis of almost four million residents 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.

Pitangui is a town of approximately 25,000 people. The local economy is based on agriculture, cattle breeding and a small pig iron plant. Manpower, energy and water are readily available.

The Turmalina mining complex lies approximately 700 m above sea level ("MASL"). The Pitangui area terrain is rugged in places, with numerous rolling hills incised by deep gullies along drainage channels. Farming and ranching activities are carried out in approximately 50% of the region.

The area experiences six months of warm dry weather (April to November) with the mean temperature slightly above 20° C, followed by six months of tropical rainfall. Annual precipitation ranges from 1,300 to 2,500 mm and is most intense in December and January. The climate is suitable for year-round operations.

Belo Horizonte is one of the world's mining capitals with a regional population in the range of four million people. Automobile manufacturing and mining services dominate the economy. General Electric has a major locomotive plant that 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. The Turmalina Mine site is within commuting distance of Belo Horizonte.

The Turmalina Mining Complex includes a nominal 2,000 tpd processing plant and tailings disposal area. Electrical power is obtained from the national grid.

All ancillary buildings are located near the mine entrance: gate house including a reception area and waiting room, administration building, maintenance shops, cafeteria, warehouse, change room, first aid and compressor room. The explosives warehouse is located 1.2 km away from the mine area, in compliance with the regulations set forth by the Brazilian Army.

Other ancillary buildings are located near the processing plant and include an office building, a laboratory, warehousing and a small maintenance shop.

There is no infrastructure related to the Faina and Pontal historic open pit operations.

History

Gold was first discovered in the area in the 16th century, and through the 19th century, intermittent small-scale production took place from alluvial terraces and outcropping quartz veins. Gold production exploited alluvium or weathered material, including saprolite and saprolite-hosted quartz veins. Records from this historical period are few and incomplete.

AngloGold controlled the mineral rights from 1978 to 2004 through a number of Brazilian subsidiaries. AngloGold explored the project area extensively between 1979 and 1988 using geochemistry, ground geophysics, and

trenching, which led to the discovery of the Turmalina, Satinoco (Orebody C), Faina, Pontal and other mineralized zones. Exploration work at these mineralized bodies included 22 diamond drill holes totalling 5,439 m drilled from the surface to test the downward extension of the sulphide mineralized body. At the Satinoco target (Orebody C), a total of 1,523 m was completed in nine holes.

In 1992 and 1993, AngloGold mined 373,000 t of oxide ore from open pits at the Turmalina, Satinoco (now referred to as Orebody C), Pontal, and Faina zones. It recovered 35,500 oz. of gold using heap leach technology. Subsequently, AngloGold drove a ramp beneath the pit and carried out drifting on two levels in the mineralized zone at approximately 50 m and 75 m below the pit floor to explore the downward extension of the sulphide mineralized body.

Jaguar acquired the AngloGold Turmalina properties in 2004 and continued operation of the underground mine. The mine is accessed from a 5 m x 5 m primary decline located in the footwall of the main deposit.

Geological Setting

The Turmalina deposits are located in the western part of the Iron Quadrangle, which has 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 about 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-aged banded iron formations (BIF) contained within greenstone belt supracrustal sequences.

In the Brumal region, outcrops belonging to the granitic gneiss basement of the Nova Lima and Quebra sub-groups of the Rio das Velhas Supergroup occur. The granitic gneiss 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 upper contact of the sequence is discordant and tectonically induced by reverse faulting. The Rio das Velhas is regionally represented by schists of the Nova Lima and meta-ultramafic rocks of the Quebra Group including serpentinites, talc schists, and metabasalts.

Iron formations occur as the only meta-sedimentary rocks in layers with thicknesses up to 10 m. The Nova Lima Group can be sub-divided into two units: a unit consisting of talc chlorites and intercalations of iron formation, fuschite schist, quartz sericite schist, and carbonaceous phyllite; and a unit hosting sulphidized gold bearing iron formation and quartz sericite schists.

The Pitangui area, where Turmalina is located, is underlain by rocks of Archean and Proterozoic age. Archean units include a granitic basement, overlain by the Pitangui Group, a sequence of ultramafic to intermediate volcanic flows and pyroclastics and associated sediments. The Turmalina deposit is hosted by chlorite-amphibole schist and biotite schist units within the Pitangui Group. A sequence of sheared, banded, sulphide iron formation and chert lies within the stratigraphic sequence. The stratigraphy locally strikes azimuth 135°.

Proterozoic units include the Minas Supergroup and the Bambui Group. The former includes basal quartzites and conglomerates as well as phyllites. Some phyllites, stratigraphically higher in the sequence, are hematitic. The Bambui is composed of calcareous sediments.

The local geology in the Turmalina and adjacent exploration areas was defined by AngloGold, specifically by UNIGEO geologists during the initial exploration field work. At that time, the mapped lithologies were defined and classified as a greenstone sequence, within a possible western extension of the Iron Quadrangle.

The stratigraphic column defined by UNIGEO in the region, from bottom to the top was:

- Basement

The basement is composed of foliated, leucocratic granite and gneisses. Locally, it has been defined as migmatite portions with porphyry crystals of quartz and K- feldspars. Granitic intrusions with fine to medium texture and diabase dikes are common.

- Pitangui Group

The Pitangui Group is defined as a greenstone belt sequence, of Archean age. It shows the following sequence:

- Meta-Ultramafic and Meta-Mafic Volcanic Unit (Basal Unit): constituted by interlayered igneous ultramafic and mafic flows represented by serpentinite, chlorite-actinolite schist and amphibolite with layers of talc schist, oxide BIF and carbonaceous schist;
- Meta-Mafic and Meta-Sediment Unit (Middle Unit): constituted by interlayered meta-mafic (chlorite-actinolite schist with dacitic intrusion at the top);
- Meta-sediment: cummingtonite BIF and metachert-rich horizons interlayered with carbonaceous and chlorite schist, locally, layers of meta-arkose can be observed);
- Meta-mafic: alternation of amphibolite and chlorite-actinolite layers;
- Pyroclastic and meta-pelites: volcanic meta-conglomerates at the bottom, transitioning to or alternating with foliated meta-lapilli tuffs and metatuffs at the top of the sequence, where the meta-tuffs are predominant;
- Meta-sediments (Upper Unit): narrow and numerous interlayered layers of quartz-sericite schist, quartz-chlorite schist, quartz-sericite-chlorite schist, and carbonate-rich schist.

- Minas Supergroup

The Minas Supergroup is defined as clastic and chemical sediments in a Proterozoic sequence composed by thin to coarse quartzites with layers of the basal conglomerates. The quartzite is covered by grey carbonate phyllites and white sericite phyllites, which present hematite increasing to the top of the sequence.

- Intrusive Rocks

The intrusive rocks are defined as granitic and mafic to ultramafic rocks. The general stratigraphic sequence strikes towards azimuth 320° and dips moderately to steeply to the east. The sequence consists the Pitangui Group of bedded metasediments of volcanic origin including quartz-sericite schists and sericite-chlorite-biotite schists grading stratigraphically upwards into a metachert, banded iron formation (BIF) and graphitic schist. Overlying these sediments is a thicker sequence of tuffaceous metasediments and quartz-chlorite schists. All units have been metamorphosed to the amphibolite grade.

Exploration

Geochemistry

AngloGold performed a regional geochemistry survey covering an area of 430 km² in the Turmalina region. A total of 875 stream sediments and 446 pan concentrate samples were collected. Stream sediment samples were assayed for Au, Cu, Zn, Pb, Cr, Sb, and As. Pan concentrate samples were assayed for Au only.

Soil geochemistry sampling was executed by AngloGold in both the Faina and Pontal areas with grids varying from 100 m x 20 m to 10 m x 10 m. At Faina, 1,272 soil samples were collected and 16,900 m of lines were opened. At Pontal, 1,698 soil samples were collected and 28,000 m of lines were opened.

Several samples returned gold grades superior to 300 parts per billion. A significant portion of the soil samples collected from these targets were also assayed for As and Sb. There is a strong relation between gold and As/Sb since gold is associated directly with quartz veins with arsenopyrite and/or berthierite in the region.

Initial exploration efforts by Jaguar in 2004 focused on the re-interpretation of the AngloGold data (trenches, soil geochemistry, and drilling) to better understand the local geology. These efforts were concentrated on the targets previously identified by AngloGold: Main, NE and Satinoco.

An exploration program was carried out at the Satinoco (Orebody C) target by Jaguar from March 2006 to April 2008 in order to collect sufficient information to prepare an estimate of the Mineral Resources in accordance with NI 43-101. This Satinoco (Orebody C) program included the opening of about 700 m of trenches and the collection of 146 channel samples crossing the mineralized zone and a complementary diamond drill program.

Jaguar carried out a program of soil sampling, chip sampling, trenching, and geological mapping in 2018 on the Zona Basal target, located approximately four kilometres to the west of Orebodies A and C.

The soil sampling program involved the collection of 670 soil samples from the B-horizon which were analysed for gold and 48 elements by the ALS Chemex laboratory located in Vespasiano. This soil sampling program was carried out along a series of 12 sampling lines, that were spaced approximately 50 m apart. The soil sampling program detected the presence of two gold anomalies that were oriented in a northwest-southeast direction, roughly parallel to the regional stratigraphic trends. The gold anomalies contained elevated values of arsenic and antimony. Detailed mapping in the area of the soil anomalies found several small gossanous outcrops where grab samples yielded grades between 1.38 g/t Au and 26.5 g/t Au.

A total of 14 trenches were excavated totaling 1,434 m in length. These trenches were geologically mapped and samples taken of any material that was believed to contain gold mineralization. A total of 1,055 channel samples were taken.

Geological mapping was carried out by Jaguar's exploration team over an area of approximately 78 hectares at a scale of 1:2,500 (Figure 9-3). This mapping program discovered numerous occurrences of rock outcroppings, mostly located along the various drainage features in the area.

It is clear that the exploration program carried out over the Zona Basal target has discovered gold mineralization over an area measuring approximately 1,000 m to 1,250 m along strike and approximately 500 m across strike in an area that was not previously considered as having potential for hosting potentially economic mineralization. RPA agrees with Jaguar's view that the results obtained from the Zona Basal target area merit further examination by means of a preliminary diamond drilling program. In RPA's opinion, the soil sampling and geological mapping programs should be extended along the southwestern projection of the Zona Basal stratigraphy to search for the presence of additional gold-bearing mineralization in this area.

Geophysical Surveys

In the 1980s, AngloGold contracted the Instituto de Pesquisas Tecnológicas (IPT) to execute a ground geophysics survey at the Faina and Pontal areas. At Faina, a 50 m x 100 m grid was made composed of 11 lines covering about 31.5 ha. At Pontal, the grid was 40 m x 100 m, with 24 lines covering about 130 ha. Part of this area (approximately 56 ha) was surveyed by ground magnetics in a 5 m x 25 m grid.

Several geophysical anomalies were defined by both methods and most of them showed a strong relation with the geochemical anomalies. This information was used for the planning of trench locations.

In 2004, the Minas Gerais Government Mining Agency (COMIG) completed a supplementary airborne geophysical survey, covering all the Iron Quadrangle and the adjacent areas, totalling approximately 36,400 km². This survey was performed by LASA SA on a 250 m grid using magnetic and gamma ray methods. All Jaguar targets, including the Turmalina Mine, were covered with these geophysical surveys.

Drilling

Following the trenching and channel sampling program between March 2006 and April 2008, Jaguar completed a three-phase drilling campaign in the Turmalina Mine area:

Phase 1: 5,501 m drilled in 35 holes. This program tested the continuity of the mineralized bodies between the weathered zone and up to 200 m below the surface.

Phase 2: 3,338 m drilled in 24 complementary in-fill holes to create a 25 m x 60 m grid between the surface and 100 m below and to test the lateral continuity of the mineralized bodies.

Phase 3: An additional drill hole campaign was carried out in 2007, which consisted of 12,763 m drilled in 48 holes. Results from holes FSN 10 to 68 from this campaign were included in the mineral resource estimate contained in the original TechnoMine technical report, dated October 22, 2007. Results from the remaining drill holes FSN 69 to 113 were included in the second TechnoMine technical report dated February 5, 2008.

During the three Satinoco/Orebody C drilling phases, 2,338 core samples from holes FSN 10 to 113 were collected. The drill program was carried out by Mata Nativa Comércio e Serviços Ltda. (Mata Nativa), a local drilling company, using Longyear drill machines.

Drill hole lengths ranged from 32 m to 453 m. Core diameters were consistently HQ from surface through the weathered rock to bedrock. At approximately 3 m into bedrock, the holes were reduced to NQ diameter to the final depth.

Collar locations for the holes were established by theodolite surveys. All holes were drilled within 3 m of the planned location. Azimuth and inclination for angle holes were set by Brunton compass, deemed accurate to within 2° azimuth and <1° inclination.

Following completion of the holes, the collars were resurveyed with theodolite and cement markers emplaced. Downhole surveys were completed in all holes with length greater than 100 m, using Sperry-Sun or Maxibore equipment.

The average core recovery was greater than 90%. Core samples were collected during these phases and sent to laboratories for gold assays (discussed in the next section).

Jaguar has continued to carry out drilling and channel sampling programs on the Orebodies. The drilling has been carried out from surface locations that provide general information as to the location of the mineralized zones. Further detailed drill hole information is gathered for the three Orebodies from underground locations. Final detailed information of the location and distribution of the gold mineralization is collected by means of channel sampling of underground exposures.

Surface diamond drilling was carried out by the drilling contractor Mata Nativa using HQ and NQ tools. HQ-sized equipment is used for the portion of the hole that traverses the saprolite horizon and the hole diameter is then

reduced to NQ when the fresh rock is reached. The diamond drill core procedures adopted by Jaguar are described below:

- Only drill holes with more than 90% core recovery from the mineralized zone were accepted.
- Drill hole deviations (surveys) were measured by Sperry-Sun or DDI/Maxibore equipment.
- The cores were stored in wooden boxes of 1 m length with 3 m of core per box (HQ diameter) or 4 m of core per box (NQ diameter). The hole's number, depth, and location were identified in the boxes by an aluminum plate on the front of the box and by a water-resistant ink mark on its side. The progress interval and core recovery are identified inside the boxes by small wooden or aluminum plates.

The results of on-going drilling programs that targeted the down-plunge areas of Orebody A and C were released in the 2018. The holes were designed to intersect the projected plunge and dip of the mineralization as closely as perpendicularly as possible. A summary of the significant intersections of the 2018 drilling campaign has been gathered as at December 31, 2018, is provided in Table 3.

Table 3: Summary of Significant Intersections, 2018

2018 Drilling Program Jaguar Mining Inc. – Turmalina Mine						
Hole ID	From (m)	To (m)	DownHole Interval (m)	Estimated True Width (m)	Gold Grade (g/t Au)	GT (ETW)
FTS1480	166.65	177.00	10.35	9.13	2.52	23.01
Including	172.90	177.00	4.10	3.60	5.55	19.98
FTS1481	178.20	184.30	6.10	5.61	2.35	13.18
FTS1482	174.30	180.15	5.85	5.11	7.70	39.34
FTS1483	193.05	194.05	1.00	0.80	4.47	3.58
FTS1484	No Impact					
FTS1485	206.45	209.30	2.85	2.49	3.97	9.88
FTS1486	185.00	200.10	15.10	14.65	5.10	74.76
FTS1487	217.85	219.95	2.10	1.95	6.84	13.34
FTS1488	178.15	179.41	1.26	1.22	4.36	5.32
	181.46	188.09	6.63	6.46	1.85	11.95
	192.30	199.30	7.00	6.82	5.42	36.96
FTS1489	183.00	186.15	3.15	2.34	4.65	10.89
FTS1544	65.20	72.38	7.18	6.99	2.78	19.43
FTS1545	74.95	79.10	4.15	3.75	7.57	28.39
FTS1546	67.70	69.80	2.10	1.80	4.44	7.99
FTS1547A	80.41	83.60	3.19	2.76	2.96	8.17
FTS1553	93.95	95.05	1.10	0.90	1.79	1.61
FTS1555	176.00	177.90	1.90	1.70	1.27	2.16
FTS1556	109.80	110.90	1.10	1.09	2.09	2.28
	206.70	209.40	2.70	2.50	5.11	12.78
FTS1557	163.10	167.20	4.10	3.90	1.39	5.42
	187.75	192.25	4.50	4.00	7.95	31.81
FTS1550	201.65	202.90	1.25	1.24	1.10	1.36
FTS1551	149.05	150.00	0.95	0.89	1.01	0.90

FTS1552		No Impact				
FTS1553	93.95	95.05	1.10	0.90	1.79	1.61
FTS1558	256.80	257.70	0.90	0.87	3.32	2.89
	335.30	336.30	1.00	0.97	2.73	2.65
FTS1559	191.00	193.05	2.05	1.98	2.86	5.74
FTS1560	154.30	155.30	1.00	0.85	1.82	1.55
FTS1561	222.35	224.35	1.00	1.90	5.25	9.98
FTS1562	186.45	187.45	1.00	0.89	1.50	1.34
FTS1563	120.45	121.45	1.00	0.90	1.23	1.11
FTS1564	208.35	209.35	1.00	0.90	1.29	1.16
FTS1565	109.30	110.45	1.15	0.95	1.12	1.06
FTS1566		No Impact				
FTS1567	138.50	139.50	1.00	0.92	3.68	3.39
FTS1568	148.85	151.75	1.05	2.68	4.02	10.77
FTS1569	101.10	103.05	1.95	1.83	1.97	3.61
	165.60	169.65	4.05	3.78	2.43	9.19
FTS1574	82.54	85.44	2.90	2.58	2.80	7.22
	107.67	114.48	6.81	6.06	2.62	15.88
FTS1627	77.79	80.42	2.63	2.58	3.55	9.16
	102.91	105.06	2.15	2.11	3.45	7.28
FTS1628A	57.00	59.00	2.00	1.73	9.23	15.97
	73.00	75.00	2.00	1.63	5.13	8.36
	78.00	89.85	11.85	9.70	2.07	20.08
	94.60	96.00	1.40	1.23	4.73	5.82
FTS1629	66.00	76.00	10.00	7.00	3.78	26.46
	82.00	88.00	6.00	4.24	8.41	35.66
FTS1630	66.30	84.77	18.47	17.50	3.81	66.68
FTS1631	56.73	73.00	16.27	14.95	3.82	57.11
FTS1632	69.22	70.22	1.00	0.90	3.07	2.76
FTS1646	184.95	188.80	3.85	3.20	6.86	21.95
FTS1647	195.85	198.15	1.10	1.88	1.53	2.88
FTS1649	21.80	35.03	13.23	11.45	1.72	19.69
FTS1650	20.00	22.10	2.10	1.43	1.43	2.04
	27.35	29.39	2.04	1.76	2.50	4.40
FTS1651	22.10	45.09	22.99	18.83	2.35	44.25
FTS1652	29.34	58.97	29.63	22.69	5.76	130.69
FTS1659	37.13	39.15	2.02	1.98	3.13	6.20
	42.23	43.27	1.04	1.02	4.68	4.77
FTS1660	26.30	40.67	14.37	9.98	4.63	46.21
FTS1661	20.70	33.67	12.97	9.17	1.61	14.76
	44.70	47.99	3.29	2.52	3.39	8.54
FTS1662	32.82	50.72	17.90	15.65	5.03	78.72
FTS1663	39.22	54.02	14.80	12.56	6.40	80.38

