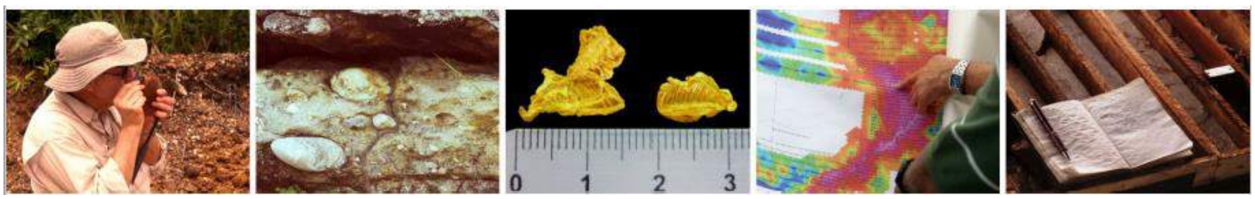
NATIONAL INSTRUMENT 43-101 TECHNICAL REPORT

Mineral Resource Update for the Castelo de Sonhos Gold Project, Pará State, Brazil

Effective Date: December 31st, 2020



Qualified Persons for this Report:

Mohan Srivastava, B.Sc., M.Sc., P.Geo

Porfírio Cabaleiro Rodriguez, B.Sc., MAIG

TRISTAR GOLD

DATE AND SIGNATURE PAGES

QP CERTIFICATE OF R. MOHAN SRIVASTAVA

a) I, R. Mohan Srivastava, am a geostatistician specializing in mineral resource estimation, with my office at #1100 - 120 Eglinton Avenue East, Toronto, Ontario, Canada M4P 1E2.

b) This certificate applies to the Technical Report entitled "Mineral Resource Update for the Castelo de Sonhos Gold Project, Pará State, Brazil" with an effective date of December 31, 2020.

c) I hold the following academic qualifications: a B.Sc. in Earth Sciences from the Massachusetts Institute of Technology, and an M.Sc. in Geostatistics from Stanford University.

   I have worked as a geostatistician and resource estimation specialist since graduation from university in 1979. My relevant experience for the purpose of this Technical Report includes:

   - 1979 to present - Consulting geostatistician specializing in mineral resource estimation, reviews and audits for gold projects in their exploration and development phases, as well as producing gold mines, in North and South America, Australia, Asia, African and Europe.
   - 2016 to present - Vice President of TriStar Gold Inc., responsible for field programs and technical studies including: drilling, petrophysics, QA/QC of analytical laboratories, mineral resource estimation and quantitative risk assessment.

   I have been a Practising Member (#0547) of the Professional Geoscientists of Ontario continuously since 2003.

   I meet all of the education, work experience and professional registration requirements of a "Qualified Person" as defined in Section 1.1 of National Instrument 43-101.

d) I last visited the Castelo de Sonhos project site from September 23rd to 28th, 2019.

e) I am responsible for Sections 1 through 12, 14, 15, 20, and 23 through 27 of this Technical Report.

f) I am not independent of the Issuer, TriStar Gold Inc.

g) I have worked on the Castelo de Sonhos Gold Project continuously since 2015, first doing a due diligence review of the project for new management, then assessing the project's exploration target range and, in recent years, supervising and coordinating technical work programs in Brazil and North America.

h) I have read National Instrument 43-101; the parts of this Technical Report for which I am responsible have been prepared in compliance with this Instrument, including the CIM Definition Standards on Mineral Resources and Mineral Reserves.

i) At the effective date of the Technical Report, and at the date it was filed, to the best of my knowledge, information, and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and sealed in Toronto, Canada, on April 30, 2021.

R. Mohan Srivastava

R. Mohan Srivastava (B.Sc., M.Sc., P.Geo.)

QP CERTIFICATE OF PORFÍRIO CABALEIRO RODRIGUEZ

a) I, Porfírio Cabaleiro Rodriguez, am a Mining Engineer and Director for GE21 Consultoria Mineral, located at Avenida Afonso Pena, 3130 − 12º andar, Belo Horizonte, MG, Brazil, CEP 30.130-910.

b) This certificate applies to the Technical Report entitled "Mineral Resource Update for the Castelo de Sonhos Gold Project, Pará State, Brazil" with an effective date of December 31, 2020.

c) I hold the following academic qualifications: a B.A.Sc. in Mining Engineering from the Federal University of Minas Gerais, in Belo Horizonte, Brazil.

   I am a professional Mining Engineer, with more than 42 years of experience in the mining industry. My relevant experience for the purpose of this Technical Report includes:

   - 1986 to 2015 – Consultant, manager and director with consulting engineering firms that specialize in technical studies and audits of mineral resource and reserves, mine planning, geometallurgy, pit optimization and analysis of economic viability for many types of mineral deposits, including gold projects in their exploration and development phases, as well as producing gold mines.
   - 2015 to present – Director of GE21 Consultoria Mineral, which provides advice, assistance and audits for the entire mining cycle, from defining strategies, generating and selecting targets and investments, mineral exploration, project development, geological assessments, resource reserve estimation for JORC and NI 43-101 reports, conceptual technical and economic studies, and economic feasibility.

   I am a member of the Australian Institute of Geoscientists (#3708).

   I meet all the education, work experience and professional registration requirements of a "Qualified Person" as defined in Section 1.1 of National Instrument 43-101.

d) I have not inspected the property that is the subject of this Technical Report.

e) I am responsible for Sections 13, 16 through 19, and 21 through 22 of this Technical Report.

f) I am independent of the Issuer, TriStar Gold Inc.

g) Previously, I have worked on the Preliminary Economic Assessment (PEA) for the property that is the subject of this Technical Report, and served as a QP for the NI 43-101 report on that PEA.

h) I have read National Instrument 43-101 and the parts of the Technical Report for which I am responsible have been prepared in compliance with this Instrument, including the CIM Definition Standards on Mineral Resources and Mineral Reserves.

i) At the effective date of the Technical Report, and at the date it was filed, to the best of my knowledge, information, and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and sealed in Belo Horizonte, Brazil, on April 30, 2021.

Porfírio Cabaleiro Rodriguez
MAIG 3708

Porfírio Cabaleiro Rodriguez (B.A.Sc., MAIG)

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ABBREVIATIONS AND UNITS

4A - ICP	Four Acid Inductively coupled plasma
AARL	Anglo American Research Laboratories (carbon stripping method)
Ai	Abrasion Index
ANM	Agência Nacional de Mineração
CAPEX	Capital Expenditure
CCD	Counter Current Decantation
CDF	Cumulative Distribution Functions
CDS	Castelo de Sonhos Gold Project
CFEM	Financial Compensation for the Exploration of Mineral Resources
CGL	Conglomeratic
CIL	Carbon in Leach
CIM	Canadian Institute of Mining Metallurgy and Petroleum
CIP	Carbon in Pulp
CONAMA	Concelho Nacional do Meio Ambiente
CSA	CSA Global
CRM	Certified reference materials
DCF	Discounted Cash Flow
DDH	Diamond drillhole
DGI	DGI Geoscience
DNPM	Departamento Nacional de Produção Mineral
DXF	Drawing Interchange Format
EC	Esperança Center
EE	Esperança East
EGL	Effective Grinding Length
EIA	Environmental Impact Assessment
ES	Esperança South
FW	Foot-Wall
Ga	Billion years
g/t	Grams per Tonne
GE21	GE21 Consultoria Mineral
GFT	Gravity Face Tool
GIS	Geographic Information System
GPS	Global Positioning System
GRG	Gravity Recoverable Gold
HW	Hanging-Wall
ICP	Inductively coupled plasma mass spectrometry
IRR	Internal rate of return
ISO	International Organization for Standardization
LI	Licença de Instalação
LIDAR	Light Detection and Ranging
LO	Licença de Operação
LOM	Life of Mine
LP	Licença Prévia
IK	Indicator Kriging

Kg or kg	Kilogram
Ma	Million Years
MIK	Multiple Indicator Kriging
mA	Metamorphosed Sandstone
mAC	Metamorphosed Conglomeratic Arenites
MAIG	Member of the Australian Institute of Geoscientists
mC	Metamorphosed Conglomerates
mC1	Metamorphosed Clast-supported Conglomerate
mC2	Metamorphosed Matrix-supported Conglomerate
mC3	Metamorphosed Micro-conglomerate
MCDS	Mineração Castelo dos Sonhos Ltda.
MLI	McClelland Laboratories
mm	Millimetre
Moz	Million Troy Ounces
MP	Provisional Measures
Mtpa	Million of ton per year
NI 43-101	National Instrument 43-101 – Standard of Disclosure for Mineral Projects
NPV	Net Present Value
NSR	Net Smelter Return
OPEX	Operational Expenditure
OTV	Optical Televiewer
oz	Troy Ounces
PAE	Plano de Aproveitamento Econômico
PCA	Plano de Controle Ambiental
PEA	Preliminary Economic Assessment
PFS	Pre-Feasibility Study
ppb	Parts per Billion
ppm	Parts per Million
PRAD	Plan for the Recovery of Degraded Areas
PRM	Prepared Reference Material
pXRF	Portable X-Ray Fluorescence
QA/QC	Quality Assurance and Quality Control
QP	Qualified Person
RC	Reverse Circulation
RCA	Environment Control Report
RIMA	Relatorio de Impacto Ambiental
RMB	RMB Consultoria Mineral
ROM	Run of Mine
RQD	Rock Quality Designation
SAD	South American Datum
SAG	Semi-Autogenous Grinding
SEM	Scanning Electron Microscope
SEMAS	Secretaria de Estado de Meio Ambiente e Sustentabilidade
SI	International System of Units
SIRGAS	Sistema de Referencia Geocéntrico para Las Américas
SMBS	Sodium Metabisulfide

SMU	Selective Mining Unit
SUDAM	Superintendência do Desenvolvimento da Amazônia
t	Tonne
TDH	Total Dynamic Head
TSX	Toronto Stock Exchange
UC	Uniform Conditioning
US	United States
UTM	Universal Transverse Mercator
VoIP	Voice over Internet Protocol
WACC	Weighted Average Cost of Capital
WST	Water Service and Technologies
XRF	X-Ray Fluorescence

1. SUMMARY

1.1 Qualified Persons, Experience and Independence

The non-independent Qualified Person (QP) responsible for this report's content on issues related to geology and mineral resources is R. Mohan Srivastava (P.Geo., M.Sc.), a Vice President of TriStar Gold Inc., who has more than 40 years of experience in mineral resource estimation for gold deposits.

The independent QP responsible for this report's content on issues related to mining, processing and economic analysis is Porfírio Cabaleiro Rodriguez (MAIG, B.A.Sc.), a Principal Mining Engineer and Managing Director of GE21 Consultoria Mineral, who has at least 40 years of experience in all aspects of assessment of mining projects, from early exploration through to bankable feasibility studies.

1.2 Introduction

This Technical Report has been prepared for TriStar Gold Inc. to assist preparations for the upcoming Pre-Feasibility Study of the Castelo de Sonhos Gold Project by updating the mineral resource estimates using new drilling information that not only improves confidence in grade estimates but also enables the creation of an improved geological model that guides local directions of maximum continuity of gold grades.

1.3 Reliance on Other Experts

The QPs have not independently verified land title and the status of mineral concessions.

1.4 Property Description and Location

The Castelo de Sonhos gold deposit lies on a plateau that rises 350m above the cattle-grazing plains of southern Pará State in Brazil. The mineral concessions held by TriStar Gold's Brazilian subsidiary include five older concessions for which exploration reports have been submitted and that are now into the phase of permitting and environmental assessment, and a sixth that was recently added and that is in its initial exploration phase.

1.5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

The project site is less than a one-hour drive from Castelo dos Sonhos, a town on Brazilian Federal Highway 136, a major transportation corridor that connects the soy farms of Brazil's interior, about 1,000 km to the south, to ports on the Amazon River, about 1,000 km to the north. With a small airstrip on the plateau, the project can be reached directly by air; it is less than a one-hour flight from Alta Floresta, a city with commercial air service.

The sub-tropical climate poses no difficulties for mining operations, even during the rainy season. Fresh water, which is abundant on the plateau, can be sourced from nearby rivers and streams and from water wells. The current camp is connected to the national electrical grid via a spur that runs from the 138 kV line that runs along Highway 136, 15−20 km away.

The nearby town has banks, schools, a medical clinic and a police station. As a major stop on Highway 136, Castelo dos Sonhos has businesses that can repair and service heavy equipment. It is a source of both skilled and unskilled workers, as are other towns and cities to the north and south along the highway. Pará State, which is home to some of Brazil's biggest mining operations, has a long history of large mines; two if its federal universities have programs in the science and engineering disciplines that support modern industrial mining.

1.6 History

The Castelo de Sonhos plateau was the site of a major gold rush several decades ago, as small-scale artisanal miners worked the creeks and streams that drain the plateau, extracting gold from the gravels. In 1995-1996, Barrick Gold drilled 23 holes on the plateau and identified the conglomerates that rim the plateau as the source of the alluvial gold. Artisanal miners then moved up onto the plateau and began digging huge trenches, following the dipping conglomerate band for many kilometres along strike, with their trenches extending down the dip of bedding until their inability to keep water out of the trenches caused almost all of the miners to leave.

The project passed through the hands of Osisko before ending up with TriStar Gold in 2010. Since 2011, TriStar has been drilling and conducting field studies to advance the project toward its full feasibility study. Several resource estimates have been done, growing the in-situ gold contained in the project's resources from a few hundred thousand ounces in 2014 to two million ounces in 2018.

1.7 Geological Setting and Mineralization

The Castelo de Sonhos Formation is a small remnant of sedimentary rock caught between continental plates that collided almost two billion years ago. Prior to the collisions that added crust to what is now the Amazonian plate, sediments ranging in size from sand to large boulders accumulated in an alluvial fan and marine delta near the shoreline of an ancient super-continent now referred to as "Nuna".

When the continental plates collided, a large granite intrusion formed below the sedimentary rocks, and dykes of molten material intruded into the sediments, metamorphosing them slightly. The sediments were folded into the bowl-shaped structure which eventually became a plateau because its silicified rocks were more resistant to weathering than the surrounding granites.

Most of the gold mineralization occurs in the conglomerate band, in the matrix between pebbles, and tends to be higher in grade where large, abundant and well-rounded pebbles are evidence of fast-flowing water at the time of original deposition. Some of the gold has been remobilized, but only a short distance, by the hot fluids from the granites that post-date the original deposition of gold grains by 200 million years. Remobilized gold occurs along fractures and cracks in the metamorphosed conglomerates.

1.8 Deposit Types

Castelo de Sonhos is referred to as a "modified paleo-placer". It is a "placer" because the free gold grains from higher elevations in the hinterland were transported downhill, toward the shore, and accumulated in the bottom gravels of rivers and creeks. It is "paleo" because it was formed two billion years ago, during the Paleoproterozoic Era (2,500 to 1,600 million years ago). It is "modified" because it has been slightly metamorphosed into a hard and consolidated rock.

Other modified paleo-placers that now host operating mines include Tarkwa in Ghana and Jacobina in Brazil, both of which formed at the same time as Castelo de Sonhos, also along the coastline of Nuna. The vast Witwatersrand deposits are also paleo-placers; although these formed several hundred million years before the Nuna paleo-placers, their geology and mineralization are strongly similar.

1.9 Exploration

The Barrick and TriStar exploration programs have consisted of sampling and analyses of soils, stream sediments, outcrops, trenches and drillholes. They have also included airborne geophysical surveys, down-hole petrophysical logging and imaging of the walls of drillholes using an optical televiewer. Along with surface reconnaissance and mapping, the field studies have confirmed the coincidence between gold mineralization and the conglomerate band.

Recently, since the project's last technical report, a high-precision survey of topography was conducted using LIDAR, along with acquisition of high-resolution georeferenced aerial photographs of the entire plateau. Machine-learning has been used to identify in drillholes long intervals whose multi-element chemistry fingerprints are similar; these clusters have been correlated from hole to hole and developed into a 3D model of the litho-geochemistry and stratigraphy of the sub-surface.

1.10 Drilling

A combination of diamond drilling and reverse-circulation drilling has been used to test gold mineralization within the reach of open-pit mining methods, to a depth of approximately 150m. In places, holes have been drilled deeper. Recently, TriStar has begun testing potential targets that are more than 300m deep, in locations where granitic intrusions and dykes may have concentrated gold sufficiently to be amenable to underground mining methods.

By the end of 2020, almost 600 holes had been drilled on the plateau, with a total length of more than 66,000m, almost all of it in the mineralized conglomerate band.

The drilling has established the broad geometry of the deposits, a bowl-shaped band of mineralized conglomerates many tens of square kilometres in its lateral extent. It has also confirmed the major structural offsets, two major faults that cause the mineralization in the Esperança East block of the deposit to be offset from the mineralization in the Esperança Center and Esperança South blocks on either side.

Assays from the drilling campaigns have shown that most of the economically viable mineralization is in the 1−2 g/t range. Grades are occasionally above 10 g/t, usually in areas where gold has been remobilized.

1.11 Sample Preparation, Analyses and Security

The Castelo de Sonhos project follows industry norms for sample preparation, with samples being crushed and then pulverized before a sub-sample is taken for chemical analysis. The assay data base includes fire assays as well as assays done by the Leachwell method, an aggressive acid leaching method that analyzes a 1 kg sample that is much larger than the 50 g aliquot analyzed in a fire assay. Studies of the gold grain size distribution have established that the median grain size is approximately 100 microns. At this size, analysis of 1 kg of material provides data that are much more reliable for resource estimation purposes than analysis of only 50 g can provide. For this reason, Leachwell assays are preferred over fire assays for resource estimation. Fire assays are still used as the first assay for most drill holes because fire assays are less expensive than Leachwell assays, and can provide a good first check for the higher-grade significant intervals that need a Leachwell assay.

In addition to the internal quality assurance and quality control (QA/QC) programs used by all the ISO-certified labs that have analyzed Castelo de Sonhos samples, TriStar also has an external QA/QC program that uses standards, blanks and duplicates to monitor the reliability of the results reported by commercial laboratories. Recent improvements to TriStar's external QA/QC program include the use of "prepared reference materials" (PRMs) that provide more information on data quality than do the "certified reference materials (CRMs) used previously. PRMs are blank RC chips spiked with carefully measured quantities of gold. Unlike CRMs, which are small packets of pulp powder that don't get crushed and pulverized, PRMs included in the sample stream look like regular RC samples and have to go through all of the sample preparation steps before they can be analyzed.

Sample bags are sealed at site, with the seals not being broken until the samples are in the custody of the laboratory.

1.12 Data Verification

TriStar maintains the drill hole data for the Castelo de Sonhos project in an MX Deposit data base. Assay information in the digital data base has been verified against original assay certificates each time that resources have been calculated, including this current resource estimate. No error in data base compilation has been identified, and no inconsistency has been found in the way that multiple assays are combined to give the grades used for resource estimation, which are Leachwell assays, if available, or fire assays otherwise.

1.13 Mineral Processing and Metallurgical Testing

Metallurgical test work has confirmed that the significant majority of gold occurs as free grains, with simple gravity methods of recovery achieving high recoveries, above 80% in lab-scale Knelson centrifuges and above 70% in bulk gravity concentration tests performed with material ground to 75 microns. Abrasion and grinding tests of the Castelo de Sonhos quartzites show that they are abrasive and of medium hardness. Cyanidation tests show that high recoveries can be achieved with low reagent consumption, with or without pre-concentration by gravity methods.

Tests of a combination of gravity recovery and cyanidation on material ground to 75 microns show that total metallurgical recoveries of 98% can be achieved with Castelo de Sonhos material in the 1−2 g/t range.

1.14 Mineral Resource Estimates

In the current resource block model, the distribution of gold grades for volumes the size of truckloads has been estimated within 20x20x4m blocks using multiple indicator kriging (MIK). This is a change, and an improvement, from previous historical estimates that have estimated only the average grade of very small blocks. The grade interpolation makes use of the 3D model of litho-geochemical units, using its erosional surfaces as hard boundaries and its non-erosional surfaces as indications of bedding direction.

Classification of the resource into lower-confidence Inferred resources and higher-confidence Indicated resources was done by using information on the proximity of nearby data to assign preliminary confidence codes which were smoothed to create spatially coherent and contiguous zones of consistently-classified blocks that conform to the requirements of the CIM Definition Standard.

The classified resources for the Castelo de Sonhos project, reported within a pit shell, are summarized in Table 1.1 below.

Classification	Tonnage (Mt)	Grade (g/t Au)	Metal Content (Moz)
Indicated	40.1	1.2	1.5
Inferred	22.2	1.0	0.7

Notes:

1. *All figures have been rounded to the reflect the appropriate precision for the estimates. Summed amounts may not add due to rounding.*
2. *The mineral resource estimate was prepared in accordance with the CIM Definition Standard and CIM Best Practice Guidelines, using geostatistical methods, plus economic and mining parameters appropriate to the deposit during the next ten years.*
3. *The 0.3g/t cutoff corresponds to marginal cutoff grade for an open pit with processing + G&A cost of $US 12/t, metallurgical recovery of 98% and a gold price of $US 1,250/oz.*
4. *These are mineral resources and not reserves and as such do not have demonstrated economic viability.*
5. *The metal content estimates reflect gold in situ, and do not include considerations typically taken into account for reserves, such as external dilution, mining losses and process recovery losses.*
6. *The QP responsible for resource estimates is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing or political factors that might materially affect these mineral resource estimates.*

Table 1.1 Mineral Resource estimate for the Castelo de Sonhos Project Gold for a reporting cutoff grade of 0.3g/t, with an effective date of December 31st, 2020.

1.15 Mineral Reserve Estimates

Mineral reserves have not yet been estimated for the Castelo de Sonhos project.

1.16 Mining Methods

A Preliminary Economic Assessment (PEA) was previously done for the project, and filed on SEDAR in a Technical Report entitled "Castelo de Sonhos Gold Project, Pará State, Brazil Amended Independent Technical Report – Preliminary Economic Assessment" with an effective date of September 14, 2018. This PEA, which used the project's previous resource estimate, remains relevant and current.

The 2018 PEA developed a plan for a process plant that had an annual production rate of 3,000,000 tonnes of mineralised material, fed by an open pit operation that used a contract mining fleet of hydraulic excavators, front-end loaders, 40 t haul trucks and ancillary equipment.

1.17 Recovery Methods

The 2018 PEA developed a plan for a conventional carbon-in-pulp process plant that could produce 150,000 oz of gold annually from 3,000,000 tonnes of run-of-mine material with an average grade of 1.5 g/t, assuming a metallurgical recovery factor of 95%.

1.18 Project Infrastructure

The 2018 PEA envisaged waste dumps being created close to the open pits, with the plant site on the plains east of the plateau and the tailings storage facility near the plant, making use of the steep slopes of the flanks of the plateau and a dam at its low point to create a volume sufficient to hold all the tailings from an operation with a life-of-mine of 10 years.

1.19 Market Studies and Contracts

The 2018 PEA envisaged an average gold price of $US 1,250/oz during the life of the mine.

1.20 Environmental Studies, Permitting and Social or Community Impact

For the four mineral concessions that hold all of the current resources, the first phase of the permitting process began in 2020 with Pará State's environmental regulatory authority issuing Terms of Reference for the Environmental Impact Assessment (EIA). Year-long baseline studies began in 2020 and will continue through 2021 so that data can be acquired during the wet season and the dry season. Once the EIA studies have been completed, their findings will be compiled into a technical report and into a separate public consultancy report called the RIMA. These will be submitted to the state as part of the application for the first of three licenses required for constructing a mine.

1.21 Capital and Operating Costs

The 2018 PEA estimated that the total CAPEX of the project would be $184 million. The OPEX of the process plant was estimated to be $9.99 per tonne processed; mining was estimated to cost, via contract mining, $2.17/t; and G&A costs were estimated to be $2.0 million annually.

1.22 Economic Analysis

The discounted cash flow analysis from the 2018 PEA estimated that, at an annual discount rate of 5%: the project's post-tax NPV would be $264 million; its post-tax IRR would be 43%; and its payback period would be 1.9 years.

1.23 Adjacent Properties

There are no known mineral deposits on the adjacent lands that surround the plateau.

Drilling is currently underway to test the potential for significant gold mineralization at depths beyond those that an open pit could reach but that might be amenable to underground mining methods.

1.24 Other Relevant Data and Information

Restrictions created during the current COVID-19 pandemic are slowing the advancement of the project as TriStar works together with the local community to protect public health and safety. Despite some delays in drilling, and in lab turnaround time, TriStar has been able to continue advancing the project, and expects to release the Pre-Feasibility Study in Q4 of 2021.

1.25 Interpretation and Conclusions

The new, current resource block model has the majority of the resource in the higher-confidence Indicated category, which now has approximately twice the tonnage and metal content of the Indicated resource in the previous resource block model, now historical. Accordingly, the tonnage and metal content of the Inferred resource have decreased.

The improvement in the confidence of resource estimates is due to infill drilling that now closes the drill spacing to 50m in most of Esperança South, and to the use of the detailed litho-geochemistry and stratigraphy interpretation developed by machine learning.

1.26 Recommendations

The following recommendations, estimated to cost $4,500,000 have been made as the project now advances to its next major milestone, the Pre-Feasibility Study (PFS):

1. Update the 3D model of litho-geochemistry units and erosional surfaces using new multi-element chemistry and gold assays not available at the end of 2020, and incorporating information on bedding direction from available optical televiewer (OTV) images.
2. Incorporate into the project's maps a revised soil anomaly map that incorporates all soil samples, including those from 2019 and 2020 that expand soil sample coverage into areas left blank on previous maps.
3. Integrate the Barrick stream sediment samples with the drainages that can now be resolved with high precision using the LIDAR topography to explore the possibility of identifying well-mineralized source rocks that have not yet been drilled.
4. Extend the machine-learning analysis of dykes and dyke margins to include OTV images, and gold assays from drillholes and soil samples to enable 3D modeling of dykes into the interior of the plateau, with the goal of identifying other locations where gold may be enriched by dykes or intrusions.
5. As laboratory capacity and productivity allow during COVID-19 restrictions, complete Leachwell analyses for all sample intervals in significant intervals calculated at 0.1 g/t, including one sample on either side of these significant intervals.
6. Perform an extensive campaign of density test work to improve the density of information across the deposit, including in the friable upper arenite that will account for much of the stripping along the high-walls of the open pits.
7. Continue to expand the total mineral resource with:
    a) holes that extend current resources into adjacent areas where the deposits remain open along strike and down-dip
    b) holes that infill 100m drilling to improve the classification of resources from Inferred to Indicated
    c) holes that test resource potential in the interior of the plateau, particularly at depths beyond the reach of open-pit operations.
8. For the PFS, classify resources using the conditional simulation approach that links resource confidence to the uncertainties on quarterly and annual production.
9. Include in the PFS a trade-off study of the technical and economic viability of pre-concentration by gravity and flotation and leaching of concentrates, with recovery around 94%, versus whole ROM leaching, CCD and Merrill Crowe recovery.
10. Complete an options analysis for tailings disposal. This should look at a comparison between a standard tailings storage facility and a form of thickened or dry-stack tailings facility.
11. Complete the closely-spaced 10x10m drilling so that the data from that area can serve as the basis for studies of mineralised material loss, mining dilution and grade control.

12. Conduct field trials of portable XRF analysis and other rapid screening technologies for the purpose of improving grade control through improved local delineation of sedimentary packages and erosional surfaces.
13. Develop a costed plan for conducting, after the PFS but before the FS, a test mining or bulk mining exercise in the area with 10x10m drilling.

2. INTRODUCTION

2.1 Issuer

This Technical Report has been prepared for TriStar Gold Inc., a company listed on the TSX Venture Exchange and the owner of the Castelo de Sonhos Gold Project.

2.2 Terms of Reference and Purpose

TriStar's Castelo de Sonhos Gold Project is nearing the time when a Pre-Feasibility Study (PFS) will be done. Drilling has been underway since the Fall of 2020, and is continuing into 2021. The engineering studies for several aspects of the PFS will benefit from the project's mineral resources being updated to incorporate 2019-2020 drilling that post-dates the previous resource estimate. For example, better decisions can be made about where to drill geotechnical holes along the high-wall of a planned open pit if the location of the high-wall is based on an up-to-date resource block model.

TriStar regards this new resource model as an interim update because the resource block model will be updated again in the coming months to include data from new holes drilled in 2021, and to include a revised interpretation of the stratigraphic and structural controls on mineralization.

The main purposes of this interim resource update are:

- To improve local accuracy of grade estimates by incorporating new drilling and a new geological interpretation.
- To create a resource block model well suited to the needs of upcoming engineering studies: specifically, to adopt a larger block size that reflects the uncertainties created by drill hole spacing better than a small-block block model can.
- To create a resource block model that will support an assessment of mining dilution better than a small-block block model can.
- To test the use of the geological model developed for the project using tools from artificial intelligence and machine learning.

2.3 Source of Information and Data

The principal sources of information are: drillhole data (described in Section 10), a new high-precision LIDAR survey of topography (Section 9) and a new geological interpretation and digital model (Section 9).

2.4 Personal Inspections by QPs

R. Mohan Srivastava, the QP for the geology and resource sections of this report, last visited the Castelo de Sonhos site in September 2019, spending a week there during which he discussed drilling, geophysics, QA/QC and geological interpretations with site geologists and TriStar's external consulting geologists.

Porfírio Cabaleiro Rodriguez, the QP for the mining, processing and economic assessment sections of this report, has not visited the Castelo de Sonhos project site.

3. RELIANCE ON OTHER EXPERTS

On issues related to ownership and mineral concession rights, the authors rely on legal opinions given to the Company by its Brazilian lawyers, namely that the Company does have 100% ownership of the Castelo de Sonhos Project through its Brazilian subsidiary, and that its mineral concession rights are in good standing with the Agência Nacional de Mineração, the Brazilian federal agency that regulates and oversees mining. No independent verification of property title or mineral concession status has been conducted by the authors.

4. PROPERTY DESCRIPTION AND LOCATION

4.1 Property Description

The Castelo de Sonhos Gold Project is in south-western Pará State, Brazil, approximately 20km north-east of the town of Castelo dos Sonhos, which lies on the main north-south BR-163 highway that links Cuiabá, a major business city with a population of two million, and Santarém, an important port city on the Amazon River. The Project area is centered approximately at 8°12’07’’ south, 54°59’20’’ west.

Figure 4.1 The location of the Project in Brazil

4.2 Mining Legislation, Administration and Rights

When TriStar was created in 2011, mining activity in Brazil was regulated by the Departamento Nacional de Produção Mineral (DNPM). In a major consolidation and updating of mining law in 2018, a new federal agency, the Agência Nacional Mineral (ANM), was created. The procedures for applying for mineral concession rights and for maintaining them in good standing are largely unchanged from the DNPM era to the ANM era. The following summary of the main steps refers to ANM even though the original applications were made to DNPM.

1. The entity (an individual or a corporation) makes an application to ANM for the right to conduct mineral exploration activities in a specified area. If the area has no previous applicant, the new entity has priority during the review period.
2. If it finds the application acceptable, ANM grants an exploration permit that gives the entity three years to conduct mineral exploration studies.
3. Before the three-year permit expires, the entity must file either a Partial Exploration Report or a Final Exploration Report. Filing a Partial Exploration Report allows the entity to request a three-year extension of the exploration permit. If this request is approved by ANM, the entity must submit the Final Exploration Report within the three-year extension period. In addition to presenting results, analysis and interpretations from the mineral exploration studies, a Final Exploration Report must also reach a conclusion on whether the studies were positive (if mineralization with economic value has been found) or negative (no success was obtained in the work).
4. When a positive Final Exploration Report is approved by the ANM, a corporate entity has one-year to file a Plano de Aproveitamento Econômico (PAE) that demonstrates that the project is technically and economically viable, and that presents an implementation plan. The PAE period may be extended through a request to the ANM.
5. Once the ANM has approved the PAE, the Minister of Mines and Energy grants a mining permit. The company must start the implementation plan within six months. There is no fixed time period for a mining permit, which remains valid as long as the company continues to follow the implementation plan or has ANM’s approval for changes, and continues to meet the permitting and reporting requirements of state and federal agencies responsible for the environment, sustainability and community development.

4.3 Mineral Concessions

The Castelo de Sonhos Gold Project spans six contiguous mineral claims (Figure 4.2) with a combined total area of 17,177ha. TriStar Mineração do Brasil Ltda, a Brazilian company 100% controlled by TriStar, holds the title on all six claims.

Most of the gold resources on the Castelo de Sonhos plateau lie on the mineral concession shown as #1 on Figure 4.2 (claim number 850.329/2002), which had its final positive exploration report approved by the ANM on 17th April 2017 and is now in the environmental study phase.

For the concession shown as #2 (850.391/2016), the partial exploration report has been submitted and is awaiting approval. The final exploration report is due by October 2022

Concessions #3 (850.310/2011), #4 (850.309/2011) and #5 (850.784/2009) had their final exploration reports filed on 24th August 2017 and are now in the environmental study phase.

TriStar was officially granted the concession marked as #6 (850.775/2020) in June 2020, it has until 2023 to submit the partial exploration report.

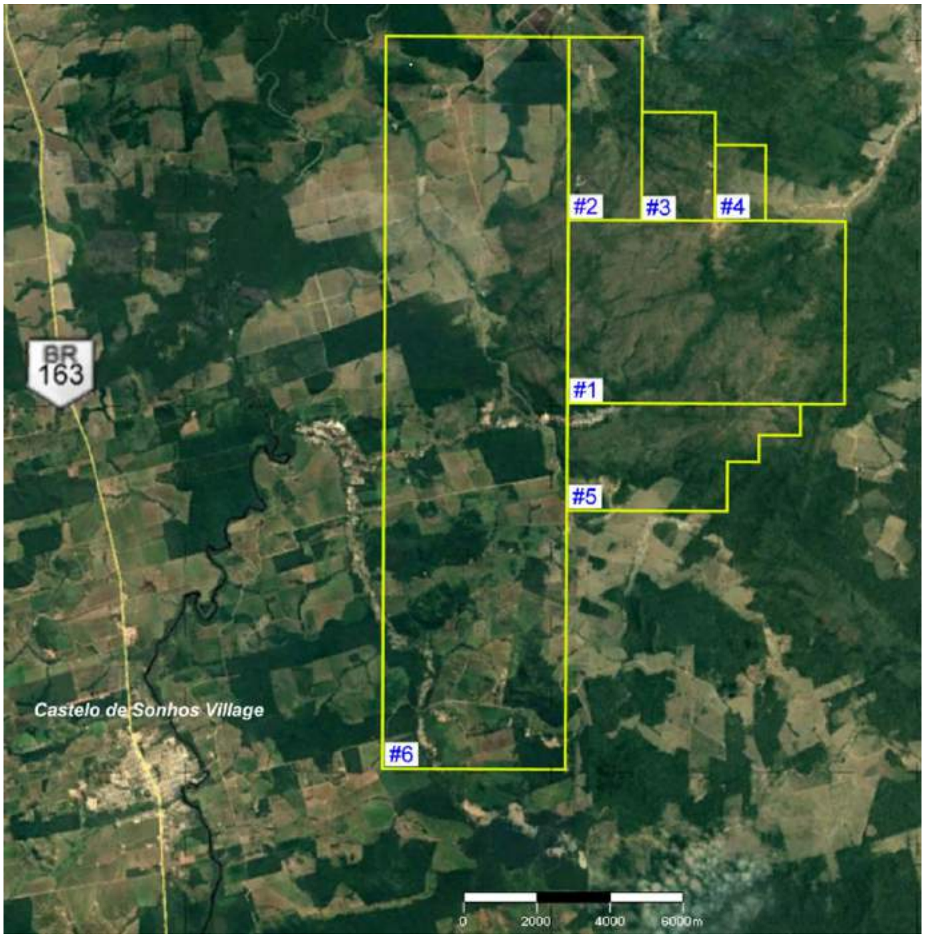


Figure 4.2 Mineral concessions for the Project area shown by yellow outline.

4.4 Coordinate System

Historically, all survey data for the project were acquired in UTM coordinates using the SAD69 datum. In 2017, the Brazilian government mandated the use of SIRGAS 2000 coordinates for all federal government reports, a directive that covers reports provided to the federal ANM, which regulates mining activity in Brazil.

In late 2020, TriStar migrated to the SIRGAS 2000 coordinate system for all data collection while also retaining UTM/SAD69 coordinates in its data bases for historical harmonization.

5. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Accessibility

The Project site is accessible year-round by dirt road from the village of Castelo dos Sonhos, which lies on BR-163, the paved federal highway that connects Cuiabá, the capital of Mato Grosso State, to Santarém, a port city on the Amazon, 850 km to the north. During the rainy season, the most direct route to BR-163 is sometimes impassable at bridges covered by flood-water, but the site can still be reached by a longer and more circuitous route.

The 550m airstrip at the Castelo de Sonhos field camp (Figure 5.1) makes the site directly accessible by small aircraft from cities served by commercial airlines, like Alta Floresta (a 50-minute flight) or Sinop (a 90-minute flight). Larger airplanes can land at the 1,100m runway at the village of Castelo dos Sonhos.

Figure 5.1 Image taken from a drone showing the airstrip located in Esperança Center, with camp buildings in the background.

5.2 Climate and Length of Operating Season

The region has a tropical monsoon climate, with most of its annual rainfall of about 2,000mm falling during the December–May rainy season, and average daily temperatures higher than 24°C all year (Figure 5.2).

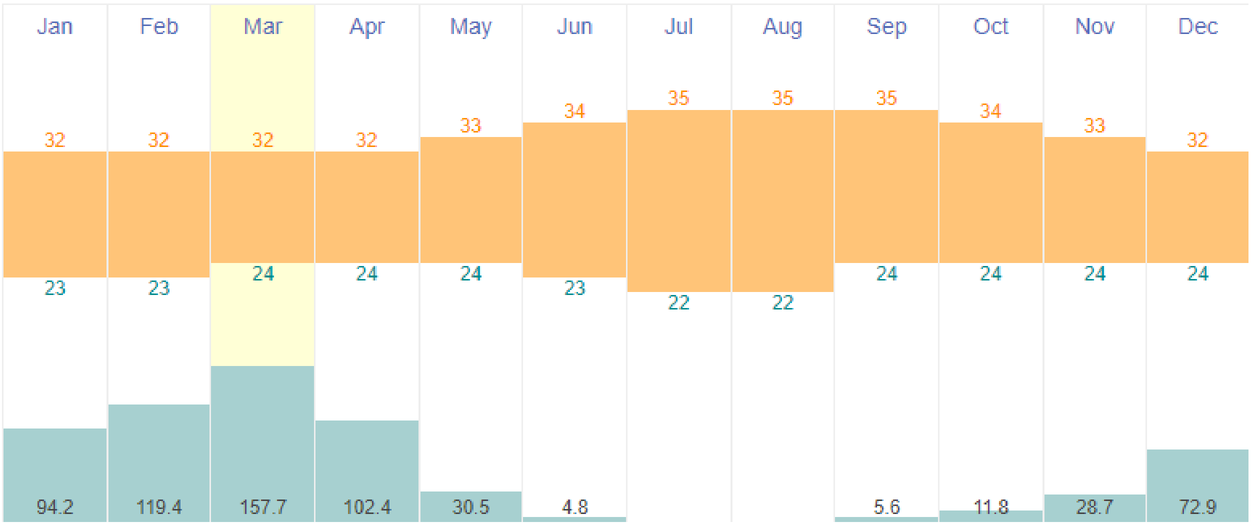


Figure 5.2 Variations in average daily temperature highs and lows (orange graph in degrees Celsius) and total monthly rainfall (teal graph in millimetres), from 1985 to 2015 for southern Pará State (Source: https://www.timeanddate.com/weather/@6319433/climate).

Mineral exploration may be conducted year-round. The Project location on the plateau with its good drainage minimizes the effect of the rainy season, although lightning strikes on the plateau do occasionally bring field activities to an end in the late afternoon. Elsewhere in the region, producing mines can operate year-round with supporting infrastructure.

In October 2020 TriStar installed an active weather station on the plateau to gather data on local temperature, average wind direction, humidity, and pressure as part of its environmental baseline monitoring program. Every 15 minutes the weather station automatically uploads data to the WeatherLink Cloud through a Bluetooth connection. However, not enough data has yet been collected to represent annual climate fluctuations. Information will continue to be gathered for full annual summary reports for future publication.

5.3 Physiography

The Castelo de Sonhos deposit sits on an incised plateau that rises several hundred meters above the plains and grasslands around the Rio Curuá, which runs west of the plateau, and its tributaries to the east.

The plains have an average elevation of approximately 250m above sea level while the plateau itself is approximately 550m above sea level. The contrasting elevation between the plateau and the surrounding plains is a result of higher resistance to erosion of the silicified arenites and conglomerates on the plateau.

The vegetation on the plateau is mostly South American savanna: small trees, bushes and grasses growing on a rocky soil; taller trees can be found in drainages. On the surrounding plains, the vegetation is grasslands that were cleared for farming and cattle ranching.

5.4 Local Resources and Infrastructure

The village of Castelo dos Sonhos (Figure 5.3) has banks, telecommunications, mail, medical services, police, supermarkets, restaurants and hotels. It also has businesses able to service and repair heavy equipment and machinery; these began when the village was a center of logging activity and have continued to the present because the village is a major pit stop for the heavy trucks that haul soy from Mato Grosso State to the Amazon along BR-163.

Figure 5.3 Panoramic view of the village of Castelo dos Sonhos, looking north along highway BR-163.

Given the mining history of Pará State and the country in general, skilled and unskilled exploration and mining personnel are available in the region. Pará State has two universities with geology and mining education programs: the Federal University of Pará with its main campus in Belém, and the Federal University of Southern and Southeastern Pará in Marabá; both of these universities have several satellite campuses, including in Altamira, the large municipality in which Castelo de Sonhos lies.

When final exploration reports are filed, the ANM requires the concession holder to submit an area reduction proposal that makes the concession boundary fit tightly around the resource/reserve areas. This inevitably means that most mining operations enter their development phase needing to place infrastructure on adjacent land they no longer control. At the time of development, permission for siting mine infrastructure on adjacent land needs to be negotiated with those who own and control that property.

A 138kV powerline runs along BR-163, bringing power from three small hydroelectric plants on the Curuá and Três de Maio rivers near the southern border of Pará State, where the drop from the Serra do Cachimbo plateau creates many waterfalls.

In southern Pará State, the primary source of income is farming (soy, sugarcane, fruit) or cattle ranching. In 2018, TriStar worked together with local farmers to fund the construction of a spur from the main powerline on BR-163 to farms that flank the plateau and up to TriStar's camp in Esperança Center. The camp can also meet all of its current electricity needs from a diesel generator.

There is a satellite telephone at the TriStar camp, along with high-speed internet that provides excellent communication. A Wi-Fi tower located in Esperança South enables voice-over-IP (VoIP) communications. A shortwave radio system provides voice communication within the project area.

The camp has sufficient space to house up to 30 people, including professional staff, technicians, contractors, visiting consultants and workers from the nearby village. The local workers staff a small kitchen and dining hall, provide cleaning services and run the camp laundry.

There is abundant water, all of it potable, on the Castelo de Sonhos plateau, in many creeks and streams that flow year-round. A well provides the camp with water for drinking, cooking and cleaning. Septic tanks and a leach field provide for sewage waste disposal.

The camp also has: office space that accommodates up to 10 people; facilities for sawing diamond drill core and for logging and photographing core samples and RC chips; and a core storage area that can store 25,000m of core and 44,000m of RC chips.

6. HISTORY

6.1 History of Exploration

The Castelo de Sonhos Gold Project lies along the southeastern edge of the Tapajós gold province, the region where the biggest gold rush in Brazil's history occurred.

From the 1960s to the mid-1990s, hundreds of thousands of artisanal miners, garimpeiros, (Figure 6.1) mined 16–30Moz of gold in a vast swath of south-western Pará State. In the Castelo de Sonhos area, an estimated 300,000oz of gold were mined in small-scale operations, garimpos, that targeted the gravels in rivers and creeks that drain the plateau.

Eventually, the declining price of gold in the 1990s ended this period of prosperous gold mining for the garimpeiros.

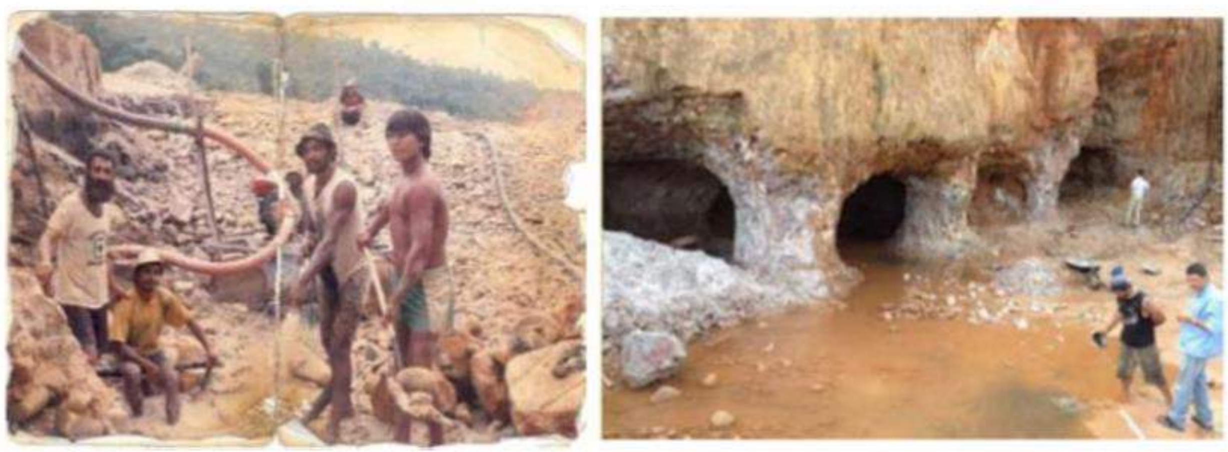


Figure 6.1 Artisanal miners or garimpeiros (left) and abandoned excavations or garimpos (right) at Castelo de Sonhos Gold Project.

6.2 History of Mineral Tenure

By the mid-1990s, the region had gained the interest of major mining companies and from 1995 to 1997 Barrick Gold held the title for the mineral claims on the plateau. Although their exploration program confirmed that the source of gold for the surrounding alluvial deposits was the silicified conglomerates on the plateau, Barrick Gold ultimately decided to relinquish the project in 1997.

When Barrick left in 1997, garimpeiros began developing trenches, pits and small tunnels in and around the areas where Barrick had drilled (Figure 6.2). Although hand-dug, these surface workings were extensive and continuous, eventually spanning several kilometres of the conglomerate outcrop.

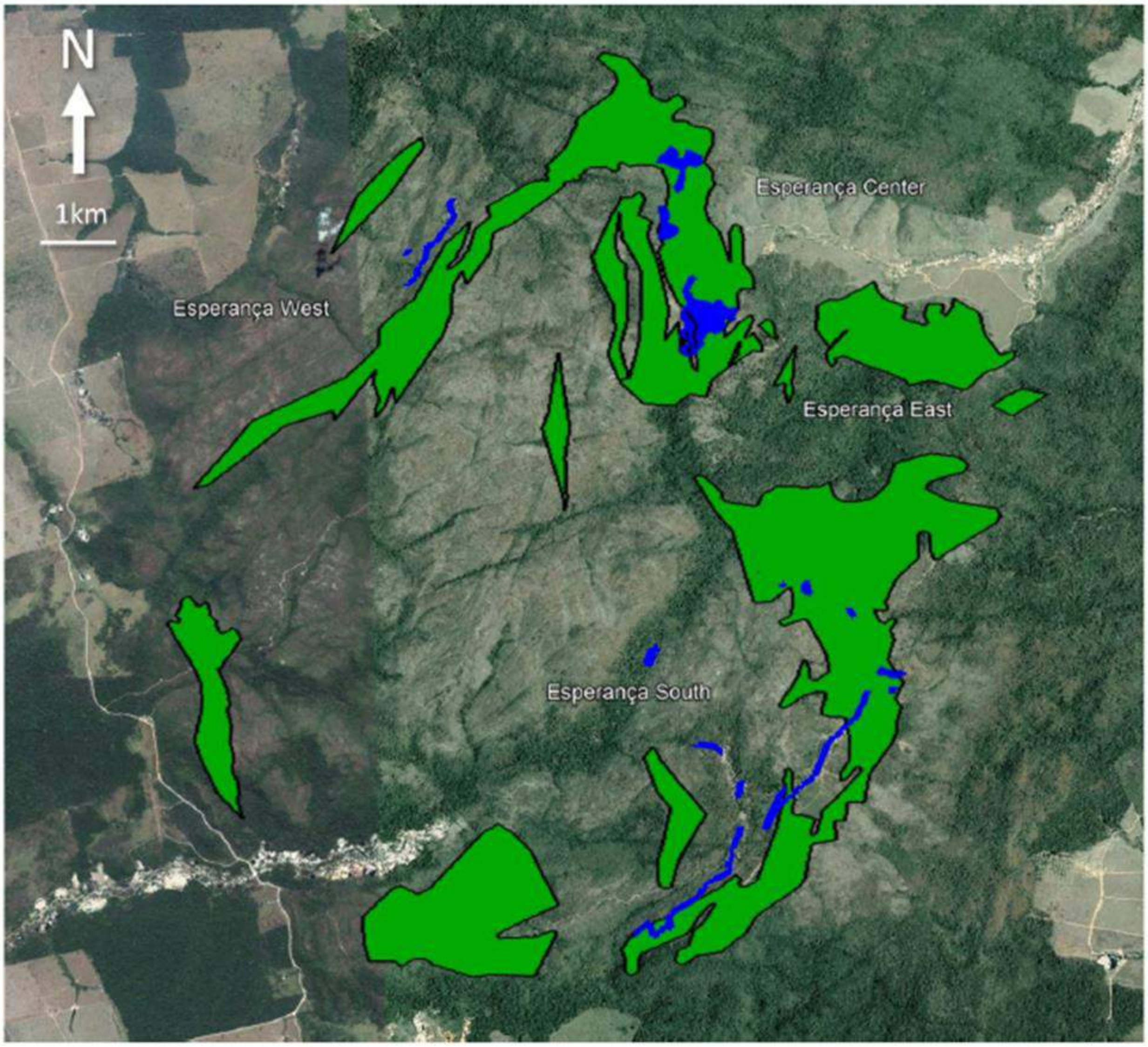


Figure 6.2 Plan map showing the continuity of the hand-dug garimpos (in blue) mirroring the mineralized conglomerate band outcrop (in green).

Limited by the increasing difficulty of extracting the gold from hard rock without the use of explosives and mechanized equipment, and by the difficulty of dewatering the trenches, pits and tunnels, the number of garimpeiros has dwindled to a few part-time solo operators today.

From 2004 to 2009, Osisko Brasil Mineração Ltda (Osisko) held the title for the mineral claims on the plateau without doing any new exploration. Control of Osisko was passed to the Brazilian property owner when Osisko left Brazil in 2009.

In 2010, TriStar Mineração do Brasil Ltda, a wholly-owned subsidiary of TriStar, signed an option contract with then property owner, Mr. João Américo França Vieira, with terms and conditions as described in Section 4.4.

Following TriStar's airborne geophysical survey and the soil geochemistry study, six of the original Osisko claims were identified as having little or no potential and were returned to the ANM.

6.3 Property Results – Previous Owners

Barrick (1995–1997) spent over $1.5 million in exploration work that included soil geochemistry, stream sediment sampling, surveying, geophysical surveying, trenching and 23 diamond drillholes totaling approximately 2,027m.

It was during this phase of exploration when the two-significant gold-bearing zones, Esperança South and Esperança Center, were identified.

In Esperança South, Barrick's geochemical survey defined a gold-in-soil anomaly approximately 5km long and 1–2km wide, defined by a 30ppb threshold. The Esperança Center anomaly measured approximately 2.6km x 500m as defined by a 150ppb Au threshold. The gold values found in the soil ranged from zero to 1,722ppb Au. Both areas had coincident magnetic and radiometric anomalies.

Barrick's work was concentrated on the Esperança South target. Most of the Esperança South trenching (total of over 4,700m) and drilling (15 drillholes totalling 1,448m) focused on a 2.5 km segment of the anomaly. One hole (160m) was drilled in the Esperança Center anomaly, and seven holes (418m) were drilled at the southern end of the Esperança East anomaly. Although many of Barrick's trench and soil samples produced assays below the detection limit, many of them were well mineralized, with grades reaching 18g/t both in drill hole samples and in trench samples. All of Barrick's trenches in the conglomerate outcrop produced consecutive runs of samples above 0.5g/t, with the horizontal lengths of these well mineralized composites ranging from 4m to 77m. All of Barrick's drillholes that encountered a significant length of conglomerates also encountered mineralization above 0.5g/t. The only Barrick trenches and/or holes that did not encounter mineralization were those that did not target the conglomerates.

6.4 History of Resource Estimation

2004 historical resource estimate (not compliant with NI 43-101)

A July 2004 Osisko report on Castelo de Sonhos included earlier undated work by João Batista Taixeira that summarized the project's gold potential as falling into one of three types: "tailings from the alluvial gold deposits mined by garimpeiros, supergene enriched gold mineralization and primary gold mineralization, probably occurring at depth." Taixeira provided semiquantitative estimates of the total gold, using simple assessments of volume, tonnes and average grade that led to the conclusion that approximately 900,000oz of gold may be present in all three categories.

The historical estimate included only an estimate of contained metal, without any form or resource classification. The assumptions, parameters and methods used to prepare the resource estimate are unknown. The reader is cautioned that these resource estimates do not comply with the resource classifications approved by the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) in their document "CIM Definition Standards on Mineral Resources and Mineral Reserves (2014)" because: they have not been classified; the cutoff is not stated (but appears to be 0g/t); their geographic location is undocumented; and there was no Qualified Person identified. The authors and TriStar have no basis upon which to assess the reliability of the resource estimate.

The historical estimate has not been considered in any of TriStar's plans for project development. A Qualified Person has not done sufficient work to classify the historical estimate as a current resource estimate. No attempt has been made to identify the steps required to make this historic resource compliant with the resource classifications approved by the CIM since the historical estimate was not the basis for any subsequent mineral resource estimate.

2014 historical resource estimate

The 2014 drillhole database consisted of 143 holes drilled by TriStar and two by Barrick. Three dimensional (3D) wireframes of the mineralization were developed from cross-sections, guided by assay grades and the general dip of the stratigraphy. Gold grades were estimated for 5m x 5m x 2m blocks. Ordinary kriging was used to interpolate grades of 2m composites that had been capped at 10g/t. Classification of the estimated resources into "Indicated" and "Inferred" categories was based on drillhole spacing, with the 50m x 50m drilling in Esperança South being sufficient for "Indicated" resources. None of the blocks in either of the block models was classified as "Measured". Resources were reported inside a pit shell to ensure that the resources had reasonable prospects for economic extraction. Although the block models contain grade estimates for blocks outside the pit shells, these blocks are not included in the resource inventory. Because this resource estimate relied on drillhole data, both for grade interpolation and development of wireframes, it was necessarily restricted to the areas that had been drilled by 2014, which covered only about 4.5km of the total of 16km of mineralized outcrop. Because it was reported inside a pit shell that reached a depth of only 70m, it was restricted to near-surface mineralization.

2017 historical resource estimate

The 2017 drillhole database consisted of 240 drillholes. Gold grades were estimated using uniform conditioned (UC) estimation, with 30x30x6m panels and 5x5x2m selective mining units within the panels. The UC estimates of the SMU distribution of grades within a panel were based on 1 m composites that had been capped at 20g/t. The capping value was deduced from cumulative distribution functions (CDF) and from Au grades sorted in ascending order. All resources above a depth of 120m below ground surface, inside the conglomerate band, and within 100m from drillholes were classified as "Inferred", no resources were classified as "Measured" or "Indicated". The choice of using 120m below ground surface as a base for the mineralization was based on the very strong similarities between geological, mineralogical, mining and metallurgical characteristics between Tarkwa and Castelo de Sonhos and the fact that the Tarkwa pits reach depths greater than 120m below the original ground surface lends validity to the assumption that mineral resources at Castelo de Sonhos have reasonable prospects for eventual economic extraction to a depth of 120m.

2018 historical resource estimate

At the time of the 2018 PEA, 163 diamond holes (19,973m) and 167 RC (18,991m) holes had been drilled. The 2018 resource estimate covered the three main areas with drilling: Esperança South (ES), Esperança Center (EC) and Esperança East (EE).

3D models of the hanging-wall (HW) and foot-wall (FW) of the conglomerate band were created that honour:

- Locations of contacts as mapped on the ground surface,
- Field measurements of bedding strike and dip,

- Contacts in drill holes, and
- Minimum curvature.

The wireframes of the 3D geometry of the conglomeratic band allowed the elevation, Z, at any location to be positioned stratigraphically by calculating its relative position between the foot-wall and hanging-wall. The 2018 resource estimate recognized two stratigraphically conformable reefs where the average gold grade consistently exceeded 0.1g/t and where the average at that stratigraphic elevation over the entire deposit exceeded the marginal cutoff.

The two reefs separated the deposits into five domains. With some gold mineralization at the base of the upper arenite, the top of Domain 1 was not at the hanging-wall of the conglomeratic band. Instead, the CGL-HW wireframe served as a soft boundary as did the bottom of domain 5 at the foot-wall of the conglomeratic band.

The contacts of the upper and lower reef served as hard boundaries. Samples inside the reefs were not used for grade estimation in any blocks outside the reefs, and vice versa.

A single block model was constructed for the entire project with all three targets. Block size was defined as 5m x 5m x 2m. 2.68t/m^3 was used as the dry bulk density for all mineral resource blocks; this value was the average of 28 measurements of dry bulk density done by GE21. Gold grades were interpolated by ID^3 weighting, directly from assays, with the ID^3 weight being multiplied by the sample length. The interpolation was done in a single pass, using a quadrant search strategy. For the two reef domains (2 and 4), the long radius was 150m and the short radius was 15m. For the non-reef domains (1, 3 and 5), the long radius was 100m and the short radius was 10m. All assays were capped at 10g/t.

All of the historical estimates that were compliant with National Instrument 43-101 are summarized in Table 6.1.

Year Company	Project Areas Covered	Reporting Cutoff (g/t Au)	Classification	Tonnage (Mt)	Grade (g/t Au)	Metal Content (Moz Au)
2014 RMB Consultoria Mineral	ES + EC	0.4	Indicated	2.8	2	0.2
			Inferred	1.4	2.1	0.1
2017 CSA Global	ES + EC	0.4	Inferred	31	1.3	1.3
2018 GE21 Consultoria Mineral	ES + EC + EE	0.3	Indicated	17.7	1.2	0.7
			Inferred	39.8	1	1.3

Table 6.1 Historical Mineral Resources for the Castelo de Sonhos Gold Project.

7. GEOLOGICAL SETTING AND MINERALIZATION

The Castelo de Sonhos gold deposit formed 2.0 to 2.1 billion years ago along the coast of a supercontinent known as 'Nuna' (Eglington, 2015). In Figure 7.1 the orange triangles are gold deposits whose ages are known to be 2.0Ga or older, i.e. they all existed, likely along an Andes-like central mountain range, at the time when Castelo de Sonhos was forming. These deposits would have been the natural source for gold grains that were eroded by fast-flowing creeks and rivers with headwaters in the mountains. The gold suspended in flowing water would have been transported down-hill, and would fall out of the flowing water where the water velocity drops: either along the inner edge of bends in the river, on an alluvial plain, or near the mouth of the river, where it opens to the sea.

Castelo de Sonhos was located at the southern edge of the continental plate now called the Amazonian plate (left of Figure 7.1). At approximately the same time as gold was accumulating in the river gravels and pebbles that are now the Castelo de Sonhos deposit, gold was also accumulating elsewhere along the coast of Nuna: on the edge of the continental plate that now forms West Africa, in the deposit that is now being mined at Tarkwa; and on the edge of the plate that is now called the Rio de le Plata plate, in the deposit that is now being mined at Jacobina.

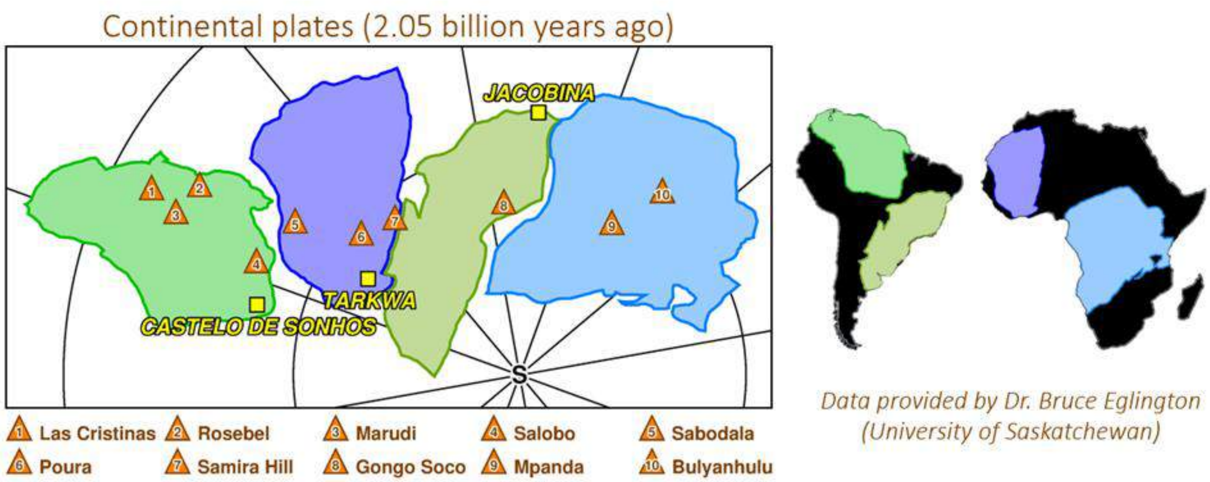


Figure 7.1 (left) Map of the Nuna Super-Continent, with location, at the time, of 10 gold deposits that are at least 2.0 billion years old. The "S" marks the location of the South Pole when Nuna formed; (right) The modern positions of the continental crust that comprised Nuna. (Source: Eglington, 2015).