	59.68	68.07	8.39	7.03	2.72	19.12
FTS1664	49.91	76.45	26.54	19.09	5.65	107.86
	63.22	76.45	13.23	9.51	7.79	74.08
FTS1668	174.40	180.60	1.10	5.82	2.73	15.89
FTS1671	101.00	108.30	7.30	6.32	4.07	25.72
FTS1672	49.91	58.59	8.68	6.24	5.32	33.20
FTS1673	80.60	88.85	8.25	8.00	5.25	42.00
FTS1674	62.50	65.00	2.50	1.05	10.95	11.50
	88.45	92.50	4.05	2.02	3.60	7.27
FTS1675	112.00	113.00	1.00	0.76	10.01	7.61
FTS1676	88.00	98.00	10.00	9.06	1.63	14.77
	104.60	110.50	5.90	5.34	3.34	17.84
FTS1677	82.67	88.14	5.47	4.91	2.81	13.80
	95.70	98.59	2.89	2.45	6.31	15.46
FTS1678	186.90	189.95	1.05	2.86	1.52	4.35
FTS1682	48.28	52.08	3.80	2.95	1.23	3.63
FTS1683	56.88	72.00	15.12	11.91	2.49	29.66
	78.94	79.63	0.69	0.54	20.35	10.99
FTS1684	46.85	60.41	13.56	10.97	3.75	41.14
	65.83	68.61	2.78	2.19	8.42	18.44
FTS1685	49.32	64.34	15.02	13.26	2.42	32.09
FTS1686	54.10	58.01	3.91	3.51	4.56	16.01
FTS1687	No Impact					
FTS1688	43.32	46.17	2.85	2.77	2.09	5.79
FTS1690	66.90	74.85	7.95	7.20	2.00	14.40
	105.70	114.46	8.76	8.23	18.35	151.02
FTS1691	60.81	61.67	0.86	0.79	1.66	1.31
	81.38	82.36	0.98	0.83	1.51	1.25
	99.65	100.60	0.95	0.86	1.09	0.94
FTS1692	137.00	139.29	2.29	2.00	9.95	19.90
FTS1693	123.44	124.31	0.87	0.71	4.13	2.93
FTS1695	107.84	117.51	9.67	7.92	9.43	74.69
FTS1706	78.00	91.00	13.00	12.05	3.94	47.48
FTS1707	62.75	65.00	2.25	2.11	2.22	4.68
	89.30	91.60	2.30	2.16	13.13	28.36
FTS1708	95.65	96.65	1.00	0.85	7.76	6.59
FTS1709	109.60	111.75	2.15	1.90	8.70	16.53
FTS1711	84.00	94.80	10.80	8.50	5.73	48.71
FTS1717	100.18	102.20	2.02	1.90	6.20	11.78

Sample Preparation, Analyses and Security

Sampling

The sampling and sample preparation procedures used by Jaguar are as follows:

Surface/Exploration Channel Sampling

- Channel samples are regularly collected from outcrops and trenches.
- 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 1 m and are from 1 to 2 kg in weight.
- Each sample is collected manually in channels with average widths between 5 and 10 cm, and about 3 cm 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 with holes in HQ or NQ diameters.
- Underground drilling is performed either by Jaguar or contractors with holes in BQ and LTK diameters.
- Drill holes are accepted only if they have more than 85% of recovery from the mineralized zone.
- All the drill holes have their deviations measured by Maxibor or equivalent survey tool.
- The cores are stored in wooden boxes of 1 m length with 3 m of core per box (HQ diameter) or 4 m 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 an offsite secure location nearby to the 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 LM-series drill holes) the whole core is sampled as the core diameter does not permit splitting into halves.
- All 2018 exploration samples were sent to ALS Chemex Brazil laboratories and all results were checked and validated using industry standard QAQC procedures and protocols.

Underground Production Channel Sampling

- The sector of 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 1 m and are from 2 to 3 kg in weight.

- Channel samples were taken by manually opening the channels, using a hammer and a little steel pointer crowned by carbide or a small jackhammer.
- The channel samples have lengths ranging from 50 cm to 1 m, average widths between 5 and 10 cm, and about 3 cm deep.
- Two sets of channel samples on the face are regularly collected. One set of channel samples are taken from the top of the muck pile once the work area has been secured. The second set of channel samples are taken at waist height once the heading has been mucked clean and secured.
- At roughly 5 m intervals, the walls and back are sampled by channel sampling. The channel samples are collected starting at the floor level on one side and continue over the drift back to the floor on the opposite side.
- Either an aluminum tray or a thick plastic canvas 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.

Security of Samples - Sample Preparation and Analysis

For surface-based exploration drill holes, samples are prepared at the SGS laboratories in Belo Horizonte. For other drill holes and channels, samples are 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 atomic absorption (AA) 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 email, followed by a hard copy.

In 2018, all core samples were sent to ALS Chemex Brasil laboratory, where sample preparation was undertaken as follows: Half of the sawed sample is forwarded to the analytical laboratory for analysis while the remaining half of the core is stored in a secure location. The drill core samples are transported in securely sealed bags and sent for physical preparation to the independent ALS Chemex Brasil (subsidiary of ALS Global) laboratory located in Vespasiano, Minas Gerais, Brazil. The analysis is conducted at ALS Global's respective facilities (fire assay is conducted by ALS Global in Lima, Peru and multi-elementary analysis are conducted by ALS Global in Vancouver, Canada). ALS has accreditation in global management system that meets all requirements of international standards ISO/IEC 17025:2005 and ISO 9001:2015. All major ALS geochemistry analytical laboratories are accredited to ISO/IEC 17025:2005 for specific analytical procedures.

A process control laboratory at Turmalina analyzes the shift and plant samples, while all delineation drill core, channel and exploration drill core samples from Turmalina are forwarded to the in-house laboratory located at the Caeté mine site.

At Jaguar's Caeté laboratory, the samples are dried and then crushed. A 1 kg 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 AA. 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 AA 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.

Quality Assurance and Quality Control

The Caeté laboratory carries out an internal program of Quality Assurance/Quality Control (QA/QC) for all drill core samples. No QA/QC is performed for channel samples. 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 are inserted at a frequency of every 45–50 samples.

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.

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.

Mineral Resource Estimates - Combined

Table 4 summarizes the Turmalina Mine Complex Mineral Resources as of December 31, 2018, based on a \$1,500/oz. gold price. The total Mineral Resources for the Turmalina Mine Complex comprise 3.92 million t at an average grade of 5.53 g/t Au containing 697,000 oz. of gold in the Measured and Indicated Resource category and 2.74 million t at an average grade of 6.00 g/t Au containing 529,000 oz. of gold in the Inferred Mineral Resource category. The Mineral Resources include Turmalina and two satellite deposits, Faina and Pontal. A cut-off grade of 2.10 g/t Au was used to report the Mineral Resources for the Turmalina Mine, and cut-off grades of 3.80 g/t Au and 2.90 g/t Au were used to report the Mineral Resources for the Faina and Pontal deposits, respectively.

The conceptual operational scenarios considered during preparation of previous Mineral Resource estimates for the Faina and Pontal deposits envisioned that the fresh, unoxidized mineralization would be excavated on a satellite deposit basis and transported by truck to the existing Turmalina plant for processing. Preliminary metallurgical tests have been completed on samples of fresh, unoxidized mineralization from the two deposits from that conceptual perspective. They have yielded unacceptably low recoveries when the material is considered as potential feed to the existing Turmalina plant, and have concluded that the mineralization at both deposits is refractory.

An alternative conceptual operational scenario was developed for the current update of the Mineral Resources in which the mineralized material will be excavated by means of underground mining methods and transported to the Turmalina plant for processing. A gold-rich flotation concentrate is envisioned to be generated after appropriate upgrades have been made to the existing plant. The gold-rich flotation concentrate would then be shipped or sold to a domestic source for recovery of the gold.

Table 4: Summary of Mineral Resources as of December 31, 2018

Jaguar Mining Inc. – Turmalina Complex			
Category	Tonnes (000)	Grade (g/t Au)	Contained Metal (000 oz. Au)
Turmalina			
Measured	1,767	5.37	305
Indicated	1,486	5.70	272
Sub-total M&I	3,253	5.52	577
Inferred	1,066	4.31	148
Faina			
Measured	72	7.39	17
Indicated	189	6.66	42
Sub-total M&I	261	6.87	58
Inferred	1,542	7.26	360
Pontal			
Measured	251	5.00	40
Indicated	159	4.28	22
Sub-total M&I	410	4.72	62
Inferred	130	5.03	21
Total: Turmalina Mine Complex			
Measured	2,090	5.40	362
Indicated	1,834	5.68	336
Measured & Indicated	3,924	5.53	697
Inferred	2,738	6.00	529

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are inclusive of Mineral Reserves.
3. Mineral Resources include the Turmalina Mine, Faina deposit, and Pontal deposit.
4. Mineral Resources are estimated at a cut-off grade of 2.10 g/t Au at Turmalina, 3.80 g/t Au at Faina, and 2.90 g/t Au at Pontal.
5. Mineral Resources are estimated using a long-term gold price of \$1,500 per ounce for Turmalina and \$1,400 per ounce for the Faina and Pontal deposits.
6. Mineral Resources are estimated using an average long-term foreign exchange rate of 3.70 Brazilian Reals: 1 US Dollar for Turmalina and 2.5 Brazilian Reals: 1 US Dollar for Faina and Pontal.
7. A minimum mining width of approximately 2 m was used.
8. Bulk density is 2.83 t/m³ for Orebodies A and B and 2.91 t/m³ for Orebody C at the Turmalina mine.
9. Gold grades are estimated by the Ordinary Kriging (OK) interpolation algorithm using capped composite samples.
10. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
11. Numbers may not add due to rounding.

RPA 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.

Mineral Resource Estimate – Turmalina Mine

The updated block model for Turmalina is based on drilling and channel sample data using a data cut-off date of December 31, 2018. The updated database comprises a total of 3,934 drill holes and 16,246 channels. The estimate was generated from a block model constrained by three-dimensional (3D) wireframe models that were constructed using a minimum width of 2 m. The gold grades are interpolated using several interpolation algorithms using capped composited assays. A capping value of 50 g/t Au was applied for all three Orebodies. The Mineral Resources are reported using the gold grades estimated by the Ordinary Kriging (OK) method. The wireframe models of the mineralization and excavated material for the Turmalina Mine, Faina Deposit, and Pontal Deposit were constructed by Jaguar and reviewed by RPA.

The 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, the observed continuity of the mineralization, the drill hole and channel sample density, and previous production experience with these orebodies.

The Mineral Resources are inclusive of Mineral Reserves. For those portions of the Mineral Resources that comprise the Mineral Reserve, stope design wireframes were used to constrain the Mineral Resource reports.

Additional Mineral Resources are present that reside beyond the Mineral Reserves. For these areas, clipping polygons were prepared to aid in the estimation of the Mineral Resources. The clipping polygons were prepared in either plan or longitudinal views, as appropriate. The clipping polygons 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. The clipping polygons were used to appropriately code the block model and report the Mineral Resources. At a cut-off grade of 2.10 g/t Au, the Mineral Resources at Turmalina comprise 3.25 million t at an average grade of 5.52 g/t Au containing 577,000 oz. of gold in the Measured and Indicated Resource category and 1.06 million t at an average grade of 4.31 g/t Au containing 148,000 oz. of gold in the Inferred Mineral Resource category. The Mineral Resources are presented in further detail in Table 5.

Table 5: Summary of Mineral Resources by Orebody as of December 31, 2018

Jaguar Mining Inc. – Turmalina Mine			
Category	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz. Au)
Orebody A			
Measured	894	6.86	197
Indicated	339	7.61	83
Sub-total M&I	1,233	7.07	280
Inferred	372	4.81	58
Orebody B			
Measured	353	3.34	38
Indicated	192	4.26	26
Sub-total M&I	545	3.66	64
Inferred	18	6.46	4
Orebody C			
Measured	520	4.20	70
Indicated	955	5.31	163
Sub-total M&I	1,475	4.92	233
Inferred	676	3.97	86
Total: Turmalina Mine			
Measured	1,767	5.37	305
Indicated	1,486	5.70	272
Measured & Indicated	3,253	5.52	577
Inferred	1,066	4.31	148

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are estimated at a cut-off grade of 2.10 g/t Au.
3. Mineral Resources are estimated using a long-term gold price of \$1,500 per ounce.
4. Mineral Resources are estimated using an average long-term foreign exchange rate of 3.70 Brazilian Reais: 1 US Dollar.
5. A minimum mining width of approximately 2 m was used.
6. Bulk density is 2.83 t/m³ for Orebodies A and B and 2.91 t/m³ for Orebody C.
7. Gold grades are estimated by the Ordinary Kriging (OK) interpolation algorithm using capped composite samples.
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.

RPA 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.

Mineral Reserve Estimate

Mineral Reserves for Turmalina are based on the Mineral Resources as of December 31, 2018, mine designs, and external factors, depleted with the material mined during 2018. Table 6 summarizes the Mineral Reserves.

Table 6: Turmalina Mineral Reserves as of December 31, 2018

Jaguar Mining Inc. – Turmalina Mine				
Orebody	Category	Tonnes (000)	Grade (g/t Au)	Contained Metal (000 oz. Au)
A	Proven	345	5.23	58
	Probable	257	5.78	47
C	Proven	388	3.53	44
	Probable	418	5.85	79
Total	Proven & Probable	1,408	5.05	228

Notes:

1. CIM (2014) definitions were followed for Mineral Reserves.
2. Mineral Reserves were estimated at a break-even cut-off grade of 2.50 g/t Au.
3. Mineral Reserves are estimated using an average long-term gold price of \$1,300 per ounce.
4. A minimum mining width of 3 m was used.
5. Bulk density is 2.83 t/m³ for Orebodies A and B and 2.91 t/m³ for Orebody C.
6. Numbers may not add due to rounding.

The Mineral Reserves consist of selected portions of the Measured and Indicated Resources that are within designed stopes and associated development, designed by MCB Serviços e Mineração (MCB), a Brazilian consulting group.

Dilution and extraction (mining recovery) have been included in the reserve estimate through the following:

- Areas within the stope designs below 2.50 g/t Au. The resource wireframes were constructed at a cut-off grade of 0.50 g/t Au, and therefore include material below the reserve cut-off grade for continuity.
- Planned dilution includes areas where the stope designs run outside of the resource wireframe, to achieve minimum width and due to irregularities in geometry. 30% unplanned dilution is added based on recent operating results.
- Extraction is assumed to be 100%. Although some losses are encountered during blasting and mucking, they are minimal, and reconciliation to mill results indicates that high dilution/high extraction assumptions match up well.

Cut-Off Grade

A break-even cut-off grade of 2.50 g/t Au was estimated for Mineral Reserves, using a gold price of \$1,300/oz. and average gold recovery of 90% and 2018 cost data for the Turmalina Mine. Gold prices used for reserves are based on consensus, long term forecasts from banks, financial institutions, and other sources.

Cost data was stated in US dollars, using the exchange rate at the time of the reporting (approximately 3.7 BRL to the US dollar). A majority of Turmalina costs are denominated in BRL.

An incremental cut-off grade of 1.40 g/t Au was estimated using variable costs only. Some stopes with diluted grades between 1.40 g/t Au and 2.50 g/t Au were included in Mineral Reserves. Incremental-grade stopes make up a small proportion of the total, which RPA considers to be reasonable.

Mining Operations and Metallurgical Process

The Turmalina Mine Complex consists of a number of tabular bodies known as Orebodies A, B and C. Two satellite deposits, Faina and Pontal, are located along strike to the northwest.

The conceptual operational scenarios considered during preparation of previous Mineral Resource estimates for the Faina and Pontal deposits envisioned that the fresh, unoxidized mineralization would be excavated on a satellite deposit basis and transported by truck to the existing Turmalina plant for processing. Preliminary metallurgical tests have been completed on samples of fresh, unoxidized mineralization from the two deposits from that conceptual perspective. They have yielded unacceptably low recoveries when the material is considered as potential feed to the existing Turmalina plant, and have concluded that the mineralization at both deposits is refractory.

An alternative conceptual operational scenario was developed for the current Mineral Resources in which the mineralized material will be excavated by means of underground mining methods and transported to the Turmalina plant for processing. A gold-rich flotation concentrate is envisioned to be generated after appropriate upgrades have been made to the existing plant. The gold-rich flotation concentrate would then be shipped or sold to a domestic source for recovery of the gold.

The main production of the mine has been from Orebody A, which is dominated by a folded and steeply east-dipping tabular deposit, with a strike length of approximately 250 m to 300 m, and an average thickness of 6 m. Mineralization has been outlined to depths of 1,100 m to 1,150 m below surface. The southern portion of Orebody A is composed of two parallel narrow veins. The northern portion of Orebody A is much the same as the southern; however, the two parallel zones nearly or completely merge and therefore the zone is much wider overall (up to 10 m).

Orebody B includes two thinner, lower-grade lenses parallel to Orebody A. They are located approximately 50 m to 75 m in the structural hanging wall and are accessed by a series of crosscuts that are driven from Orebody A. The mineralization in this deposit has been outlined along a strike length of approximately 350 m to 400 m and to depths of 650 m to 700 m below surface. Orebody B is narrow along its entire strike length.

As a result of the drilling campaigns carried out in 2018, additional mineralized zones have been discovered such that Orebody C has now increased to include a series of 26 lenses that are located to the west in the structural footwall of Orebody A. The mineralization occurs as a number of tabular sheets that strike in a northwesterly direction and dip steeply to the northeast. The lower portions of the Orebody C mineralization are accessed by two cross-cuts from the main ramp, while access to the upper levels is via ramp access from the southwest. While historically a minor amount of production has been achieved from these lenses to date, the increasing successes of Jaguar's drilling programs is leading to production plans from which an increasing proportion of the production being sourced from Orebody C. The mineralization in this deposit has been outlined along a strike length of approximately 1,100 m to 1,200 m and to depths of 800 m to 850 m below surface.

Two of the newly discovered mineralized lenses are located between Orebody A and the previously known lenses comprising Orebody C. These new lenses were discovered as a result of the exploration drilling that was carried out from the underground drill bays to define and evaluate the lower portions of the CSE mineralized lenses. As these are newly discovered lenses, their full limits and economic potential are not fully understood at present. RPA agrees with the view of Jaguar's geological team that the presence of these mineralized lenses demonstrate that the presence of potentially economic mineralization is not restricted to only the previously defined mineralized horizons. The possibility of additional mineralized zones located elsewhere in the mine stratigraphy must be considered and evaluated as exploration targets.

Mining Method

The mining method currently in use is longhole sublevel stoping with delayed backfill. Backfill consists of cemented rock fill, or a paste fill product prepared from detoxified CIP tailings in a plant located near the mill.

The mine is accessed from a 5 m x 5 m primary decline located in the footwall of the deposit. The portal is located at elevation 695 MASL. The mine is divided into levels with Level 1 established at elevation 626 MASL. Starting at this level, the vertical clearance between levels is 114 m in the upper portions of the mine (i.e., Level 2 is at elevation 512 m). Five sublevels, spaced 20 m apart vertically, are driven from the main ramp. Since the initial development phases, level spacing has been modified so that the mining method could more easily adapt to changing conditions and modifications to the mining method. The current level spacing is 75 m with sublevels placed every 15 m vertically. A 3 m thick sill pillar is left at each level, except for Level 3.