7.1 Regional Geology

The Castelo dos Sonhos Formation is an isolated package of slightly metamorphosed sandstones and conglomerates which form a roughly circular plateau rising 300m above the surrounding plains near the southern border of Pará State in Brazil. The plateau lies on the Amazonian Craton (Figure 7.2), ancient continental crust that was first formed three billion years ago and that grew as other continental crust was accreted to it during continental collisions. The Castelo de Sonhos plateau lies at the border between the Tapajós and Iriri-Xingu tectonic domains.

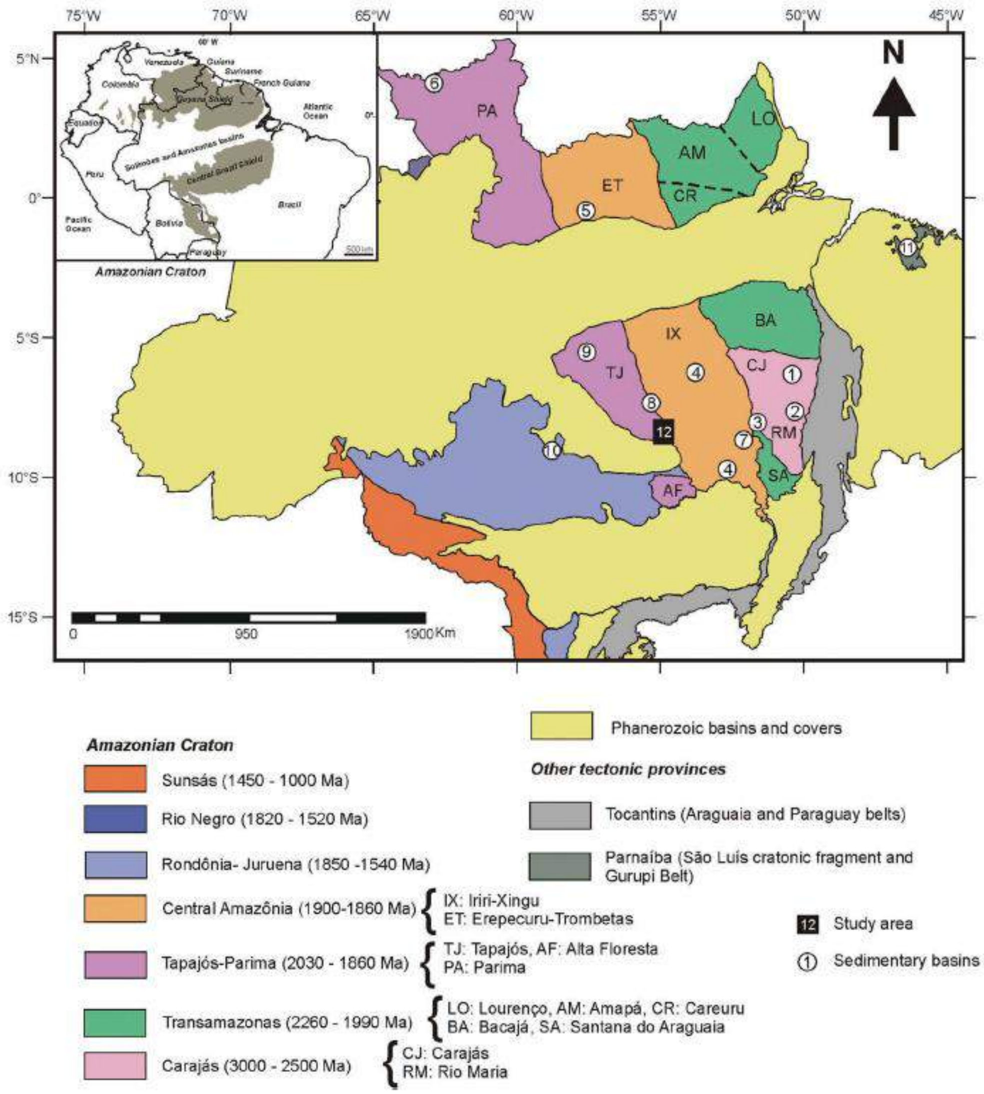


Figure 7.2 Amazonian Craton and its major geochronological domains (Source: Klein et al., 2017).

The Castelo dos Sonhos Formation is a relic of a sedimentary basin that likely formed near the coast, where sediments eroded from higher elevations accumulated in alluvial fans and, occasionally, aeolian dunes. U-Pb isotope dates from detrital zircons indicate that deposition of these sediments occurred 2.01–2.05 billion years ago in the Paleoproterozoic (Klein et al., 2017), slightly before plate collision that accreted the continental rocks that now form the eastern edge of the Tapajós Domain. The Castelo dos Sonhos conglomerates and sandstones have been gently folded, likely during the continental collisions, and slightly metamorphosed, likely during the intrusions of Maloquinha granites approximately 1.9 billion years ago.

7.2 Stratigraphy

Figure 7.3 shows a schematic column of the broad stratigraphy of the Castelo dos Sonhos Formation. Most of the formation consists of medium to coarse-grained, cross-bedded sandstones that are described locally as metamorphosed arenites. At places within the formation, the size of the particles increases, and the formation becomes a proper conglomerate. In the stratigraphically vertical direction, fluctuations between sandstones and conglomerates were influenced by the rate of sediment accumulation, how close (or far) they were from the source where they eroded, and how mature they were (i.e. their size, roundedness and sorting).

The gradual nature of these changes gives rise to a continuous spectrum, from sandstones (mA) to conglomeratic arenites (mAC) to conglomerates (mC). In the conglomerate, pebbles range in size from granules (~2mm) to large boulders (~1m). Where the pebbles touch each other, the conglomerate is described as clast-supported (mC1); where they do not touch each other, it is described as matrix-supported (mC2). Where the entire conglomerate consists of small granules, and has the appearance of a gritstone, it is described as a micro-conglomerate (mC3).

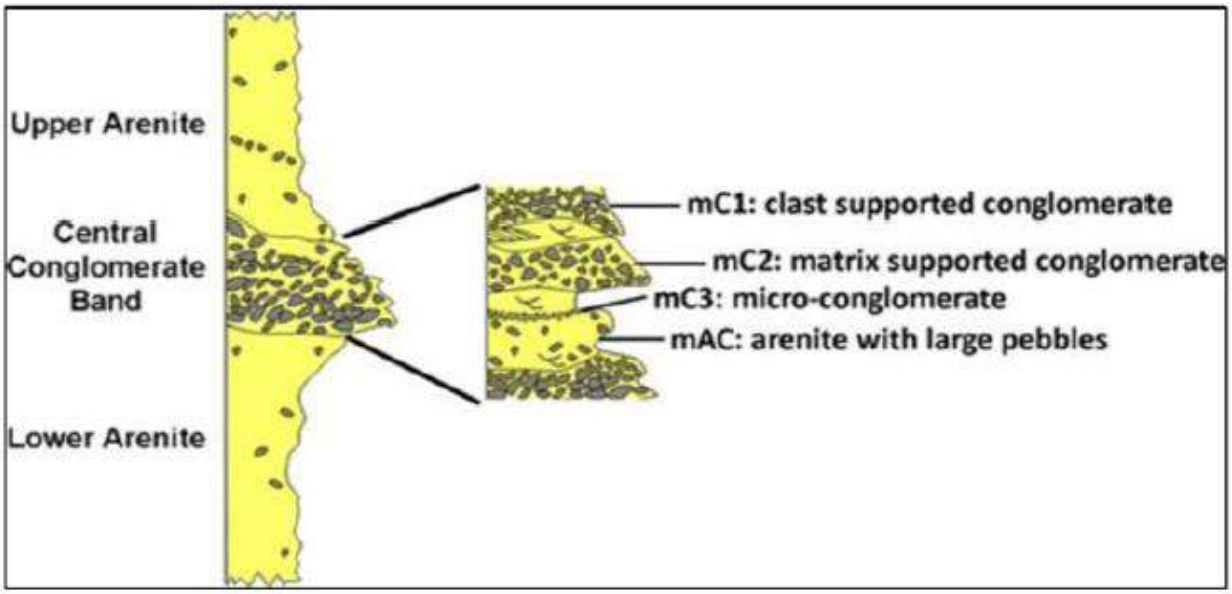


Figure 7.3 Schematic stratigraphy of the Castelo dos Sonhos Formation.

Most of the gold mineralization in the Castelo dos Sonhos Formation lies in a central band where the various conglomerate lithologies dominate. At the base and top of this band, the conglomerates are interlayered with arenites, which become more frequent as one moves away from the conglomeratic band, either downward into the older rocks (the lower arenite) or upward into the younger rocks (the upper arenite).

The central conglomeratic band is 250–300m thick; the upper and lower arenites are more than 500m thick. At least one additional untested conglomeratic band, in the order of tens of metres thick, is known to occur in the upper arenite.

Figure 7.4 shows a schematic column of the stratigraphy within the main conglomeratic band, along with the conceptual model that summarizes the current understanding of the original depositional environment: a Gilbert fan-delta in which deposition occurs sub-aerially near the head and sub-marine near the toe, with sea-level changes affecting the location of the shoreline (Kosters and Steel, 1984). The conglomerate band can be broadly divided into three units, with the cobbles being smaller and less frequent in the upper and lower units. The gradual progression in the stratigraphically vertical direction, from finer grained sediments to coarser is believed to reflect the sequence typically seen in alluvial and deltaic fans that build outwards as they also build upwards.

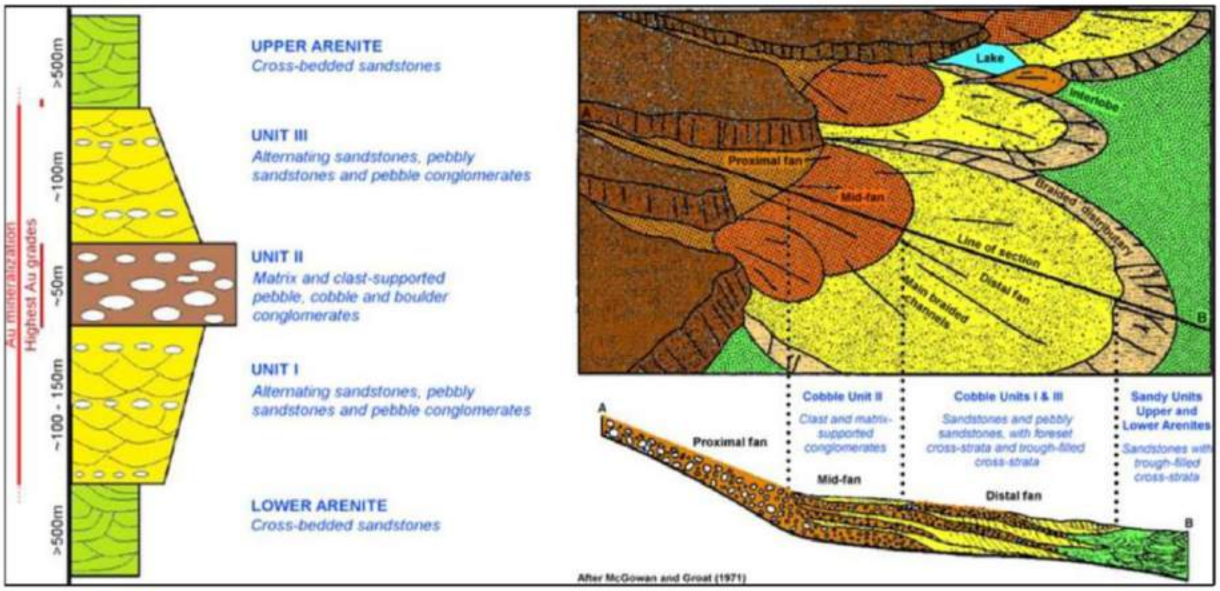


Figure 7.4 Schematic stratigraphy of the main units within the central conglomeratic band of Castelo dos Sonhos Formation, and conceptual model of the depositional environment. (Source: Modified by Karpeta, 2016, after McGowan and Groat, 1971)

The vast majority of clasts in the conglomerate are from quartz veins; minor amounts of the pebbles consist of banded iron formation, quartzite, tourmalinite and, less frequently, metavolcanics. Significantly, no clasts of granite or andesite have ever been seen, indicating that these rocks, which lie beneath the Castelo dos Sonhos Formation, are due to intrusions that post-date the sediments. A few of the pebbles and cobbles are composed of the Castelo dos Sonhos Formation itself, indicating that successive lobes of the alluvial fan have sometimes scavenged and reworked older lobes beneath them.

Structural deformation of the sedimentary rocks (discussed below) removes any possibility of establishing an absolute sense of the original paleo-current directions. But trough cross-bedding in the sandstones and pebble imbrication in the conglomerates both establish that the paleo-current was from the northeast to the southwest in today’s orientation of the plateau (Karpeta, 2016; Lipson, 2016).

7.3 Metamorphism and Structural Deformation

As the continental crust of the Tapajós Domain accreted from the west, the foreland basin closed, and the sedimentary rocks of the Castelo dos Sonhos Formation were intruded by granites and an andesite between 1.9 and 2.0 billion years ago. The sedimentary rocks were metamorphosed by heat from these intrusive events, and by hydrothermal fluids driven upward from the intrusions. The metamorphism was low grade, and left the original sedimentary fabric apparent (Quieroz, 2015).

The outcrop of the conglomerate band approximately follows the rim of the plateau, its arcuate shape being the result of folding and tilting of the alluvial fan from its original flat-lying orientation (Figure 7.5); the axial plane of the fold runs northeast to southwest through the nose at the north end of Esperança Center.

The cross-section in Figure 7.5 shows an interpretation of the shape of the folded conglomerate band. Within the areas where drilling has occurred, and where most of the garimpos are located, the hinge-line of the fold appears to plunge to the southwest, but the fold may, in fact, close on the less-studied west side of the plateau, forming a bowl-shaped structure whose western limb is slightly overturned (Lipson, 2016).

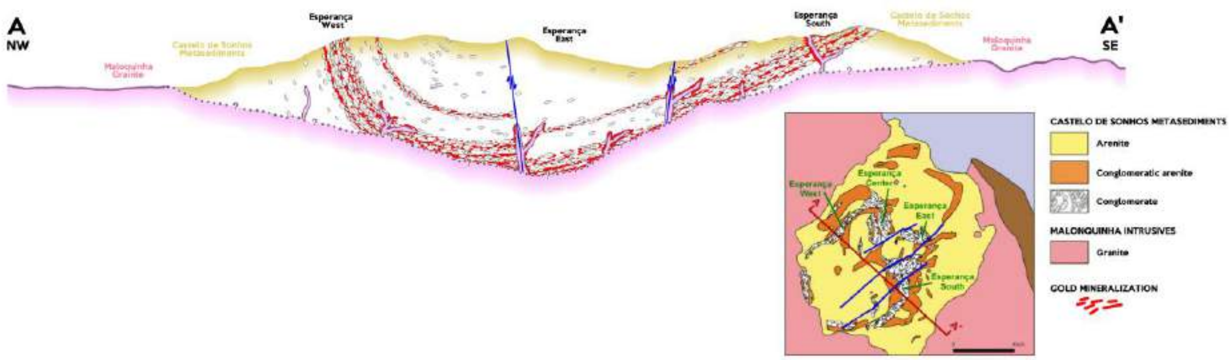


Figure 7.5 Map and schematic cross section of the bedrock geology of the Castelo de Sonhos plateau.

In Esperança South, bedding dips 25–35° to the northwest. On the north-south limb of Esperança South, in Esperança East and in Esperança Center, the dip is slightly shallower (20–30°) and to the west. The bedding dip begins to steepen at the nose of the fold at the north end of Esperança Center, reaching 50–60° degrees at the north end of Esperança West, where it dips to the southeast. Bedding becomes nearly vertical as one moves to the south along Esperança West and becomes slightly overturned in outcrops on the far western edge of the plateau.

Two major faults offset the conglomerate band on the eastern side of the plateau. Although these are interpreted as strike-slip faults in Figure 7.5, regional stress considerations make it more likely that these are principally dip-slip faults, with the Esperança East block being down-dropped and the apparent eastward displacement being a consequence of downward movement of a band that dips to the southwest.

Geological characteristics that reflect stress and strain, such as shearing in mylonites and pebble elongation in conglomerates, are all approximately aligned in the same direction, sub-parallel to the faults that offset Esperança East.

7.4 Hydrothermal Alteration

Hydrothermal alteration events affect much of the mineralized conglomerate band. The most widespread of these are silicic and hematitic alteration, both of which can, in places, be intense. Other alteration minerals that are less widespread and generally less intense include sericite, muscovite, fuchsite and epidote.

Much of the silicic alteration was likely drawn from quartz in the sediments that was precipitated a short distance from where it was dissolved. Much of the iron must have been sourced from the underlying intrusions, traveling upward along fractures in fluids, occasionally forming visible dikes that penetrated the sediments. The lack of chilled margins on the dikes indicates that the temperatures were low when they were emplaced.

As granitic dikes have been observed in the conglomeratic band, it is assumed that the underlying granitic intrusion probably removed the deeper parts of the bowl-shaped conglomeratic band; but this has not been directly observed in any drillholes, most of which are relatively shallow. The deepest hole, drilled in the center of the plateau, reached a depth of 500m and remained entirely in the upper arenite without ever reaching either the top of the conglomerate band or the intrusive granite.

7.5 Mineralization

Gold occurs as free grains and flakes of various sizes, from sub-visible (less than 100 microns) to highly visible. In the near-surface workings dug by local artisanal miners, supergene enrichment creates nuggets that can reach a few centimetres in size.

The two predominant styles of mineralization are:

1. Paleo-placer: Free grains of gold that were likely deposited along with the quartz-rich sediments. In core these can be seen in the matrix of the conglomerate, sometimes in heavy mineral bands.
2. Remobilized: Gold associated with alteration, usually hematitic alteration. Free grains of gold have been observed in hematite-filled fractures, and as thin films plated onto fracture surfaces.

As shown on the left side Figure 7.4, gold mineralization occurs throughout the conglomeratic band. Although there are many barren samples within the conglomerate, there are gold grades above 0.5g/t in almost every drill hole that penetrates more than half of the stratigraphic thickness of the central conglomeratic band. Gold grades tend to be higher in the central cobble unit, often reaching several grams per tonne. The lowest grade encountered in drilling to date is below detection limit; the highest grade encountered in drilling to date is a 160g/t assay over a 1m interval. The existence of gold in heavy mineral bands, and its tendency to be more frequent in the proximal rocks are consistent with the view that most of the gold in the conglomerate band was deposited along with the sediments.

Where gold mineralization extends into the upper and lower arenites, such as the interval of 5 – 10g/t mineralization seen at the base of the upper arenite in several Esperança South drillholes, this is understood to be the result of remobilization caused by hydrothermal fluids. This remobilized gold in the arenites, along with direct observations of gold in direct association with hematite-filled fractures in the conglomerates, confirms that some of the gold within the conglomerate band must also be remobilized. The low temperatures of dike emplacement, the low grade of metamorphism, the difficulty of keeping gold in solution, and the proximity of the remobilized gold in the arenites to the conglomerate band all support the view that remobilized gold did not travel far from where it was originally deposited as paleo-placer gold. There is currently no evidence that any of the remobilized gold has migrated more than a few tens of metres.

The strike length of the mineralized conglomerate is approximately 16km; samples from outcrops and workings along the entire length of this band return both barren samples and well mineralized samples. The true width of the central conglomerate band is 250-300m. At surface, the apparent width is close to true width in Esperança West, where the dip is vertical, and is approximately three times the true width in Esperança Center, where the dip can be as low as 20°.

The true depth of mineralization is unknown since the deepest parts of the conglomerate have never been encountered in drilling, but are known to be at least 500m from surface in the center of the plateau. In drill holes, well mineralized samples (above 4g/t) have been encountered at depths of 300m. The current mineral resource estimate spans the conglomerate band from hanging-wall to foot-wall, but is restricted in its strike length by the availability of drilling and by the decision to report resources to a depth of only 150m. Some of the blocks on the edge of the current resource model are well mineralized, leaving the model open in the strike direction and down dip.

The garimpeiros followed high-grade reefs very closely, with their hand-dug trenches stepping over wherever faults disrupt the continuity of the reefs they were mining. The hand-dug garimpos show that the continuity of mineralization is very strong at surface, and to depths of several tens of metres where the garimpeiros dug tunnels to follow gold reefs at the base of their trenches. Between offsetting faults, many of the individual garimpos are several hundred metres in length.

The longest of the garimpos extends unbroken for more than 500m in length. With the surficial weathered layer being very thin (1 to 2 metres), almost all the garimpos, including all the longest ones, are continuous in fresh unweathered rock, so it is assumed that the 100-500m continuity of high-grade zones seen in the garimpos is typical of the continuity of mineralization in the near-surface region covered by the open-pit resource block models.

7.6 Mineralization Thicknesses and Orientation

Esperança South

The mineralization in Esperança South is hosted in a series of stacked metaconglomerate beds striking north-south or northeast-southwest and dipping west, or northwest, at 30° to 35°, with thicknesses of individual mineralized reefs ranging from 2m to 20m. The mineralized reefs in Esperança South are thinner than in Esperança Center but have higher gold grades. This is consistent with the interpretation that the proximal (land) side of the Gilbert fan-delta system lay in what is now Esperança Center and the distal (sea) side lay in what is now Esperança South. Continuous winnowing of the Esperança South sediments in a near-shore sub-marine environment would have caused free gold grains to accumulate in narrow intervals, creating well-mineralized bands that are thinner but also higher in grade, separated by thick intervals with little gold. At the head of the fan, in Esperança Center, where there would have been little reworking and winnowing of the sediments, mineralization is more pervasive but also lower in grade.

Esperança Center

The mineralization is hosted in a series of beds, striking north-south and dipping 20° to 30° west. Thicknesses of individual mineralized reefs range from 1m to 20m. Although the highest grades in Esperança South are higher than in Esperança Center, it is Esperança Center that has the higher average grade because it has far fewer very low-grade intervals. With more of the grade distribution lying close to an average of 0.2g/t, the thickness of mineralized horizons in Esperança Center increases as the cutoff used to define a significant interval is lowered. At cutoffs near 0.2g/t, Esperança Center has many thick intervals, some exceeding 50m.

Esperança East

Esperança East is more structurally complex than Esperança Center and Esperança South, with bedding directions often changing quickly between the available outcrops. Generally, the mineralization dips to the west, consistent with the view that the Esperança East block is the bridge between Esperança Center and Esperança South.

Parts of Esperança East more closely resemble Esperança Center, with long runs of mineralization near 0.2g/t; other parts more closely resemble Esperança South, with grades occasionally exceeding 10g/t over short intervals.

True Thickness

Almost all diamond holes were drilled to intercept the mineralized beds at right angles, or as close as practically possible, in Esperança South, Center and East. As a result, the core axis angle of bedding is often very high (70−90°), making the apparent thickness of most intervals from diamond drillholes very close to true thicknesses. In RC holes, which were drilled vertically, the apparent thickness of an interval observed in the hole is about 15% longer than the true thickness, due to a bedding dip that averages 25° to 35°.

8. DEPOSIT TYPES

Castelo de Sonhos displays all the characteristics of the paleo-placer deposit type, when compared with the most important mined deposits of this class elsewhere in the world (Table 8.1). This is particularly true when compared with Tarkwa and Jacobina, deposits that are of similar Paleoproterozoic age to CDS. The presence of hematite in the conglomerate matrix is another important similarity with these paleo-placer deposits. The variation in the composition of the conglomerates, from pebbles of the same type (oligomictic) to pebbles of several types (polymictic) is very similar to Tarkwa, as is the degree of deformation. The style of cross bedding in the surrounding arenites is common to all four deposits (Table 8.1).

Although the deposits in Table 8.1 are all generally regarded as paleo-placers, they all also show clear evidence for gold remobilization, which causes them to often be referred to as "modified paleo-placers" (Frimmel, 2014; 2005). It is most likely that all gold originated in a paleo-placer setting since there is no gold associated with the rare quartz veins which cut the deposit. This style of mineralization would be expected were there a component of superimposed hydrothermal gold input as is found at the Damang deposit developed in the Tarkwa siliciclastic sequence in Ghana (White et al., 2010).

	Witwatersrand	Tarkwa	Jacobina	Castelo de Sonhos
Age	2.6 to 2.8Ga	2.1Ga	2Ga	2 to 2.1Ga
Conglomerate hosted	Yes	Yes	Yes	Yes
Silicification	Yes	Yes	Yes	Yes
Fuchsite in quartzites	Yes	Yes	Yes	Yes
Carbon	Yes	No	Yes	No
Hematite	No	Yes	Yes	Yes
Magnetite	No	Yes	No	Yes
Pyrite	Yes	No	Yes	No
Uranium	Yes	No	Yes	Anomalous in footwall
Cross-bedded quartzites	Yes	Yes	Yes	Yes
Mineralization thickness	0.1 to 3m	Up to 8m	1 to 10m	1 to 20m

Table 8.1 Geological characteristics of Castelo de Sonhos and other modified paleo-placers.

9. EXPLORATION

9.1 Exploration Program

There have been two major periods of exploration at Castelo de Sonhos: from 1995 to 1996, when Barrick held the mineral claims, and from 2011 to present, under TriStar. During both periods, exploration consisted of drilling (summarized in Section 10 – Drilling), airborne geophysics, soil sampling, surface mapping and outcrop sampling, as summarized in Table 9.1.

<table>
<tr><th>Year</th><th>Company</th><th>Task carried out by:</th><th>Work completed</th></tr>
<tr><td rowspan="7">1995 to 1996</td><td rowspan="7">Barrick</td><td rowspan="3">Barrick Staff</td><td>Soil/rock sampling</td></tr>
<tr><td>Stream sediment sampling</td></tr>
<tr><td>Trench sampling</td></tr>
<tr><td>SETA</td><td>Core drilling</td></tr>
<tr><td>Barrick Staff</td><td>Tracks opened for geochemical soil sampling</td></tr>
<tr><td>Satplan Ltda</td><td>Topography</td></tr>
<tr><td>Geomag/Aerodat Inc</td><td>Airborne geophysics (mag/gamma) 200m spacing</td></tr>
<tr><td rowspan="12">2011 to present</td><td rowspan="12">TriStar</td><td rowspan="3">TriStar Staff</td><td>Surface mapping</td></tr>
<tr><td>Geochemical sampling</td></tr>
<tr><td>Soil/rock sampling program</td></tr>
<tr><td>Fugro - Lasa Prospecções S.A</td><td>Airborne geophysics (mag/gamma) 200m spacing</td></tr>
<tr><td>Layne do Brasil</td><td>Core drilling</td></tr>
<tr><td>TriStar Staff</td><td>Exploration target range</td></tr>
<tr><td>Geosedna/GeoLogica/Geosol/ Servitec Foraco</td><td>RC drilling</td></tr>
<tr><td>DGI Geoscience/AFC Geofísica</td><td>OTV/Downhole petrophysics</td></tr>
<tr><td>Rael Lipson/Paul Karpeta</td><td>Detailed sedimentological mapping</td></tr>
<tr><td>Satplan Ltda</td><td>Topography</td></tr>
<tr><td>GeoSolid</td><td>LIDAR survey and orthophotos</td></tr>
<tr><td>GoldSpot Discoveries</td><td>Multi-element chemistry clustering using A.I and Machine Learning</td></tr>
</table>

Table 9.1 Summary of exploration work completed on the Castelo de Sonhos property.

Barrick (1995 to 1996)

The exploration campaign undertaken by Barrick proved helpful to TriStar for planning and executing future exploration programs. The available data from Barrick's geochemical assays, geophysical maps and geological mapping compared well with TriStar's versions of similar data and were deemed reliable and trustworthy. However, many of the Barrick drillhole collars were excavated over time by garimpeiros who used the strategic locations of the drillholes as indicators for mineralization. Two of these collars can still be located in the field today.

In addition to the drilling, airborne geophysics, soil sampling, surface mapping and outcrop sampling, the Barrick campaigns also included collection and analysis of almost 700 stream sediment samples.

TriStar (2011 to Present)

In 2011, TriStar constructed the field camp, built a new airstrip and developed new access roads. Since 2011, TriStar has completed an airborne geophysical survey, soil sampling, geological mapping and rock chip sampling programs. In addition, various complementary studies on structure, lineament analysis, satellite imagery and petrology were undertaken.

With the decision to start using reverse-circulation (RC) drilling in 2017, TriStar also undertook petrophysical logging and optical televiewer (OTV) imaging of drill holes so that the OTV images could support the logging of geological and structural information that is often difficult in RC holes.

Recently, TriStar has analyzed multi-element chemistry clusters that can be integrated with many other sources of information to identify mappable stratigraphic units. In 2020, TriStar commissioned a LIDAR survey of the plateau that included a complete set of high-resolution aerial photographs.

9.2 Geochemical Soil Sampling

The soil sampling programs covered the majority of the claims deemed to have good exploration potential and were completed on a systematic 100m x 50m grid ultimately covering the whole conglomerate outcrop. In areas where the terrain was adjudged to be less likely to contain mineralization, the spacing between samples was increased.

In 2020, after discussions with GoldSpot Discoveries and Rael Lipson, soil sampling locations were suggested in new areas deemed to have potential for mineralization. The sites centered around granite outcrops where remobilised gold was targeted.

Over the entire lifespan of the project, a total of 11,984 soil samples have been sent to various labs for gold analysis.

9.3 Mapping

Early mapping of the area was completed by TriStar geologists and revealed a band of metaconglomerates outcropping on the Project concessions for 16km in a horseshoe shape, open to the west. More recent mapping has revealed that the “horseshoe” closes on the west and that the band of metamorphosed conglomerates actually forms a roughly circular structure that rims the plateau (Figure 9.1). The shape of the conglomerate band is due to folding and faulting of the original flat-lying fan of sediments.

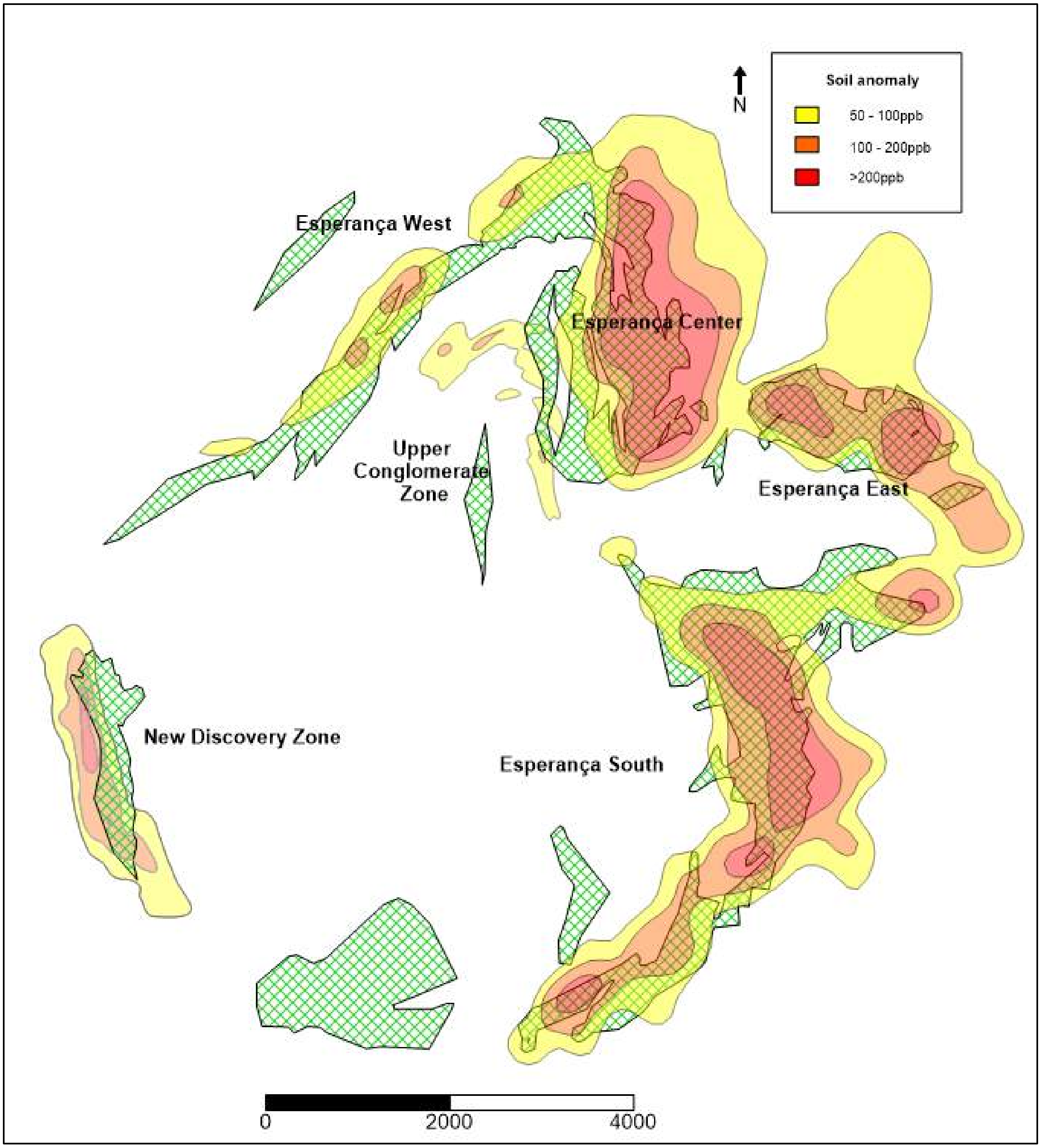


Figure 9.1 Soil sample anomalies (isolines) and mapped metaconglomerate bands (green hatch) at Castelo de Sonhos.

Surface reconnaissance has also confirmed the existence of a thinner conglomerate band that sits in the upper arenite, several hundred meters above the main band.

Since 2016, Rael Lipson and Paul Karpeta were contracted by TriStar to assist in developing an understanding of the evolution of the Castelo de Sonhos deposit and the factors that control and influence gold mineralization on the plateau.

Both of these geologists have extensive experience on paleo-placer deposits, including the strongly analogous Tarkwa deposit in Ghana. They identified detailed mapping of sedimentary structures as one of the cornerstones of a coherent and consistent geological model for Castelo de Sonhos, and each spent several weeks in the field, acquiring data across the plateau on paleocurrent directions (from trough cross-bedding and pebble imbrications), pebble elongations, foliation and bedding orientations and spatial variation in statistics of pebble sizes. Their work has also led to improvements in core logging procedures that capture information on characteristics of pebble geometry and sedimentary features that have proven useful for resource modeling at other paleo-placer deposits.

9.4 Geophysical Surveys

TriStar contracted Fugro-Lasa S.A. (of Rio de Janeiro) to complete an airborne magnetic and radiometric geophysical survey to cover all areas of the Castelo de Sonhos Gold Project site. The survey covered over 7,000km of flight lines at an altitude of 100m.

The data obtained allowed for the generation of nine different maps: residual magnetic field, analytical signal and residual magnetic field, first vertical derivative of the residual magnetic field concentrations of radiometric channels potassium, uranium and thorium, total count, ternary radiometric channels and a digital terrain model.

9.5 Petrophysical Downhole Surveying and Optical Televiewer (OTV)

In 2017, TriStar completed a borehole petrophysics and OTV program on a selection of the diamond core drillholes (Figure 9.2 and Figure 9.3) and RC holes. A second campaign of OTV logging was conducted in 2019-2020.

During the 2017 petrophysical and OTV logging campaign, AFC Geofisica, a Brazilian company based in Porto Alegre, were contracted to measure natural gamma, resistivity, temperature, fluid conductivity and sonic velocity. DGI Geoscience, a Toronto-based company, imaged the drillholes using an optical televiewer. They also measured the magnetic susceptibility and downhole orientations of the drillholes.

In 2019-2020, AFC and DGI worked together, focusing on acquiring OTV images in the Esperança South area.

The holes were selected based on their availability and strategic locations along strike and intersections of zones of good gold mineralization. Several holes were not accessible due to blockages.

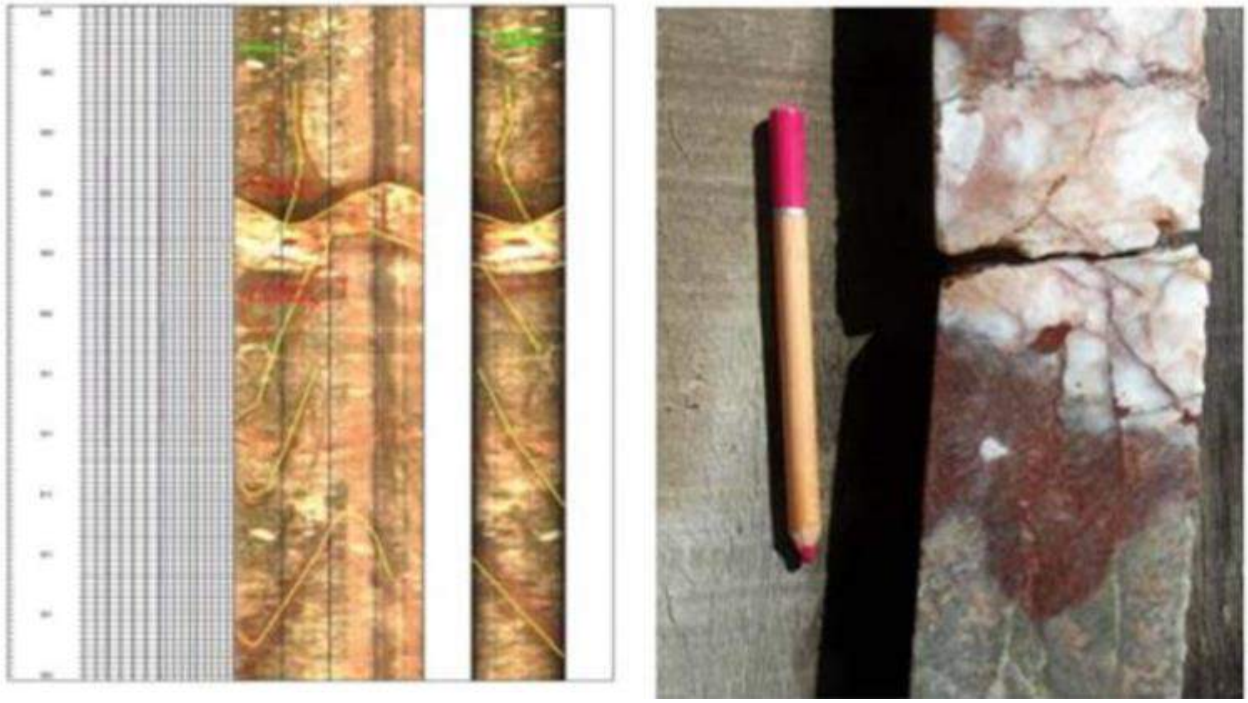


Figure 9.2 OTV image of a diamond hole compared with actual core from same interval.

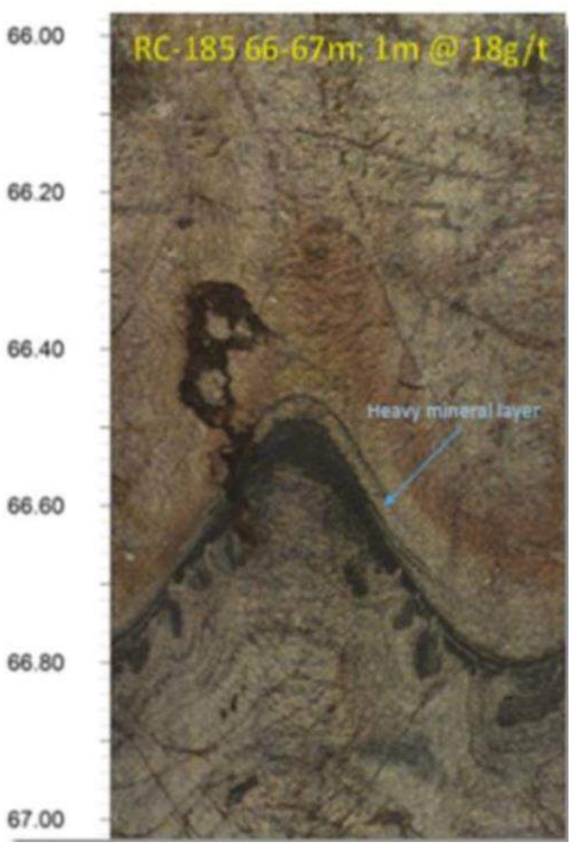


Figure 9.3 Example of OTV image in an RC drillhole section.

9.6 Multi-Element Chemistry

In 2012, TriStar sent three core holes for ICP analysis. The results were sent to GoldSpot Discoveries to attempt to reveal any chemically similar horizons that appeared to be correlatable. GoldSpot were able to show that cluster analysis worked well for those three holes and because of this, TriStar sent 13 more holes, all in close proximity to each other, for additional ICP analysis.

Figure 9.4 shows that the results were encouraging. It reveals that the clusters identified by machine learning algorithms form thick bands of similar chemistry within a hole and are correlatable from hole to hole.

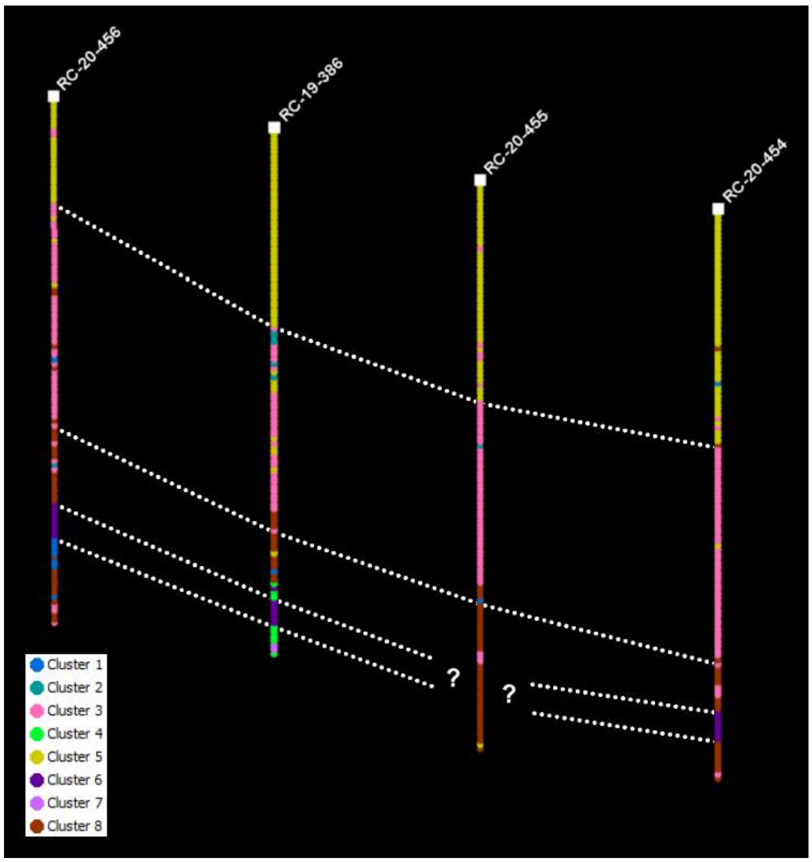


Figure 9.4 Example of clusters developed by machine learning from 4A-ICP multi-element chemistry, and correlatable from hole to hole, with interpretation of marker horizons.

Following the successful demonstration of the consistency and correlatability of machine-learning clusters, TriStar has the lab do 4A-ICP analysis on every other sample as part of its regular protocol.

Much of the multi-element chemistry fingerprint of a sedimentary sequence is due to the details of the bedrock being eroded by creeks, streams and rivers at higher elevations in the hinterland. Cluster analysis aims to identify these geological fingerprints that were deposited at the same time, along with changes in erosional patterns and group them in the vertical profile.

GoldSpot were able to integrate the geochemical clusters with geophysics, topography and air photos from the LIDAR survey as well as TriStar's geological mapping of the plateau to create a 2D map of the major litho-geochemical units shown in Figure 9.5.

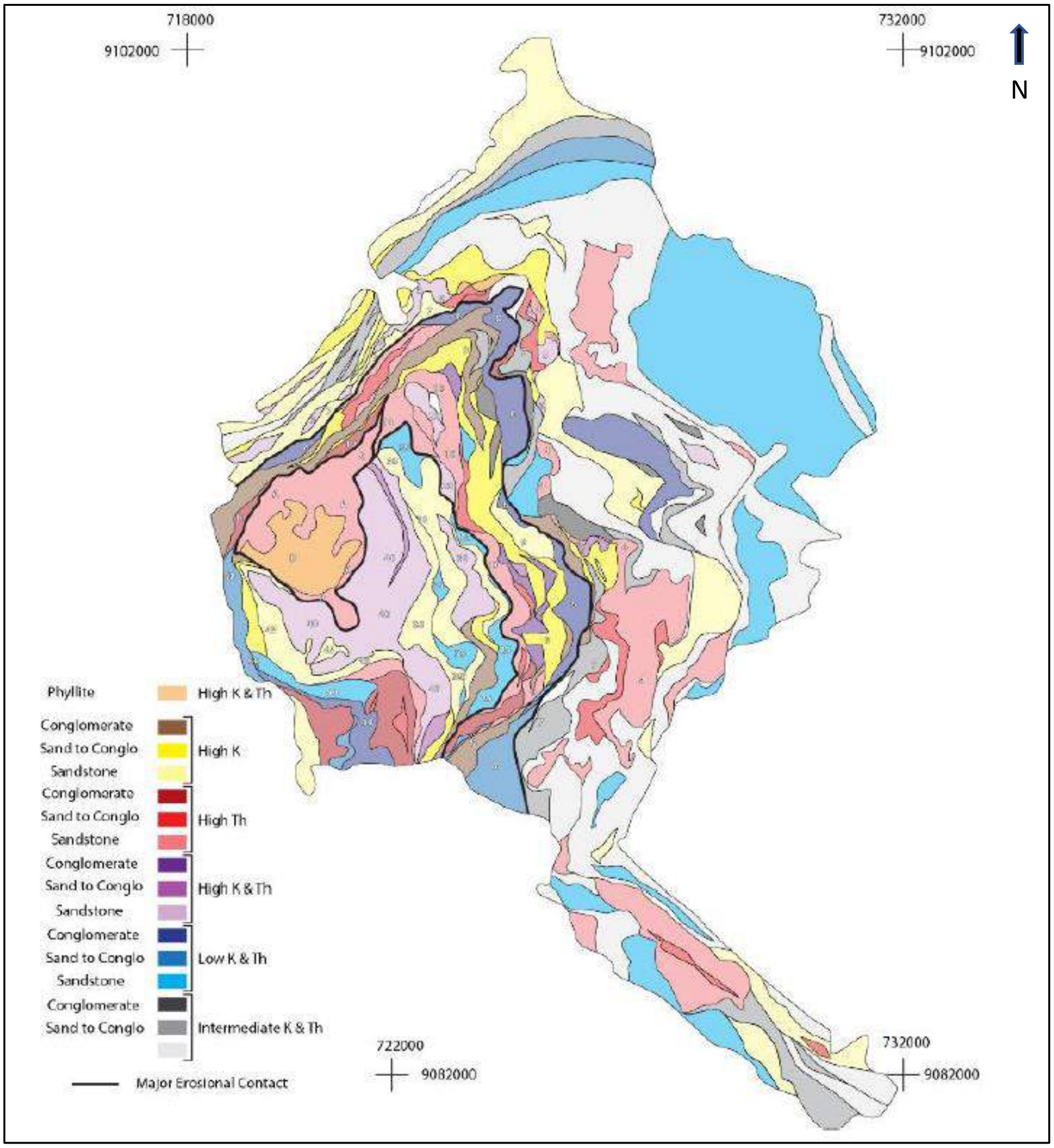


Figure 9.5 Preliminary interpretation of surficial geology using multielement geochemical clusters and information from 2D surface data sets such as airborne geophysics.

Using the integrated 2D map, GoldSpot undertook 3D modeling that honours the information at depth from cluster analysis in drill holes, that honours surface information and that incorporates surface reconnaissance measurements of bedding strikes and dips to create a coherent and consistent three-dimensional interpretation of the major litho-geochemical units and the erosional surfaces across the entire Castelo de Sonhos plateau.

Figure 9.6 and Figure 9.7 show examples of the interpreted litho-geochemical units and erosional surfaces on two cross-sections. 15 units in total were interpreted and rendered as wireframed solids. Some of these are sedimentary units that run sub-parallel to the bowl-shaped stratigraphy of the plateau's meta-sediments, identified by the predominating elements that allow the clusters to be differentiated from each other. Others do not run parallel to the general bedding direction; instead, they are non-sedimentary rocks that cut across the stratigraphy.

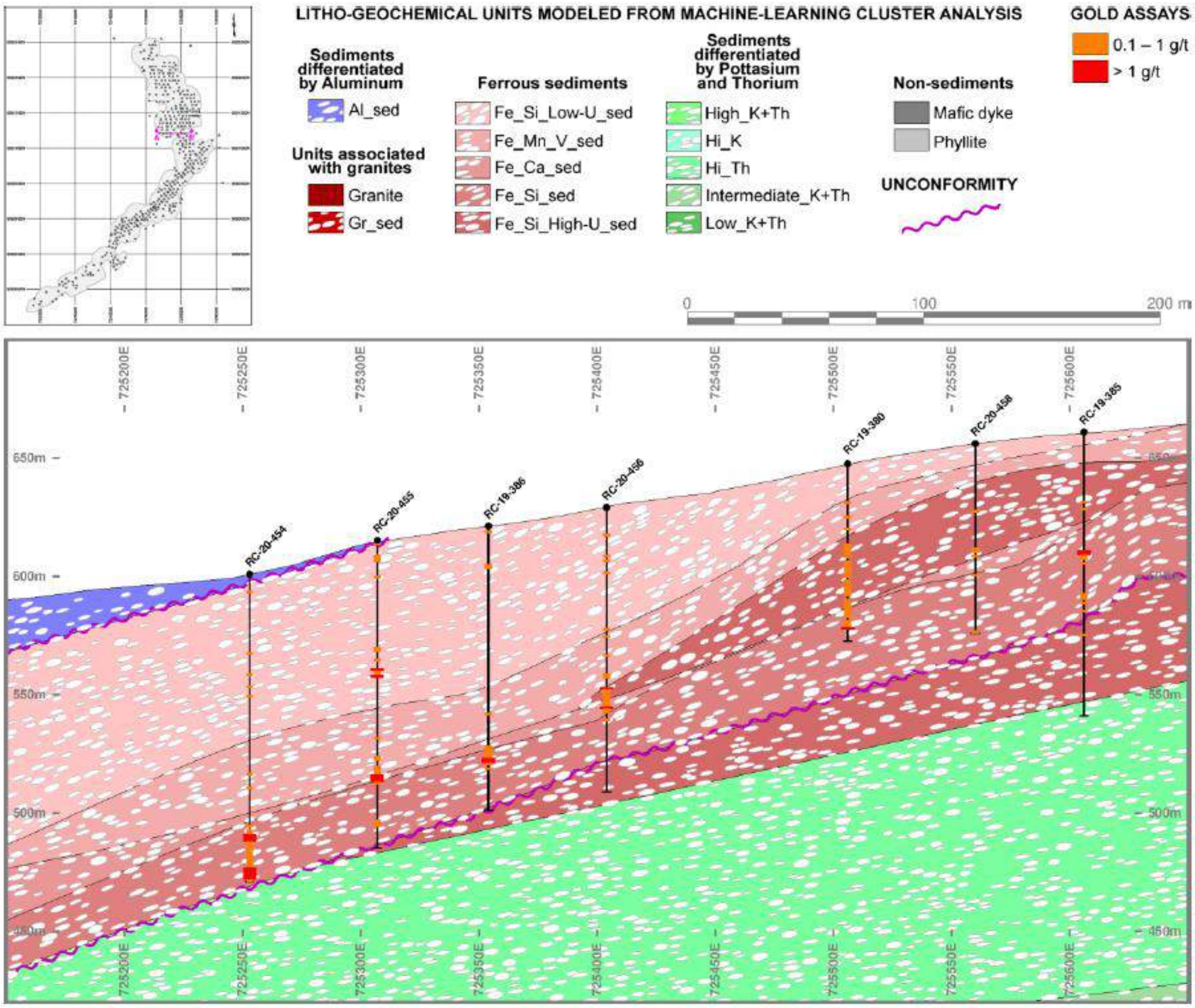


Figure 9.6 Model of litho-geochemical units on cross-section A-A' on the north arm of Esperança South.

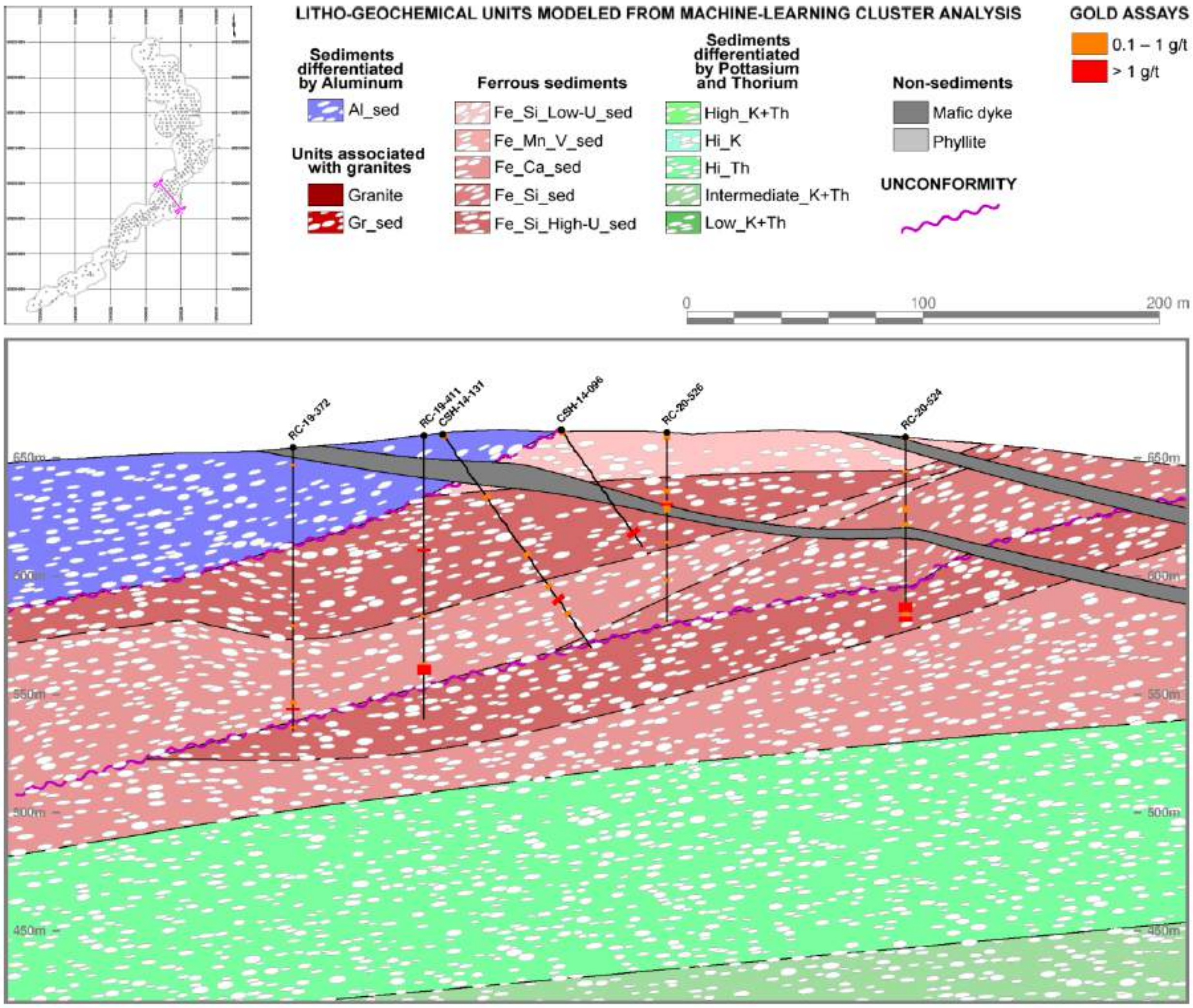


Figure 9.7 Model of litho-geochemical units on cross-section B-B’ on the southwest arm of Esperança South, where the mafic dykes cross.

The three that cut across stratigraphy are: a granitic cluster that corresponds to dykes from the large granitic intrusion that lies beneath the plateau; a cluster that correspond to two east-west mafic dykes with shallow dips (~20°) to the south; and a phyllite that only has influence in the Esperança Center modeling area.

As indicated schematically by the pebble texture used in Figure 9.6 and Figure 9.7, the bedding is interpreted to run parallel to the top and bottom of each of the sedimentary units, except where the top is an erosional surface or is the current topography. Erosional surfaces cut across the stratigraphy of the underlying layer, and form the base that the stratigraphy of the overlying layer will initially run parallel to.

9.7 LIDAR Topography and Aerial Imagery

In 2020, TriStar contracted Geosolid Geoprocessamento e Mapeamento to survey a large area covering the entire project region including the proposed location of tailings and the road to the village. Detailed elevation surfaces were provided in 1,240 500 x 500m tiles, each tile containing about half a million XYZ points. Relative adjustments were performed using surveyed ground control points located around the plateau. Geosolid also provided high resolution orthophotos. The LIDAR surfaces and orthophotos were used to confirm and increase confidence in the surficial geological interpretations.

The area covered by the LIDAR topography is shown in Figure 9.8.

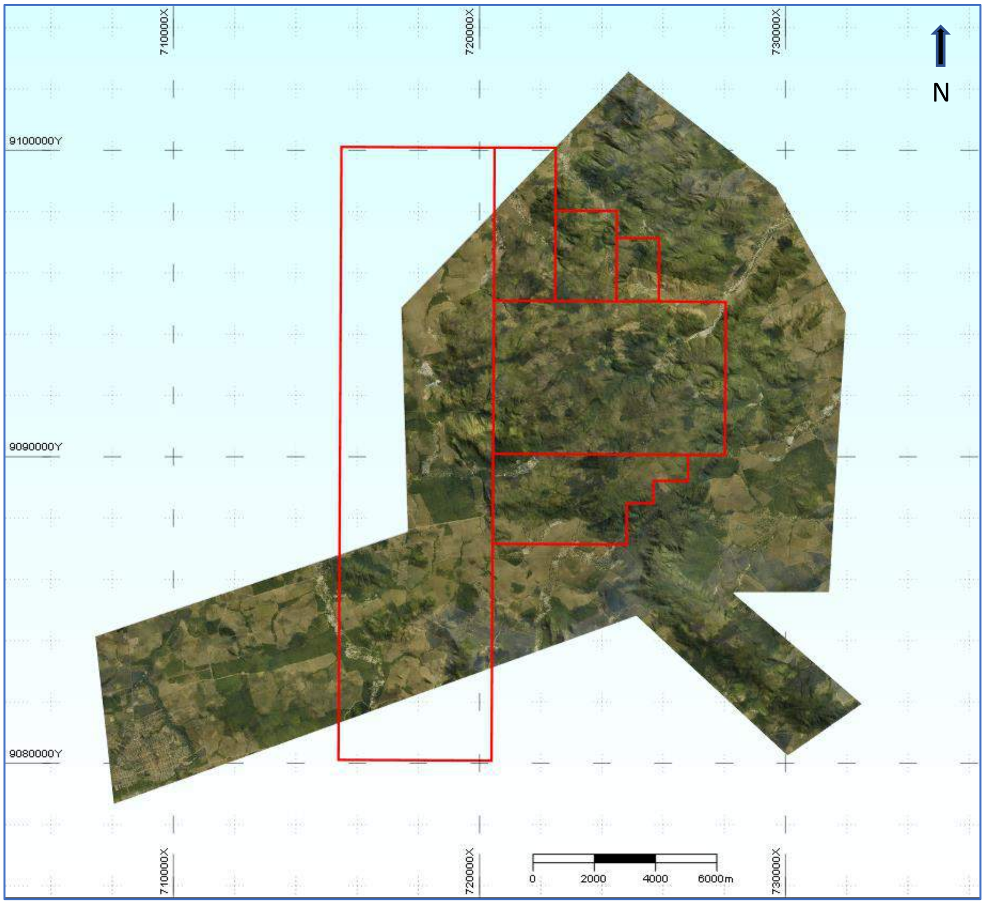


Figure 9.8 Areal extent of LIDAR and orthophoto provided by Geosolid. Red outline shows current concession boundaries.

10. DRILLING

Seven drilling campaigns have been carried out at Castelo de Sonhos Project by TriStar (Figure 10.1). The campaigns in 2011, 2012, 2014 and 2016 were all diamond drilling; the 2017 campaign consisted entirely of RC drilling, and the 2018 to 2020 campaigns consisted of a combination of RC and diamond drilling. Since TriStar took control of the property, 205 diamond holes (25,291m) and 387 RC (41,024m) holes have been drilled.