At each level and sublevel, drifts are developed in the mineralized zone to expose the footwall and the 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 orebody are reached.

Orebody A and C are the primary structures being mined, while mining in Orebody B is suspended pending review of economics. Orebody A is located in the footwall of the shear zone and Orebody B in the hanging wall of the shear structure.

Orebody A is closest to the main ramp and is accessed first. Development is currently progressing to Level 11 in Orebody A.

Orebody C is a secondary system being mined to the west of the portal. Historically, Orebody C has been lower grade than Orebody A, but this perception is changing with additional development and exploration drilling results that are demonstrating the presence of higher grade ore shoots within the overall Orebody C package.

Past mining used a longitudinal retreat sequence for Orebody A and B: stope extraction began at the ends of the levels and retreated back towards the access. Stopes are 50 m in length along strike and separated by a 5 to 10 m wide pillar, depending on the thickness of the zone. Once mining of each longhole stope has been completed, the excavation is filled using a combination of development waste and pumped paste fill. A bund is constructed using development waste to contain the backfill. Once the cement content of the paste fill has been allowed to set, the next stope in the sequence can be mined. The sequence continues until the entire level/sublevel is mined. Mining then proceeds upward to the next sublevel until the sill pillar is reached. Stopes are mined from several individual levels simultaneously in order to provide the required number of active workplaces needed to meet production targets.

The retreat sequence, and the need to complete Orebody B mining before cutting off access by mining Orebody A, reduced productivity by limiting the number of stopes available for mining at a given time.

The current life of mine plan (LOMP) does not consider mining of Orebody B and involves a change in mine design. Orebody A will be mined in a primary/secondary sequence via transverse access to the thick centre portion of Orebody A, requiring additional accesses developed in waste. Each primary or secondary stope is 15 m along strike, with no pillars. The design change has the effect of increasing the number of available workplaces, and de-links the narrow, lower-productivity ends from the centre.

Although Orebody B is not in the LOMP, and is no longer included in Mineral Reserves, future access is possible, either by mining through cemented paste fill and supporting appropriately, or by mining concurrently with the thinner ends of Orebody A.

Environmental Considerations

Environmental studies related to the acid mine drainage potential are being made as requested by SUPRAM on LO 012/2008 (“Licença de Operação” - Operation Licence). Those studies will be performed until the end of mining and milling operations at Turmalina. All environmental costs for the Turmalina Project are associated with obligations laid out in the various licences.

The MTL operating license is under analysis by the applicable environmental agency. In September 2016, a 4 day inspection took place at Mine Site. In August 2018, Jaguar cooperated with SUPRAM to provide a fulsome response to its request for additional information.

Jaguar has all the necessary environmental licences for the operation of the Turmalina mining complex.

Taxes

Income taxes are 34% of taxable profit, including a 25% corporate tax rate and a 9% social contribution. In addition to direct operating costs, royalty payments and depreciation are deductible in determining taxable profit.

Mine Life

The current LOMP, based on Mineral Reserves, details mining operations at Turmalina to 2022. There is good potential to extend the mine life, through infill drilling and further conversion of Mineral Resources to Mineral Reserves.

Markets

The principal commodity at Turmalina is freely traded, at prices that are widely known, so that prospects for sale of any production are virtually assured. A gold price of \$1,300 per ounce was used for estimation of Mineral Reserves.

2. Caeté Mining Complex

The scientific and technical information contained in this AIF relating to the Company’s Caeté Mining Complex from December 31, 2015, to December 31, 2018, is derived from the technical report titled “*Technical Report on the Roca Grande and Pilar Operations,*” to be filed on SEDAR on or before April 15, 2019 (the “Caeté Technical Report”), which was prepared by Jeff Sepp, P. Eng. and Reno Pressacco, P. Geo., both from RPA, who are both “qualified persons” as that term is defined in NI 43-101. Updated Mineral Resource and Mineral Reserve estimates as of December 31, 2018 are noted below.

Property Description and Location

The Caeté Mining Complex, which includes the Pilar and Roça Grande Mines and the Caeté Plant, is located in the state of Minas Gerais, Brazil, 50 to 100 km east of the city of Belo Horizonte. The property is currently constituted of 20,023 ha of mining and exploration concessions. The property is owned through Jaguar’s wholly owned subsidiary, MSOL.

In December 2003, Jaguar acquired the Santa Bárbara property, which includes 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 2,090 ha 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 seven Roça Grande concessions. The final transfers of the Roça Grande concessions to Jaguar were concluded in December 2010 and August 2011. In November 2014, four of the six Roça Grande concessions acquired from Vale were returned to Vale by amending the original contract.

The mining concessions related to Caeté's Pilar and Roça Grande Mines are in good standing. Jaguar has all the necessary environmental licences that are required for the operation of the mining complex. The license revalidation process was requested in time by Jaguar that waits for the official analysis.

Accessibility, Climate, Local Resources, Infrastructure and Physiography

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 (35,000 inhabitants) and Santa Bárbara (30,000 inhabitants) are comparable towns, located 55 km and 100 km, respectively, from Belo Horizonte.

The towns have good urban infrastructure, including banks, hospitals, schools and general commerce. Skilled labour is readily available.

The properties can be accessed via a federal highway and state paved roads. A partially paved 27 km secondary road is used to transport Pilar run-of-mine (ROM) ore to the Caeté Plant.

Annual rainfall in area averages between 1,300 and 2,300 mm, 84% of which falls during the rainy season between October and March. December and January present the most intense precipitation. Winds, predominantly from the south and southeast, have a low average speed (<1 m/s). The annual average temperature is slightly above 20°C. Air humidity ranges up to 90% even in the summer months. Annual average evaporation is approximately 934 mm.

Power to the project site is currently supplied by CEMIG. Diesel back-up generators provide emergency power.

History

Jaguar acquired the Pilar property from Vale in December 2003 and, in November 2005, the two companies entered into a mutual exploration and option agreement with respect to the RG mineral concessions.

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

During 2007, a number of key events occurred with respect to the Caeté Project. Jaguar completed a scoping study, received the Implementation Licence for the Project, 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 September 2008, expansion plans at the Caeté Project continued as TechnoMine completed the NI 43-101 feasibility study technical report. 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 RG was temporarily suspended; however, development at Pilar continued.

In December 2008, Jaguar began transporting ore by truck from Pilar to the Paciência Plant to supplement the ore being supplied from Paciência's 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 focused on the implementation and construction of the Caeté Project. The Caeté 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 \$127 million.

In October 2010, TechnoMine completed an amendment to the 2008 feasibility study, which consisted of an enhancement of the process route and updated Mineral Resource and Mineral Reserve estimates afforded by an increase of the gold price over the LOM.

In June 2011, Jaguar filed a NI 43-101 compliant technical report prepared by TechnoMine on a number of targets located within the Caeté mining complex. This technical report added 159,250 oz. of Measured and Indicated Mineral Resources and 92,040 oz. of Inferred Mineral Resources for the Caeté mining complex.

During 2012, an operational review of the Caeté operation determined that operational overhead could be reduced and productivity improved without impacting long-term production capability. It was also determined to transition the operation to smaller ore and waste development headings, reduced stope dimensions and new ground control methodologies in order to improve head grade over historical results through reduced dilution. The new ground control methodology is progressing and work is ongoing on the transition toward smaller heading. The changes are being implemented concurrently with continuing operations and are expected to reduce the cash operating cost per ounce and allow for increased and more predictable ounce production.

Gold production at Caeté increased to 41,788 oz. in 2018, as compared to 38,686 oz. in 2017 and 33,350 oz. in 2016.

Please refer to section General Development of the Business – Caeté Mining Complex – Production, Added Mineral Resources, and Operational Review for recent developments regarding the Caeté Mining Complex.

Geological Setting

Shortly after the Portuguese discovered Brazil in 1500, Portuguese explorers known as Bandeirantes ventured into the interior of the country from Rio de Janeiro and Salvador and discovered alluvial gold in the mid-16th century. Later, the Bandeirantes ventured into the country's interior primarily from São Paulo. Gold found in stream drainages in several parts of the Iron Quadrangle was a major factor in the development of the region. During the 17th and 18th centuries, an era commonly referred to as the Brazilian Gold Cycle, mining in the Caeté and Santa Bárbara regions included numerous moderate sized mines, such as Gongo Soco, Cuiabá, Taquaril, São Bento, Santa Quitéria, Pary, Luis Soares, Juca Vieira and Brumal.

The Iron Quadrangle was the principal region for Brazilian hard rock gold mining until 1983 and accounted for about 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.

The orebodies are emplaced in Archean age meta-volcanic and meta-sedimentary rocks of the Nova Lima Group. The hosting rocks are intensively folded and sheared along a NE-SW regional trend.

- *Pilar*

The Pilar Orebody is located at the base of the Nova Lima Group, a unit with a predominance of meta-mafic and meta-ultramafic rocks constituted of both clastic and chemical meta-sediments. The volcanic rocks predominantly

consist of talc schist, meta-basalts, meta-dunites, meta-peridotites and serpentinites. Secondly, schist occurs with variable amounts of carbonaceous material, sericite, carbonate, chlorite and quartz. Banded Iron Formation and meta-chert layers are hosted in the meta-sediment unit.

Original bedding can be observed, with variable directions due to folds, resulting in an average axis of approximately 135°/45°. The main BIF layer as mapped at Pilar is continuous along 10 km of strike length and width variable between 5 to 50 m. At the Pilar property, the BIF northern extremity, known as São Jorge target, is intercepted by a shear zone resulting in strong hydrothermal alteration of the BIF. At surface, the São Jorge target gold mineralization is characterized by high contents of limonite, as a result of the weathering of the sulphides found in underground (pyrite, pyrrhotite, and arsenopyrite).

Hydrothermal alteration related to the shear zone is characterized by the introduction of large quantities of sericite, chlorite, carbonate, silica, sulfides and gold.

A preliminary interpretation of the gold mineralization at Pilar is that the BIF and gold were deposited simultaneously in an early mineralization event. Later, due to the shearing events, additional gold was intruded in the system culminating in remobilization and concentration and generating the known ore shoots. Average azimuth and inclination of the ore shoots varies from E76° - 83° S / 38° -42° respectively. The regional foliation (S₂) is very well preserved in all schists showing regular direction of N30° - 50° E / 40° -65°.

Reverse faulting (low angle thrust faults) are observed at the western border of Pilar, resulting in the older rocks (talc schists) repositioning over the younger rocks. As a result, the orebodies associated to the eastern BIF flank constitute 'blind' targets, being identified only after underground development of the Eastern orebodies.

- *Roça Grande*

The Roça Grande mine is hosted in the upper unit of the Nova Lima Group. Dominant rock types at RG are meta-volcanoclastics (tuffs), represented by quartz-sericite-chlorite schists with variable amounts of carbonaceous material, BIF, metacherts and graphitic schists. Bedding is well defined by the iron carbonate and siliceous facies of the BIF horizons, with an average strike of N70° E, dipping about 30° SE.

Folds are very common and present a regular fold axis azimuth of approximately 110°/30°. A total of four BIF horizons are recognized in the Roça Grande property. Two of them host the mineralization as identified during the Vale and Jaguar exploration. They are roughly parallel and are called Structures 1 and 2. The Northern Structure (Structure 1) hosts the RG-01 mineralized body and the South Structure (Structure 2) hosts the RG-02, RG-03 and RG-06 mineralized bodies. The RG-07 mineralized body, associated to quartz lodes, is located immediately in the hanging wall of Structure 1.

All rocks examined in the Pilar and Roça Grande orebodies were subjected to different degrees of hydrothermal alteration that resulted in the development of carbonate, chlorite, sericite haloes and quartz veins. Disseminated sulfides (pyrite, arsenopyrite, stibnite, pyrrhotite, and chalcopyrite) in the quartz veins are common.

Mineralization

- *Pilar*

The mineralization at Pilar is hosted by a number of the host rock units including the BIFs along with mafic schists and talc-chlorite schists. Gold mineralization is associated with sulphide mineralization consisting of arsenopyrite and pyrrhotite. Quartz veins and veinlets can also be present, but the presence of quartz is not a prerequisite for higher gold values. The sulphide minerals occur mostly as disseminations in the host rock, but can achieve semi-massive to massive concentrations locally over a few tens of centimetres. Quartz veins are typically less than 1 m in width and can be observed to be of two generations. The quartz veins of the first generation are typically associated

with the gold mineralization and are folded. The quartz veins of the second generation are typically lower grade or barren and not affected by folding.

The SW Orebody is hosted by iron formation of the Santa Quitéria Unit. The remaining mineralized lenses are hosted by the mafic and ultramafic schists of the Ouro Fino and Morro Vermelho Units.

- *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 hanging wall contact of the iron formation sequence and are 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.

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).

Deposit Types

Gold mineralization has been found mainly within three general types of deposits in the Iron Quadrangle:

1. Syngenetic deposits. These are hosted by BIF and chemical sedimentary rocks (meta-chert). Gold is typically associated with fresh to limonite-rich sulphide masses, ranging from disseminated to massive, in association with the BIF layers or in hydrothermally altered schists rich in quartz, chlorite and sericite. Disseminated sulphides hosted in quartz schist, BIFs, and meta-cherts have also been economically exploited.

2. Epigenetic deposits. These are dominated by hydrothermal quartz veins (silicification zones). Gold is related with masses of milky to microcrystalline quartz containing fresh to limonite-rich sulphides and, sometimes, visible gold. The veins are hosted by hydrothermally altered schists rich in quartz, chlorite, carbonate and sericite.

3. Paleo-placer deposits. Conglomerates are found in the geologic section that contains clasts of quartzite, milky quartz, massive and banded chert, felsic volcanic rocks, and quartz schists. The matrix can be quartzitic, arkosic, or carbonaceous. Locally, round (buckshot) pyrite and crystalline pyrite are abundant in the matrix.

Most gold-bearing units in the Iron Quadrangle, with the exception of the gold-bearing conglomerates, are strongly controlled by linear structures such as fold axes, stretching lineations, and intersection foliations. The orebodies form cigar or pencil shapes, showing continuity along the plunge and relatively small distances laterally. They can be longer than 5 km, such as at the Morro Velho and Cuiabá Mines. The thickness of the deposits varies from a few centimetres to more than 30 m.

Gold is associated with sulphides, mainly pyrite, pyrrhotite and arsenopyrite. The distribution of the mineralized bodies is often controlled by mineral stretching lineations and fold axes.

Exploration History

- *Pilar*

In 2006, Jaguar started an exploration campaign at the Pilar property in order to complete a mineral resource evaluation in accordance with NI 43-101 guidelines.

In 2010 and during 2011, Jaguar completed an underground drilling program to investigate the down-plunge continuity of the mineralization between Levels 4 and 10 at Pilar.

In 2014, the magnetic data from the airborne Companhia de Desenvolvimento Econômico de Minas Gerais (“CODEMIG”) survey was re-processed.

A high-definition induced polarization ground survey covering the south extension of Pilar was carried out in 2015. The estimated depth of penetration of the survey was up to 1,000 m.

Geological mapping and a total of 744 soil samples were collected on the Pacheca and Cubas targets in 2015. 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.

- *Roça Grande*

Initial exploration activities carried out by Vale in the Roça Grande Mine area consisted of regional geological, geochemical 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.

Soil sampling programs have been carried out throughout the various claim blocks that comprise the CCA project. Jaguar has intensively drilled the RG orebodies. Four mineralized bodies named RG01/07, RG02, RG03 and RG06 were selected for infill diamond drilling and underground exploration started in the RG01/07 orebody. The following has been completed through December 2010:

- RG01/07: 10,625 m in 111 surface and underground drill holes and 5,906 m in ramps and drifts
- RG02: 16,580 m in 59 surface drill holes and 1,168 m in ramps and drifts
- RG03: 9,407 m in 56 surface drill holes
- RG06: 7,954 m in 55 surface drill holes

During 2011 and subsequent to the Caeté Feasibility Study, Jaguar completed 9,983 m in 71 drill holes at the RG01/07 body as part of an underground infill-drilling program. In 2012 and 2013, Jaguar performed 13,922 m and 10,142 m of underground delineation drilling respectively in RG01/07.

Drilling

- *Pilar*

In 1989, Vale carried out the first exploratory drilling at the Pilar deposit. From 1989 to 1994, a total of 11,163 m of exploratory diamond drilling were performed. Eldorado Gold Corp. executed a 3,069 m diamond drilling campaign to evaluate the deposit from 2002 to 2003.

In 2006, Jaguar started an exploration campaign at the Pilar property that targeted the Pilar Sul, São Jorge and São Jorge Extensão sectors of the deposit. The exploration effort comprised three phases as follows:

Phase 1: After interpretation of the available data, an exploratory diamond-drilling program was carried out to test the structural controls and the continuity of the mineralization to 200 m below the surface. Mineralized shoots mainly occurred within the BIF. The holes intercepted several significant mineralized intervals and pointed out the need for additional investigation of the structural geology of the area. During this phase, a total of 6,489 m was drilled in 36 diamond drill holes.

Phase 2: Diamond drill holes tested the structural control and the continuity of the mineralization to 300 m below surface. Mineralized shoots occurred both within the BIF and the shear zone. A total of 12,926 m in 41 holes was drilled during Phase 2.

Phase 3: Underground exploration and underground and surface diamond drilling was conducted during this phase. Infill underground drilling was completed to delineate mineralization at 693 MASL. Surface drilling was carried out to obtain more data on the structural control and the main zones of mineralization. Through December 2010, Jaguar completed a total of 10,390 m in ramps and drifts, 11,200 m of underground drilling in 180 holes, and 10,186 m of surface drilling in 19 holes.

Late in 2010 and during 2011 (subsequent to the Caeté Feasibility Study), Jaguar completed an underground drilling program to investigate the down-plunge continuation of the mineralization to Level 11, approximately 860 m from surface. A total of 12,574 m in 44 drill holes were completed, confirming the extension of the mineralized zones to depth. Delineation drilling underground continued in 2012 and 2013.

A small program of exploration drilling (9 holes, 910 m) was carried out in November 2014 to test near-surface targets in the proximity of the crown pillar of Pilar. In late 2014 to May 2015, Jaguar carried out an underground exploration-drilling program focused on testing for additional gold mineralization along the down-plunge projections of Orebodies A, B and C. In all, 90 holes were completed for a total length of 14,875 m.

In 2017, Jaguar conducted an underground exploration diamond drill program with 9 holes in a total of 4,258 m to check the BA, BF and BFII orebodies' down-plunge. All exploration drill holes were performed by Major Drill in NQ diameter. All samples were sent to ALS Chemex Brazil laboratories to assay and all results were checked and validated.

Jaguar continued to carry out a drilling program during 2018 that continued to focus on locating and beginning to define the down-plunge extensions of the BA, BF, and BF II mineralized zones located between elevation 350 m to -210 m, approximately 200 m below the bottom of the ramp. The drilling program also focused on providing additional detailed, in-fill information for those mineralized intersections discovered by the 2017 drilling program. A total of 87 definition holes were completed in 2018 for a total length of approximately 2,190 m. A total of 76 exploration and delineation drill holes were completed in 2018 for a total length of approximately 11,510 m.

The drilling procedures at Pilar were similar to those used at RG. Surface diamond drilling was carried out by the drilling contractor Mata Nativa. The underground drilling program in 2015 was completed by Geosol Ltd. of Belo Horizonte using BQ (36.5 mm) and LTK (36.3 mm) sized equipment. Infill drilling programs carried out from underground stations were completed by Jaguar staff and company-owned equipment.

A summary of the drilling campaign is provided in Table 7 and a summary of significant intersections from the 2018 is provided in Table 8. It is important to note that the reported intersections do not represent true thicknesses as they have been drilled from underground-based platforms and consequently have intersected the mineralized zones at varying angles.

Table 7: Summary of Drilling Campaigns, Pilar Mine

Jaguar Mining Inc. – Caeté Operations					
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 Expl.	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		
Sub-Total: Jaguar		1,255	144,354		

Table 8: Summary of Significant Intersections, 2018

Drilling Program Jaguar Mining Inc. – Pilar Mine						
Hole ID	From (m)	To (m)	DownHole Interval (m)	Estimated True Width (m)	Gold Grade (g/t Au)	GT (ETW)
PPL409	44.90	58.60	13.70	13.00	5.16	67.08
PPL419A	40.50	67.20	26.70	22.94	2.46	56.43
PPL420	46.15	61.60	15.45	14.17	12.38	175.42
PPL421	34.25	54.40	20.15	17.31	3.42	59.20
	139.1	143.0	3.9	3.4	36.6	125.81
PPL446	154.0	165.8	11.8	9.6	15.9	152.54
	161.9	165.8	3.9	3.2	29.5	93.54

PPL455	51.00	66.78	15.78	15.02	5.32	79.91
PPL460	75.2	84.65	9.45	8.3	8.52	70.72
PPL470A	44.6	55.65	11.05	10.52	5.06	53.23
PPL471	44.9	65.8	20.9	20.75	7.17	148.78
PPL472	40.65	68.85	28.2	27.97	6.67	186.56
PPL478	72	83.9	11.9	10.69	7.38	78.89
PPL479	72.3	81.55	9.25	8.14	7.23	58.85
PPL484	41.45	65.75	24.3	20.82	3.14	65.37
PPL485	46	52	6	5.36	12.45	66.73
	53.7	64	10.3	9.47	5.3	50.19
PPL489A	65.7	86.4	20.7	15.03	3.54	53.21
	91.9	113.5	21.6	10.14	13.56	137.50
PPL495	26.05	34.4	8.35	8.21	12.93	106.16
PPL496	26.15	38.8	12.65	10.48	7.29	76.40
PPL497A	75	96	21	9.5	5.78	54.91
PPL498	30	43	13	12.69	12.16	154.31
PPL500	43	59.2	16.2	14.8	4.63	68.52
PPL502A	23.3	43	19.7	17.25	4.27	73.66
PPL503	49.9	68.3	18.4	16.53	4.1	67.77
PPL508	101	137	36	34.25	3.98	136.32
PPL509	55.1	90.2	35.1	28.03	6.63	185.84
PPL510	43.5	67	23.5	20.85	2.68	55.88
	69.8	90.5	20.7	18.67	3.7	69.08
PPL514	61.67	99	37.33	31.44	11.04	347.10
	72.5	99.6	27.1	24.38	2.96	72.16
PPL515	116.1	162.85	46.75	41.21	6.08	250.56
	177	223	46	43.87	3.38	148.28
PPL518	113	131.9	18.9	18.6	6.86	127.60
PPL523A	61.7	77.65	15.95	13.41	3.76	50.42
	156.75	184.7	27.95	24.86	5.95	147.92
	128.1	151.6	23.5	20.1	2.62	52.66
PPL524	155.35	194.05	38.7	34.32	3.343	114.73
	194.05	206.9	12.85	11.66	7.91	92.23
PPL530	99.15	108	8.85	8.61	6.99	60.18
PPL536A	14.64	26	11.36	10.21	8.63	88.11
PPL537	64.9	71.2	6.3	5.45	22.76	124.04
PPL541A	58	74	16	13.69	4.41	60.37
FSB519	4.7	14.4	9.7	9.7	11.8	114.46
FSB528	0	6.8	6.8	6.65	12.38	82.33
FSB604	1.11	15.01	13.9	13.46	6.13	82.51
FSB648	2	14	12	11.08	4.86	53.85
FSB701	9	24	15	11.76	6.77	79.62
FSB715	8	42.7	34.7	33.12	2.37	78.49

FSB723	0	12.35	12.35	11.59	4.39	50.88
FSB726	8.25	30.75	22.5	14.44	4.6	66.42
FSB733	4.55	15.4	10.85	10.5	8.2	86.10

- Roça Grande

Jaguar has carried out a number of surface-based and underground-based drilling programs at RG 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.

Jaguar started diamond drilling at RG 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 infill program to delineate these zones.

The drill hole lengths ranged from 40 m to 559 m. Holes were targeted to investigate the continuity of the mineralized zones laterally and at depth. Core diameters are consistently HQ (63.5 mm) from surface through the weathered rock to bedrock. At one to three m into the bedrock, the holes were reduced to NQ diameter (47.6 mm). Surface diamond drilling was carried out by the drilling contractor Mata Nativa while the underground in-fill drilling programs were carried out by Jaguar staff using company-owned equipment.

The diamond drill core procedures adopted by Jaguar are described below:

- Only drill holes with more than 90% core recovery from the mineralized zone were accepted.
- Drill hole deviations (surveys) were measured by Sperry-Sun or DDI/Maxibore equipment.
- The cores were stored in wooden boxes of 1 m length with 3 m of core per box (HQ diameter) or 4 m of core per box (NQ diameter). The hole's number, depth and location were identified in the boxes by an aluminum plate on the front of the box and by a water-resistant ink mark on its side. The progress interval and core recovery are identified inside the boxes by small wooden or aluminum plates.

Drill collars were set out using a theodolite or global positioning system (GPS). All holes were drilled within three m of the intended planned location. Azimuth and inclination for the angle holes were set by Brunton compass, deemed accurate to within 2° azimuths and <1° inclination.

Following completion of the holes, the collars were surveyed with theodolite and cement markers were emplaced. Downhole surveys were completed on all holes more than 100 m long using Maxibor equipment.

A small program of 14 surface-based exploration holes, for a total length of 794 m, was completed in September 2014 to test targets in the areas of the existing open pit mines.

A summary of the drilling campaigns completed at RG is provided in Table 9.

Table 9: Summary of Drilling Campaigns, Roça Grande

Jaguar Mining Inc. – Caeté Operations					
Period	Target	Diamond Drilling		Roto-Percussive Drilling	
		No. Holes	Total Length (m)	No. Holes	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		
2000	RG03,04 and 06	10	625		
	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	RG01/07	71	9,983		
2012	RG01/07		19,922		
2013	RG01/07		10,142		
2014	RG03/RG06	14	794		
Sub-Total, Jaguar			79,407		

Sample Preparation, Analysis and Security

Sampling

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 1 m and are from 1 to 2 kg in weight.
- Each sample is collected manually in channels with average widths between 5 and 10 cm, and about 3 cm 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 with holes in HQ or NQ diameters.
- Underground drilling is performed either by Jaguar or contractors with holes in BQ and LTK diameters.
- 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 or equivalent survey tool.
- The cores are stored in wooden boxes of 1 m length with 3 m of core per box (HQ diameter) or 4 m 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 RG.
- 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.
- All 2018 exploration samples were sent to ALS Chemex Brazil laboratories and all results were checked and validated using industry standard QAQC protocols and procedures.

Underground Production Channel Sampling

- The sector of 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 1 m and are from 2 to 3 kg in weight.
- Channel samples were 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 m, average widths between 5 and 10 cm, and are approximately 3 cm deep.
- Two sets of channel samples are regularly collected on the face. One set of channel samples is taken from the top of the muck pile once the work area has been secured. The second set of channel samples is taken at the waist height once the heading has been mucked clean and secured.
- Channel samples from the walls and back are collected at approximately 5 m intervals. The channel samples are collected starting at the floor level on one side and continue over the drift back to the floor on the opposite side.
- Either an aluminum tray or a thick plastic canvas 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.

For surface-based exploration drill holes, samples were prepared at the SGS laboratories in Belo Horizonte. For other drill holes and channels, samples are 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 atomic absorption (AA) finish.

All samples from the 2015 to 2018 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.

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 email, followed by a hard copy.

For core samples sent to the ALS Chemex laboratory, the following procedures were used. Half of the sawed sample is forwarded to the analytical laboratory for analysis while the remaining half of the core is stored in a secure location. The drill core samples are transported in securely sealed bags and sent for physical preparation to the independent ALS Chemex (subsidiary of ALS Global) laboratory located in Vespasiano, Minas Gerais, Brazil. The analysis is conducted at ALS Global's respective facilities (fire assay is conducted by ALS Global in Lima, Peru and multi-elementary analysis are conducted by ALS Global in Vancouver, Canada). ALS has accreditation in global management system that meets all requirements of international standards ISO/IEC 17025:2005 and ISO 9001:2015. All major ALS geochemistry analytical laboratories are accredited to ISO/IEC 17025:2005 for specific analytical procedures.

At Jaguar's Caeté laboratory, samples from the Roça Grande and Pilar mines are dried and then crushed. A 1 kg 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 AA. 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 AA 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 sample locations are surveyed.

Quality Assurance and Quality Control

The Caeté laboratory carries out an internal program of Quality Assurance/Quality Control (QA/QC) for all drill core samples. 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 (Rocklab standards Si81 (recommended value of 1.790 g/t Au), SJ80 (recommended value of 2.656 g/t Au) and SL76 (recommended value of 5.960 g/t Au) are inserted at a frequency of every 45 to 50 samples.

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 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.

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.

Mineral Resource Estimates (combined)

Table 10 summarizes the Mineral Resources as of December 31, 2018, based on a \$1,500/oz. gold price to Pilar Mine and \$1,400/oz. gold price to Roça Grande. The total Mineral Resources for the Caeté Mine Complex comprise 6.01 million t at an average grade of 3.94 g/t Au containing 762,000 oz. of gold in the Measured and Indicated Resource category and 3.14 million t at an average grade of 3.54 g/t Au containing 358,000 oz. of gold in the Inferred Mineral Resource category. The Mineral Resources include the Roça Grande and Pilar mines. The estimates to Roça Grande are based on the 2015 model, and depleted for mining through to 2018, and to Pilar are based on the 2018 updated model. A cut-off grade of 1.46 g/t Au was used to report the Mineral Resources for RG, and a cut-off grade of 1.8 g/t Au was used to report the Mineral Resources for Pilar.

Table 10: Summary of Mineral Resources as of December 31, 2018

Jaguar Mining Inc. – Caeté Operations			
Category	Tonnes (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	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
Total: Caeté Operations			
Measured	3,267	4.26	448
Indicated	2,744	3.56	314
Measured & Indicated	6,011	3.94	762
Inferred	3,144	3.54	358

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 RG and 1.8 g/t Au for Pilar.
3. Mineral Resources are estimated using a long-term gold price of \$1,500 per ounce to Pilar Mine and \$1,400 per ounce to Roça Grande Mine.
4. Mineral Resources are estimated using an average long-term foreign exchange rate of 3.7 Brazilian Reals: 1 US Dollar to Pilar Mine.
5. Mineral Resources for RG are prepared by depletion of the 2015 grade-block model by the excavation volumes as of December 31, 2018.
6. A minimum mining width of approximately 2 m was used.
7. Gold grades are estimated by the inverse distance cubed interpolation algorithm using capped composite samples for the Roça Grande mine. Gold grades were estimated by the Ordinary Kriging (OK) interpolation algorithm using capped composite sample for Pilar.
8. No Mineral Reserves are currently present at RG. Mineral Resources are inclusive of Mineral Reserves for Pilar.

9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not add due to rounding.

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

Mineral Resource Estimates – Roça Grande

The updated block model for RG is based on drilling and channel sample data using a data cut-off date of June 30, 2015. 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 1 m. 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 minimum width criterion was subsequently applied to the Mineral Resource reporting criteria by using a minimum grade times thickness product of 3 gram-metres. The gold grades are estimated using the inverse distance cubed interpolation (ID3) algorithm using capped composited 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 Mineral Resources are reported using the gold grades estimated by the inverse distance cubed (ID3) method. The wireframe models of the mineralization and excavated material for RG were constructed using the excavation information as of December 31, 2015.

The 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, the observed continuity of the mineralization, the drill hole and channel sample density, and previous production experience with these orebodies.

A cut-off grade of 1.46 g/t Au is used for reporting of Mineral Resources. This cut-off grade was arrived at using a gold price of \$1,400/oz., average gold recovery of 88%, and 2014 actual cost data for RG.

At a cut-off grade of 1.46 g/t Au, the Mineral Resources at RG comprise 1.077 million t at an average grade of 2.77 g/t Au containing 96,000 oz. of gold in the Measured and Indicated Resource category and 1.759 million t at an average grade of 3.48 g/t Au containing 197,000 oz. of gold in the Inferred Mineral Resource category. The Mineral Resources are presented in further detail in Table 11.

Table 11: Summary of Mineral Resources by Orebody as of December 31, 2018

Jaguar Mining Inc. – Caeté Operations			
Category	Tonnes (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	2.95	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			
Measured	188	2.14	13
Indicated	889	2.91	83
Measured & Indicated	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 \$1,400 per ounce.
4. Mineral Resources are estimated using an average long-term foreign exchange rate of 2.5 Brazilian Reals: 1 US Dollar.
5. A minimum mining width of approximately 2 m was used.
6. Gold grades are estimated by the inverse distance cubed interpolation algorithm using capped composite samples.
7. No Mineral Reserves are currently present at RG.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not add due to rounding.

RPA 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.

It is RPA's 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).

Mineral Resource Estimates – Pilar

The updated block model for Pilar is based on drilling and channel sample data using a data cut-off date of December 31, 2018. The database comprises 1,658 drill holes and 20,698 channels. The estimate was generated from a block model constrained by three-dimensional (3D) wireframe models that were constructed using a minimum width of 2 meters. 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 LHW Orebody. The Mineral Resources are reported using the gold grades estimated by the Ordinary Kriging (OK) method. The wireframe models of the mineralization and excavated material for Pilar were constructed using the excavation information as of December 31, 2018.

The 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, the observed continuity of the mineralization, the drill hole and channel sample density, and previous production experience with this deposit.

A cut-off grade of 1.8 g/t Au is used for reporting of Mineral Resources. This cut-off grade was arrived at using a gold price of \$1,500/oz., and actual cost data for Pilar. Gold prices used for reserves are based on consensus, long term forecasts from banks, financial institutions, and other sources. For resources, gold prices used are slightly higher than those for reserves.

At a cut-off grade of 1.8 g/t Au, the Mineral Resources at Pilar comprise 4.93 million t at an average grade of 4.20 g/t Au containing 666,000 oz. of gold in the Measured and Indicated Resource category and 1.38 million t at an average grade of 3.61 g/t Au containing 161,000 oz. of gold in the Inferred Mineral Resource category.

The Mineral Resources are inclusive of Mineral Reserves. For those portions of the Mineral Resources that comprise the Mineral Reserve, the stope design wireframes were used to constrain the Mineral Resource reports.

The Mineral Resources are presented in further detail in Table 12.

Table 12: Summary of Mineral Resources by Orebody as of December 31, 2018

Jaguar Mining Inc. – Caeté Operations			
Pilar Mine			
Category	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz. Au)
Orebody BA			
Measured	521	4.13	69
Indicated	82	3.62	9
Sub-total M&I	603	4.03	78
Inferred	98	3.03	9
Orebody BF			
Measured	815	4.47	117
Indicated	459	5.24	77
Sub-total M&I	1,274	4.74	194
Inferred	398	3.29	42

Jaguar Mining Inc. – Caeté Operations			
Pilar Mine			
Category	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz. Au)
Orebody BF II			
Measured	969	4.94	154
Indicated	186	3.46	21
Sub-total M&I	1,155	4.71	175
Inferred	538	4.42	77
Orebody Torre			
Measured	373	3.99	48
Indicated	273	3.95	35
Sub-total M&I	646	4.00	83
Inferred	300	3.02	29
Orebody LFW			
Measured	185	2.93	17
Indicated	18	2.84	2
Sub-total M&I	203	2.91	19
Inferred	10	3.08	1
Orebody LHW			
Measured	67	2.72	6
Indicated	7	2.33	1
Sub-total M&I	74	2.94	7
Inferred	-	-	-
Orebody LPA			
Measured	149	4.96	24
Indicated	-	-	-
Sub-total M&I	149	4.96	24
Inferred	-	-	-
Orebody SW			
Measured	-	-	-
Indicated	830	3.23	86
Sub-total M&I	830	3.23	86
Inferred	42	2.02	3
Total: Pilar Mine			
Measured	3,079	4.40	435
Indicated	1,855	3.87	231
Measured & Indicated	4,934	4.20	666
Inferred	1,385	3.61	161

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are estimated at a cut-off grade of 1.8 g/t Au.
3. Mineral Resources are estimated using a long-term gold price of \$1,500 per ounce.
4. Mineral Resources are estimated using an average long-term foreign exchange rate of 3.7 Brazilian Reals: 1 US Dollar.
5. A minimum mining width of approximately 2 m was used.
6. Bulk densities used are variable for each mineralized wireframe.

7. Gold grades are estimated by the Ordinary Kriging (OK) interpolation algorithm using capped composite samples.
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.

RPA 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.

It is RPA's 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).

Mineral Reserve Estimates

Table 13 summarizes the Mineral Reserves for Pilar as of December 31, 2018 based on a gold price of \$1,300 per ounce. A break-even cut-off grade of 1.9 g/t Au was used to report the Mineral Reserves for Pilar.

Mineral Reserves have not been estimated for the Roça Grade Mine.

Table 13: Pilar Mineral Reserves as of December 31, 2018

Jaguar Mining Inc. – Caeté Operations			
Category	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz. Au)
Proven	1,176	3.79	143
Probable	608	3.47	68
Total	1,784	3.68	211

Notes:

1. CIM definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated at a cut-off grade of 1.9 g/t Au.
3. Mineral Reserves are estimated using an average long-term gold price of \$1,300 per ounce and a US\$/BRL\$ exchange rate of 3.7.
4. A minimum mining width of approximately 2 m was used.
5. Bulk densities used are either 2.84 t/m³ for iron-formation poor domains or 3.21 t/m³ for iron-formation rich domains.
6. Numbers may not add due to rounding.

Dilution was addressed in two ways – internal, or planned dilution is included in the design solids where they extend beyond the resource wireframe. This occurs in order to respect minimum width for development, or to keep stope walls to achievable outlines. 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 up from the floor of stopes. It was addressed by applying percentage factors to various excavation types, as listed in Table 14.

Table 14: External Dilution by Mining Method

Jaguar Mining Inc. – Caeté Operations	
Mining Method	Dilution (%)
Raising	10
Development	20
Cut & Fill	8
Longhole Stopping	10

Total dilution included in reserves averages approximately 25%, which is a good match for measured results for 2018 mining.

Cut-Off Grade

Mineral Reserves were calculated using a break-even cut-off grade of 1.9 g/t Au, calculated using the following inputs:

- Gold price of \$1,300/oz.
- Exchange rate of US\$1.00:BRL\$3.7
- Metallurgical recovery of 90%
- Operating costs of BRL\$282/t

Metal prices used for reserves match well with consensus, long term forecasts from banks, financial institutions, and other sources, and with prices used by major gold producers. Exchange rates are based on bank forecasts. Metallurgical recovery is in line with recent operating results, as are operating costs.

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

Mining Operations and Metallurgical Process

The Caeté Gold 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.