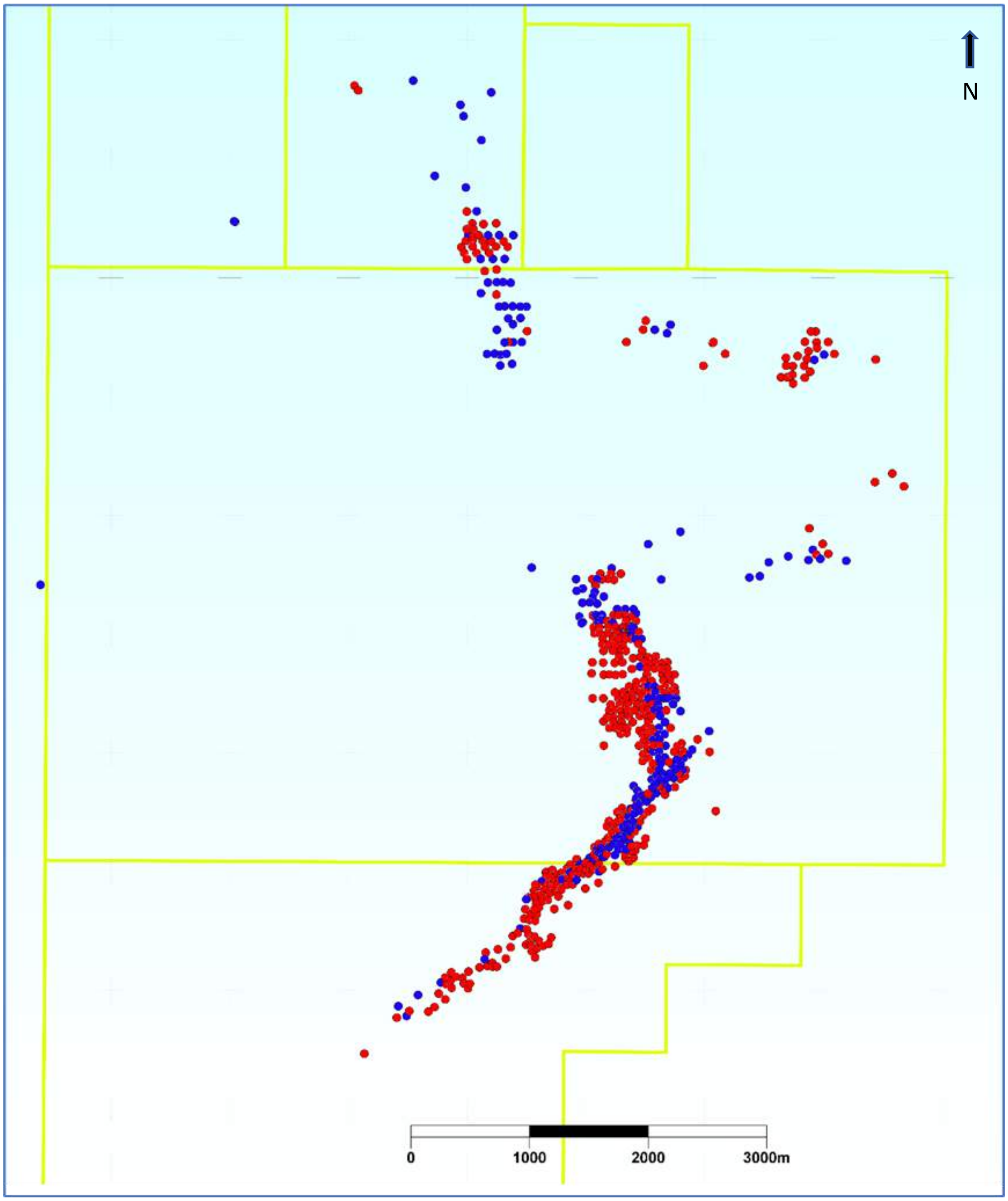


Figure 10.1 Diamond (blue) and RC (red) drillholes.

10.1 Diamond Drilling

Prior to TriStar, Barrick diamond drilled 2,027m of core in 23 drillholes. Checks of the collar locations of Barrick holes whose survey monuments can still be located confirm that the location uncertainty is small, in the order of 10m in the east-west direction. Re-assays of quarter-core from the half-core left from the Barrick exploration program confirm the reliability of the Barrick data.

TriStar drilled 144 diamond holes over three different drilling campaigns from 2011 to 2014. This work allowed the submission of the necessary reports to the ANM for the important areas on the plateau and the preparation of an initial mineral resource estimate.

Under new management in 2016, TriStar successfully drilled 12 diamond holes in the northern end of Esperança Center and southern extent of Esperança South to demonstrate the validity of the exploration target conceptual model, determining additional structural information and expanding the mineralization along strike.

In 2018, TriStar drilled an additional eight diamond drill holes at the north end of Esperança South, where rugged and steep topography made a man-portable diamond rig the safest and most efficient way to test the mineralized conglomerate band.

In 2019/2020, TriStar drilled 18 more diamond holes in Esperança South. Two of these holes tested the possibility that gold might have been concentrated in a remobilized front ahead of the basal intrusion, three holes were twins of shallow RC holes to test short scale variability close to surface, bias in gold grade and the remainder were drilled for exploration purposes.

Most diamond drilling was carried out using HQ diameter (63mm) core. For depths beyond 80– 100m, NQ diameter (47mm) core was used.

10.2 Reverse Circulation Drilling

In 2017, TriStar undertook a drilling campaign consisting entirely of RC drilling using three drill rigs over a six-month period from March to September. Two of these rigs were provided by Geosedna Perfurações Especiais S/A (Geosedna) and one was provided by GeoLogica Sondagens Ltda (GeoLogica). The Geosedna holes were 127mm in diameter and the GeoLogica holes were 139mm in diameter.

During this campaign, TriStar drilled 133 RC holes to infill between the diamond holes in a dense enough pattern that would allow an updated resource to be estimated in accordance with NI43-101 and CIM standards. RC drilling has the advantage of being faster and cheaper than diamond drilling but has the disadvantage of collecting only rock chips, not the integral cylindrical cores of rock collected from diamond drill holes. To mitigate this, TriStar employed DGI Geoscience, a Toronto-based company, to take continuous high-resolution OTV photographs of the inside of the drillholes and display them using WellCAD software. This 'virtual drill core' could then be examined for structures and other important sedimentological information in great detail. Three twin RC holes were drilled at the same collar location and orientation as TriStar's diamond drill holes DH-40, DH-44 and DH-104 to compare and verify assay results. All other RC holes were drilled vertically.

The 2017 RC drilling was planned on a 100 x 100m "rhomboidal" grid pattern on the south-western limb of Esperança South, and the northern extent of Esperança Center, and on a 50 x 50m grid in areas previously drilled to satisfy ANM requirements for final exploration reports.

In 2018, 34 RC holes were drilled. These filled in gaps in Esperança Center and in Esperança South; they also provided the first significant testing of Esperança East.

The purpose of the 2019/2020 RC drill campaign was to infill between existing holes to increase confidence from inferred to indicated classification. 220 holes were included in this resource update with the campaign continuing into 2021. The initial phase of drilling was performed by Geosedna before switching to Servitec Foraco mid-campaign.

10.3 Summary of Drilling

A summary of the drilling is provided in Table 10.1.

Hole Type	Title Holder	Year	No. of holes	Total (m)
Diamond	Barrick	1996	23	2,027
Diamond	TriStar	2011	22	4,003
Diamond	TriStar	2012	71	9,000
Diamond	TriStar	2014	51	4,110
Diamond	TriStar	2016	12	2,828
RC	TriStar	2017	133	15,019
Diamond	TriStar	2018	8	962
RC	TriStar	2018	34	3,973
RC	TriStar	2019	84	9,324
Diamond	TriStar	2020	18	2,361
RC	TriStar	2020	136	12,708
Total			**592**	**66,315**

Table 10.1 Summary of the drilling campaign completed in the Project.

10.4 Sampling

RC Sampling

Sampling of RC holes is done by initial split at the drill rig using a Metzke riffle splitter at a proportion of 75% and 25%. The 25%, approximately 7.5kg sample in weight for the 1m sample intervals used in RC holes, was bagged for assay. The remaining 75% was also bagged and stored on site for reference, organized by drillhole number and depth.

Representative rock chips were collected during the drilling and logged on site by a geologist to establish the stratigraphic context of the sampling and to provide a geological description of each sample. These have been stored along with the archived diamond drill core in the core storage area beside the camp office.

TriStar undertook a field trial of OTV technology, using the services of Toronto-based firm DGI Geoscience to take high-definition photos of the inside of the RC drillholes. In addition to using the chips to log the RC holes, on-site geologists also used these OTV images to help refine the logging of RC holes. Several diamond holes were also imaged by OTV to calibrate the logging techniques.

Core Sampling

HQ core samples were halved using a core saw with one half sent to a laboratory to be assayed; the other half was retained in the core box for quality control and verification purposes. Where resampling needed to be done, the half core that remained in the box was quartered and sent for re-assay, leaving the other quarter in the core box.

In early holes, from 2011, sample intervals were mostly 1m wide, but in 2012-2014 sample intervals were generally 2m, with shorter intervals being used where important geological changes were recognized.

Since 2016, all sample intervals in diamond drill holes have been 1m except where lithological contacts dictate slightly shorter or longer sample intervals.

Core Logging

All drill core during the 2011–2014 programs was logged using the lithological codes developed by TriStar at the beginning of its first drilling program in 2011. The geologists were asked to note the major lithology type and alteration intensity. A rock quality designation (RQD) was recorded in the earlier holes. Recoveries were generally excellent with complete core recovery in most runs.

From 2016 onwards, on advice from Rael Lipson, a more thorough logging system was put in place that required geologists to note clast sizes, basal contact, gradation, hydrothermal alteration, fabric, gold occurrence, geological structure, roundness, sorting, grain size and lithology. Using this new logging template, several older holes were also relogged.

Assay Accuracy and Reliability

There are no known factors that could materially impact the accuracy of the assay results. With most of the gold being free, and some of this being coarse, assay results are affected by the "nugget effect" issue, and often show considerably variability in duplicates and replicates. This variability is considerably lower in the RC drill holes where large volume (1kg) Leachwell cyanide-leach assays were done. The nature of the nugget effect issue makes the drillhole assay database conservative in the sense that some of the very low-grade intervals might have returned higher assays had they been re-assayed, but all the high-grade intervals were re-assayed.

The RC holes were the focus of the petrophysical logging program, which included a caliper log. Almost all of the RC holes show little variation in diameter, a reflection of the high RQD of most of the silicified rock. Two of the RC holes caved in the friable upper arenite and had to be abandoned.

The visual logging protocols for RC drilling included a column for recording whether the samples were wet or dry when they reached the surface. In 41,024 of RC drilling, 1526 samples (4%) were reported as wet. Comparisons of grades from wet sample intervals and dry sample intervals do not show any systematic bias in the wet intervals, nor any smearing of gold grades along the hole. Comparisons of grade profiles in three pairs of twinned core-RC holes shows that the assay data from RC is reliable. Lithology logging suffers in RC holes, where it is harder to distinguish lithologies from chips; but the availability of optical televiewer images mitigates this problem and allows reliable lithology logging in all the RC holes that were accessible to the optical televiewer instrument.

Field duplicates from the RC drilling program confirm that the sample splitters at the head of the three drill rigs were all functioning well, with no bias between the first split that was sent to the lab and subsequent splits that were used as field duplicates.

10.5 Surveying

Collar Surveying

TriStar drill collars were initially surveyed using one of two handheld GPS devices, either a Garmin GPS map 78S or a Garmin eTrex touch unit, immediately following the completion of a drillhole. Later, TriStar re-surveyed the collars with a GPS Pro Mark 500 for more accurate coordinate readings.

Downhole Surveying

Downhole surveying was performed using either the EZ-Shot system from Reflex or using the Maxibor system from Reflex. Many of the shorter holes were not surveyed down the hole; for these, their downhole orientations are calculated from a single survey of the orientation of the hole at the collar.

For the RC holes, the Advanced Logic Technology's OTV tool used by DGI Geoscience includes instrumentation that measures the azimuth and inclination of the hole. Except for three RC holes that were oriented parallel to an adjacent core hole, all the RC holes were drilled vertically; the down-hole surveys acquired to support the optical televiewer images confirm that there is almost no horizontal deviation in the vertical RC holes, less than two metres in all the holes that were surveyed to a depth of 120m.

Holes drilled in 2020 by drill contractor Servitec used a GFT (gravity face tool) from Trust suppliers.

10.6 Interpretation

Esperança South

Esperança South is the area on the property with the highest grades. Almost every drill hole drilled along its 4.5km strike length intercepted gold above the resource reporting cutoff grade. This area is open along strike to the south and there is strong evidence of additional mineralization to the north in terrain that is currently not easily accessible to a large drill rig; this has been verified by a limited program of seven diamond drill holes with a man-portable rig, all of which showed multiple reefs of mineralization. The mineralization in the northern end appears to be offset by a major east-west fault (see Figure 7.4).

In Esperança South, the strike of the mineralized conglomerate band bends, having an approximately northeast-southwest strike on its southwestern limb that swings to approximately north-south strike to the north. Drillholes were drilled in a due east direction (090°) in the northern end while in the south the azimuth of each hole was 140° to intercept, as closely as possible, the mineralized beds at right angles to the strike. Almost all the holes are collared in the outcrop of the conglomerate band, and few penetrate the footwall of this band; estimates of the true thickness of the conglomerate band are based on surface mapping of the conglomerate band outcrop, adjusted to consider the dip of bedding. Through most of Esperança South, the conglomerate band has a true thickness of 250–300m.

Esperança Center

Esperança Center has been drilled along 2.5km of strike length and down to 120m depth. Like the northern end of Esperança South, the conglomerate band strikes in a north-south direction meaning all diamond holes were drilled due east (90°), with an inclination of -60° to intersect the conglomerate at right angles to the 30° west dipping beds. Mineralization is open at depth. The southern extent of Esperança Center appears to be truncated by a major east-west trending fault offsetting mineralization eastward to Esperança East. In the northern end of Esperança Center, mineralization arches around to the west, mimicking the surficial exposure of the folded bowl structure, as evidenced by the soil sample anomalies (see Figure 9.1). Mineralization in Esperança Center is different than in Esperança South; there are fewer no-detects in Esperança Center, but also fewer very high-grade assays, giving Esperança Center lower variability, a lower proportion of assays above the resource reporting cutoff grade, but a slightly higher average grade than in Esperança South.

Esperança East

As confirmed by mapping by Paul Karpeta in 2018, Esperança East is more structurally complex than Esperança Center and Esperança South, with bedding directions often changing quickly between the available outcrops. Generally, the mineralization dips to the west, consistent with the view that the Esperança East block is the bridge between Esperança Center and Esperança South.

Parts of Esperança East more closely resemble Esperança Center, with long runs of mineralization slightly below the resource reporting cutoff grade; other parts more closely resemble Esperança South, with grades occasionally exceeding 10g/t over short intervals.

True Thickness

Almost all diamond holes were drilled to intercept the mineralized beds at right angles, or as close as practically possible, in Esperança South and Center. As a result, many of the measured bedding core angles are generally high angle 70–90° to the long core axis. Therefore, the thickness of most intervals from diamond drillholes are very close to true thicknesses. In RC holes, which were drilled vertically, the apparent thickness of an interval observed in the hole is about 15% longer than the true thickness, due to a bedding dip that averages 25° to 35°.

11. SAMPLE PREPARATION, ANALYSIS AND SECURITY

The TriStar drilling campaigns have consisted of diamond drillholes (2011–2016, 2018 and 2020) and RC holes (2017-2020) and have primarily involved three commercial laboratories: Acme (2011–2012), SGS/Geosol (2012–2017) and ALS (2017-2020).

Laboratory	Year	Prep Lab Location	Analytical Lab Location	Certification
Acme	2011-2012	Itaituba, Brazil	Santiago, Chile	ISO9001:2008
SGS/Geosol	2012-2017	Parauapebas, Brazil	Vespasiano, Brazil	ISO9001:2009
ALS	2017-2020	Goiânia, Brazil	Lima, Peru	ISO9001:2010

Table 11.1 Commercial analytical laboratories utilized by TriStar.

The laboratories and their employees are independent from TriStar. TriStar personnel, consultants and contractors were not involved in laboratory sample preparation and analysis.

Fire assays were used to establish gold grades for all the diamond drillhole (DDH) samples, and some of the samples from the early RC drillholes. Leachwell assays were used for most of the RC samples in 2017, and all of the RC and diamond drill hole samples in 2018. Since 2019, fire assays have been used as the first screening assay for drill hole samples, with all significant intervals above 0.1g/t being re-submitted for Leachwell assays. In the sections that follow, the different sample preparation protocols used for DDH and RC samples are discussed first, followed by the different analytical procedures used by each laboratory. Quality assurance and quality control (QA/QC) programs are then discussed, followed by commentary on sample custody and security.

Also used in the resource estimates were samples from the Barrick drilling campaigns in 1995 and 1996. Archived core from this first drilling campaign on the Castelo dos Sonhos plateau was still available in 2011 when TriStar began its work, along with electronic archives of Barrick data and documents. The verification of the reliability of the Barrick assays is discussed in Section 12 (Data Verification).

When TriStar began its work on Castelo de Sonhos, the project archives contained no reports on analytical methods, sample preparation or QA/QC procedures in use during the Barrick exploration program. Excel spreadsheets do record assays done by three different labs: SGS, Nomos and Bondar-Clegg, with most intervals having assays from two or more labs. The archived spreadsheets also record the insertion of blank material at a rate of 1 in every 20 samples. With no reports that pertain to the reliability of the Barrick data, TriStar undertook a re-assaying program of two entire drill holes, taking ¼ core from the ½ core archives that remained from the Barrick drilling.

11.1 Sample Custody Security

Drill samples collected by TriStar geologists were placed in plastic bags that were tagged and sealed (Figure 11.1). These were grouped into batches for shipment to the preparation lab, using large sacks. Each laboratory batch would consist of a few large sacks, each of which typically contained a few dozen individual sample bags. The sacks were also sealed and labelled to indicate how many large sacks belonged to the same batch. TriStar's external QA/QC samples (field duplicates, blanks and standards) were included in the sacks at site by TriStar geologists.

Figure 11.1 Drillhole samples collected and bagged in the core storage area at site.

Batches awaiting shipment were stored on site, typically for two to three weeks until several batches were transported together, by closed truck, to the preparation lab. The seals on the sacks and bags were broken at the preparation lab, which reported back to TriStar on the samples it received and logged into its laboratory information management system.

Through many years of drilling, there have been no samples lost in transit, or additional samples received that were not part what TriStar recorded as having been shipped. There have also been no cases of the individual sample bags being damaged or leaking, or of sample tags being missing or illegible; sample integrity has remained excellent throughout the drilling programs.

At the preparation lab, pulp material was prepared for analysis and transported by commercial air freight to the analytical laboratory, where the samples were again inventoried and checked against the prep lab's records.

11.2 Laboratory Sample Preparation

Diamond Drillholes

Drill core from diamond drillhole sites was transported, by truck or by all-terrain vehicle, to the core storage and logging area, where it was photographed and sawn. Half of the core was bagged for shipment to the laboratory and the other half was retained at site; some of the half-core has been used for other studies, such as further QA/QC checks or for metallurgical test work and is now reduced to quarter-core at site. For the early TriStar drilling campaigns, the core was sampled in 2m intervals; shorter intervals were sometimes sampled where significant changes in geological characteristics were noted. From 2018 onwards, diamond intervals were typically sampled in 1m lengths.

Reverse Circulation Drillholes

Samples from the TriStar RC holes were collected every metre, with the splitter at the RC rig being set to deliver approximately one quarter of the chips to the buckets that were then bagged for shipment to the laboratory. The remaining chip material was stored on site for use in further studies, and a small collection of chips from each interval were retained for viewing purposes in the core storage area.

Lab Preparation for Fire Assays

The entire sample received by the lab was dried and crushed to 2mm using a jaw crusher, with the exact specification for crushing being slightly different for each of the primary labs that did fire assays:

- 85% less than 2mm was used by Acme, which handled the samples from August 2011 through March 2012 (holes CSH-11-001 to CSH-12-033);
- 95% less than 2mm was used by SGS/Geosol, which handled the samples from August 2012 through May 2017 (holes CSH-12-034 to CSH-16-155, and RC-17-156 to RC-17- 170);
- 90% less than 2mm was used by ALS, which handled samples from May 2017 through the time of this report (holes CSH-18-289 to CSH-20-491, and holes RC-17-171 to RC-20-550).

After homogenization of the crushed material, the preparation lab took a subsample and pulverized it:

- Acme took a 500g subsample of the homogenized crushed material and pulverized it to 85% less than 75 microns (200 mesh);
- SGS/Geosol took a 200–300g subsample of the homogenized crushed material and pulverized it to 95% less than 100 microns (150 mesh);
- ALS took a 1kg subsample of the homogenized crushed material and pulverized it to 95% less than 100 microns (150 mesh).

The pulverized material was then shipped to the analytical laboratory.

Lab Preparation for Leachwell Assays

ALS is the only lab that has done Leachwell assays for the Castelo de Sonhos Gold Project, using their prep lab in Goiania, Brazil, and their analytical laboratory in Lima, Peru. Since May 2017, the Leachwell method has been the primary basis for the gold values used for resource estimation. Wherever Leachwell assays are available, they are used instead of any other type of assay that might also be available for the same interval. Since September 2019, the fire assay method has been used as a preliminary screening assay that establishes which intervals require a Leachwell assay; all samples in significant intervals above 0.1g/t, including additional samples on either side, are submitted for reanalysis by Leachwell.

The ALS preparation for Leachwell assays followed the same steps as described above for the few fire assays done by ALS. The preparation lab dried and crushed the entire received sample, to 90% passing 2mm. After homogenization of the crushed material, a 1kg subsample was taken and pulverized to 95% less than 100 microns (150 mesh). The pulverized material was then shipped to the analytical laboratory in Lima, where the entire 1kg was analysed using the Leachwell procedure.

11.3 Sample Analysis

Fire Assays

The conventional fire assays done by TriStar for the Castelo de Sonhos Gold Project (by Acme, SGS/Geosol and ALS) have all used 50g aliquots with an atomic absorption finish. Occasionally, fire assays have had a gravimetric finish; and metallic screen assays were used at times to confirm the reliability of fire assays.

Leachwell Assays

ALS does Leachwell assays using a four-hour bottle-roll agitation of 1kg of pulp in a cyanide solution that accelerates leaching using the Leachwell assay tabs manufactured by Mineral Process Control, the developer of the Leachwell technology. An atomic absorption finish is used to measure the mass of gold in solution, and to back-calculate the head grade of the original sample.

11.4 Quality Assurance and Quality Control (QA/QC)

All the laboratories used by TriStar are ISO certified and have internal QA/QC programs for monitoring the accuracy and precision of the analytical results they provide to clients. In addition to the lab's internal QA/QC programs, TriStar also runs its own external QA/QC program that includes standards, blanks and duplicates inserted into the sample stream at the Project site, prior to shipment to the preparation lab. TriStar has used conventional standards supplied by a certified manufacturer but in 2018 began using 'spiked' standards known as PRMs, as described below.

Table 11.2 summarizes the number of QA/QC samples that TriStar has included in the sample stream.

Sample type		No. of Samples	Insertion rate
Regular samples		58,517	
Standards	PRMs (from 2019 onwards)	2,294	1 in 25
	CRMs (through 2018)	1,386	1 in 20
Blanks		1,392	1 in 20
Field duplicates		931	1 in 50

Table 11.2 External QA/QC samples included at site by TriStar in the sample stream.

Analysis of Standards

Since the start of TriStar's drilling in 2011, there have been 13 instances (1%) where the assay of a standard was more than 10% above or below its certified reference value. Two of these are likely sample mix-ups, either at the site or in the lab. Of the remaining 11, only one of them was off by more than 20% (a low assay on one standard in the fall of 2016). TriStar switched labs to rectify errors in blanks and standards reporting.

Prepared Reference Material

Since 2018, TriStar embarked in a campaign of creating their own prepared reference material (PRMs) instead of using certified reference material (CRMs) used to monitor accuracy. The standard is created by spiking blank material, RC cuttings of known below detection limit grade, with a carefully measured mass of certified high-grade standard. By accurately weighing each material, an expected grade can be calculated.

Figure 11.2 shows the preliminary round robin results TriStar used to test the PRMs standards using a CRM with a value of 5.65g/t and below detection RC cuttings.

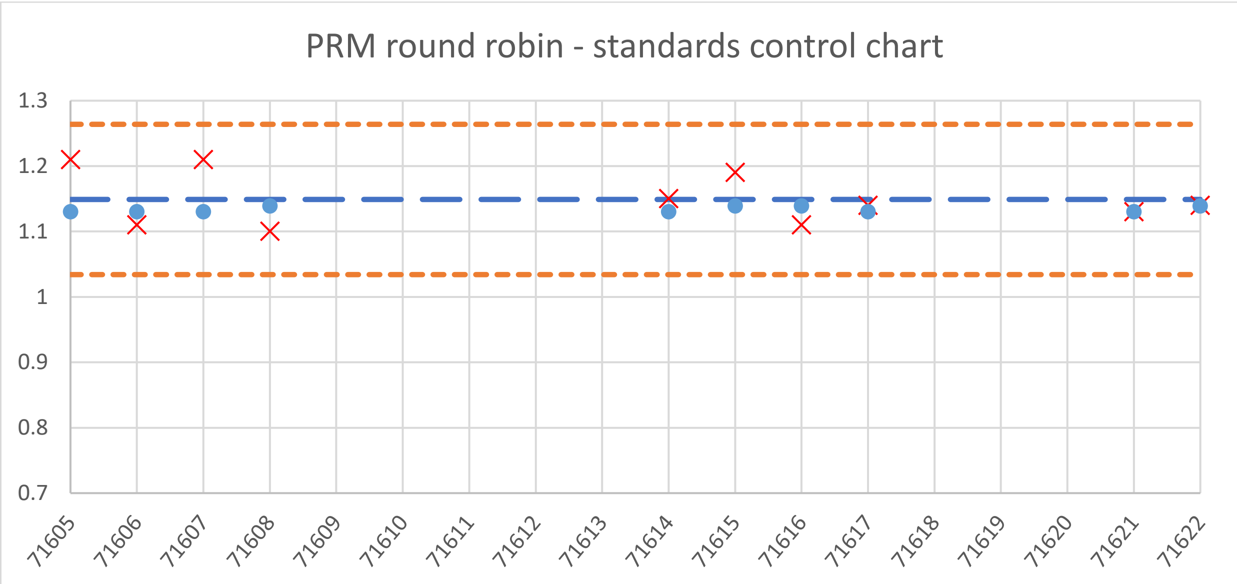


Figure 11.2 Chart showing expected PRM results (blue dots) versus actual results (red crosses).

Duplicate Analysis

Figure 11.3 shows a scatterplot of the assays from the field duplicates. The field duplicates of fire assays compare very well to each other, as do the field duplicates of Leachwell assays. A correlation coefficient of 0.97 is excellent, given that the samples being compared are entirely separate when bagged and tagged at site, and are prepared, processed and analysed as entirely independent samples.

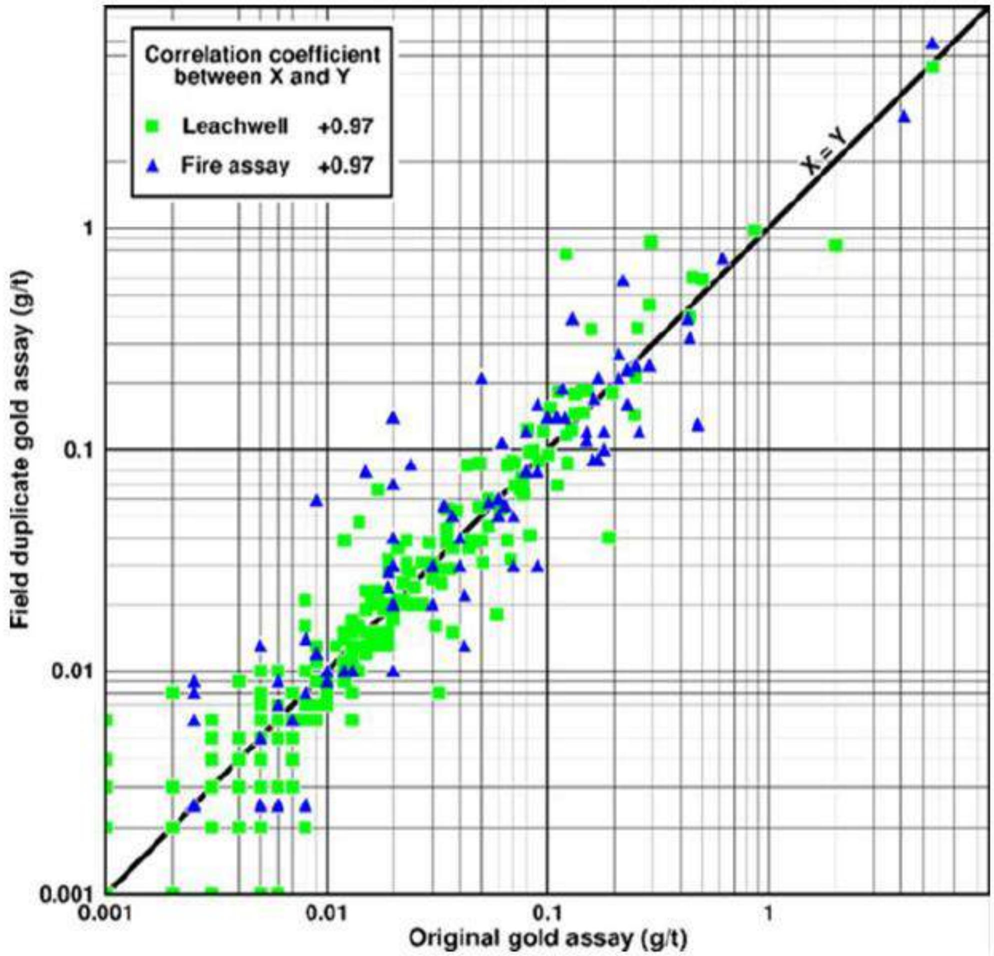


Figure 11.3 Comparison of gold assays from field duplicates; samples analyzed by fire assay are shown in blue, those analyzed by the Leachwell method are shown in green.

Blanks Analysis

Since the start of TriStar's drilling in 2011, only five of the blanks (<0.5%) have returned assays more than 10x the detection limit of 0.005g/t. TriStar switched labs to rectify errors in blanks and standards reporting.