RG recently produced approximately 500 tpd; however, management is currently reviewing its mining plans. Ore from Pilar is transported by truck 40 km to the Caeté Gold Complex for processing.

At Pilar, gold mineralization is contained within a shear zone with an average 50° to 60° dip. The mineralization is structurally complex due to intense folding and displacements (up to 2 m) due to local faulting. This results in direction changes and pinching and swelling of the vein over relatively short distances. The ore zone hanging wall (HW) and footwall (FW) contacts are visible by eye though sampling shows that there is, on occasion, an assay wall within the formation. The orebody is approximately 250 to 350 m along strike and the orebody is mined along strike access via cross cuts perpendicular to the orebody.

Mining Methods

There are two mining methods in use. The cut and fill method is utilized in the narrower sections of the deposit whereas the longhole method is used in the thicker areas. The current LOMP forecasts longhole mining for a majority of the Mineral Reserves.

The mine is accessed from a 5 m x 5 m primary decline located in the footwall of the deposit. The portal is located at elevation 760 MASL. The mine is divided into levels with Level 1 established at elevation 690 m. Starting at this point, the vertical clearance is 75 m, i.e., Level 2 is at elevation 615 m, Level 3 at elevation 540 m, etc. A 3 m thick sill pillar is left between levels. Sublevels have also been excavated from the main ramp at 15 m vertical intervals to provide for intermediate access to the mining panels. The decline has reached Level 7, a vertical depth of approximately 500 m.

At each level and sublevel, drifts are developed near the centre of the mineralized zone to expose the FW and HW 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.

Longhole mining is carried out on a longitudinal retreat sequence, towards the central access. Stopes are 50 m in length and separated by 3 to 5 m wide pillars, depending on the thickness of the zone. When the mining of each longhole stope has been completed, the excavation is filled using a combination of development waste and hydraulically placed cemented classified flotation tailings. A drainage bund is constructed using development waste to contain the backfill. The backfill is then placed in the mined-out excavation. Once the cement is allowed to set, the next stope in the sequence is drained of excess water and can be mined. The sequence continues until the entire sublevel is mined. Mining then proceeds upward to the next sublevel and the sequence is repeated until the sill pillar is reached. Stopes are mined from several individual levels simultaneously in order to provide the required number of active workplaces needed to meet production targets.

For cut and fill mining, the level development is carried out to the extent of the ore, then backfilled. Once drained of excess water and allowed to cure, the access drift is back-slashed to allow vehicle access to the top of the backfill elevation. The subsequent cut is advanced using the breasting technique. Mining progresses in two directions from the access towards the ends of the orebody. Drilling of the breasts is completed using two-boom electric-hydraulic jumbos equipped with extension steel. This configuration allows for the normal 3.5 m long rounds to be extended to 7 m. Mucking is performed using six cubic yard Load-Haul-Dump (LHD) units and haulage to surface is by a fleet of off-highway surface trucks varying in size from 10 to 25 t. Initial access to each mining panel is from the main level (at the base of the panel). As mining progresses, a 20% slope ramp is constructed in the fill to provide access to the next cut above the previously placed backfill. As this internal ramp is constructed, the roof immediately above it is raised, maintaining a clearance of 4.2 m. The excavation and backfill sequence is repeated until the next sublevel (15 m above) is reached. The sequence is then repeated for a total of five sublevels until the next level is reached.

Backfill is sourced from the filtered coarse portion of the flotation tailings from the Caeté Mining Complex mill, supplemented with available development waste. The filtered tailings are backhauled using the same highway trucks used to transport the ore from the mine to the mill. The fill is re-pulped on surface prior to being pumped underground.

The mine is highly mechanized. Development and mining activities are accomplished with a fleet of five two-boom electric-hydraulic jumbos. Longhole drilling is completed with two Atlas Copco Simba drills. Three six cubic yard LHD units are used for mucking. A fleet of eight Iveco 25-tonne trucks and four 10-tonne trucks are used to haul broken rock to surface. This type of truck was designed for surface use and are often found to be insufficiently robust for underground use. Mechanical availability of these units can be lower than normally observed with haulage trucks specifically designed for underground mining applications.

Ground conditions were observed by RPA to be good. The main decline, portions of which were developed up to ten years ago, did not exhibit any roof or wall deterioration. Primary support in the 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.

Recovery Methods

The Caeté processing plant has a design capacity of 720,000 tonnes per annum (tpa) of ROM ore. In 2018, the plant processed feed from the Pilar and Roça Grande mines. Over the past three years of operation, the Caeté processing plant operated at approximately 60% of its design capacity.

The overall recovery achieved in 2018 was 89%.

The process flowsheet primarily consists of the following unit steps.

- Crushing
- Grinding
- Gravity Gold Recovery
- Flotation
- Leaching & Carbon-in-Pulp
- Gold Recovery
- Detoxification
- Tailings

The ore from the Pilar and Roça Grande Mines is transported by trucks to the crusher circuit and placed in the ROM stockpile. The crushing circuit is made up of a primary jaw crusher in open circuit, and secondary and tertiary cone crushers, operating in closed circuit.

The ROM stockpile ore is fed to the jaw crusher through a grizzly and vibrating feeder. The jaw crusher discharge feeds a multi deck screen, which feeds either the secondary or tertiary crushing circuit or the final product conveyor. The secondary cone crusher operates in closed circuit with a double deck screen. 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, with the product recycling to the crusher or going to the final product conveyor, which goes to crushed ore stockpile. The final particle size of the crushing process is 16 mm.

Grinding & Gravity Gold Recovery

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

Gravity concentration at the Caeté plant uses a centrifugal gravity concentrator (Knelson) to recover fine particles of free gold. The gravity concentrate proceeds to an intense cyanidation plant (Acacia), from which the gold bearing solution is pumped directly to a dedicated set of electrolytic cells. The precipitate from the cells is sent to a refinery for further processing into doré gold bars.

The flotation circuit consists of a series of twelve (12) 500 cubic foot 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 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 four CIP tanks are designed to hold activated carbon in each tank through a designed screen that allows slurry to flow from tank to tank, but retains the carbon in each tank. The carbon interacts with the slurry, adsorbing the gold cyanide complex created in the leach tanks.

The gold loaded carbon is transferred to a desorption column. A hot solution (approx. 98° C) of caustic soda and 1% cyanide concentration is pumped upwardly through the elution column to remove or desorb the gold cyanide complex from the carbon.

After the desorption cycle, the sludge, steel wool and cathodes are withdrawn and sent to the refinery for production of gold doré containing about 80% gold. The doré gold is then further refined, obtaining pure gold bars (minimum 99.99%).

Environmental Studies and Permitting

The mining title for Pilar (claim 830.463/1983) initially belonged to the Companhia Vale do Rio Doce (“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 to cease progress at the mining project.

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

In preparation for permitting of the underground mine, MSOL acquired a preliminary licence for the activity by COPAM process 00132/1999/004/2007. SUPRAM issued the preliminary licence on August 16, 2007, under certificate number 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 number 152/2008.

On September 22, 2009, MSOL applied for an operating licence that was subsequently issued by SURPAM on June 30, 2010 under certificate number 153/2010, COPAM process 00132/1999/007/2009. On February 23, 2016, MSOL applied for a renewal of the operating licence, 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 Pilar.

Taxes

Income taxes are 34% of taxable profit, including a 25% corporate tax rate and a 9% social contribution. In addition to direct operating costs, royalty payments and depreciation are deductible in determining taxable profit.

Mine Life

The current LOMP extends into 2022.

Markets

All gold produced at the Caeté operation is transported to São Paulo on a weekly basis for refining and sale at market prices.

Non-Material Mineral Properties

1. Gurupi Project

The Gurupi Project is located in the state of Maranhão, Brazil. MCT, which was formerly wholly owned by Jaguar prior to the sale of MCT to Avanco, controls the Gurupi Project through a total of 32 mineral concessions totalling 137,419 ha. The Cipoeiro and Chega Tudo deposits, which were the subject of a January 2011 feasibility study filed by Jaguar, are located in two of these 32 mineral concessions. No commercial production of gold has taken place on the Gurupi property. The mineral rights (applications for mining concessions) in connection with the Cipoeiro and Chega Tudo deposits are in good standing.

Gurupi Avanco Earn-in Transaction

On October 4, 2016, Jaguar entered into the Avanco Agreement with Avanco, pursuant to which Avanco may earn up to a 100% interest in Gurupi. Avanco is a Brazilian focused mining exploration and development company, targeting exploration and near-term production from copper and gold projects. Avanco's Board of Directors and Management team have extensive global resource industry experience, particularly in Northern Brazil where they have recently commissioned the Antas coppergold mine on-schedule and under budget. Avanco has offices in Perth, Australia, and Rio de Janeiro and Parauapebas, Brazil.

On September 18, 2017, Jaguar announced that it has signed a revised accelerated earn-in agreement with Avanco for the Gurupi project. Under the terms of the Agreement, and following the satisfactory completion of certain closing conditions, Avanco earned 100% of Jaguar's equity interest in Gurupi by committing to pay to Jaguar \$9 million in aggregate cash payments. To date, Jaguar has received an initial aggregate cash payment of \$4 million, in two instalments of \$2 million each in September and October 2017. The additional \$5 million is expected to be paid to Jaguar in a series of 10 instalments of \$500,000 per month once the injunction on the project is lifted. Jaguar completed the sale of the Gurupi Project to Avanco on October 31, 2017.

In addition, within 24 months of the initial \$4 million payment, Avanco will arrange to have published an Australian JORC code compliant technical report completed regarding Gurupi with mineral reserves in excess of 500,000 oz. of gold. Any delay in this milestone will result in a project delay fee payable to Jaguar of \$250,000 per six months of delayed period. Within 60 months of the initial \$4 million payment, Avanco will aim to commission the Gurupi mine and plant. Any delay in this commissioning milestone will result in a separate project delay fee payable to Jaguar of \$250,000 per six months of delayed period.

As part of the Agreement, Jaguar will retain a LOM Royalty from production at Gurupi. The Royalty will be 1% NSR on the first 500,000 oz. of gold or gold ounce equivalents sold; 2% NSR on sales from 500,001 to 1,500,000 oz. of gold or gold ounce equivalents; and 1% NSR on gold sales exceeding 1,500,000 oz. of gold or gold ounce equivalents.

2. Paciência Mining Complex

The Paciência mining complex consists of an underground mine (Santa Isabel) and a CIP processing plant (the "Paciência Plant"). The Paciência Plant was commissioned in April 2008 and commercial production was declared in December 2008 and has been placed on care and maintenance since 2012.

The well-built facilities remain functional. However, it is clear that, based on the defined resources, the underground mine cannot support a start-up of the facility at this time. To restart operations, the Company would need to identify

sufficient feed for a sustained operation by carrying out exploration and development of the mineral deposits that surround the facility. Some delineated reserves available for mining exist but these reserves will not sustain an economic plant start-up. Ultimately, the Company may start up, redeploy, sell or joint-venture or otherwise monetize the Paciência processing facility. The Company has not established a timeframe to complete the Paciência remediation plans and restart production as it intends to focus on optimizing production and costs at the Turmalina and Caeté operations.

3. Sabar

During 2011 and 2012, Sabar remained on care-and-maintenance. In 2013, the Sabar operation was shut down and remediation work began to restore the Sabar plant area and the open pit areas with re-vegetation. The Company continued to restore the Sabar plant area during 2017 and 2018, and this work will continue until completion expected in the fiscal year 2019.

4. Pedra Branca Project

The Pedra Branca Project is located in the State of Cear in northeastern Brazil and is currently comprised of 24 exploration licences, totalling 38,925 ha covering a 38-km section of a regional shear zone. Final exploration reports and a Preliminary Economic Analysis (“PEA”) have been delivered to ANM for three of these licences. The concessions are located in and around municipal areas with good infrastructure. The mineralized structures are open along strike with potential for significant gold mineralization.

Further work on the Pedra Branca Project, has been delayed as the Company focuses its efforts on the Turmalina and Caeté operations. Consequently, the Company made only those expenditures required to maintain the claims and land tenure in good standing.

The Pedra Branca Project is 100% owned by Jaguar. Based on the acquisition agreement of the project entered into with Glencore Xstrata plc. (“Glencore”), Glencore holds rights to a Net Smelter Royalty of one percent (1%) on future gold production and rights of first refusal on any Base Metal Dominant Deposit (as defined in the amendment) discovered, which if exercised, would allow Glencore to hold 70% of equity in a newly formed legal entity to hold such rights upon payment of three hundred percent (300%) of the Company’s exploration expenditures incurred exclusively on the relevant Base Metal Dominant Area of the property.

RISK FACTORS

I. Risks Relating to the Gold Industry

Gold prices are volatile and there can be no assurance that a profitable market for gold will exist.

Gold prices are volatile and subject to changes resulting from a variety of factors including international economic and political trends, expectations of inflation, global and regional supply and demand and consumption patterns, stock levels maintained by producers and others, currency exchange fluctuations, inflation rates, interest rates, hedging activities and increased production due to improved mining and production methods. While the price of gold has recently been strong, there can be no assurance that gold prices will remain at such levels or be such that Jaguar's properties can be mined at a profit.

Mining is inherently risky and subject to conditions and events beyond Jaguar's control.

Mining involves various types of risks and hazards, including:

- environmental hazards;
- unusual or unexpected geological operating conditions, such as rock bursts, structural cave-ins or slides;
- flooding, earthquakes and fires;
- labour disruptions;
- industrial accidents;
- unexpected mining dilution such as occurred at Turmalina in 2010;
- metallurgical and other processing problems; and
- metal losses and periodic interruptions due to inclement or hazardous weather conditions.

These risks could result in damage to, or destruction of, mineral properties, production facilities or other properties, personal injury or death, environmental damage, delays in mining, increased production costs, monetary losses and possible legal liability.

Jaguar may not be able to obtain insurance to cover these risks at affordable premiums or at all. Insurance against certain environmental risks, including potential liability for pollution or other hazards as a result of the disposal of waste products occurring from production, is not generally available to Jaguar or to other companies within the mining industry. Jaguar may suffer a material adverse effect on its business if it incurs losses related to any significant events that are not covered by its insurance policies.

Calculation of Mineral Reserves and Mineral Resources and metal recovery is only an estimate, and there can be no assurance about the quantity and grade of minerals until mineral resources are actually mined.

The calculation of mineral reserves, mineral resources and corresponding grades being mined or dedicated to future production are imprecise and depend on geological interpretation and statistical inferences or assumptions drawn from drilling and sampling analysis, which might prove to be unpredictable. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. Until mineral reserves or mineral resources are actually mined and processed, the quantity of mineral reserves or mineral resources and grades must be considered as estimates only. Any material change in mineral reserves, mineral resources, grade or stripping ratio at Jaguar's properties may affect the economic viability of Jaguar's properties. In addition, there can be no assurance that metal recoveries in small-scale laboratory tests will be duplicated in larger scale tests under on-site conditions or during production.

The mineral reserve estimates contained in this Annual Information Form are based upon estimates or reports published by Jaguar's personnel and independent geologists, who use assumed future prices, cut-off grades and operating costs that may prove to be inaccurate. Such estimation is a subjective process, and the accuracy of any

mineral reserve or mineral resource estimate depends on the quantity and quality of available data and on the assumptions made and judgments used in interpreting geological data. There are numerous uncertainties inherent in estimating mineral reserves and mineral resources and metal recovery, many of which are beyond Jaguar's control, and as a result, no assurance can be given as to the accuracy of such estimates or reports. Extended declines in the market price for gold may render portions of Jaguar's mineralization uneconomic and result in reduced reported mineral reserves. A material reduction in Jaguar's estimates of mineral reserves, or of Jaguar's ability to extract this mineralization, could have a material adverse effect on Jaguar's financial condition and results of operations.

Significant uncertainty exists related to inferred mineral resources.

There is a risk that inferred mineral resources referred to in this Annual Information Form cannot be converted into measured or indicated mineral resources. Due to the uncertainty relating to inferred mineral resources, there is no assurance that inferred mineral resources will be upgraded to resources with sufficient geological and grade continuity to constitute measured and indicated resources as a result of continued exploration.

II. Risks Relating to Jaguar's Business

Jaguar's operations involve exploration and development and there is no guarantee that any such activity will result in commercial production of mineral deposits.

The proposed programs on the exploration properties in which Jaguar holds an interest are exploratory in nature and such properties do not host known bodies of commercial ore. Development of these mineral properties is contingent upon, among other things, obtaining satisfactory exploration results. Mineral exploration and development involves substantial expenses related to locating and establishing mineral reserves, developing metallurgical processes and constructing mining and processing facilities at a particular site. It also involves a high degree of risk, which even a combination of experience, knowledge and careful evaluation may not be able to adequately mitigate. Few properties that are explored are ultimately developed into producing mines, and there is no assurance that commercial quantities of ore will be discovered on any of Jaguar's exploration properties. There is also no assurance that, even if commercial quantities of ore are discovered, a mineral property will be brought into commercial production, or if brought into production, that it will be profitable. The discovery of mineral deposits is dependent upon a number of factors including the technical skill of the exploration personnel involved. The commercial viability of a mineral deposit is also dependent upon, among a number of other factors, its size, grade and proximity to infrastructure, current metal prices, and government regulations, including regulations relating to required permits, royalties, allowable production, importing and exporting of minerals and environmental protection. The exact effect of these factors cannot be accurately predicted, but any one of these factors or the combination of any of these factors may prevent Jaguar from receiving an adequate return on invested capital. In addition, depending on the type of mining operation involved, several years can elapse from the initial phase of drilling until commercial operations are commenced. Some ore reserves may become unprofitable to develop if there are unfavourable long-term market price fluctuations in gold, or if there are significant increases in operating or capital costs. Most of the above factors are beyond Jaguar's control, and it is difficult to ensure that the exploration or development programs proposed by Jaguar will result in a profitable commercial mining operation.

Fluctuations in currency exchange rates may adversely affect Jaguar's financial position and results of operations.

Fluctuations in currency exchange rates, particularly operating costs denominated in currencies other than U.S. dollars, may significantly impact Jaguar's financial position and results of operations. Jaguar generally sells its gold based on a U.S. dollar price, but a major portion of Jaguar's operating expenses is incurred in non-U.S. dollar currencies. In addition, the appreciation of the Brazilian Real against the U.S. dollar could further increase the dollar costs of gold production at Jaguar's mining operations in Brazil, which could materially and adversely affect Jaguar's earnings and financial condition.

Competition for new mining properties may prevent Jaguar from acquiring interests in additional properties or mining operations.

The gold mining industry is intensely competitive. Significant and increasing competition exists for gold and other mineral acquisition opportunities throughout the world. Some of the competitors are large, more established mining companies with substantial capabilities and greater financial resources, operational experience and technical capabilities than Jaguar. As a result of this competition, Jaguar may be unable to acquire rights to additional attractive mining properties on terms it considers acceptable. Increased competition could adversely affect Jaguar's ability to attract necessary capital funding or acquire an interest in additional operations that would yield mineral reserves or result in commercial mining operations.

Jaguar relies on its management and key personnel, and there is no assurance that such persons will remain at Jaguar, or that it will be able to recruit skilled individuals.

Jaguar relies heavily on its management. Jaguar does not maintain "key man" insurance. Recruiting and retaining qualified personnel is critical to Jaguar's success. The number of persons skilled in the acquisition, exploration and development of mining properties is limited and competition for the services of such persons is intense. In addition, as Jaguar's business activity grows, it may require additional key financial, administrative, technical and mining personnel. The failure to attract and/or retain such personnel to manage growth effectively could have a material adverse effect on Jaguar's business, prospects, financial condition and results of operations.

Actual capital costs, operating costs, production and economic returns may differ significantly from those estimated by Jaguar and there can be no assurance that any future development activities will result in profitable mining operations.

Capital and operating costs, production and economic returns, and other estimates contained in the feasibility studies for Jaguar's projects may differ significantly from those anticipated by Jaguar's current studies and estimates, and there can be no assurance that Jaguar's actual capital and operating costs will not be higher than currently anticipated. In addition, delays to construction schedules may negatively impact the net present value and internal rates of return of Jaguar's mineral properties as set forth in the applicable feasibility studies.

Jaguar's cash operating costs per ounce sold and all-in sustaining costs per ounce sold* for the years ending December 31, 2018, 2017, and 2016 were as follows:

		2018	2017	2016
Turmalina	Cash operating costs per ounce sold	\$754	\$705	\$566
	All-in sustaining costs per ounce sold	\$1,256	\$900	\$787
Pilar	Cash operating costs per ounce sold	\$704	\$937	\$926
	All-in sustaining costs per ounce sold	\$992	\$1,226	\$1,286
Roça Grande	Cash operating costs per ounce sold	\$1,230	\$1,422	\$1,425
	All-in sustaining costs per ounce sold	\$1,230	\$1,743	\$1,648
Consolidated	Cash operating costs per ounce sold	\$732	\$837	\$719
	All-in sustaining costs per ounce sold	\$1,244	\$1,212	\$1,099

* Cash operating costs per ounce sold and all-in sustaining costs per ounce sold are non-IFRS measures with no standard definition under IFRS. Refer to the non-IFRS financial performance measures section of the Company's MD&A.

Increases in energy costs or the interruption of Jaguar's energy supply may adversely affect Jaguar's results of operations.

Jaguar's operations are energy intensive and rely upon third parties for the supply of the energy resources consumed in its operations. The prices for and availability of energy resources may be subject to change or curtailment,

respectively, due to, among other things, new laws or regulations, imposition of new taxes or tariffs, interruptions in production by suppliers, worldwide price levels and market conditions. Disruptions in supply or increases in costs of energy resources could have a material adverse impact on Jaguar's financial condition and the results of operations.

There can be no assurance that the interests held by Jaguar in its properties are free from defects.

Jaguar's properties may be subject to prior recorded and unrecorded agreements, transfers or claims, and title may be affected by, among other things, undetected defects. Title insurance is generally not available for mineral properties, and Jaguar's ability to ensure that it has obtained a secure claim to individual mining properties or mining concessions may be severely constrained. Jaguar has not conducted surveys of all of the claims in which it holds direct or indirect interests. A successful challenge to the precise area and location of these claims could result in Jaguar being unable to operate on its properties as permitted or being unable to enforce its rights with respect to its properties. No assurance can be given that Jaguar's rights will not be revoked or significantly altered to its detriment. There can also be no assurance that its rights will not be challenged or impugned by third parties.

Jaguar is exposed to risks of changing political stability and government regulation in the country in which it operates.

Jaguar holds mineral interests in Brazil that may be affected in varying degrees by political instability, government regulations relating to the mining industry and foreign investment therein, and the policies of other nations in respect of Brazil. Any changes in regulations or shifts in political conditions are beyond Jaguar's control and may adversely affect its business. Jaguar's operations may be affected in varying degrees by government regulations, including those with respect to restrictions on production, price controls, export controls, income taxes, expropriation of property, employment, land use, water use, environmental legislation and mine safety. The regulatory environment is in a state of continuing change, and new laws, regulations and requirements may be retroactive in their effect and implementation. Jaguar's operations may also be adversely affected in varying degrees by political and economic instability, economic or other sanctions imposed by other nations, terrorism, military repression, crime, extreme fluctuations in currency exchange rates and high inflation.

Jaguar is subject to additional business and financial risks inherent in doing business in Brazil.

The Company's principal operations and mineral properties are located in Brazil. There are additional business and financial risks inherent in doing business in Brazil as compared to the United States or Canada. Since 1996, Transparency International has published the "Corruption Perceptions Index" ("CPI") annually ranking countries by their perceived levels of corruption, as determined by expert assessments and opinion surveys. The CPI ranks countries on a scale from 100 (very clean) to 0 (highly corrupt). In 2018 and out of 180 countries in the World, Canada was ranked 9th with CPI score of 81, the United States was ranked 22nd with a CPI score of 71, and Brazil was ranked 105th with a CPI score of 35. In 2016, Brazil had a score of 40 and was ranked 79th. The average score on the 2018 Corruption Perceptions Index was 43 out of 100. Anything below 50 indicates governments are failing to tackle corruption and it represents a challenge in those countries requiring extra attention by those who conduct business there.

Corruption does not only occur with the misuse of public, government or regulatory powers, it also can occur in business's supplies, inputs and procurement functions (such as illicit rebates, kickbacks and dubious vendor relationships) as well as the inventory and product sales functions (such as inventory shrinkage or skimming). Employees as well as external parties (such as suppliers, distributors and contractors) have opportunities to commit procurement fraud, theft, embezzlement and other wrongs against the Company. While corruption, bribery and fraud risks can never be fully eliminated, the Company reviews and implements controls to reduce the likelihood of these irregularities occurring. The Company utilizes an internal auditor, third-party security services and closed-

circuit video surveillance at its operations in Brazil.

Jaguar is subject to significant governmental regulations.

Jaguar's mining and exploration activities are subject to extensive local laws and regulations. Failure to comply with applicable laws, regulations and permitting requirements may result in enforcement actions thereunder, including orders issued by regulatory or judicial authorities, who may require operations to cease or be curtailed, or corrective measures requiring capital expenditures, installation of additional equipment, or remedial actions. Parties engaged in mining operations may be required to compensate those suffering loss or damage by reason of the mining activities and may have civil or criminal fines or penalties imposed for violations of applicable laws or regulations.

Amendments to current laws, regulations and permits governing operations and activities of mining companies, or more stringent implementation of such requirements, could have a material adverse impact on Jaguar and cause increases in capital expenditures or production costs or reductions in levels of production at producing properties or require abandonment or delays in development of new mining properties.

Jaguar's operations are subject to numerous governmental permits, which are difficult to obtain, and it may not be able to obtain or renew all of the permits it requires, or such permits may not be timely obtained or renewed.

Government approvals and permits are sometimes required in connection with Jaguar's operations. Although Jaguar believes it has all of the material approvals and permits to carry on its operations, Jaguar may require additional approvals or permits or may be required to renew existing approvals or permits from time to time. Obtaining or renewing approvals or permits can be a complex and time-consuming process. There can be no assurance that Jaguar will be able to obtain or renew the necessary approvals and permits on acceptable terms, in a timely manner, or at all. To the extent such approvals are required and not obtained, Jaguar may be delayed or prohibited from proceeding with planned exploration, development or mining of mineral properties.

Under current regulations, all exploration activities that the Company undertakes through its subsidiaries must be carried out on valid exploration licences or prospecting permits issued by the DNPM, a department of the Brazilian federal government. The DNPM is responsible for the administration of all mining and exploration licences, and prospecting permits. According to local regulations, the Company must submit a final exploration report before the expiry date of any licence or permit, which is usually three years from the date of grant. However, Brazilian mining laws and regulations are currently undergoing a major restructuring, and draft legislation to this effect has been submitted to the federal legislature for review and approval. The effects of this restructuring will, if adopted, be far-reaching in the ways that mining rights can be acquired and maintained in the country.

Current proposals include an auction process for new licences, minimum expenditures designed to eliminate the "warehousing" of mining permits and licences as well as new fee schedules. They also provide for land owner participation where applicable. It is the Company's understanding, based on consultations with local counsel, that licences currently held in good standing will be grandfathered and not subject to certain requirements of the proposed new regime. Production from the Company's mines results in a 1% royalty fee payment to the Brazilian government (the "CFEM"), on the value of the ore produced. However, and as mentioned above, the Brazilian government is currently considering the adoption of new mining legislation that would include increases in the CFEM royalties.

Environmental permits are granted for one to ten-years periods and all local agencies have the right to monitor and evaluate compliance with the issued permits even though such monitoring tends to be minimal in scope and nature. Any changes to the exploration activities that result in a greater environmental impact require approval.

The work the Company carries out on its exploration licences is largely restricted to drilling and ancillary activities associated with the drilling programs (i.e., low impact road construction, drilling stations). As such, the reclamation

costs in respect of drilling activities are not material to the Company and are factored into the budget for exploration programs.

Jaguar is subject to substantial environmental laws and regulations that may increase its costs and restrict its operations.

All phases of Jaguar's operations are subject to environmental regulations in the jurisdictions in which it operates. These laws address emissions into the air, discharges into water, management of waste and hazardous substances, protection of natural resources and reclamation of lands disturbed by mining operations. Environmental legislation is evolving in a manner that will require stricter standards and enforcement, increased fines and penalties for non-compliance, more stringent environmental assessments of proposed projects and a heightened degree of responsibility for companies and their officers, directors and employees. This is especially true in 2019 following the high-profile Brumadinho dam disaster that occurred on January, 25 2019 when Dam I, a tailings dam at Vale's Córrego do Feijão iron ore mine, 9 kilometres (5.6 mi) east of Brumadinho, Minas Gerais, Brazil, suffered a catastrophic failure. Compliance with environmental laws and regulations may require significant capital outlays and may cause material changes or delays in, or the cancellation of, Jaguar's intended activities. There can be no assurance that future changes in environmental regulation, if any, will not be materially adverse to Jaguar's operations. Specifically, new laws and regulations, amendments to existing laws and regulations, or more stringent enforcement of existing laws and regulations could have a material adverse impact on the Company, increase costs, cause a reduction in levels of production and/or delay or prevent the development of new mining properties.

The properties in which Jaguar holds interests may contain environmental hazards, which are presently unknown to it and which have been caused by previous or existing owners or operators of the properties. If Jaguar's properties do contain such hazards, this could lead to Jaguar being unable to use the properties or may cause Jaguar to incur costs to clean up such hazards. In addition, Jaguar could become subject to litigation should such hazards result in injury to any persons. Jaguar currently has four downstream dams, with one downstream dam having a section permitted to be used as upstream; however, that section of the upstream was never utilized by the Company. There is a risk that the regulatory authorities may impose either operating restrictions or additional expenditures to all of the Company's dams, particularly in relation to the upstream section of the downstream dam.

Land reclamation requirements for Jaguar's mining and exploration properties may be burdensome.

Land reclamation requirements are generally imposed on companies engaged in mining operations and mineral exploration activities in order to minimize long-term effects of land disturbance. Reclamation may include requirements to control dispersion of potentially deleterious effluents and reasonably re-establish pre-disturbance land forms and vegetation. In order to carry out reclamation obligations imposed on Jaguar in connection with its mining and exploration activities, Jaguar must allocate financial resources that might otherwise be spent on further exploration and development programs. If Jaguar is required to carry out unanticipated reclamation work, its financial position could be adversely affected.

Jaguar is subject to restrictive debt covenants.

The Sprott Credit Agreement contains certain restrictions that limit Jaguar's ability to incur additional indebtedness. These restrictions may limit Jaguar's ability to take advantage of business opportunities as they arise. More importantly, Jaguar's ability to comply with the covenants may be affected by changes in economic or business conditions or other events beyond its control. A breach of these covenants by Jaguar and a corresponding default under the Sprott Credit Agreement in circumstances may result in the aggregate amount of the principal and interest on the Sprott Credit Facility becoming due and payable by Jaguar. Jaguar's ability to make accelerated payments will be dependent upon its cash resources at the time, its ability to generate sufficient revenue and its access to alternative sources of funds.

The financial covenants related to the Sprott Facility require the Company to maintain a minimum of \$5 million

unrestricted cash and cash equivalents and positive working capital computed monthly.

Internal controls provide no absolute assurances as to reliability of financial reporting and financial statement preparation, and ongoing evaluation may identify areas in need of improvement.

The Company has invested resources to document and assess its system of internal control over financial reporting and undertakes an evaluation process of such internal controls. Internal control over financial reporting are procedures designed to provide reasonable assurance that transactions are properly authorized, assets are safeguarded against unauthorized or improper use, and transactions are properly recorded and reported. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, safeguards with respect to the reliability of financial reporting and financial statement preparation.

As part of the annual audit of the Company's annual financial statements, the Company's external auditor assesses the effectiveness of the Company's internal controls for financial reporting and communicates to the Company's audit committee any significant deficiencies that the external auditor has identified. In the past, the external auditor has at times identified some deficiencies that have been reviewed, assessed, discussed with the external auditor and, if required, remedied by the Company. The Company currently believes that no material weakness exists in regard its internal controls for financial reporting that result in a reasonable possibility that a material misstatement of Company's financial statements will not be prevented or detected on a timely basis. However, if the Company fails to maintain the adequacy of its internal control over financial reporting, as either the Company's or applicable regulatory standards are modified, supplemented, or amended from time to time, then the Company may not be able to ensure that it can conclude on an ongoing basis that it has effective internal controls over financial reporting. If in the future the Company is required to disclose a material weakness in its internal controls over financial reporting, then this could result in the loss of investor confidence in the reliability of the Company's financial statements, which in turn could harm the Company's business and negatively impact the trading price of its common shares. In addition, any failure to implement required new or improved controls, or difficulties encountered in their implementation, could harm the Company's operating results or cause it to fail to meet its reporting obligations.

Jaguar may need additional capital to accomplish its exploration and development plans or to cover its expenses and maintain adequate working capital, and there can be no assurance that financing will be available on terms acceptable to Jaguar, or at all.

Depending on gold prices and Jaguar's ability to achieve its plans and generate sufficient operating cash flow from its existing operations, Jaguar may require substantial additional financing to accomplish its exploration and development plans, maintain adequate working capital, or fund any non-operating expenses that may arise or become due such as interest, tax (in Canada or Brazil) or other expenses. Failure to obtain sufficient financing, or financing on terms acceptable to Jaguar, may result in a delay or indefinite postponement of exploration, development or production on any or all of Jaguar's properties or even a loss of an interest in a property, or even a loss of an interest in a property, or an inability to pay any of Jaguar's non-operating expenses which could also lead to late fees or penalties, depending on the nature of the expense. The only source of funds now available to Jaguar is through production at Turmalina and Caeté, the sale of debt or equity capital, properties, royalty interests or the entering into of joint ventures or other strategic alliances in which the funding sources could become entitled to an interest in Jaguar's properties or projects. Additional financing may not be available when needed. If funding is available, the terms of such financing might not be favourable to Jaguar and might involve substantial dilution to existing shareholders. If financing involves the issuance of debt, the terms of the agreement governing such debt could impose restrictions on Jaguar's operation of its business. Failure to raise capital when needed could have a material adverse effect on Jaguar's business, financial condition and results of operations.

Jaguar is exposed to risks of labour disruptions and changing labour and employment regulations.

Employees of Jaguar's principal projects are unionized, and the collective bargaining agreements between Jaguar and the unions that represent these employees must be renegotiated on an annual basis. Although Jaguar believes it has good relations with its employees and with their unions, production at Jaguar's mining operations is dependent upon the continuous efforts of Jaguar's employees. In addition, relations between Jaguar and its employees may be affected by changes in the scheme of labour relations that may be introduced by the relevant governmental authorities in whose jurisdictions Jaguar carries on business. Labour disruptions or any changes in labour or employment legislation or in the relationship between Jaguar and its employees may have a material adverse effect on Jaguar's business, results of operations and financial condition. Labour litigation in Brazil is an ongoing exposure for all companies working in Brazil, especially in the mining sector. Jaguar has a number of labour claims and the settlement of such claims may result in significant cash outflow in future.

Substantially all of Jaguar's assets are held by foreign subsidiaries that are subject to the laws of the Federal Republic of Brazil.

Jaguar conducts operations through its wholly owned foreign subsidiary MSOL and substantially all of Jaguar's assets are held through this entity. Accordingly, any governmental limitation on the transfer of cash or other assets between Jaguar and MSOL could restrict Jaguar's ability to fund its operations efficiently. Any such limitations or the perception that such limitations may exist now or in the future could have an adverse impact on Jaguar's prospects, financial condition and results of operations.

Jaguar may be subject to litigation.

All industries, including the mining industry, are subject to legal claims, with and without merit. Generally, the labour claims are due to disputed overtime, danger pay, wage parity, etc. The Company may become involved in legal disputes in the future. Defense and settlement costs can be substantial, even with respect to claims that have no merit. Due to the inherent uncertainty of the litigation process, there can be no assurance that the resolution of any particular legal proceeding will not have a material effect on the Company's financial position or results of operations.

Brazilian labour law is a complex system of statutes and regulations, which in general has a favourable approach to employees of the Company. As such, corporate labour compliance is a key success factor in Brazilian-based operations to minimize the impact of labour claims. The Company has historically not been in full compliance of labour regulations nor did it have the proper procedures in place to support labour claims defences, which led to the bulk of the litigation provisions recorded.

In March 2013, management retained external counsel to review the Company's labour practices in Brazil to determine areas of improvement. As a result, management received a report that identified 48 labour law violations in the Company's legacy human resource practices capable of generating financial liability. Management has been tracking these 48 violations and has since implemented changes in procedures to eliminate those issues going forward and made significant progress during the last three years in addressing the deficiencies. The Company's human resource and legal departments have been continually reviewing the Company's practices and establishing action plans to improve labour practices and both departments continue to monitor the implementation of actions to remediate the legacy deficiencies.

Jaguar may be subject to community relations and social licence to operate issues, or involvement from Non-Governmental Organizations (NGOs).

Jaguar mines in a peri-urban environment adjacent to communities surrounded by lands used for agriculture, residence, and other industry. Jaguar has no significant community relations issues at present. However, ore from Pilar is trucked to the Caeté site for processing which passes through one or two towns depending on the route.

Jaguar has maintained good community relations with the neighbouring communities and city councils to date. Relations between Jaguar and its local communities may be affected by elections changing the relevant governmental authorities in whose jurisdictions Jaguar carries on business, by local community dissatisfaction with our operations, or by involvement of a NGO opposed to mining. Community disruptions, changes in the relationship between Jaguar and the communities wherein it operates, or new involvement by NGOs opposed to mining, may have a material adverse effect on Jaguar's business, which could result in changes in operational and financial conditions. Social licence to operate in Brazil is an ongoing exposure for all companies working in Brazil, especially in the mining sector.

Jaguar may be subject to impacts on production if the road route between the Pilar Mine and the Caeté site cannot be used due to rain or other events.

Jaguar has material properties located in the state of Minas Gerais, Brazil. Typically, the state's wet season is from November to April. During the wet season, the properties and surrounding infrastructure may be subject to unpredictable weather conditions such as heavy rains, strong winds, and flash flooding. Pilar is located approximately 50 km by road from the Caeté plant. Ore from Pilar is hauled to the Caeté plant. Ore haulage activities may be slowed or delayed as roads may be temporarily flooded or if the maintenance or provision of such infrastructure is impacted by other events. Any delays could adversely affect Jaguar's operations, financial condition, and results of operations. Jaguar has undertaken to mitigate the potential effects of the wet season by discussing alternative routes with the neighbouring communities.

Jaguar has no record of paying dividends.

Jaguar has paid no dividends on its common shares since incorporation and does not anticipate doing so in the foreseeable future. Payment of any future dividends will be at the discretion of the Board after taking into account many factors, including operating results, financial condition, capital requirements, business opportunities and restrictions contained in any financing agreements.