Metallic Screen Assays

In addition to the external QA/QC samples summarized in Table 11.2, TriStar has also done metallic screen assays of 2,297 of the intervals that had fire assays. Although there is coarse free gold in the Castelo de Sonhos samples, metallic screen assays give similar results to the conventional fire assays.

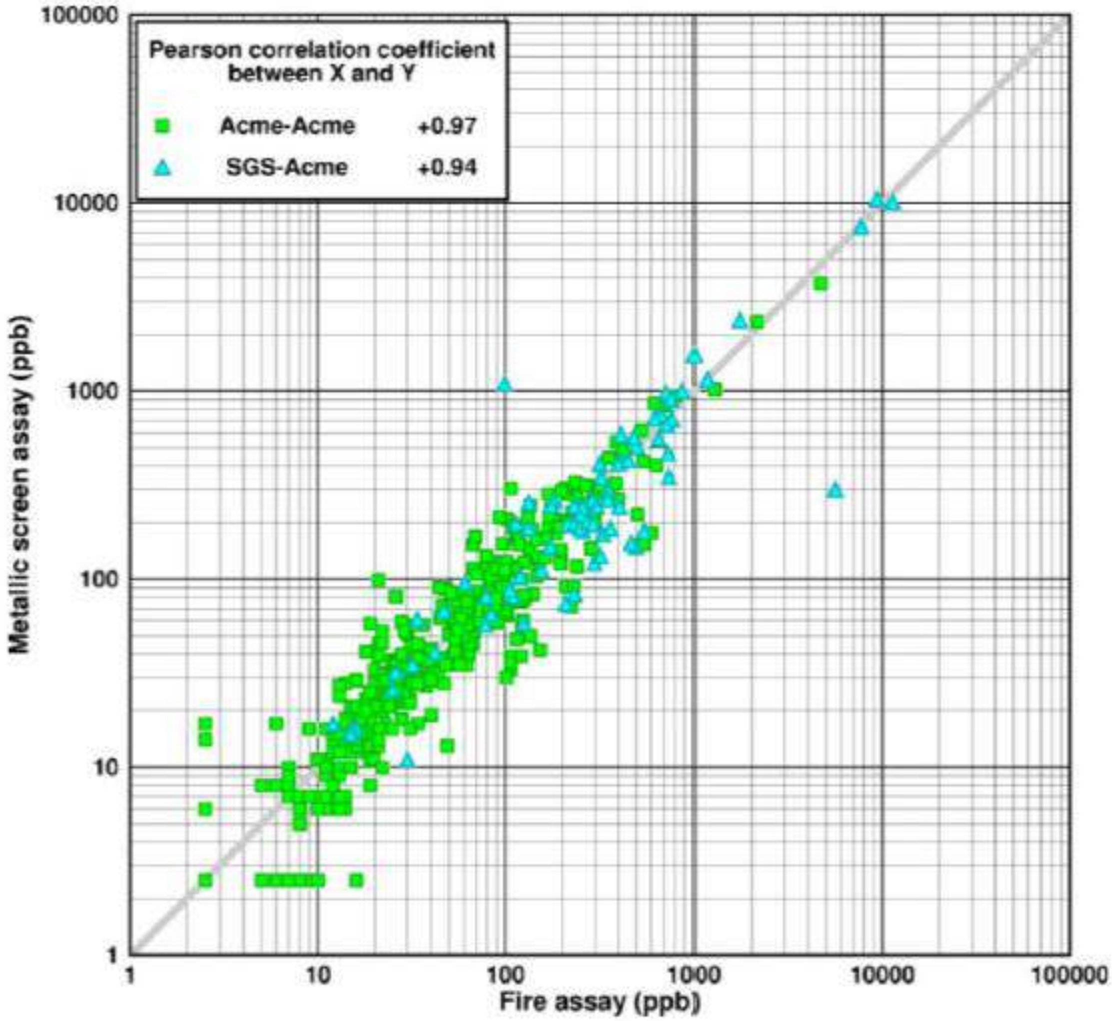


Figure 11.4 Comparison between results of conventional Fire Assays and Metallic Screen Assays. Green squares show samples for which Acme did both assays; blue triangles show samples for which SGS did the Fire Assay and Acme did the Metallic Screen Assay.

Figure 11.4 shows a plot of samples comparing fire assay and metallic screen results. For both groups of data, the correlation is very good: 0.94 for SGS-Acme and 0.97 for Acme-Acme, with only two outliers in almost 500 checks. TriStar decided to continue to use conventional fire assays through its diamond drilling programs.

Leachwell Assays

The Leachwell procedure uses an aggressive cyanide leach to extract gold from pulverized rock. The principal advantage of this analytical method is that it analyses a much larger mass of material than a conventional fire assay. In the case of the Castelo de Sonhos samples, the Leachwell assays were done on 1kg of pulp, 20 times the mass of the 50g aliquots analysed in a fire assay and 6 times the mass analysed by metallic screen assay. Analyzing a larger mass of material helps to reduce assay variability caused by nuggets of free gold in the sample. TriStar tested the Leachwell procedure on some of the first RC holes drilled in 2017 and found that this method does produce more reliable assays. Of the 485 blanks run through the Leachwell procedure, none of them returned grades more than 5x the detection limit. For the CRMs, the variability of the Leachwell assays is lower than it was with fire assays, and the average grade matches the reference value much more closely. For the high-grade CRM, for example, the variance from the Leachwell assays is less than half that of the fire assays on the same material; and the average Leachwell assay matches the certified reference value to the second decimal place, 5.65g/t, while the average of the fire assays runs slightly high at 5.78g/t. The scatterplot of field duplicates (Figure 11.3) also indicates that Leachwell assays have better precision than fire assays: the spread of the sample pairs from fire assays (blue triangles) from the X=Y line is broader than that of the Leachwell assays (green squares).

In the fall of 2020, 6,000 previously sampled fire assays of significant intervals (above 0.1g/t) were sent for Leachwell analysis for comparison. Due to the onset of the global Covid-19 pandemic, laboratories have been forced to slow down production. However, TriStar did receive a number of these results, about 10% so far out of the 6,000. Preliminary analysis of these samples shows several outcomes:

- the Leachwell assays are, on average, very close to the average of all the fire assays for those same intervals
- for samples whose first fire assay was above 0.3g/t, the Leachwell results run about 10% lower, a result that’s to be expected as high-grade samples tend to run lower on repeat
- for samples whose first fire assay was below 0.3g/t, the Leachwell results run about 15% higher, same reasoning as above, low grade samples tend to run higher on repeat
- of the "waste" samples (between 0.1 - 0.3g/t), 10% of them had a mineralised (>0.3g/t) Leachwell grade
- correlation between Leachwell assay and the first fire assay is 0.89

Sample preparation analysis

To better understand the impact of free grains of gold on the repeatability (precision) of fire assays and Leachwell assays, TriStar had IOS Services Géoscientifiques Inc. of Québec, Canada do a complete analysis of the gold grains in chips from ten RC drill hole intervals ranging in grade from 0.5g/t to 3g/t. Each sample weighed approximately 2kg and was taken from the original chips, so that grain sizes would not be affected by crushing or pulverizing. The ARTGold™ (Advanced Gold Recovery) technology developed by IOS separates gold grains on a fluidized bed and then images all of them using a scanning electron microscope (SEM). Figure 11.5 shows SEM photographs of all gold grains in the ten CDS samples.

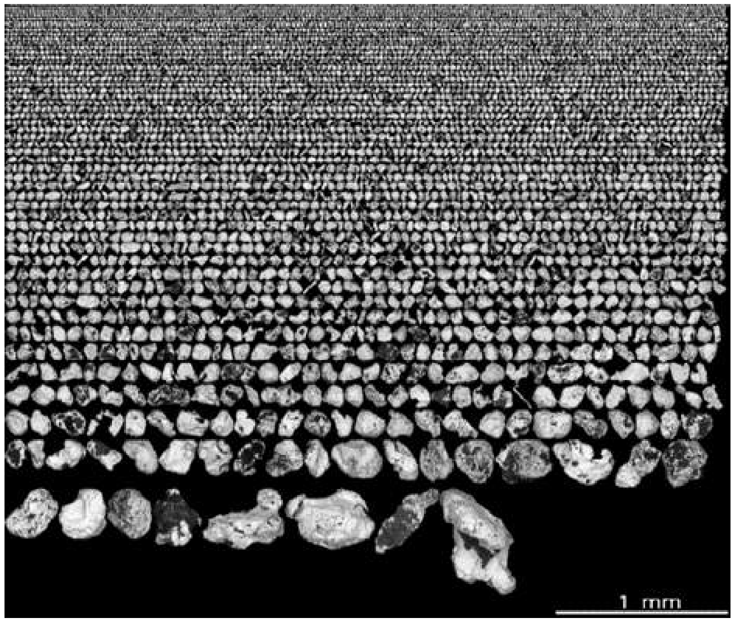


Figure 11.5 Mosaic of all 5,166 gold grains recovered by SEM analysis in the ten CDS samples.

With the ability to isolate and measure the gold grains in a sample, ARTGold^{TM} can build the cumulative distribution curve of grain size for each sample. As seen in Figure 11.6, which shows the cumulative grain size distributions for the ten samples, the median grain size is approximately 100 microns in diameter.

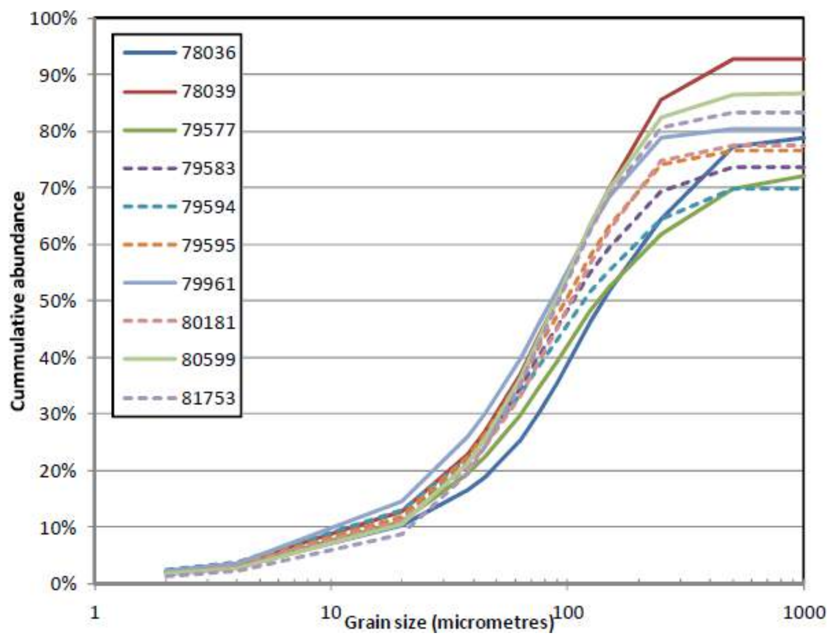


Figure 11.6 Cumulative grain size distributions for the ten samples.

In any well-mineralized sample submitted to the lab, there are several hundred gold grains. The imprecision on laboratory analyses is related, in large part, to the details of which gold grains get into the pulp material that is eventually analyzed: a 50g aliquot in the case of a fire assay, or the 1kg of material analyzed by the Leachwell method. The IOS studies led to the recognition that the inclusion or exclusion of a single gold grain of median size (approximately 100 microns) will alter a 50g fire assay result by ±0.2g/t, but will have only a ±0.01g/t effect on a 1kg Leachwell assay.

With this better understanding of the interaction between grain size and assay imprecision, TriStar has been using fire assays as a screening tool to identify the significant intervals and then using Leachwell assays to get a more precise measurement of the gold grade in the drill hole sample intervals that account for the vast majority of the mineral resource estimate.

In addition to providing insight into analytical QA/QC issues, the IOS studies also shed light on the question of how much of the gold can be regarded as original paleo-placer gold and how much should be remobilized. The ARTGold™ technology allows the individual grains to be analyzed and classified according to their morphology, with rounded or slightly reshaped grains being more indicative of original paleo-placer gold and thin flakes or needles of gold being more indicative of gold that has been remobilized and reprecipitated along the surfaces of micro-cracks or in the linear intersections of two micro-cracks. From the analysis of the morphology of all 5,166 grains extracted from the CDS samples, IOS concluded that 4% of the gold is in grains that resemble remobilized gold grains.

11.5 Adequacy of Procedures

The QP for resource estimates is of the opinion that sampling collection, sample preparation, assay procedures and QA/QC results are inside acceptance limits of mineral industry standards for purpose of mineral resource estimates.

12. DATA VERIFICATION

12.1 Verification of Drillhole Data

TriStar assay data

From the time it took over the project in 2011, TriStar has maintained a complete archive of the project's assay certificates, all of which have been provided in an electronic format by the laboratories. The MX Deposit data base records the sample number and assay certificate number for every interval, making it easy to retrieve the original certificate for any assay done under TriStar's direction. It also records information on which assays have been used to create the "Au_model" field, following the hierarchy shown in Figure 14.2, which facilitates the checking of multiple assay certificates when the gold grade used for resource estimation is an average of two or more assays.

In each of the previous historical resource estimates, one of the QPs has checked the digital data base used for resource estimation against original certificates for a subset of the drill holes, typically 1−2% of them, containing several hundred assays. No discrepancy has ever been detected between assay certificates and the digital data base used for resource estimation; and there has been no instance where the hierarchy for the use of multiple assays has been mis-applied.

For the current resource estimate, the QP responsible for resource estimation continued the practice of checking digital data against certificates, choosing one of the 11 new diamond drill holes (CSH-20-481) and four of the 200 new RC holes (RC-19-331, RC-19-384, RC-20-534 and RC-20-535) to check original against assay certificates. These holes contain slightly more than 2% of the new assays in the data base since it was last checked for the 2018 historical resource estimate. They contain a mixture of intervals for which the value used for resource estimation came from a single fire assay, from an average of two fire assays, and from a single Leachwell assay; they also contained intervals for which there was no recovery recorded in the drill log, and for which there should be no assay recorded in the MX Deposit data base.

With no errors or discrepancies having been found, the QP for resource estimation is of the opinion that the Castelo de Sonhos drill hole assay data base has a very high degree of integrity, and is supported by ancillary information that facilitates tracing all assay information back to original laboratory certificates.

TriStar collar coordinates

Locations of new drill holes have been verified using the new LIDAR topography and the aerial photographs taken during the LIDAR survey. The aerial photographs were collated into a single georeferenced orthophoto that has very high resolution; its individual pixels are 0.1 x 0.1 m. Drill pads from the 2019−2020 drilling campaign can easily be identified on the orthophoto. For 21 of the new drill hole collars (10%), the digital version of their collar location was checked against the orthophoto to confirm that there is a visible drill pad at the location recorded in the collar file; in all instances, the visual evidence of a drill pad confirmed the location in the digital data base to within a few metres in map view.

The elevation of a drill hole's collar is usually more uncertain than its X, Y location in map view, especially when measured by a single reading from a hand-held GPS device. The LIDAR topography provides measurements of the elevation of the ground surface that are consistent: all the elevations were acquired using the same technology within a few days. The LIDAR topography also has a very high precision, within ±0.5m. For the purposes of resource estimation, each hole collar was set to the LIDAR topography elevation at the Easting and Northing location of its collar. With all collars referenced to the consistent

LIDAR topography, any errors that might have existed in GPS elevation measurements of hole collars have been removed.

Barrick assay data

Although a digital version of the 1995-1996 Barrick drill holes data base was available to TriStar when it assumed control of the project in 2011, the original assay certificates from the Barrick campaigns were no longer available. To verify the reliability of the Barrick assay data, TriStar took the ½-core that remained from Barrick's drilling and submitted ¼-core samples for reanalysis. Figure 12.1 shows the comparison of the assay values recorded in Barrick's digital data base to the new assays done by TriStar.

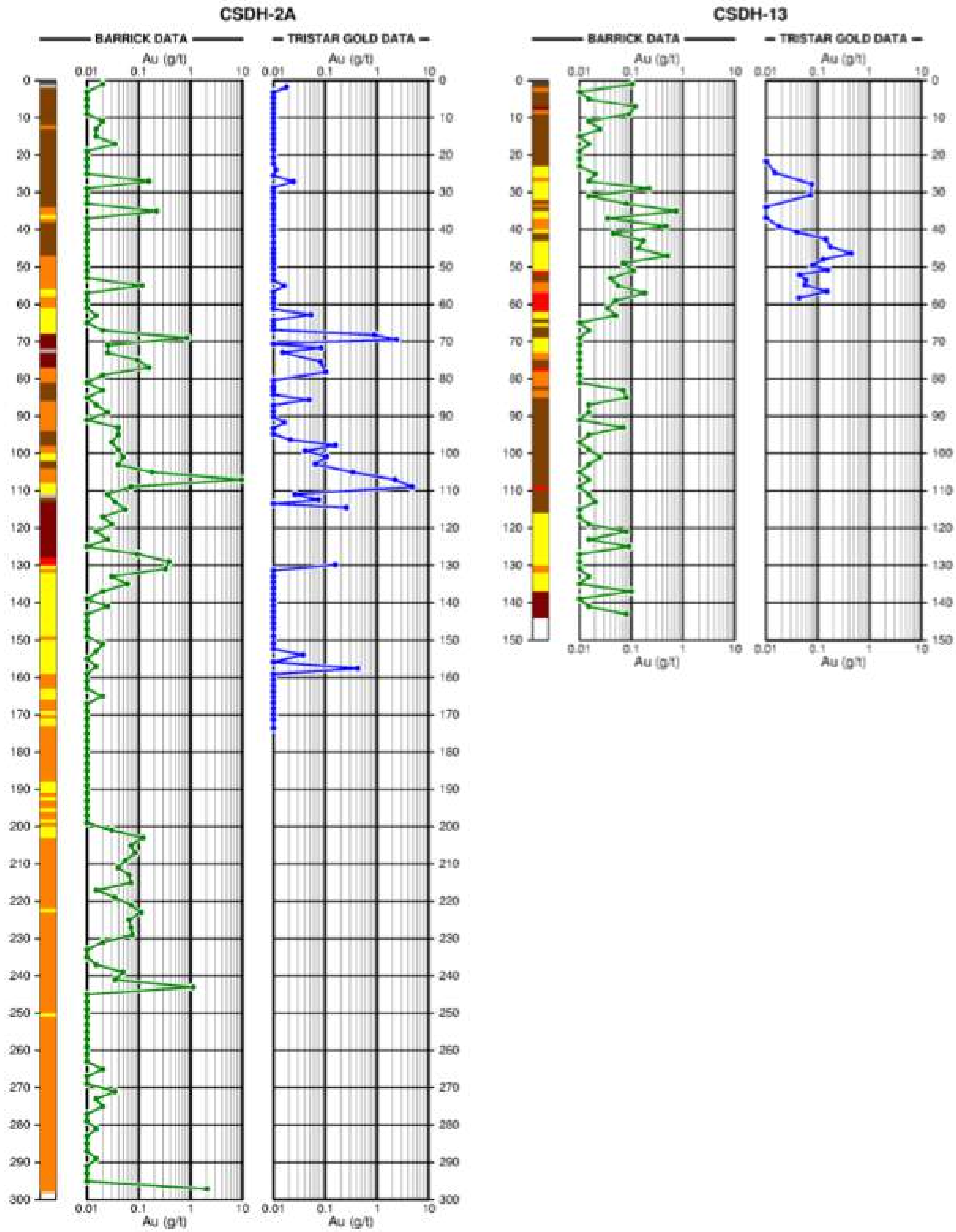


Figure 12.1 Comparison of Barrick ½−core assays to TriStar ¼−core assays, with Barrick assays having been composited to the 2m intervals sampled by TriStar.

With strong agreement between more than 150 checks of new ¼–core assays to old ½–core assays, the QP for resource estimation regards the Barrick data as being reliable for the purposes of resource estimation.

Barrick collar coordinates

For two of the 23 Barrick hole collars, their collar monuments still exist in the field; for the other Barrick holes, their collar monuments were destroyed by small-scale artisanal mining that often used Barrick hole collars as locations to begin mining.

For the two Barrick holes whose collars can still be surveyed, the Easting recorded in Barrick's files differed by an average of +12m from the Easting measured by TriStar, and the Northing differed by +1m. The collar locations recorded in Barrick's digital data base were shifted 12m to the west and 1m to the south to adjust for the small bias seen in the two hole collars for which new GPS measurements could be done.

Following the small adjustment to the Easting and Northing of its collar, each Barrick hole was assigned the elevation of the LIDAR survey at its collar.

The assays and locations of Barrick holes, many of which lie close to TriStar holes, have been checked by plotting them on cross-sections with holes drilled much later, and viewing them in a 3D visualizer. No significant discrepancies have been noted.

12.2 Verification of Topography Data

The topography files used for previous resource estimates were assembled from different sources of data that were digitally merged. These have all now been entirely replaced with the LIDAR topography, a single plateau-wide, high-resolution survey done in August 2020, giving the project a consistent single source of information on the elevation of the ground surface.

Since LIDAR technology measures relative height, it needs to be calibrated to ground-control points that have been accurately and precisely surveyed. At the beginning of the LIDAR survey, when ground-control survey locations were being established, TriStar requested that the LIDAR contractor's ground crew survey 25 locations in addition to those that they were going to survey for use as LIDAR ground-control points. Eight of the locations chosen by TriStar now serve as survey monuments across the plateau that can be used in future to field-check any GPS device against a permanently-marked location with 1st order survey precision. The other 17 of TriStar's locations are hole collars.

When the final LIDAR topography data base was delivered to TriStar, the XYZ files were checked against the 22 ground-control points and against the 25 additional locations chosen by TriStar. For the 22 ground-control points, the differences between the surveyed elevation and the LIDAR elevation at those locations were all less than ±0.1m; this confirms that the post-processing of the raw LIDAR data correctly tied the LIDAR elevations to the ground-control points. At the other 25 locations, the ones chosen by TriStar, the differences between the surveyed elevation and the LIDAR elevation were larger, but all less than ±0.5m. The larger error confirms that the locations chosen by TriStar were not used as ground-control points and that they are genuine validation points, independent of the LIDAR data. With the surveyed elevations at the TriStar locations all being within ±0.5m of the LIDAR elevations, the claimed sub-metre precision of the LIDAR survey has been verified.

12.3 Adequacy of Data

The QP responsible for the current resource estimate is of the opinion that the drill hole and topography data bases have been compiled and maintained well, and that the data is adequate for the purposes of resource estimation.

13. MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Technological Characterization and Metallurgical Testwork

Exploratory Testwork

For preliminary characterization, 41 (forty-one) samples were collected by TriStar from 12 (twelve) drill holes (CSH-41, 43, 44, 47, 57, 58, 59, 80, 81, 83, 85 and 87) and sent to SGS-Geosol laboratory in Vespasiano facility, Minas Gerais, in 2014. These samples, previously crushed to minus 2mm, were combined to generate a 52kg composite.

This master composite was dried, homogenized and split in 1kg sub-samples:

- The gold average grade analyzed of 3.11g/t does not reflect the average grade expected for the orebody. However, the testwork indicates that the material is amenable for the routes tested. About 41.5% of the gold is associated to the fraction coarser than 250µm;
- 1kg aliquot as-is (<2mm) was leached with cyanide in rolling bottles. The extraction after 24h under rolling reached 78.9% with medium consumption of cyanide (ranging from 605 up to 649g/t) and lime (150 – 200g/t);
- Two 10kg samples (combined from the 1kg aliquots) were ground to P80 of 150µm and 53µm and submitted to gravity concentration testwork, in a Falcon centrifuge. The tailings from these tests were sampled and leached in rolling bottles.

Preliminary Testwork

Preliminary metallurgical testwork was carried out by McClelland Laboratories (MLI) at Sparks, Nevada, USA during the first half of 2017.

A 163kg bulk sample, composed of 63 intervals from 11 drill holes (CSH-11-003, 018. CSH-12- 036, CSH-14-103, 116, 118, 119, 121, 127, 133 and 138) representing the Esperança South mineralization was sent to MLI. The intent was to maximize spatial and rock type representativity targeting an average grade of 1.50g/t. Rock type mC1 and mC2 which represented the majority of the deposit made up 55% and 24% of the sample, respectively.

Each interval was packed in plastic, tagged and shipped in sealed drums to MLI.

<u>Sample Preparation, Analysis and Assay</u>

A total of 22kg of core was selected at random from the eleven holes to create a composite sample for Bond Grinding characterization. The material was classified as “near surface”, “mid-depth” and “deep”.

The remaining material was combined to produce samples for chemical analysis and metallurgical testwork. This sample was crushed below 10# (1.68mm), homogenized and subsampled to produce 1.0kg aliquots.

Since the sample could contain coarse gold, both direct fire assay and metallic screen fire-assay were carried out. The metallic head screen analyses indicated a grade of 1.30g/t while direct fire assay indicated 0.84g/t and 1.05g/t (average 0.95g/t). It indicates the presence of coarse gold and nugget effect. Silver grade was lower than 3.0g/t. For calculations, screen fire assay results were considered. For multi-elements, ICP analysis was conducted on the composite. Table 13.1 below shows the results.

Element	Unit	Result	Element	Unit	Result
Ag*	mg/kg	0.1	Na	%	0.07
Al	%	2.07	Nb	mg/kg	2.3
As	mg/kg	< 0.2	Ni	mg/kg	11.8
Ba	mg/kg	360	P	mg/kg	120
Be	mg/kg	0.54	Pb	mg/kg	3.1
Bi	mg/kg	0.09	Rb	mg/kg	56.7
Ca	%	0.02	Re	mg/kg	< 0.002
Cd	mg/kg	< 0.02	S	%	< 0.01
Ce	mg/kg	31.5	Sb	mg/kg	0.21
Co	mg/kg	3.5	Sc	mg/kg	4
Cr	mg/kg	58	Se	mg/kg	< 1
Cs	mg/kg	0.82	Sn	mg/kg	0.5
Cu*	mg/kg	5	Sr	mg/kg	19.5
Fe	mg/kg	1.67	Ta	mg/kg	0.24
Ga	%	4.86	Te	mg/kg	< 0.05
Ge	mg/kg	0.08	Th	mg/kg	6.44
Hf	mg/kg	1.9	Ti	%	0.087
Hg	mg/kg	< 0.005	Tl	mg/kg	0.34
In	mg/kg	0.016	U	mg/kg	2.9
K	%	0.88	V	mg/kg	28
La	mg/kg	15.2	W	mg/kg	0.9
Li	mg/kg	1.5	Y	mg/kg	3.8
Mg	%	0.05	Zn	mg/kg	5
Mn	mg/kg	85	Zr	%	64.2
Mo	mg/kg	2.02			
S_{Total}**	%	< 0.01			
$S_{Sulfate}$**	%	< 0.01			
$S_{Sulfide}$**		< 0.01			

*Quantitative analysis (4 acid digest/AA)
** Leco methods

Table 13.1 ICP Multi Element Analysis.

Bond Grinding and Abrasion Characterization

The entire sample was crushed to minus 19mm (3/4") and screened on 12.7mm (1/2") to produce a sample for abrasion testing. Reject and products for abrasion testing were combined and crushed to <6# (3.36mm) to provide feed for the Bond grinding test.

Bond comminution tests were carried out in duplicates to determine Abrasion Index (Ai), and Ball Mill Work Index (BWi). Tests were conducted using Bond standard procedures and equipment. For BWi a 150µm opening sieve was used for closing the circuit.

The Table 13.2 shows the results for Bond indexes.

Sample	Ai	BWi	
		kWh/st	kWh/t
A	0.3667	12.47	13.74
B	0.3339	12.25	13.50

Table 13.2 Standard Bond Comminution Testing Results.

According to these results, the material can be classified as abrasive and medium hardness.

Whole Rock Cyanidation

A total of six whole rock cyanidation tests were conducted on the composite, at feed sizes of 80% finer than 250µm, 150µm, 105µm and 75µm. Concentration of NaCN for these tests was 1.0g/l. Two additional tests were carried out for sizes 150µm and 105µm with NaCN concentration of 0.5g/l, to evaluate its influence on the kinetics and extraction. The tests were carried out using the standard rolling bottle test, where 2kg of ground rock were agitated for 48h. Samples were taken after 8h, 16h, 24h and 48h for gold analysis and kinetics definition. Table 13.3 summarizes the results.

Feed Size P_{80}	µm	250	150		105		75
NaCN Concentration	g/l	1.0	1.0	0.5	1.0	0.5	1.0
Au Extraction	%						
8	h	38.0	40.6	39.5	48.9	46.6	59.1
16	h	61.1	67.9	84.5	84.7	87.4	86
24	h	76.2	87.1	91.6	93.3	92.9	94.8
48	h	92.8	97.7	97.3	98.5	98.3	97.6
Au Extracted	g/t	1.28	1.30	1.07	1.3	1.17	1.24
Au Tails Grade *	g/t	0.1	0.03	0.03	0.02	0.02	0.03
Au Calculated Head Grade	g/t	1.38	1.33	1.10	1.32	1.19	1.27
Au Metallic Screen Assay	g/t	1.30	1.30	1.30	1.30	1.30	1.3
Ag Extracted	g/t	< 1	< 1	< 1	< 1	< 1	< 1
Ag Metallic Screen Assay	g/t	< 3	< 3	< 3	< 3	< 3	< 3
NaCN Consumed	kg/t	< 0.07	< 0.07	0.09	< 0.07	< 0.07	0.16
Lime Added	kg/t	0.5	0.5	0.3	0.5	0.3	0.5
Final pH		11.1	11.1	10.2	10.9	10.3	10.8
Natural pH (40% solids)		8.0	7.9	7.4	8.2	7.5	7.8

* Average of triplicate direct assay

Table 13.3 Whole Rock Direct Leaching Results.

The results suggest that extractions are not sensitive to grind sizes below 150µm. Kinetics tend to be faster for the first 16h under leaching, but extraction after this time are similar. Cyanide consumption remains low for all sizes. The results suggest that the extraction is not dependent of the NaCN concentration.

GRG Gravity Concentration

Standard GRG testing was carried out in triplicate on three subsamples of 10kg each using a laboratory-size (3 inches) Knelson centrifuge. Three sequential liberation stages were considered during the testwork with P80 of 850µm, 250µm and 75µm.

An additional testwork, more detailed, was carried out including grades by range of size and metallic screen analysis.

From Table 13.4, results suggest that gold is extremely amenable to be concentrated by gravity processes.

Test	Recovery for Concentrate (%) Nominal Grind Size (µm)				Head Grade (gAu/t)	
	850 µm	250 µm	75 µm	Total	Calculated	Assayed*
#1 (initial)	41.8	28.6	10.4	80.8	0.91	1.30
#2 (Duplicate)	42.1	29.0	11.9	83.0	1.04	1.30
#3 (Triplicate)	38.0	37.5	12.5	88.0	1.22	1.30
Additional	44.7	30.2	13.9	88.8	1.25*	1.30

* Metallic Screen Assay

Table 13.4 GRG Tests Results.

Bulk Gravity Concentration

To confirm the recovery in gravity concentration and produce samples for further testwork, a simple bulk gravity concentration test was conducted on a 47kg sample split from the master composite.

The sample was ground to 80% <75µm and concentrated in a lab-scale 3" Knelson centrifuge. The concentrate was sent for intensive leaching testwork and tailings for flotation and cyanidation testwork.

Gravity tests results suggest that the sample was easily concentrated by gravity methods. From Table 13.5, the gravity rougher concentrate weight was 0.93% of the feed with a grade of 93.48g/t and represented a gold recovery of 73.3%. The weight and gold concentration ratios were 108:1 and 79:1, respectively. The gravity rougher tail grade was 0.32g/t.

From Table 13.6, 99.9% of gold reported to gravity concentrate was extracted under intensive leaching, and approximately 96% of the gold contained in the rougher gravity tailings.

Products	Weight	Cum. Wt.	Assay	Au Distribution	
	%	%	gAu/t	%	Cum. %
Rougher Concentrate	0.9	0.9	93.48	73.3	73.3
Rougher Tailings	99.1	100.0	0.32	26.7	100.0
Composite	100.0		1.19	100.0	

* Calculated head grade from concentrate cyanidation test

Table 13.5 Bulk Gravity Concentration Results.

Gravity Product		Concentrate	Tailings
NaCN Concentration	g/l	5.0	1.0
Au Extraction Kinetics	%		
8	h	88.0	92.3
16	h	97.5	95.6
24	h	98.9	96.2
48	h	99.9	>96.2
Au Extracted	gAu/t	93.38	0.25
Tails Grade*	gAu/t	0.10	<0.01
Calculated Head Grade	gAu/t	93.48	<0.26
Gravity Rougher Concentrate	gAu/t	93.48	0.31
Ag Extracted	gAg/t	2.60	<0.10
NaCN Consumed	kg/t_{conc}	0.55	0.18
Lime Added	kg/t	0.5	0.3
Final pH		11.4	10.4
Natural pH		7.5	7.4

* Average of triplicates

Table 13.6 Bulk Sample Gravity /Cyanidation Results.

From Table 13.7, 77% of the Au in the whole sample ground to 80% <75µm, was extracted by intensive leaching and 22% from the tailings, resulting in a final recovery of a combined process of 99.0%.

The reagents requirements are relatively low – 190g/t of NaCN and less than 400g/t of lime.

Product		Weight	Au Distribution	Grade	Reagents Requirements			
					Concentrate		Composite	
					NaCN	Lime	NaCN	Lime
		(%)	%	gAu/t	kg/t	kg/t	kg/t	kg/t
Rougher Concentrate	Extracted	0.9	77.0	93.38	0.55	0.50	0.01	< 0.10
	Tail		0.1	0.10				
Rougher Tails	Extracted	99.1	22.0	0.25	0.18	0.30	0.18	0.30
	Tail		0.9	0.01				
Total Extracted			99.0	1.12				
Total Tail			1.0	0.01				
Composite		100.0	100.0	1.13			0.19	< 0.40

Table 13.7 Bulk Gravity Concentration / Cyanidation Results - Met Balance.

Flotation testwork was carried out in the rougher gravity concentration tailings to determine the response to flotation and to characterize the sample. Table 13.8 summarizes the results. 73.7% of gold contained in the gravity tailings report to concentrate.

Product	Weight	Assay			Au Distribution	
	%	gAu/t	gAg/t	%S	%	Cum %
Rougher Concentrate	3.5	5.40	< 3.0	0.03	73.7	73.7
Rougher Tailings	96.5	0.07	< 1.0	0.02	26.3	100.0
Composite	100.0	0.26	N.A.	0.02	100.0	

Table 13.8 Flotation Testwork Results - Rougher Gravity Tailings.

Table 13.9 summarizes the results of bulk gravity and flotation testwork.

Product	Weight		Assay	Au Distribution	
	%	Cum %	gAu/t	%	Cum %
Gravity Concentrate	0.9	0.9	93.48	77.4	77.4
Flotation Concentrate	3.5	4.4	5.40	16.7	94.1
Flotation Tails	95.6	100.0	0.07	5.9	100.0
Composite	100.0		0.26	100.0	

Table 13.9 Summarizes the results of bulk gravity and flotation testwork.

Flotation and Product Cyanidation Testwork

A flotation test was conducted on a 12kg sample from whole rock to determine its response to flotation concentration. The sample was ground to 80% passing in 75µm, pulped with tap water to 30% solids and conditioned for ten minutes in a Denver cell. Flotation was conducted at natural pH and samples were taken at five intervals and combined in one rougher concentrate sample. The concentrate sample was split in two samples after homogenization and submitted for cyanidation testwork.

The rougher tails were sampled and assayed for determination of gold and sulfur content.

Table 13.10 summarizes the results from the flotation testwork. 83.2% of the gold was reported to concentrate, with a mass pull of 2.6%.

Product	Weight	Assay		Au Distribution	
	%	gAu/t	% S*	%	Cum. %
Rougher Concentrate	2.6	20.36	N.A.	83.2	83.2
Rougher Tailings	97.4	0.11	< 0.01	16.8	100.0
Composite	100.0	0.64	N.A.	100.0	

* Average of calculated head grades from concentrate cyanidation tests

Table 13.10 Whole ROM Flotation Results.

The rougher concentrate 80% <75µm was mixed with water to reach 25% solids in weight and agitated in a rolling bottle standard test for 48h. Samples were taken after 8h, 16h, 24h and 48h for gold analysis and pH correction for kinetics definition. Two tests were carried out at NaCN concentration of 1g/l and 5g/l, to evaluate the sensitivity to reagent concentration. Table 13.11 summarizes the concentrate leaching results. Au extraction from concentrate is very fast and reached 94% and 99% of the Au contained in the concentrate for NaCN concentrations of 1g/l and 5g/l respectively. The NaCN consumption however has doubled.

Feed Size P_{80}		µm	75	
NaCN Concentration		g/l	1.0	5.0
Au Extraction		%		
	8	h	26.2	81.8
	16	h	50.6	95.8
	24	h	69.1	99.9
	48	h	94.0	98.9
Au Extracted		g/t	18.82	20.47
Au Tails Grade *		g/t	1.21	0.22
Au Calculated Head Grade		g/t	20.03	20.69
Au Head Assay		g/t	20.36	20.36
Ag Extracted		g/t	2.1	2.5
NaCN Consumed		kg/t	1.01	2.20
Lime Added		kg/t	3.20	2.60
Final pH			11.0	11.1
Natural pH (40% solids)			7.0	7.0

* Average of triplicate direct assay

Table 13.11 Flotation Concentrate Cyanidation Results.

Conclusion

The testwork carried out with the samples indicate that the rock is amenable to all routes tested, with a high recovery and low reagent consumption for any single process. Although this study assumes a whole rock cyanidation process, for the next phases, a complete study considering the variability of the deposit is recommended.

14. MINERAL RESOURCE ESTIMATES

A new resource block model has been developed for the Castelo de Sonhos Project to consider drill hole data and a geological interpretation not available at the time of the previous estimate, specifically the geological controls on mineralization provided by the litho-geochemistry model developed by GoldSpot Discoveries using machine learning.

As with previous resource estimates for CDS, separate resource block models have been created for each of the three main deposit sub-areas; these are shown in blue in Figure 14.1. Mapping, surface sampling and drilling have confirmed that there is resource potential outside the areas outlined in blue, where the soil anomaly is less pronounced because the sedimentary layers are close to vertical. TriStar has begun drilling these other areas and may, in future, extend the areal footprint of resource estimates. For the moment, however, with the immediate need being for accurate resource estimates in areas that will be considered in an upcoming pre-feasibility study, the new resource estimate covers only the areas outlined in blue on Figure 14.1.

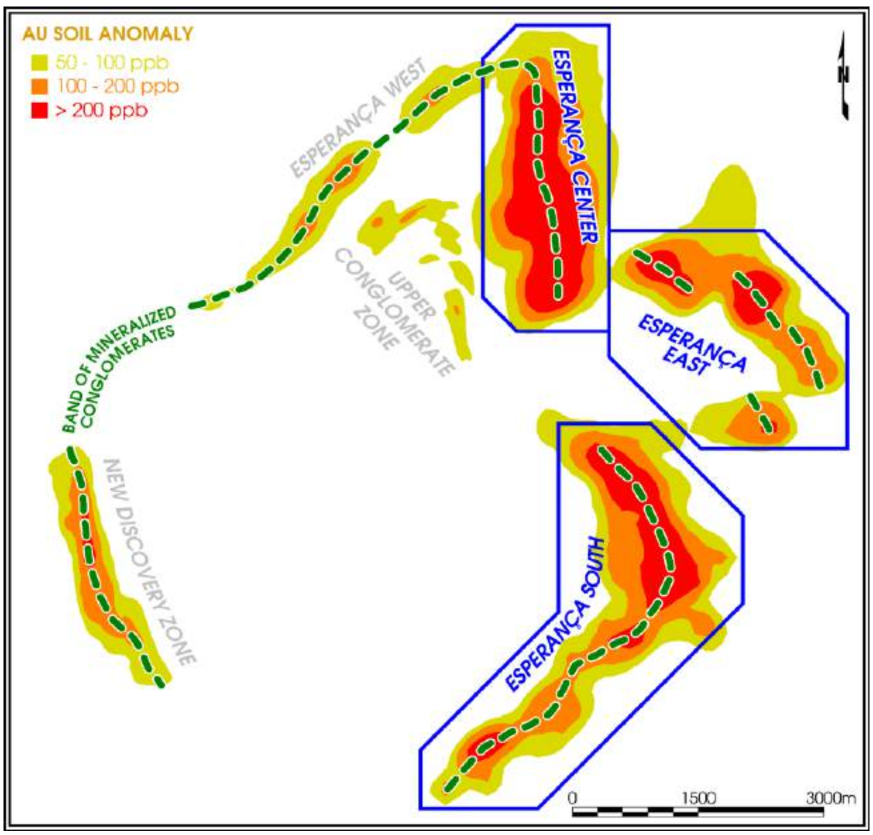


Figure 14.1 The deposit sub-areas (in blue) covered by the current resource estimate.

14.1 Data

Coordinate System

All the work on this updated resource block model was done in SIRGAS-2000 ("SIRGAS") coordinates that are now the federal cartographic standard in Brazil. All previous resource studies were done in SAD69 ("SAD") coordinates. Whenever SAD coordinates needed to be converted to SIRGAS, this conversion was either done in software that included tools for coordinate transformations, such as the MX Deposit data base management system or the ProGrid converter provided by the Brazilian federal government, or done using the following formulas:

$$Easting_{SIRGAS2000} = Easting_{SAD69} - 53.96$$

$$Northing_{SIRGAS2000} = Northing_{SAD69} - 40.24$$

These simple linear transformations have an accuracy of ±0.1m anywhere on the plateau but are less accurate as one moves away from the plateau.

Drill hole data base

The drill hole data base for the Castelo de Sonhos Project is managed using Seequent's commercial software data base management system, MX Deposit, which integrates information from field studies, drill hole logging, location surveys and laboratory assay reports.

Collars

The drill hole collars used for this updated block model are those for which assays were available at the end of January 2021. At that time, assays were available for all reverse circulation holes up through RC-2020-550 and for all diamond drill holes up through CSH-20-491.

The two Barrick holes that TriStar was able to survey in 2011, CSDH-13 and CSDH-2A, were assigned SIRGAS collars by converting the TriStar survey of their SAD coordinates. For all the other Barrick holes, whose collars were irretrievably lost when garimpeiros mined in those areas, their original Barrick coordinates were adjusted by the average of the differences seen in CSDH-13 and CSDH-2A (+12m for the Easting and +1.5m for the Northing) to create an estimate of the proper SAD coordinates. With their SAD coordinates either surveyed or calculated by making a small adjustment to the original Barrick data, the SIRGAS collars of the Barrick holes were calculated using MX Deposit.

Down-hole surveys

The down-hole survey data base is essentially the same as the 2018 version, which had down-hole survey measurements for the inclined core holes drilled that year. For all holes drilled since 2018, both RC and diamond drill holes, the data base records the as-planned orientation at the collar and copies this at the bottom of the hole, causing the trajectory to follow a straight line from the collar, at the planned azimuth and dip. Although this is not ideal, the errors are small because most holes are now RC holes drilled vertically; there are only a few inclined core holes that have been drilled in recent years. The ones that are relevant to resource estimates target the top 120m. Over this length, an error of 1-2° in the collar orientation would result in an error of <4m horizontally at the bottom of the hole, and <1m vertically. Even with the possibility of some droop in the inclined holes, there is very little chance that the bottom sample of the hole is off by more than half the resource block size. This was confirmed by taking all the inclined holes that had down-hole surveys, calculating the proper location of the bottom of the hole using the measurements of down-hole azimuth and dip, and then recalculating the location that would be erroneously calculated if the only available information was a single collar survey, rounded to the nearest 5° for both azimuth and dip. In the 34 inclined holes where this check could be done, the actual location of the bottom of the hole and the location incorrectly calculated from the as-planned collar orientation alone never differed by more than half of the resource block size. The same check, done for vertical holes that have down-hole surveys, confirms that vertical holes do not wander more than half a block at a depth of 150m.

Assays

Exports of assay data from the MX Deposit data base include the values to be used for resource modeling; this calculation follows the hierarchy that has been used since 2017, when Leachwell assays first became available:

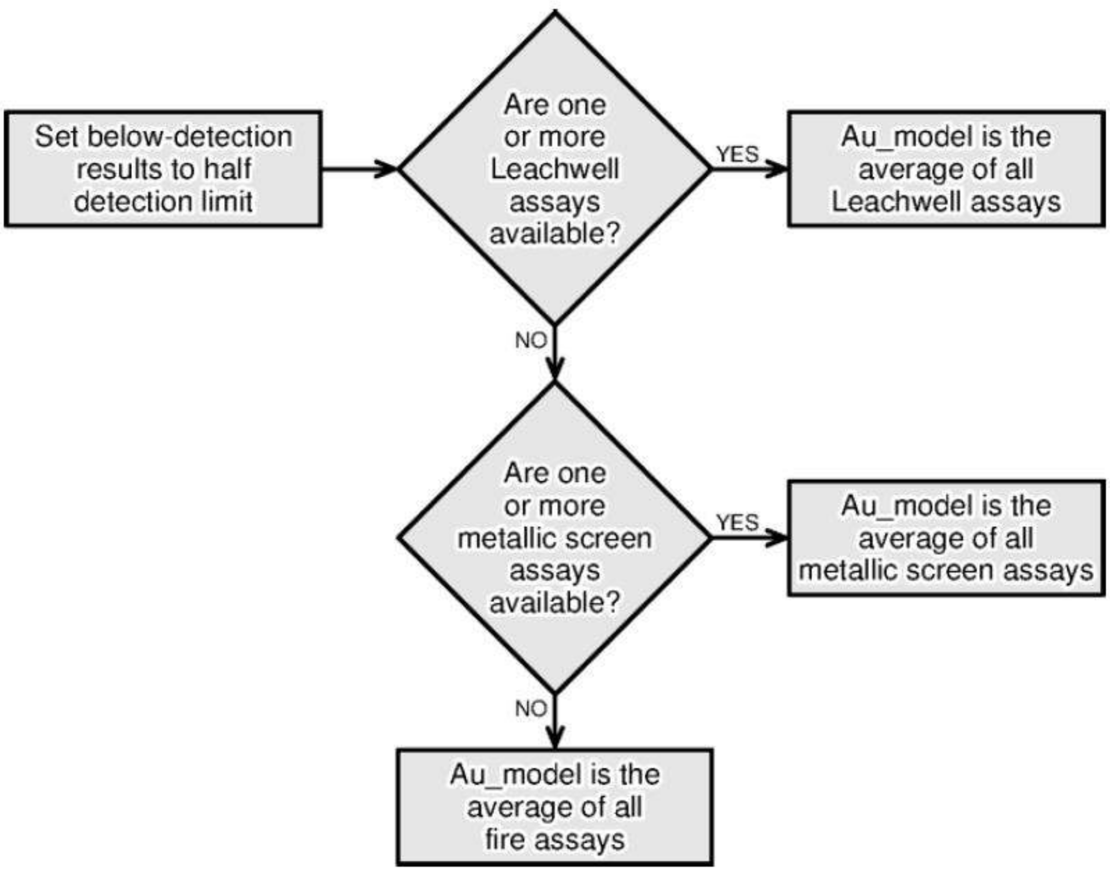


Figure 14.2 Assay selection hierarchy criteria at Castelo de Sonhos.

When considering the possibility of multiple assays for the same sample interval, the MX Deposit data base recognizes that additional assays might be reported as:

- check assays done by the lab when the grade obtained with the first assay warranted a check
- as duplicate assays requested by TriStar, either as part of the regular assay protocol, or in separate batches of additional duplicate assays
- as blind replicates created by the preparation lab for the lab's internal QA/QC program

- as duplicates required within each batch by the lab's internal QA/QC program

From the Fall of 2019 through the Spring of 2020, the assay protocol used fire assays to determine which intervals needed the large-volume, more expensive Leachwell analysis. For any interval where the fire assay came back above 0.1g/t, a second fire assay was done. Once the significant intervals were identified, these were submitted for Leachwell analysis, along with two additional samples, one on either side of each significant interval band.

In the Fall of 2020, TriStar ceased doing the 2nd fire assay, and just used the first as a screening tool to figure out where Leachwell assays were needed.

Topography

The XYZ files from Geosolid's LIDAR survey were used to create a 5x5m topography grid for each of the three project areas: Esperança South, Esperança Center and Esperança East. In each area, the topography grid extends far enough in all directions to span the crest of a reporting pit shell that might go as deep as 150m below the ground surface, with walls sloping at 55°.

Details of the topography grid for Esperança South are shown in Figure 14.3.

The Geosolid LIDAR survey has very high precision, on the order of ±0.1m and easily picks out the garimpos; Figure 14.3 shows an example of this, with the airphoto at the top and the topography contour map at the bottom. Since the topography shows the "super-trenches" dug by the garimpeiros, the resource block model does not treat the voids of the garimpos as rock.

Figure 14.3 An example of the LIDAR topography's ability to identify surface depressions of garimpos.

Density

The density data base is the same as the one available in 2018: the 28 drill core samples of the conglomeratic horizon that had an average dry bulk density of 2.68 t/m^3. This is very similar to the densities used for resource estimates at Tarkwa and Jacobina, the two closest analogs of CDS, and slightly lower than values in technical papers for the density of strongly silicified and hematized quartzites.

14.2 Modeling of Local Bedding Orientation

The triangles of the litho-geochemical wireframes developed by GoldSpot (Section 9) were used to locally interpolate the direction of bedding for each resource block. Triangles were not used in this interpolation if they were coincident with an erosional surface that formed the top of a unit, if they were coincident with topography, or if they were part of the wireframe of one of the non-sedimentary units. Figure 14.4 shows an example of the grid of local bedding orientations for the A-A' cross-section in Figure 9.6.

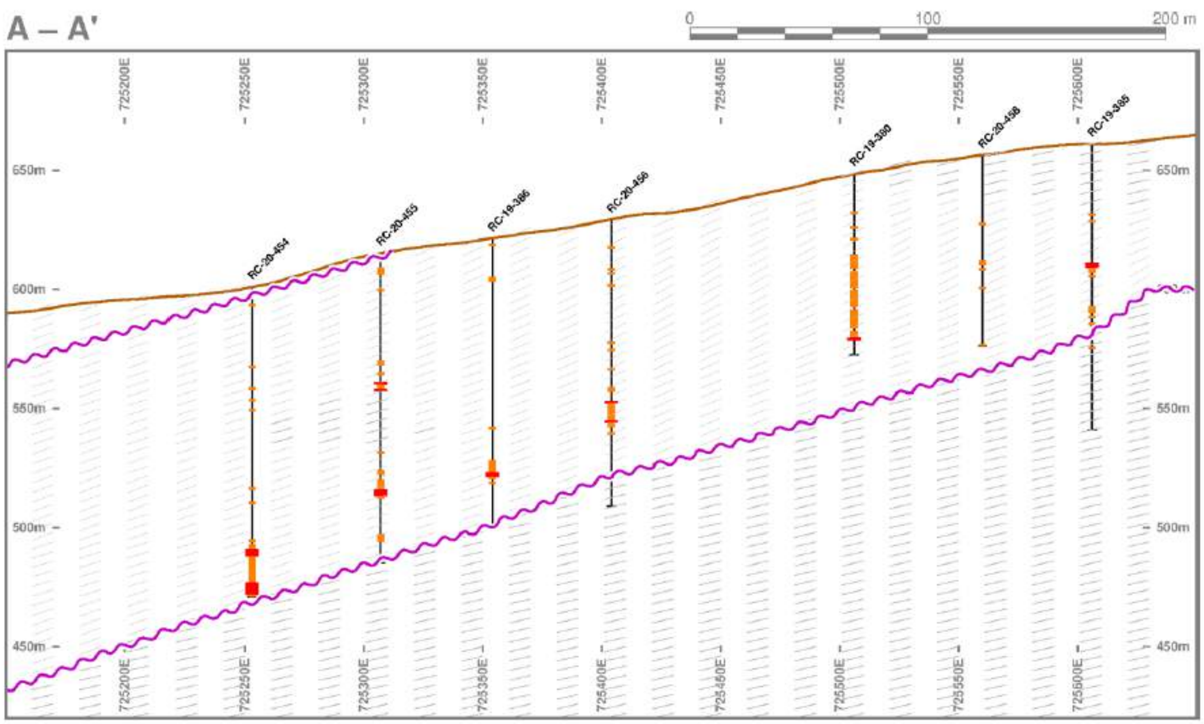


Figure 14.4 Local bedding orientations modeled from bases and non-erosional tops of litho-geochemical units in Figure 9.6.

14.3 Data Analysis and Interpretation

Erosional surfaces

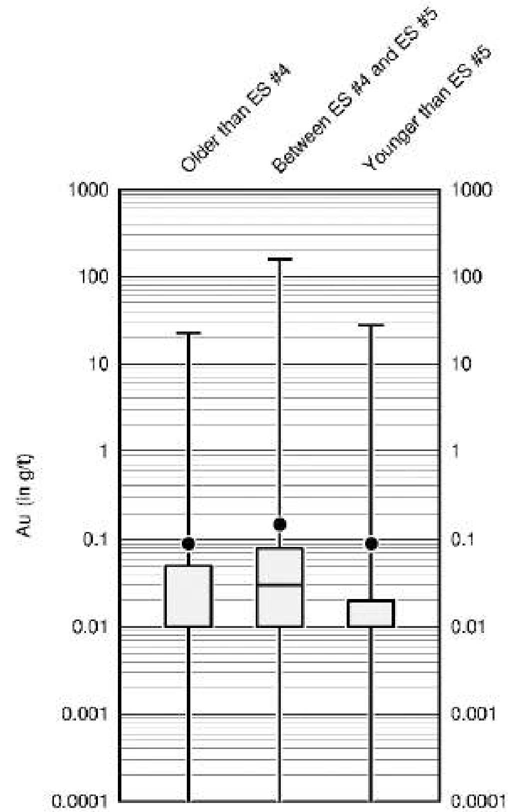
Seven erosional surfaces were identified by GoldSpot and provided as triangulated surfaces in DXF files. For the purposes of this study, these have been assigned numbers, from ES #1 for the oldest (deepest) to ES #7 for the youngest (shallowest). Table 14.1 shows the numbers used in this report and the names of the original DXF files.

ES #	GoldSpot's DXF file name
1	Geological Model - 02_Erosional_LowK&Th_Bottom.dxf
2	Geological Model - 05_A_Erosional_High_K_Bottom.dxf
3	Geological Model - 06_A_High_Th_Bottom.dxf
4	Geological Model - 20_Ferrous Sediment_Clean_Si_bottom.dxf
5	Geological Model - 50_Aluminous Sediment_bottom.dxf
6	Geological Model - 70_Erosional High_K_contact.dxf
7	Geological Model - 90_Erosional High_Th_bottom.dxf

Table 14.1 Numbers and file names for erosional surfaces.

Esperança South

In Esperança South, two unconformities, ES#4 and ES#5, partition the conglomeratic band into three erosional packages. Figure 14.5 shows side-by-side boxplots of the gold assay distribution in each of these packages. The grades in the middle package tend to be higher than in the other two: more than 50% higher, on average. The differences between the grade distributions support the view that the packages should be treated as separate domains for the purposes of grade interpolation. This is also consistent with these packages being separated by erosional surfaces; whatever spatial continuity may exist within the sedimentary rocks, it is very likely to be disrupted across those unconformities.



	Older than ES #4	Between ES #4 and ES #5	Younger than ES #5	
Number	10035	21476	12339	Number
Mean	0.09	0.15	0.09	Mean
Standard deviation	0.47	1.25	0.73	Standard deviation
Coefficient of variation	5.14	8.18	8.64	Coefficient of variation
Maximum	22.5	159.5	27.79	Maximum
75th percentile	0.05	0.08	0.02	75th percentile
Median	0.01	0.03	0.01	Median
25th percentile	0.01	0.01	0.01	25th percentile
Minimum	0.0	0.0	0.0	Minimum

Figure 14.5 Boxplots of gold assays in Esperança South for the three erosional packages separated by the unconformities.

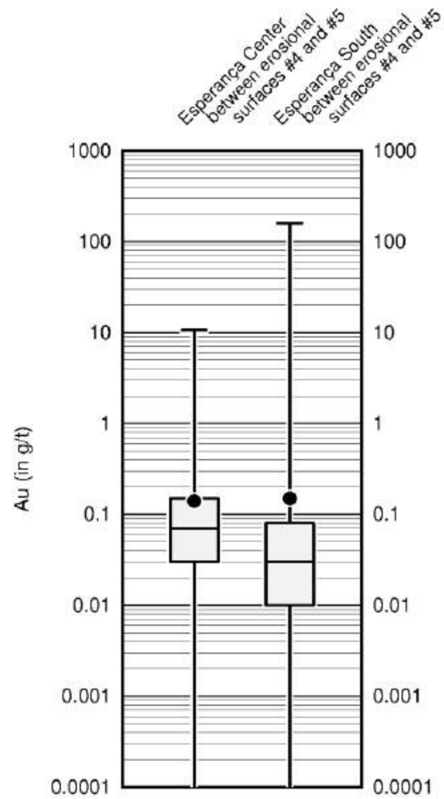
The differences seen in the grades of the three packages, with the middle package having the highest grades, is consistent with observations made by TriStar's external consulting geologists, both of whom have expressed the view that the strongest gold mineralization occurs in the cobble conglomerates that lie near the middle of the conglomeratic band (Figure 7.4; Lipson, 2016; Karpeta and Lipson, 2019).

Esperança Center

Three of the erosional surfaces that GoldSpot interpreted across the plateau cross Esperança Center. Although the Esperança Center resource block model could have been separated into three erosional units, almost all the drill hole assays in this area fall between the same two erosional surfaces that were used as domain boundaries in Esperança South, ES#4 and ES#5. Since MIK needs several hundred samples to estimate grade distributions, all of Esperança Center was treated as belonging to the same erosional unit. Figure 14.6 shows a comparison of the assay grades in Esperança Center to those in the middle erosional unit of Esperança South. The average gold grade is the same in both areas, which indicates that the GoldSpot interpretations of erosional surfaces are sound; but there is less total variability in Esperança

Center than in Esperança South. This is understood to be the result of Esperança South having been more distal at the time of deposition, where the winnowing action of near-shore processes segregated the gold into thinner, higher-grade bands that were separated by wide intervals with very low grades.

The difference seen in the variability of gold grades has implications on resources and reserves. Although Esperança South has a higher average grade above the resource reporting cutoff, Esperança Center has a higher proportion of resource-grade material. If rising gold prices cause the resource cutoff grade to be lowered, the growth in resource tonnage will be greater in Esperança Center. The variability differences also entail that the effect of mining dilution will be less severe in Esperança Center than in Esperança South.



Number	6660	21476	Number
Mean	0.14	0.15	Mean
Standard deviation	0.37	1.25	Standard deviation
Coefficient of variation	2.68	8.18	Coefficient of variation
Maximum	10.62	159.5	Maximum
75th percentile	0.15	0.08	75th percentile
Median	0.07	0.03	Median
25th percentile	0.03	0.01	25th percentile
Minimum	0.0	0.0	Minimum

Figure 14.6 Boxplots of gold assays that lie between the fourth and fifth erosional surfaces, in Esperança Center and in Esperança South.

Esperança East

There are only two erosional surface that impinge on Esperança East. As with Esperança Center, almost all the assays in Esperança East are in one erosional package, the sediments that lie between the two oldest erosional surfaces interpreted by GoldSpot. The Esperança East resource estimates treated all the assays as belonging to the same erosional package even though there are a few that fall below ES #1 or above ES #2.

Litho-geochemical units

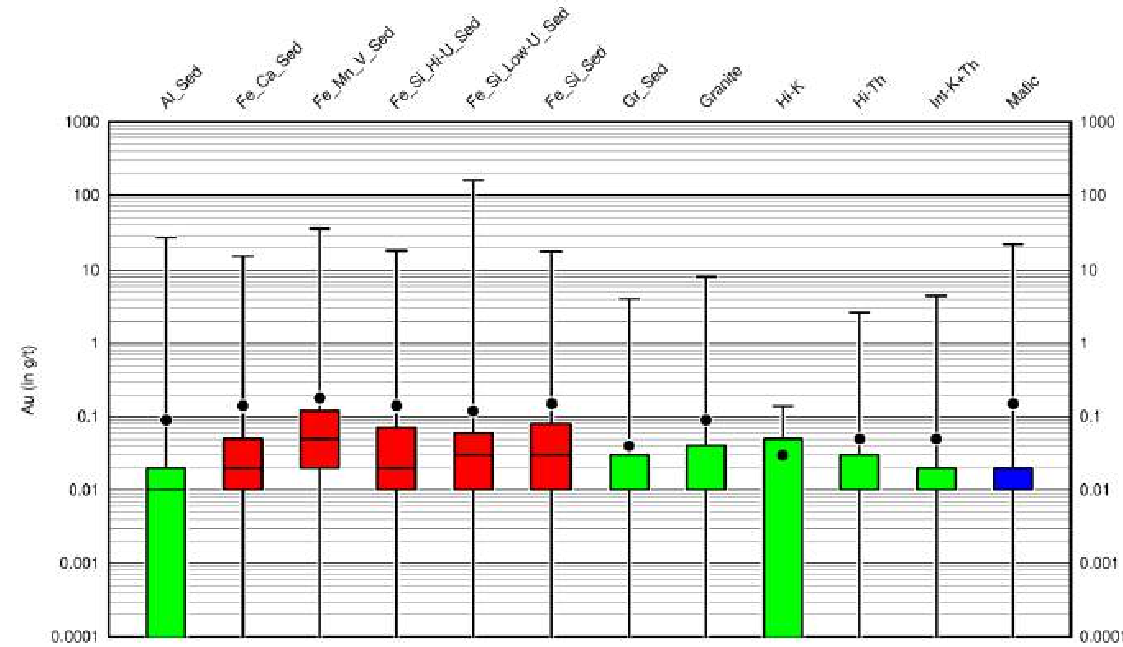
Fifteen litho-geochemical units were identified by GoldSpot and provided as triangulated solids in DXF files.