Global financial conditions may negatively impact its operations and share pricing.

Current global financial conditions have been characterized by increased volatility, particularly the markets for commodities, including gold. Access to public financing has been negatively impacted by several factors including efforts by financial institutions to de-lever their balance sheets in the face of current economic conditions. These factors may impact the ability of Jaguar to obtain equity or debt financing in the future on terms favourable to Jaguar. Additionally, these factors, as well as other related factors, may cause decreases in asset values that are deemed to be other than temporary, which may result in impairment losses. If Jaguar had to idle any of its producing properties or delay development of any project, there is no assurance that it would be able to restart production or development without undue delay, if at all. If such increased levels of volatility and market turmoil continue, Jaguar's operations could be adversely impacted and the trading price of its common shares may be adversely affected.

The trading price for Jaguar's common shares is volatile and has been, and may continue to be, greatly affected by the ongoing market volatility.

Securities of mineral exploration and early stage base metal production companies have experienced substantial volatility in the past, often based on factors unrelated to the financial performance or prospects of the companies involved. These factors include macroeconomic developments in North America and globally and market perceptions of the attractiveness of particular industries. Jaguar's common share price is also likely to be significantly affected by short-term changes in gold prices or in its financial condition or results of operations as reflected in its quarterly earnings reports. Other factors unrelated to Jaguar's performance that may have an effect on the price of its common shares include the following: the extent of analytical coverage available to investors concerning Jaguar's business may be limited if investment banks with research capabilities do not continue to follow Jaguar's securities; the lessening in trading volume and general market interest in Jaguar's securities may affect an investor's ability to

trade significant numbers of Jaguar's common shares; and the size of Jaguar's public float may limit the ability of some institutions to invest in Jaguar's securities. As a result of any of these factors, the market price of Jaguar's common shares at any given point in time may not accurately reflect Jaguar's long-term value.

DIVIDENDS

Jaguar has not paid any dividends for the years ended December 31, 2018, 2017 and 2016, and has no plans to pay dividends in the foreseeable future. Any future payment of dividends will be dependent upon the financial requirements of Jaguar to fund future projects, the financial condition of Jaguar and other factors that the Board, in its discretion, may consider appropriate under the circumstances.

DESCRIPTION OF CAPITAL STRUCTURE

Jaguar is authorized to issue an unlimited number of common shares of which there were 328,644,864 issued and outstanding as of December 31, 2018. Holders of Jaguar's common shares are entitled to receive notice of any meetings of shareholders, to attend and to cast one vote per common share at all such meetings. Holders of Jaguar's common shares do not have cumulative voting rights with respect to the election of directors, and holders of a majority of Jaguar's common shares entitled to vote in any election of directors may therefore elect all directors standing for election. Holders of Jaguar's common shares are entitled to receive on a pro-rata basis such dividends, if any, as and when declared by the Board at its discretion from funds legally available therefore and upon the liquidation, dissolution or winding up of Jaguar are entitled to receive on a pro-rata basis the net assets of Jaguar after payment of debts and other liabilities, in each case subject to the rights, privileges, restrictions and conditions attaching to any other series or class of shares ranking senior in priority to or on a pro-rata basis with the holders of common shares with respect to dividends or liquidation. Jaguar's common shares do not carry any pre-emptive, subscription, redemption or conversion rights, nor do they contain any sinking or purchase fund provisions.

MARKET FOR SECURITIES

Jaguar's common shares were listed on the TSX-V until the common shares were listed on the TSX commencing August 3, 2016 under the symbol "JAG". *For more information, refer to Jaguar's press release dated July 29, 2016.*

The following table sets forth information relating to the trading of Jaguar's common shares on the TSX for the periods indicated. The trading prices and volume data were obtained from infoventures.com.

TSX Common Shares Trading

	High	Low	Volume
January, 2018	0.34	0.40	4,964,795
February, 2018	0.34	0.40	2,037,170
March, 2018	0.33	0.41	1,468,970
April, 2018	0.33	0.36	1,692,100
May, 2018	0.34	0.40	3,319,510
June, 2018	0.32	0.38	1,191,100
July, 2018	0.31	0.37	1,181,930
August, 2018	0.18	0.34	6,303,850
September, 2018	0.19	0.26	2,071,120
October, 2018	0.18	0.24	5,095,670
November, 2018	0.18	0.22	2,591,470
December, 2018	0.19	0.21	1,622,070

PRIOR SALES

The Company has not issued any common shares or securities convertible into common shares during the year ended December 31, 2018 other than the following:

- On January 23, 2018, the Company granted an aggregate of 1,547,000 Stock Options to executives of the Company. The options are exercisable at a price of C\$0.35 and expire on January 23, 2026.
- On January 23, 2018, the Company also granted 191,000 Deferred Share Units (“DSUs”) to each of the non-executive directors, totalling a grant of 1,337,000 DSUs, 50% of which vested immediately, with the remaining 50% vesting on July 23, 2018. The DSUs are exercisable upon the retirement of such directors.
- In addition, the Company granted executives of the Company 563,000 time-vested DSUs, which vest on a quarterly basis, in 12 equal instalments, starting on April 23, 2018, and 563,000 performance-vested DSUs, which shall vest if the Company’s stock price reaches C\$1.00 measured on a 5-day volume weighted average price basis, and is maintained for at least 20 consecutive days. The DSUs granted to executives of the Company are exercisable upon vesting.
- On February 4, 2018, due to Paul Whillans’ resignation, the quantity of 350,000 Stock Options and 108,000 DSUs were canceled.
- On May 4, 2018, due to Robert Gill’s resignation, the quantity of 468,104 Stock Options and 234,302 DSUs, which had not yet vested, were canceled.
- On August 2, 2018, due to Robert Gill’s resignation, the quantity of 343,126 Stock Options and 194,998 DSUs, which had vested but were not exercised after 90 days from his resignation, were canceled.
- On August 15, 2018, due to Rodney Lamond’s resignation, the quantity of 1,933,435 Stock Options and 527,928 DSUs, which had not yet vested, were canceled.
- On September 5, 2018, the Company granted an aggregate of 1,143,000 Stock Options to executives of the Company. The options are exercisable at a price of C\$0.21 and expire on August 31, 2026. The quantity of

535,000 Stock Options for the Interim CEO Ben Guenther shall vest in monthly instalments over one year, starting 1 month following August 31, 2018.

- On September 5, 2018, the Company also granted 143,000 DSUs to each of the non-executive directors, totalling a grant of 858,000 DSUs, 50% of which vested immediately, with the remaining 50% vesting February 28, 2019. The DSUs are exercisable upon the retirement of such directors.
- In addition, the Company granted executives of the Company 775,000 time-vested DSUs, which vest on a quarterly basis, in 12 equal instalments, starting on November 30, 2018. The 360,000 DSUs granted to the Interim CEO Ben Guenther shall vest as follows: 50% in monthly instalments over 6 months, and 50% in monthly instalments over 12 months, starting one month following August 31, 2018. Also, were granted 380,000 DSUs-in-lieu-of-Compensation, which are awarded only to the Interim CEO Ben Guenther, and shall vest all in monthly instalments over 6 months, starting one month following August 31, 2018. The DSUs granted to executives of the Company are exercisable upon vesting.
- On September 12, 2018, Rodney Lamond exercised the quantity of 111,262 DSUs, which had vested before his resignation.
- On September 13, 2018, Hashim Ahmed exercised the quantity of 205,599 DSUs, which had vested.
- On November 14, 2018, due to Rodney Lamond's resignation, the quantity of 6,133,435 Stock Options, which had vested but were not exercised after 90 days from his resignation, were canceled.
- On December 18, 2018, due to Jan Dahlgren's resignation, the quantity of 117,333 Stock Options and 77,917 DSUs were canceled.

DIRECTORS AND EXECUTIVE OFFICERS

Directors and Executive Officers

On August 15, 2018, the Company announced that Rodney Lamond was resigning for personal reasons his position as CEO and a director of Jaguar. Benjamin Guenther was appointed as Interim Chief Executive Officer effective immediately. Mr. Guenther was appointed to the Board of Jaguar in November 2017 and served as the Chairman of the Technical Committee of the Board. He is a mining engineer with a wide range of management and executive experience and has worked over 40 years in the mining industry. Mr. Guenther held Senior Management Positions with AngloGold Ashanti in his past career including a long association with mining in Brazil. Mr. Guenther graduated from the Colorado School of Mines. The Company also announced that it had commenced its search for a permanent CEO.

On November 14, 2018, the Company announced that Richard Falconer had stepped down as Chairman of the Board and Thomas Weng, a current director, had been named Chairman. Mr. Falconer will continue to serve on the Board at least until the Company's Annual General Meeting in 2019. Mr. Weng has more than 25 years of experience in the financial services sector with a focus on mining, metals, industrials and consumer products. Mr. Weng is a Co-Founding Partner with Alta Capital Partners, a financial advisory provider. Previously, Mr. Weng was Managing Director at Deutsche Bank and Head of Equity Capital Markets for Metals and Mining throughout the Americas and Latin America, across all industry segments. Prior to 2007, Mr. Weng held various senior positions at Pacific Partners, an alternative investment firm, and Morgan Stanley and Bear Stearns. Mr. Weng graduated from Boston University with a Bachelor of Arts in Economics.

The following is a list of the directors and executive officers of Jaguar (collectively, the "Directors and Officers") as at December 31, 2018, and information regarding each individual including municipality of home address, position with Jaguar, date of appointment to the position with Jaguar and their principal occupation during the past five years. As of December 31, 2018, the directors of Jaguar were Richard D. Falconer, Luis Ricardo Miraglia, Edward V.

Reeser, Robert Getz, John Ellis, Thomas Weng and Ben Guenther. All directors hold office until the next annual meeting of shareholders or until their successors are elected or until their earlier death, resignation or removal.

Name & Province/State of Residence	Position and Date of Appointment	Principal Occupation (past five years)	Number of Common Shares Beneficially Owned	Percentage of Common Shares Beneficially Owned	Number of Deferred Share Units
Richard D. Falconer Ontario, Canada	Director May 22, 2012 Chairman June 29, 2012	Managing Senior Advisor of Lazard Canada Inc. since 2016. Senior Partner of Verus Partners & Co. Inc. (2014-2016)	365,023	0.11%	755,372
Luis Ricardo Miraglia Minas Gerais, Brazil	Director September 27, 2012	Senior Partner of Azevedo Sette Advogados, a Brazilian law firm, since 2004.	40,000	0.01%	755,372
Edward V. Reeser Ontario, Canada	Director June 10, 2013	President of Mobilex Corporation. President of Celco Inc. (until November 2017)	123,375	0.04%	755,372
Thomas Weng New Jersey, United States	Director April 1, 2016	Co-founder of Alta Capital Partners.	6,871	0.00%	567,145
Robert Getz Connecticut, United States	Director June 24, 2016	Managing Partner of Pecksland Capital Partners, and Partner and Co-founder of Cornerstone Equity Investors (1996-2016)	298,000	0.09%	537,472
John Ellis Nevada, United States	Director June 24, 2016	Director for International Tower Mines and for Hycroft Mines. Sunshine Silver Mines Corporation.	70,000	0.02%	537,472
Ben Guenther Colorado, United States	Director and Officer November 7, 2017	Manager at Platoro Mine Consulting LLC. Various Executive Positions at AngloGold Ashanti (1995-2017).	100,000	0.03%	964,000
Hashim Ahmed Ontario, Canada	Officer February 19, 2016	Chief Financial Officer, Jaguar Mining Inc. Financial Controller, Projects Barrick Gold (2008-2014).	59,000	0.02%	473,481

As at March 28, 2019, the directors and executive officers of the Company, as a group, beneficially owned, directly or indirectly, or exercised control over, a total of 930,919 common shares, representing 0.3% of the issued and outstanding common shares of the Company, as well as a total of 5,345,686 deferred share units. The deferred share units are exercisable upon the retirement of non-executive directors, and upon vesting for executive officers.

On November 12, 2018, the Company revised its Board Committee structures. The new Committees and members are as follows:

Corporate Governance and Nomination Committee:

- Robert Getz (Chairman)
- John Ellis
- Richard Falconer

Finance & Corporate Development Committee:

- Luis Miraglia (Chairman)
- Robert Getz
- Edward Reeser

Audit & Risk Committee:

- Edward Reeser (Chairman)
- Robert Getz
- Richard Falconer

Compensation Committee

- Robert Getz (Chairman)
- Edward Reeser
- John Ellis

Safety, Environmental, Technical and Reserves Committee

- John Ellis (Chairman)
- Luis Miraglia
- Edward Reeser
- Ben Guenther

For information on Jaguar's Audit and Risk Committee, see the section below entitled "*Audit Committee*".

Corporate Cease Trade Orders or Bankruptcies

Except as stated below, no director or executive officer of Jaguar, or shareholder holding a sufficient number of securities of Jaguar to affect materially the control of Jaguar, is, as at the date of this Annual Information Form, or has been within ten (10) years before the date of this Annual Information Form, a director or executive officer of any company that, while that person was acting in that capacity:

- i. was the subject of a cease trade or similar order or an order that denied the relevant company access to any exemption under securities legislation, for a period of more than thirty (30) consecutive days except as set forth in the second and third to last paragraphs of this section;
- ii. was subject to an event that resulted, after the director or executive officer ceased to be a director or executive officer, in the company being the subject of a cease trade or similar order or an order that denied the relevant company access to any exemption under securities legislation, for a period of more than thirty (30) consecutive days; or
- iii. within a year of that person ceasing to act in that capacity, became bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency, or was subject to or instituted any proceedings, arrangement or compromise with creditors or had a receiver, receiver manager or trustee appointed to hold its assets.

Further, except as noted below, no director, executive officer, promoter or other member of management of Jaguar has within the ten years before the date of this Annual Information Form, become bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency, or become subject to or instituted any proceedings, arrangement or compromise with creditors, or had a receiver, receiver manager or trustee appointed to hold the assets of the Nominee.

Except as follows:

- (a) Messrs. Falconer, Reeser, and Miraglia were directors of the Corporation when it obtained creditor protection under the Companies' Creditors Arrangement Act (Canada) (the "CCAA") pursuant to an order granted on December 23, 2013 by the Ontario Superior Court of Justice (Commercial List) (the "Court"). On February 5, 2014, the Corporation obtained an order from the Court sanctioning a plan leading to an overall capital reorganization of the Corporation, which was successfully implemented on April 22, 2014.
- (b) On April 20, 2009, while Mr. Getz was a director of Palladon Ventures, Ltd. ("Palladon"), Palladon became subject to a cease trade order in British Columbia as a result of certain deficiencies in its August 31, 2008 and November 30, 2008 interim financial statements, management's discussion and analysis and failure to file a business acquisition report. Palladon rectified all deficiencies identified in the cease trade order and the cease trade order was subsequently revoked on August 26, 2009. In September 2010, while Mr. Getz was a director of EarthRenew Corporation ("EarthRenew"), a private company, EarthRenew appointed a receiver-manager pursuant to the Bankruptcy and Insolvency Act (Canada) in respect of its assets and undertakings. Mr. Getz is no longer a director of EarthRenew.
- (c) Mr. Ellis was a director of Royal Coal Corp. ("Royal Coal"), a public natural resource company listed on the TSX-V. On May 9, 2012, after Mr. Ellis ceased as a director, Royal Coal became subject to a cease trade order in British Columbia for failure to file audited financial statements for the period ending December 31, 2011 during which period Mr. Ellis served as a director. Subsequently, similar cease trade orders were also issued in Ontario, Alberta, and Manitoba. The cease trade orders all remain in effect.

Audit and Risk Committee and Audit Fees

Audit and Risk Committee Charter

The text of the Audit and Risk Committee is attached as Appendix "A" to this Annual Information Form.

Composition of the Audit and Risk Committee

As at the date of this Annual Information Form, the members of the Audit and Risk Committee were Messrs. Reeser (chair), Getz and Weng. All three members are independent and financially literate within the meaning of National Instrument 52-110. The relevant education and experience of each Audit and Risk Committee member is as follows:

Edward V. Reeser is the President of Mobilex Corporation. Prior to this, Mr. Reeser served as President of Celco Inc., an importer and distributor of food equipment. Mr. Reeser has also served as a director and member of the Finance and Audit Committee of Bridgepoint Health from September 2011 to December 2014 and was the Chair of the Audit Committee of Temex Resources Corp. from 2014 to 2015. Mr. Reeser has over 15 years' experience as a senior financial officer of TSX-listed companies in the metallurgical, aviation and energy utility industries. Mr. Reeser holds a Master of Business Administration degree (finance concentration) from York University, a Bachelor of Arts from York University and an ICD.D designation from the Institute of Corporate Directors. Mr. Reeser is the Chairman and a director of RockMass Technologies Inc. and a director of Hospitality Finance Limited.

Robert Getz currently serves as Managing Partner of Pecksland Capital Partners, a private investment firm. Mr. Getz previously served as a Founder and Managing Director of Cornerstone Equity Investors from September 1996 to December 2016. Mr. Getz has extensive experience in public and private equity and debt transactions and in international mergers and acquisitions. Mr. Getz currently serves as Chairman of the Board of Directors of Haynes International, an integrated developer and producer of specialty nickel alloys primarily for use in the aerospace

industry. Mr. Getz also currently serves on the Board of Ero Copper, a Brazilian based copper mining and exploration concern. Mr. Getz previously served as Chairman of Crocodile Gold, a gold mining and exploration company, prior to the company's successful merger with Newmarket Gold and subsequently served on the of Newmarket Gold until May 2016. Mr. Getz holds a Bachelor of Arts Degree in International Relations, cum laude, from Boston University and a Masters of Business Administration in Finance from New York University.

Richard Falconer is a Senior Advisor of Lazard Canada. Mr. Falconer retired from CIBC in 2011 after 40 years with the bank. Mr. Falconer has extensive corporate finance and M&A experience in numerous industries including agriculture; energy; financial; forest products; media and telecom; mining; retail; technology; and transportation. Mr. Falconer holds a Master of Business Administration from York University, and a Bachelor of Arts (Honours) from the University of Toronto. Mr. Falconer is currently a Member of the Board of Directors of Resolute Forest Products; Board Member of Chorus Aviation; Member, CDIC Advisory Panel on Resolution; Director, LOFT Community Services; The Dorothy Ley Hospice; Member, Campaign Leadership Council, Children's Aid Foundation of Canada; and Member, Board of Governors, Shaw Festival Theatre Endowment Foundation.

Audit Fees

During the fiscal years ended December 31, 2018 and 2017, KPMG LLP, Chartered Professional Accountants ("KPMG"), charged Jaguar a total of C\$525,600 and C\$507,842 respectively, for audit services.

Audit-Related Fees

During the fiscal years ended December 31, 2018 and 2017, KPMG charged C\$nil and C\$nil respectively, for assurance and related services that are reasonably related to the performance of audit-related services but are not reported above in "Audit Fees".

Tax Fees

During the fiscal years ended December 31, 2018 and 2017, KPMG billed C\$ nil and C\$31,689 respectively, for tax compliance, tax advice and tax planning services.

All Other Fees

In each of the fiscal years ended December 31, 2018 and 2017, KPMG billed C\$nil and C\$nil respectively, for services other than those reported under "Audit Fees," "Audit-Related Fees," and "Tax Fees."

INTEREST OF MANAGEMENT AND OTHERS IN MATERIAL TRANSACTIONS

To the knowledge of the management of Jaguar, none of the directors, executive officers or principal shareholders of Jaguar and no associate or affiliate of the foregoing persons has or has had any material interest, direct or indirect, in any transaction within the past three years or in any proposed transaction that has materially affected or will materially affect Jaguar or any of its subsidiaries, except for:

Sprott Lending is an indirectly wholly owned subsidiary of Sprott Inc., of which the Chairman is Mr. Eric Sprott. Mr. Sprott is a shareholder of the Company and held approximately 19% of the common shares of the Company at the time Jaguar entered into the Sprott Credit Agreement on November 7, 2016. Sprott Lending extended credit to the Company in the amount of \$10,000,000 (the "Sprott Facility") on November 8, 2016. The Sprott Facility is payable over a term of 30 months, in equal monthly repayments, and bears interest at a rate of 6.5% per annum, plus the greater of US dollar LIBOR or 1.25% per annum. In consideration for the structuring and syndication of the Sprott Facility, the Company made a cash payment to Sprott Lending for structuring and legal fees in the amount of \$200,000 and the Company issued 650,000

common shares of the Company to Sprott Lending and to Natural Resource Income Investing Limited Partnership in consideration for providing the financing commitment.

On June 9, 2017, the Company entered into a Tranche 2 agreement with Sprott Lending for an additional tranche of \$5.0 million ("Tranche 2"). Tranche 2 of the Sprott Facility is payable over a term of 36 months, in equal monthly repayments of principal, plus interest, with an interest rate of 6.5%, plus the greater of US dollar LIBOR and 1.25% per annum. In consideration for providing the financing commitment, the Company has issued an aggregate of 375,000 common shares of Jaguar to Sprott Lending and to Natural Resource Income Investing Limited Partnership in consideration for providing the financing commitment.

In accordance with the terms of Tranche 1 and 2 of the Sprott Facility, the Company made principal repayments and interest payments of \$9.4 million and \$324,000, respectively, during the year ended December 31, 2018 (2016 – \$5 million and \$827,000; 2016 – \$827,000 and \$667,000). For a full description of the Sprott Facility, see "*General Development of the Business – Recent History – Credit Agreement with Sprott Private Resource Lending (Collector) LP*";

- The Company incurred legal fees from Azevedo Sette Advogados ("ASA"), a law firm where Luis Miraglia, a director of Jaguar is a partner. Fees paid to ASA are recorded at the exchange rate, representing the amount agreed to by the parties and included in general and administrative expenses in the consolidated statements of operations and comprehensive loss. Legal fees paid to ASA were \$31,000 for the year ended December 31, 2018 (\$131,000 for the year ended December 31, 2017).

MATERIAL CONTRACTS

Other than contracts entered into in the ordinary course of business, the only material contracts that Jaguar has entered into the most recently completed financial year, or prior thereto and are still in effect, are as follows:

- Earn-in agreement signed with Avanco Resource Limited for 100% sale of Gurupi project signed on September 18, 2017. See "*General Development of the Business – Overview of Business*".
- In May 2018, Auramet Advance agreement signed with Auramet for \$7 million unsecured customer advances. See "*General Development of the Business – Overview of Business*".

Subsequent to the 2018 year end, the Company entered into a short-term senior secured bridge facility with Auramet International LLC for US\$7.85 million, with a term of 120 days, a coupon rate of 14%, a closing fee of 1%. The Company's obligations are secured by all of the shares of Jaguar's 100% owned subsidiary, Mineracao Serras Do Oeste Eireli (MSOL). The facility closed on March 15, 2019 and expires on July 15, 2019.

INTERESTS OF EXPERTS

External Auditors

KPMG LLP, Chartered Professional Accountants are Jaguar's auditors, and have advised the Company that they are independent of the Company within the meaning of the relevant rules and related interpretations prescribed by the professional bodies in Canada and any applicable legislation or regulations.

Qualified Persons

Turmalina - "Technical Report on the Turmalina Mine, Minas Gerais State, Brazil," to be filed on SEDAR on or before April 15, 2019 (the "Turmalina Technical Report"). The Turmalina Technical Report was prepared by Jeff Sepp, P. Eng. and Reno Pressacco, P. Geo, both from RPA, each of whom is a "qualified person" as that term is defined in NI 43-101 and have verified the data.

Caeté - "Technical Report on the Roca Grande and Pilar Mines," to be filed on SEDAR on or before April 15, 2019 (the Caeté Technical Report") was prepared by Jeff Sepp, P. Eng. and Reno Pressacco, P. Geo, both from RPA, each of whom is a "qualified person" as that term is defined in NI 43-101 and have verified the data.

Jeff Sepp and Reno Pressacco do not own, directly or indirectly, any securities of Jaguar or have any direct or indirect interest in any property of Jaguar or of any associate or affiliate of Jaguar. Mr. Jonathan Victor Hill is an employee of Jaguar.

ADDITIONAL INFORMATION

Additional information relating to Jaguar may be found on SEDAR at www.sedar.com.

Additional information, including directors' and officers' remuneration and indebtedness, principal holders of Jaguar's securities, and securities authorized for issuance under equity compensation plans is contained in Jaguar's information circular for its most recent annual meeting of shareholders. Additional financial information is provided in Jaguar's audited consolidated financial statements and management's discussion and analysis for its financial year ended December 31, 2018.

APPENDIX A



JAGUAR MINING INC.

CHARTER OF THE AUDIT AND RISK COMMITTEE

A. History of the Charter

Adopted by the Board: May 12, 2005
Amended by the Board March 20, 2017

Purpose of the Committee

The Audit and Risk Committee (the "Committee") is appointed by the Board of Directors (the "Board") of Jaguar Mining Inc. (the "Company") to assist the Board in fulfilling its oversight responsibilities relating to financial accounting and reporting process and internal controls for the Company, including the preparation of any report required by The Ontario Securities Commission or other similar bodies in Canada or other countries.

The primary purpose of the Committee with respect to its audit mandate is to assist Board oversight of: (i) the integrity of the Company's financial statements, (ii) the qualifications and independence of the Company's external auditor (the "Independent Auditor") and the Internal Auditor (iii) the performance of both the Company's internal audit function and the Independent Auditor.

The primary purpose of the Committee with respect to its risk mandate is to assist the Board in fulfilling its oversight responsibilities related to the risks to which the Company is exposed and its enterprise risk management approach to managing and insuring against those risks.

The Committee is also the primary working committee of the Board with respect to overseeing matters related to compliance with ethical and anti-corruption legislation.

A. Duties

The Committee's primary duties and responsibilities are to serve as an independent and objective committee of the Company's Board, with responsibility for the completion of the general tasks set out in this section and the specific tasks set out in Section F. In addition, the Committee shall report to the Board with such recommendations and other matters as the Committee deems appropriate so that the Board is informed of the Committee's activities.

1. Conduct such reviews and discussions with management and the independent auditors relating to the audit and financial reporting as are deemed appropriate by the Committee;
2. Assess the integrity of internal controls and financial reporting procedures of the Company and ensure implementation of such controls and procedures;
3. Review the quarterly and annual financial statements, management's discussion and analysis of the Company's financial position and operating results, and all press releases and website postings pertaining to financial matters

prior to their being filed with the appropriate regulatory authorities or posted on the Company's website and report thereon to the Board;

4. Recommend the selection of the Company's external auditors and monitor the independence and performance of the Company's external auditors (the "Independent Auditors") and internal auditors, including attending private meetings with both and reviewing and approving prior to recommendation to the Board all renewals or dismissals and the remuneration of both;

5. Set clear policies regarding the hiring of employees or former employees (including partners) of the present and former Independent Auditors by the Company;

6. Monitor the quality and integrity of the Company's financial statements and other financial information; and

7. Provide oversight to related party transactions entered into by the Company.

8. Oversee the operation of the Company's whistleblower program to ensure timely and effective compliance with legal requirements and high ethical standards.

9. Oversee the Company's compliance with the Foreign Corrupt Practices Act and similar legislation in all countries relevant to the Company

10. Oversee the Company's information technology programs to ensure data integrity, sound financial control processes and security measures to protect the Company's data and information.

11. Oversee the Company's enterprise risk management and insurance programs.

B. General Authority

1. The Committee shall have the resources and authority it deems necessary and appropriate to discharge its responsibilities at the Company's expense, including authority to select and retain legal or other consultants or experts, to approve the fees and other retention terms related to the appointment of such consultants or experts, and to terminate the services of any such consultants or experts with respect to any matters including compensation.

2. The Committee shall have the power to call upon assistance from officers and employees of the Company and outside counsel and other advisers, including the Independent and Internal Auditors.

3. The Committee, and each member of the Committee in his or her capacity as such, shall be entitled to rely, in good faith, on information, opinions, reports or statements, or other information prepared or presented to them by officers and employees of the Company, whom such member believes to be reliable and competent in the matters presented and on counsel or other persons as to matters which the member believes to be within the professional competence of such person.

4. Except as limited by law, or applicable securities rules and regulations, the Committee may form and delegate authority to such individuals or subcommittees as it deems appropriate.

5. The Committee has the authority to conduct any investigation appropriate to its responsibilities.

6. The Committee shall be given unrestricted access to the books and records of the Company.

7. The Committee may fulfill additional duties and adopt additional policies and procedures as may be appropriate in light of changing business, legislative, regulatory or other conditions. The Committee shall keep the Board apprised of any additional duties it intends to fulfill.

8. The Committee shall have the power to adopt its own operating rules and procedures, without the consent of management.

9. The Committee shall perform any other activities consistent with this Charter and governing law, as the Committee or the Board deems necessary or appropriate.

C. Composition and Meetings

I. Composition of Committee

1. The Committee shall be composed of three or more directors of the Company as shall be designated by the Board from time to time. The Board shall appoint a member who shall serve as Chair of the Committee.

2. Each member of the Committee shall be “independent” and “financially literate” (as such terms are defined in Multilateral Instrument 52-110 of the CSA) and meet any eligibility criteria mandated by applicable corporate or securities law, or the rules of any applicable stock exchange.

3. Members of the Committee and the Chair shall receive such remuneration for their service on the Committee as the Board may determine from time to time (which remuneration may include cash and/or shares or options or other in-kind consideration ordinarily available to directors).

II. Committee Meetings

1. The Committee shall meet at least once each quarter, at the discretion of the Chair or a majority of its members, as circumstances dictate or as may be required by applicable legal or listing requirements.

2. A minimum of two and at least 50% of the members of the Committee present either in person or by telephone shall constitute a quorum.

3. If and whenever a vacancy shall exist that is not filled by an appointment by the Board, the remaining members of the Committee may exercise all of its powers and responsibilities so long as a quorum remains in office.

4. The time and place of the Committee meetings shall be determined from time to time by the Committee. A meeting of the Committee may be called by letter, telephone, facsimile, email or other communication equipment by giving at least 48 hours notice, provided that no notice of a meeting shall be necessary if all of the members are present either in person or by means of teleconference or if those absent have waived notice or otherwise signified their consent to the holding of such meeting. The independent auditor will be provided notice of all meetings of the Committee and will generally attend unless the subject matter is such that attendance is not required or desirable.

5. The Chair will chair all meetings of the committee and set the agendas for committee meetings.

6. The Committee shall keep minutes of its meetings, which shall be submitted, to the Board. The Committee may, from time to time, appoint any person who need not be a member to act as a secretary at any meeting.

7. The Committee may invite such officers, directors and employees of the Company and its subsidiaries or any other person as it may see fit to attend at meetings of the Committee.

8. Any matters to be determined by the Committee shall be decided by a majority of votes cast at a meeting of the Committee called for such purpose. Actions of the Committee may be taken by an instrument or instruments in writing signed by all of the members of the Committee, and such actions shall be effective as though they had been decided by a majority of votes cast at a meeting of the Committee called for such purpose. All decisions or recommendations of the Audit Committee shall require the approval of the Board prior to implementation by the Company, except for any recommendation or approval that is specifically delegated by the Board.

9. The Committee will prepare an annual work plan to guide its activities and shall review the work plan with the Board.

D. Responsibilities

1. Financial Accounting and Reporting and Internal Controls

1. The Committee shall review the Company's annual audited financial statements to satisfy itself that they are presented in accordance with applicable accounting principles and report thereon to the Board and recommend to the Board whether or not same should be approved prior to their being filed with the appropriate regulatory authorities. The Committee shall also review and approve the Company's quarterly financial statements and management discussion and analysis prior to their being filed with the appropriate regulatory authorities and report thereon to the Board. With respect to financial statements and related materials, the Committee shall discuss significant issues regarding accounting principles, practices, and judgments of management with management and the Independent Auditors as and when the Committee deems it appropriate to do so.

2. The Committee shall review all press releases pertaining to financial matters to ensure conformity with the Company's financial statements and timely disclosure obligations.

The Committee shall satisfy itself that the information contained in the annual audited and quarterly financial statements is not erroneous or misleading in a material manner and that the audit and/or review function has been effectively carried out.

3. The Committee shall review annual and quarterly management's discussion and analysis and annual and quarterly financial statements and any other public disclosure documents that are required to be reviewed by the Committee under any applicable laws prior to their public disclosure or being filed with the appropriate regulatory authorities including, without limitation, any press releases announcing annual or quarterly earnings.

4. The Committee shall review management's internal control reports and the evaluation of such reports by the Independent Auditors, together with management's responses.

5. The Committee shall meet no less frequently than annually with the Independent Auditors and the Chief Financial Officer to review accounting practices, internal controls and such other matters as the Committee deems appropriate.

6. The Committee shall inquire of management and the Independent Auditors about significant risks or exposures, both internal and external, to which the Company may be subject, and assess the steps management has taken to minimize such risks.

7. The Committee shall review, during an in-camera meeting, the post-audit or management letter containing the recommendations of the Independent Auditors and management's response and subsequent follow-up to any identified weaknesses.

8. The Committee shall provide oversight to related party transactions entered into by the Company.

9. The Committee shall satisfy itself that adequate procedures are in place for the review of the Company's public disclosure of financial information derived or extracted from the Company's financial statements and periodically assess the adequacy of those procedures.

10. The Committee shall provide oversight of the Company's programs for hedging gold prices and currencies.

II. Independent Auditors

1. The Committee shall be responsible for recommending to the Board the selection, appointment, renewal, dismissal, compensation and oversight of the Independent Auditors, and the Independent Auditors shall report directly to the Committee.

2. The Committee shall directly monitor and assess the relationship between management and the Independent Auditors and monitor, confirm, support and ensure the independence and objectivity of the Independent Auditors. The Committee shall be responsible for resolving disagreements between management and the Independent Auditors. The Committee shall establish procedures to receive and respond to complaints with respect to accounting, internal accounting controls and auditing matters.

3. The Committee shall pre-approve all audit and non-audit services not prohibited by law to be provided by the Independent Auditors to the Company or its subsidiaries. This can be completed by the Chairman of the Committee, provided the Committee receives a report at the next meeting. The Committee shall not allow fees for non-audit services provided by the Independent Auditors to exceed \$25,000 for a specific project or \$50,000 in aggregate during a given year without express approval of the Board.

4. The Committee shall review the Independent Auditor's audit plan, including scope, procedures and timing of the audit.

5. The Committee shall review, during an in-camera meeting, the results of the annual audit with the Independent Auditors, including matters related to the conduct of the audit.

6. The Committee shall obtain timely reports from the Independent Auditors describing critical accounting policies and practices, alternative treatments of information within applicable accounting standards that were discussed with management, their ramifications, and the Independent Auditors' preferred treatment and material written communications between the Company and the Independent Auditors.

7. The Committee shall review fees paid by the Company to the Independent Auditors and other professionals in respect of audit and non-audit services on an annual basis.

III. Internal Auditors

1. The Committee shall be directly responsible for the selection, appointment, renewal, dismissal, compensation and oversight of the Company's Internal Auditor(s), and the Internal Auditor will report directly to the Committee (through the Chairman) on all functional matters. The Internal Auditor shall report to the CEO with respect to operational matters and the Chairman of the Committee and the CEO will work together to ensure an appropriate balance between the independence of the Internal Auditor and conformity with the Company's overall procedures and processes.
2. The Committee will review annually the Internal Audit Charter and recommend any proposed changes to Management.
3. The Committee shall review and approve the annual internal audit plan prepared by the company's internal audit group, including scope, procedures and timing of activities.
4. The Committee shall at each Audit and Risk Committee Meeting receive a report from the Company's internal auditors based on the results of their internal audit activities.
5. The Committee shall at each Audit and Risk Committee Meeting discuss during an in camera meeting the results of the internal audit activities with the Company's internal auditors, including matters related to the undertaking of the internal audits. In addition, the Committee will periodically review with the internal auditors any significant difficulties, disagreements with management, or scope restrictions encountered in the course of their work.

IV. Whistleblower Policy

1. The Committee shall oversee the procedures for the receipt, retention and treatment of complaints including confidential or anonymous employee complaints with respect to accounting, internal accounting controls and auditing matters.
2. The Company will promptly forward to the Chairman of the Committee any complaints that it has received regarding financial statement disclosures, accounting, internal accounting controls or auditing matters. The Chairman shall keep the members of the Committee apprised of the progress of each investigation on a regular basis.
3. Any employee of the Company or any of its subsidiaries may submit, on a confidential and anonymous basis if the employee so desires, any concerns regarding financial statement disclosures, accounting, internal accounting controls or auditing matters. All such concerns will be set forth in writing and forwarded in a sealed envelope addressed to the attention of the chairman of the Audit Committee, c/o the Company's Toronto address set forth at the Company's website, in an envelope labeled with a legend such as: "To be opened by the Audit Committee only. Submitted pursuant to the Jaguar Mining Inc. Whistleblower Policy." If an employee would like to discuss any matter with the Committee, the employee should indicate this in the submission and include a telephone number at which he or she can be reached, should the Committee deem such communication is appropriate. Alternatively, concerns can be communicated by phone to Ethics Point, an independent service partner, at

1-888-279-5268 for US and Canada, 0-800-891-1667 for Brazil or

<https://jaguarmining.com/en/compliance-program/whistleblower-hotline/>

4. Following the receipt of any complaints submitted, the Chairman shall initiate an investigation. Following the investigation, the Company shall take such corrective and disciplinary actions as it considers appropriate, and such action shall be discussed with the Chairman of the Committee. The Chairman shall report to the full Committee on a regular basis regarding investigation results and corrective action.

5. The Committee may enlist employees of the Company and/or outside legal, accounting or other advisor to conduct any investigation of complaints regarding financial statement disclosures, accounting, accounting controls or auditing matters. In conducting any investigation, the Committee shall use reasonable efforts to protect the confidentiality and anonymity of the complainant.

6. It is the policy of the Company that employees will not be discharged, demoted, suspended, threatened, harassed or in any other manner discriminated against as a result of any complaint made hereunder in good faith.

7. The Company shall make this policy available to all employees.

8. The Committee will retain as a part of its records any such complaints or concerns for a period of at least seven (7) years.

G. Review of Charter and Self-Assessment

1. The Committee should review and reassess the adequacy of this Charter no less than every two years.

2. The Committee shall review annually the Committee's own performance.

3. The Committee should review no less than every two years the Whistleblower Policy.

H. Other Responsibilities

The Committee shall perform any other activities consistent with this Charter and governing law, as the Committee or the Board deems necessary or appropriate.

The Board may at any time amend or rescind any of the provisions hereof, or cancel them entirely, with or without substitution.