Twelve of these units occur within the Esperança South area shown in Figure 14.1. Figure 14.7 shows side-by-side boxplots of the gold assay distributions for the 12 units that affect Esperança South.

The litho-geochemical units with the highest grades are the ferrous sediments (coloured red in Figure 14.7); the grades in the non-ferrous sediments (green) are generally one half to one third of what is seen in the ferrous sediments. This is likely a reflection of an observation that has often been made about the conglomeratic band at Castelo de Sonhos: that strong gold mineralization often seems to be associated with hematization.

The mafic dyke units are not barren, even though they post-date the paleo-placer gold mineralization by hundreds of millions of years. Intrusive events, and their associated dykes, have remobilized the paleo-placer gold on the Castelo de Sonhos plateau. Both mafic dykes and granitic dykes often have strong gold mineralization at their contacts with the surrounding sediments. Because the definition of the mafic unit in the machine-learning analysis of clustering is based on chemistry, and not on visual observations, it is quite possible that the mafic cluster incorporates some of what a geologist would log as meta-sediments. Fluids from the dyke would have permeated the adjacent sedimentary rocks, modifying their multi-element chemistry fingerprints and making them appear more similar to the dyke than to sedimentary rocks further away from the dyke.

Although the average grade of the mafic dykes is like the ferrous sediments, the coefficient of variation is very high in the mafic group, a reflection of the fact that this unit contains a mixture of a lot of barren samples and a few samples with very high gold grades.



	Al_Sed	Fe_Ca_Sed	Fe_Mn_V_Sed	Fe_Si_Hi-U_Sed	Fe_Si_Low-U_Sed	Fe_Si_Sed	Gr_Sed	Granite	Hi-K	Hi-Th	Int-K+Th	Mafic
Number	10674	6010	3016	6157	6653	5294	1210	364	12	2131	535	569
Mean	0.09	0.14	0.18	0.14	0.12	0.15	0.04	0.09	0.03	0.05	0.05	0.15
Standard deviation	0.78	0.74	0.76	0.74	1.91	0.64	0.16	0.46	0.05	0.19	0.29	1.13
Coefficient of variation	8.7	5.18	4.25	5.21	16.15	4.23	4.35	5.44	1.63	3.43	5.75	7.53
Maximum	27.79	15.37	35.65	18.4	159.5	17.9	4.05	8.1	0.14	2.64	4.46	22.5
75th percentile	0.02	0.05	0.12	0.07	0.06	0.08	0.03	0.04	0.05	0.03	0.02	0.02
Median	0.01	0.02	0.05	0.02	0.03	0.03	0.01	0.01	0.0	0.01	0.01	0.01
25th percentile	0.0	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.0	0.01	0.01	0.01
Minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Figure 14.7 Boxplots of assay grade distributions in litho-geochemical units relevant to Esperança South.

Esperança Center

The assays in Esperança Center show a similar pattern, with the litho-geochemical units identified as ferrous sediments having higher grades, on average, than the non-ferrous sediments. The resource estimates in Esperança Center therefore used the same approach to estimation domains as was used for Esperança South: ferrous and non-ferrous sediments are treated as separate populations.

Esperança East

With the Esperança East area sitting beneath older erosional surfaces in the GoldSpot interpretation, they fall within different litho-geochemical units than those generally seen in Esperança South and Center. In the cluster analysis, Esperança East assays fell in clusters differentiated by their potassium and thorium content, and not in the ones differentiated by their iron content. Although the gold grades are higher in the unit associated with the high-thorium cluster, there are very few samples in this unit (<10), which makes it difficult to be confident that this is a meaningful difference, and makes it impossible to treat this unit as a separate domain in MIK. With only one erosional package in Esperança East, and no ability to separate meaningful litho-geochemical populations, the MIK in Esperança East was done using only one common population throughout the sub-area.

Variograms

Experimental variograms of the ferrous units are all similar, in both Esperança South and Center, regardless of where they lie relative to the unconformities, so these were combined into one group for variogram analysis. Similarly, the non-ferrous units were also combined into one group since their variograms are similar above, below and between the two major unconformities. The reason why the unconformities do not seem to play a role in variogram analysis may be an indication that the spatial continuity in the Gilbert fan-delta system is not affected by major marine transgressions and regressions. When deposition resumes after an erosional event, the size, shape and length of sedimentary lobes and alluvial channels is the same as it was before the erosional event. A different explanation for the same observation is that the primary controls on grade continuity may be near-shore marine processes: longshore drift and tidal action. These too are not likely to be affected by transgressions or regressions, which simply change the location of the shoreline, not the mechanics of the processes that occur near it.

The grade interpolation for resource estimation used multiple indicator kriging, with the same variogram model being used for all indicator thresholds, an approach often referred to as "median" indicator kriging (Goovaerts, 1997). Figure 14.8 through Figure 14.10 show the median indicator variograms for each of the three groups used for variogram analysis in Esperança South: ferrous, non-ferrous and mafic. The variograms of the two sedimentary groups are similar, with the non-ferrous sediments having slightly shorter ranges than the ferrous sediments in both the bedding direction and the perpendicular-to-bedding direction.

The variograms for the mafic dykes have the shortest ranges, but also a slightly lower nugget effect, suggesting that the very short-scale continuity of the remobilized gold might be better than that of the paleo-placer gold.

The parameters for the median indicator variograms in each group is summarized in Table 14.2.

		1st exponential structure			2nd exponential structure		
	Nugget	C_1	$Rmax_1$	$Rmin_1$	C_2	$Rmax_2$	$Rmin_2$
Ferrous	0.45	0.20	25	25	0.35	200	25
Non-ferrous	0.45	0.20	20	20	0.35	160	20
Mafic	0.30	0.30	15	15	0.40	120	15

Table 14.2 Parameters for median indicator variogram models.

In each group, the long range is in the dip plane: the bedding plane for the sedimentary units, and the average dip of the dykes for the mafic units, which have an average strike of N77°W and dip 20° to the south. The short range is perpendicular to the dip plane: across the bedding, or across the dyke.

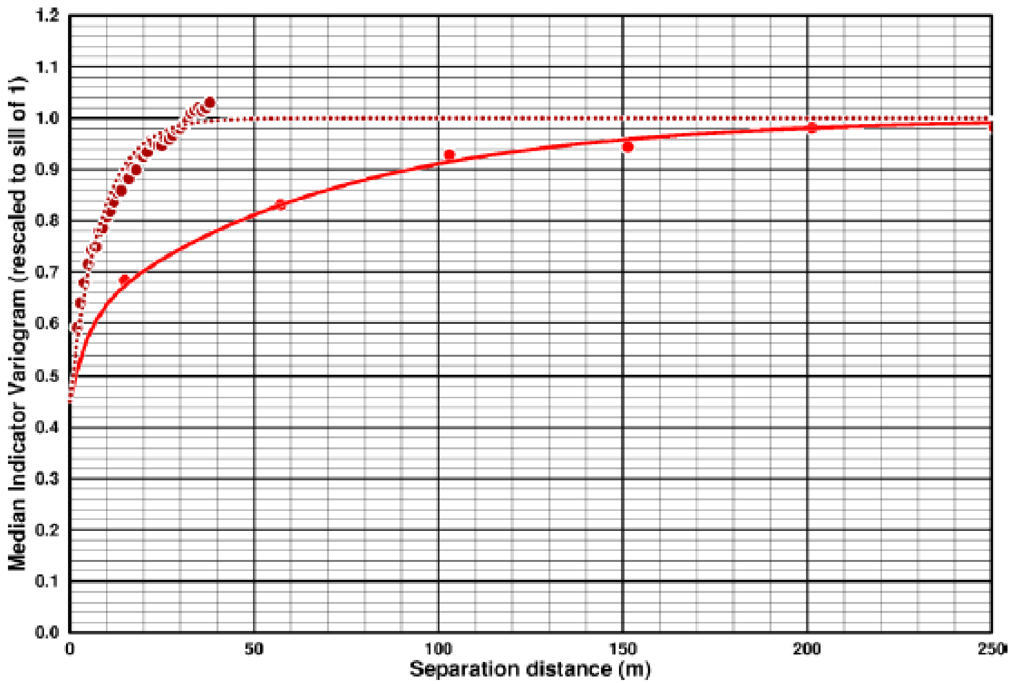


Figure 14.8 Median indicator variography for ferrous sediments, with the solid red line showing the omnidirectional variogram in the bedding plane and the dotted dark red line showing the variogram perpendicular to bedding.

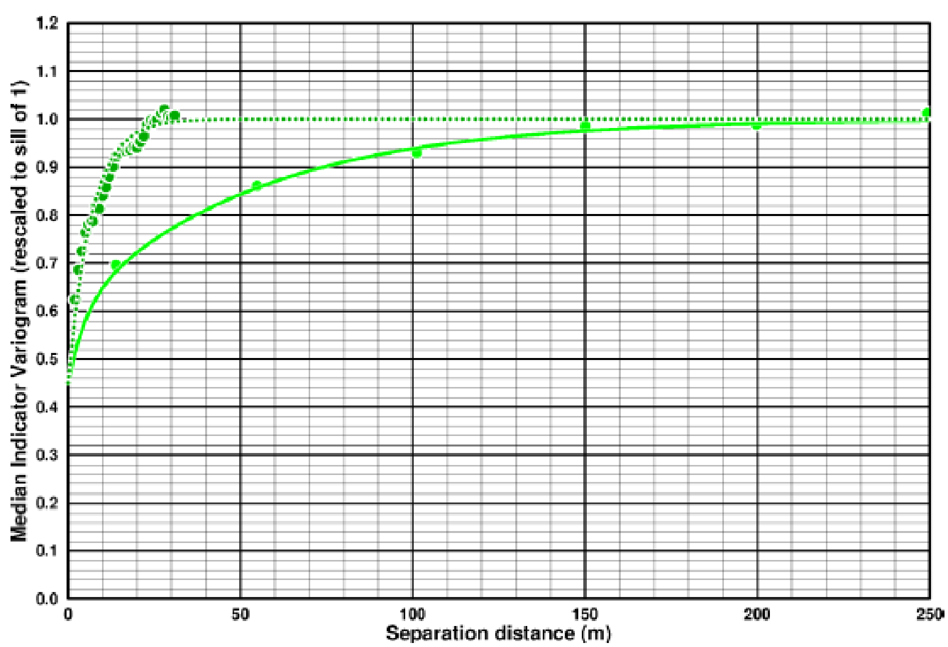


Figure 14.9 Median indicator variography for non-ferrous sediments, with the solid green line showing the omni-directional variogram in the bedding plane and the dotted dark green line showing the variogram perpendicular to bedding.

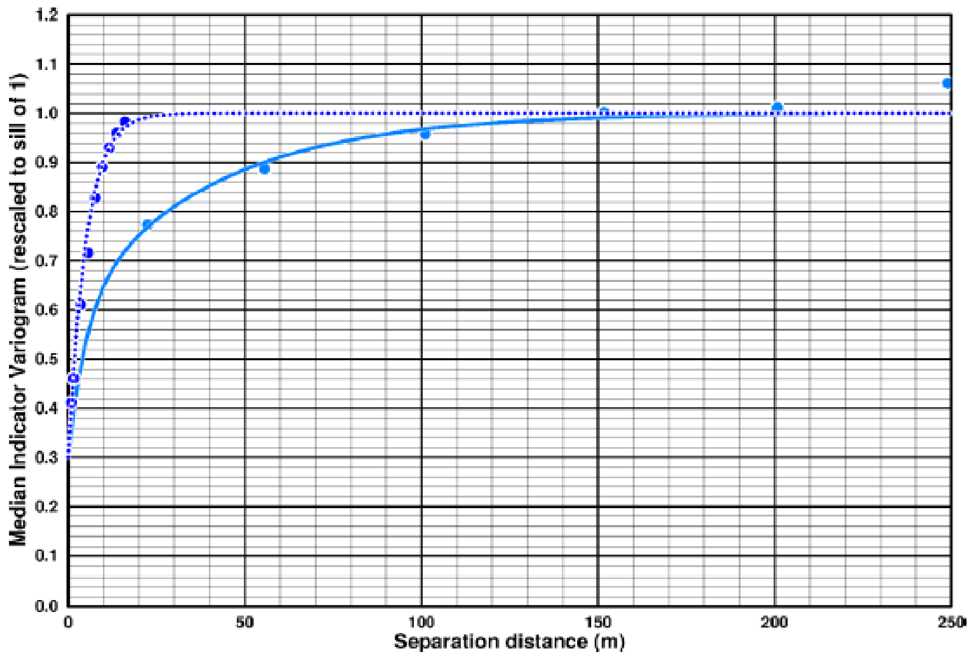


Figure 14.10 Median indicator variography for the mafic dykes, with the solid blue line showing the omnidirectional variogram in the average dip plane of the dykes and the dotted darker blue line showing the variogram perpendicular to the dykes.

The ranges of correlation are slightly longer than those seen in previous studies of Castelo de Sonhos. This is likely due to the use of a much more locally detailed geological model that not only separates data into seven different domains but also allows the calculation of directions of maximum continuity to be much better localized. Although previous studies have used a broad model of the shape of the conglomeratic band to guide predictions of bedding orientation, none of the previous studies have had the wealth of local detail that comes from the cluster analysis of geochemistry and the integration of this with surface geophysics to create a plausible and a data-consistent 3D model of the stratigraphic architecture of the plateau.

The experimental variograms of the ferrous and non-ferrous sediments in Esperança Center are similar (but noisier, due to fewer data pairs) to those shown in Figure 14.8 and Figure 14.9 for Esperança South. The variogram models used for the two populations in Esperança Center were the same as those used for Esperança South (Table 14.2).

In Esperança East, where the ferrous and non-ferrous clusters do not occur, the experimental variograms are like those of the non-ferrous sediments in Esperança South: generally lower in grade, and with shorter ranges of correlation than the ferrous sediments. The non-ferrous variogram model shown in Table 14.2 was used as the variogram model for the single estimation domain in Esperança East.

14.4 Domains for Resource Modeling

The three sedimentary packages created by the two major unconformities, combined with the red/green/blue groupings shown in Figure 14.7 create seven domains for estimation in Esperança South:

three ferrous domains separated by the two unconformities; three non-ferrous domains separated by the two unconformities; and one mafic domain that cuts across the unconformities.

The contacts between these have been treated as "hard" boundaries even though a conventional analysis of continuity across the boundaries does not show any sudden discontinuity in gold grade across any erosional surface or litho-geochemical boundary. The decision to treat the seven domains as separate populations for grade interpolation rests on the fact that their grade distributions and their ranges of correlation are different.

The ferrous sediments predominate in the middle package, between the two unconformities. This interpretation, derived solely from machine learning analysis of multi-element geochemistry clusters, is consistent with observations made by TriStar's external consulting geologists, both of whom have noted that hematization is not pervasive throughout the conglomeratic band but occurs predominantly in the center of the band in the unit they have identified as the "cobble conglomerate", and immediately above and below that cobble conglomerate (Lipson, 2016).

That hydrothermal fluids carrying iron from granitic intrusions were more easily able to find their way into the middle of the conglomeratic band is consistent with the cobble conglomerate being more porous than the finer-grained units toward the base and the top of the conglomeratic band. Furthermore, the existence of a coarser-grained cobble conglomerate in the middle of the conglomeratic band is consistent with a major marine regression that would have moved the shoreline outward, allowing coarser sediments to accumulate, followed by a major transgression that would have moved the shoreline inward. The bracketing of the ferrous sediments by major erosional surfaces above and below is therefore consistent not only with specific geological observations of the cobble conglomerate at Castelo de Sonhos and the pervasive hematization around the cobble conglomerate, but also with the geological understanding of how changes in sea level provide Gilbert fan-delta systems with their large-scale stratigraphic architecture.

There are two estimation domains in Esperança Center: the ferrous sediments and the non-ferrous sediments, both within the same erosional package.

In Esperança East there is only one estimation domain; all the blocks and drill hole data are treated as belonging to the same erosional package, and to the same litho-geochemical group.

14.5 Estimation Method

Recoverable resources within large blocks

Most of the previous resource estimates for Castelo de Sonhos have used 5×5×2m blocks. While continuing to use the same small blocks does have some value when it comes to comparing new models to old one, there are many better reasons to move to a larger block size as the project approaches its feasibility studies

A 5×5×2m block is tiny compared to the drill hole spacing, which is currently 50×50m, or wider. Grade interpolation into blocks that are much smaller than the drill hole spacing creates a false sense of smoothness in the block model. The similarity between grade estimates of neighbouring blocks is not a reflection of actual grade continuity in the deposit; instead, it is an artifact of small blocks with wide drill hole spacing. The configuration of nearby data barely changes when one goes from one 5×5×2m block to its neighbour. With the nearby data being the same and in just about the same configuration, the grade estimates of adjacent blocks will end up being very similar in a small-block block model.

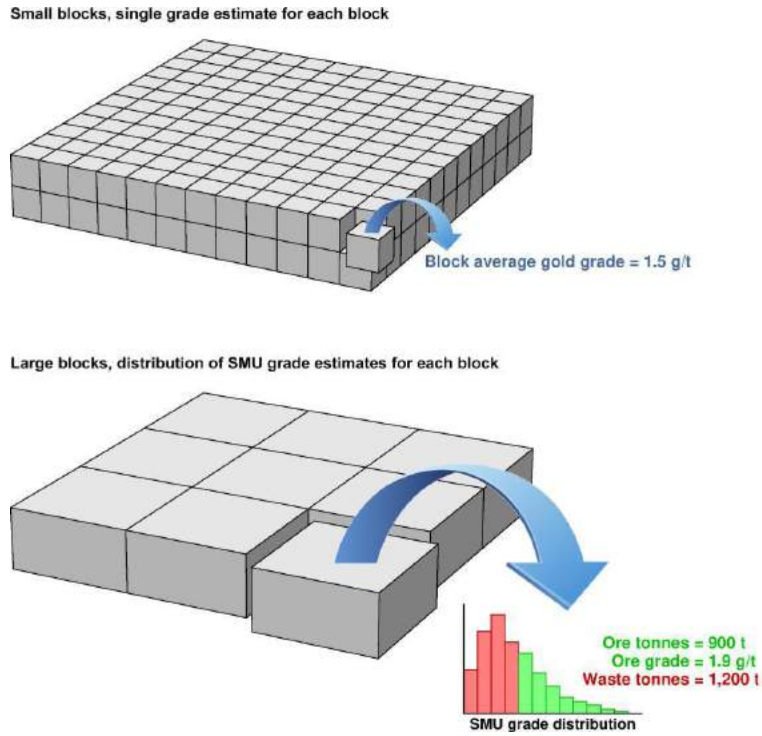


Figure 14.11 Schematic showing the difference between a conventional single-estimate block model and a recoverable-resources block model that provides an estimate of the SMU grade distributions within large blocks.

The temptation to use small blocks owes a lot to the tradition of estimating only the average grade of each block and then treating each block as either being entirely waste or entirely mineralised material, based on whether the estimate of average grade is above or below cutoff. A different way of tackling resource estimation is to go to bigger blocks and to imagine that it will be possible, within each block, to mine some of the material as mineralised while rejecting the rest of the block as waste. This approach estimates a distribution of grades with each block. Drill hole data is used to estimate the grade distribution of samples the size of drill core, and this distribution is then adjusted to consider the fact that the mine will not be able to segregate mineralised material from waste at the fine scale of small cylinders of rock but will, instead, have to deal with a practical lower limit on the volume of material that can be segregated and treated separately as either mineralised material or waste. In the technical language of mineral resource estimation, this practical lower limit is usually referred to as the "selective mining unit" (SMU). A block model that aims to estimate, within each block, the grade distribution of SMU-sized volumes is usually referred to as a "recoverable resources" model.

A recoverable resources model does not provide information on exactly where the mineralised material and waste will be found within any single block; the localization of the mineralised material and waste will await definition drilling and, ultimately grade control drilling. The conventional small block / single estimate approach seems to offer a prediction on where exactly the mineralised material and waste lie; but, as noted above, grade estimates for small blocks cannot correctly portray short-scale variability at distances much smaller than the drill hole spacing. Even though each block can be coded as being above or below a cutoff, this is an unreliable basis for mine planning when the blocks are much smaller than the drill spacing.

There are several geostatistical methods for building a recoverable resources model; the most common are the Uniform Conditioning (UC) procedure and Multiple Indicator Kriging (MIK). Done well, by someone experienced in either method, the two give similar results. UC was the method chosen by the QP for the 2017 resource estimates, Adrian Martinez of CSA. The method chosen for this internal resource update is the 'median IK' version of multiple indicator kriging (Goovaerts, 1997). With the median IK approach, the same variogram model is used for all indicator thresholds. This allows one to easily adapt the thresholds to the nearby data values in the search neighbourhood. By setting the indicator thresholds to exactly the specific grade values that occur nearby, the estimated grade distribution ends up being the collection of all nearby data, weighted by the kriging weight given by the median indicator variogram model.

Estimation parameters

<u>Block model configuration</u>

In all sub-areas (Figure 14.1) the resource block model uses 20×20×4m blocks that completely span the deposit sub-area. The horizontal dimension of the blocks is slightly less than half of the 50m drill spacing. The block height is the same as the bench height chosen for the Preliminary Economic Assessment (PEA) done in 2018.

Table 14.3 shows the boundaries of the block models in each sub-area, and the number of columns, rows and benches. Although the rectangular areas defined by the parameters in Table 14.3 overlap, there is no double-counting of resource blocks because the polygonal outlines shown in blue in Figure 14.1 were used to mask off each sub-area.

		Esperança South	**Esperança Center**	**Esperança East**
	Minimum	723000E	723000E	725000E
East-West	*Maximum*	726500E	725000E	728000E
	# of blocks	175	100	150
	Minimum	9088500N	9094000N	9092000N
North-South	*Maximum*	9093000N	9097000N	9095000N
	# of blocks	225	150	150
	Minimum	148m	336m	112m
Vertical	*Maximum*	676m	632m	536m
	# of blocks	132	74	106

Table 14.3 Block model configuration in each sub-area.

Although the height of the block model spans more than 500m of elevation, the only blocks that get MIK estimates are those within 150m of the ground surface, the notional depth of an open pit. With similar paleo-placer deposits being mined underground at Jacobina and Tarkwa, there is a possibility that the Castelo de Sonhos plateau could also hold deep resources more than 150m from the surface that could be developed by underground mining methods. Since the current focus of the CDS Project, however, is the development of a stand-alone open pit mine, no resources have yet been estimated more than 150m below the ground surface.

Volume proportion estimates for domains

In each block, the volumetric contribution of each domain was calculated directly from the litho-geochemical wireframes and the erosional surfaces. Very close to half of the blocks (49%) lie entirely inside a single domain; the other half have a mixture of two or more domains. The wireframes for the litho-geochemical units have all been clipped to topography, so any volume not accounted for by the rock domains is air.

Density

All rock in the resource model is assumed to have a dry bulk density of 2.68t/m^3, the average of the density measurements done on drill core in 2018.

Grade distributions

For each domain that contributes to a block, MIK was used to estimate its assay grade distribution from nearby samples within the same domain. In half the blocks, only one MIK estimation is necessary because the block falls entirely within a single domain. In the other half, MIK estimations are needed for each domain, with the grade distribution for each domain being estimated with an entirely different set of nearby samples. In most of the blocks that straddle domain boundaries, two MIK estimations are needed. In rare instances, especially near the mafic dykes, MIK needs to be run three times to estimate the grade distributions in each of the three domains that contribute material to some blocks.

Search ellipsoid

A 200×200×25m search ellipsoid was used for the MIK estimates for every domain in every block. This aligns the search ellipsoid with the variogram model of the ferrous sediments, which had the longest ranges. This entails that the grade distributions for the non-ferrous sediments and the mafic dykes can be estimated from samples slightly beyond the range of their variogram; but this is preferable to not being able to estimate the grade distributions for each domain that contributes to a block in those blocks where there is a mixture of ferrous and non-ferrous sediments, or a mixture of ferrous sediments and mafic dykes. The classification approach discussed later ensures that non-ferrous and mafic blocks are classified as inferred if they had no samples within the shorter ranges of their variogram models.

For the ferrous and non-ferrous domains, the long axes of the search ellipse were parallel to the local bedding direction calculated from the litho-geochemical wireframes (e.g. Figure 14.4). For the mafic dykes, the long axes of the search ellipse were parallel to the orientation of the dykes, which have an average strike of N77°W and dip 20° to the south.

Octant search and requirement that samples within the same block always be used

Since multiple indicator kriging is an attempt to estimate a distribution, it works best when many nearby samples are used. The search strategy used an octant search and allowed up to four samples in each octant. In blocks that fall entirely within a single domain, the MIK estimates were usually based on 32 nearby samples from that domain. In blocks the straddle domain boundaries, the MIK estimates can be based on 64 nearby samples from two domains or, in rare instances (usually near mafic dykes) on 96 nearby samples from three domains.

It is possible, especially in areas with dense drilling, that some of the nearby samples that were dropped in the octant search (because there were at least four other samples that were closer in the same octant) still fall within the block being estimated. To ensure that the calculation of the grade distribution in each block always considers the samples that fall within that block, additional samples were included if they fell within the block being estimated but had been dropped during the octant search.

Upper class mean

One of the reasons MIK produces good results on deposits with erratic high grades is that the workflow calls for careful attention to be paid to the upper class. MIK replaces the capping of high-grade values with the choice of a conservative mean value for the upper class. With the median IK approach allowing the thresholds to be adapted to each search neighbourhood, it might appear that there is no reason to worry about the upper class. But the underlying problem of erratic high values having undue influence does not go away. Even when the median IK version is being used, it is still good practice to choose a high threshold and to calculate a conservative value that can be used as the average grade above this threshold.

For all three sub-areas, 5g/t was chosen as the highest cutoff; this is approximately the 99.5th percentile of the grade distribution. From the assay data base, the raw average grade of the assays above 5g/t is 11.1g/t. For the interim resource model, the average assumed for any material above 5g/t was lowered to 10g/t; this results in a loss of about 3% of the metal content. 10g/t also happens to be the assay capping value that has been used in previous resource estimation studies, so this MIK model treats erratic high values in a manner similar to what has been done historically for the project.

Below 5g/t, the indicator thresholds are set to the assay values in the search neighbourhood, so there is no need for class means: each assay value below 5g/t ends up falling in its own class and can speak for itself.

Volume-variance adjustment and SMU size

MIK estimates the grade distribution at the level of selectivity of the drill hole samples: small cylinders of rock that are often regarded as “points”. Before the mineralised material and waste tonnages and grades are calculated, the point-grade distribution must be adjusted so that it properly reflects the grades that can be expected for SMU-sized volumes. This adjustment consists of preserving the mean of the point-grade distribution while reducing its variance. For this interim resource update, the method used for the volume-variance adjustment is the indirect lognormal correction (Isaaks and Srivastava, 1989), which needs just one parameter: the variance reduction factor, which calibrates how much less variable the SMU grades will be than the original drill hole grades.

For this interim resource update, the SMU is assumed to be 3.5×3.5×2m. This assumption is based on the following considerations:

- The size of the SMU is often set to the size of a single truckload since this is the minimum volume of rock that could be sent to the process plant or to the waste dumps. 3.5×3.5×2m contains approximately 65 tonnes of rock, in-situ. The truck size selected in the project’s 2018 PEA was 40t.
- The size of the SMU is sometimes chosen according to the blast hole spacing. At Tarkwa, the operating mine whose deposit is the best analog for Castelo de Sonhos, the blast hole spacing is approximately 3.5 – 4 meters.
- The PEA envisaged a 4m bench height, and many paleo-placer open pits use half-bench mining in daily operations to minimize dilution and mineralised material loss.

There are two ways of estimating how much the variance of the gold grade distribution will decrease going from drill hole assays to 3.5×3.5×2m blocks: one uses the variogram model to calculate a theoretical value, the other uses composite statistics to calculate an empirical adjustment directly from drill hole data.

Using the variogram models for the sedimentary units (Table 14.2), the theoretical approach gives a variance reduction factor of 46%. Using the assay data base, the empirical variance reduction going from assays to 2m composites is 44%. For the volume-variance adjustment of the MIK point-grade distributions, the variance reduction factor was assumed to be 45%.

Since the ferrous, non-ferrous and mafic material can be segregated within the pit, based on a combination of visual observation and portable XRF analysis, the volume-variance adjustment was done separately for the ferrous sedimentary rocks, for the non-ferrous sedimentary rocks and for the mafic dykes. In each of these groups, the SMU grade distribution moves toward the mean of that group, and not toward the mean of the entire block. This assumption has implications for grade control practices. If day-to-day grade control does not include an attempt to separate ferrous and non-ferrous materials, and to keep both separated from dykes, then the mine will experience more dilution that has been assumed in this study.

For blocks that straddle unconformities, the grade distributions from both sides of the unconformity were combined before the volume-variance adjustment was done. This is a slightly pessimistic assumption because it assumes that it will be difficult to recognize unconformities in the pit, and this may not be a correct assumption. It is possible that detailed mapping in the pit might be able to recognize unconformities, and that this might allow rock to be separated if one side of an unconformity is known to be mineralized while the other side is known to be barren.

14.6 Classification

Consistency in classification and adherence to CIM Definition Standard

Classification of the interim resource block model was done using the same approach that has been used previously for Castelo de Sonhos: preliminary classification codes based on block-by-block information from grade interpolation were smoothed to create more continuous regions that are consistently classified.

Assignment of preliminary codes from block-by-block estimation metrics

The criteria used to assign preliminary classification codes to each block, based on information gathered during the MIK estimation is shown in Table 14.4.

	Integer Code	Weighted Average Variogram Distance	Number of octants with data	Number of drill holes
Measured	1	< 0.25	4+	4+
Indicated	2	< 0.50	4+	2+
Inferred	3	Not used	1+	1+

Table 14.4 Estimation metrics for preliminary classification codes.

The weighted average variogram distance is the average of the distances to the samples used for estimation, expressed as a fraction of the variogram range, and weighted by the kriging weights assigned during MIK. When this distance is 0.5, it means that the nearby samples were, on average, at a distance halfway to the range of the variogram.

The criterion related to the number of octants with data ensures that Measured and Indicated resources are well surrounded by data on all sides. If the number of octants with data is three or less, this indicates that block was estimated by extrapolating beyond the region covered by drill hole data.

Esperança South examples of the preliminary classification codes are shown in map view in Figure 14.12, and in cross-section in Figure 14.13.

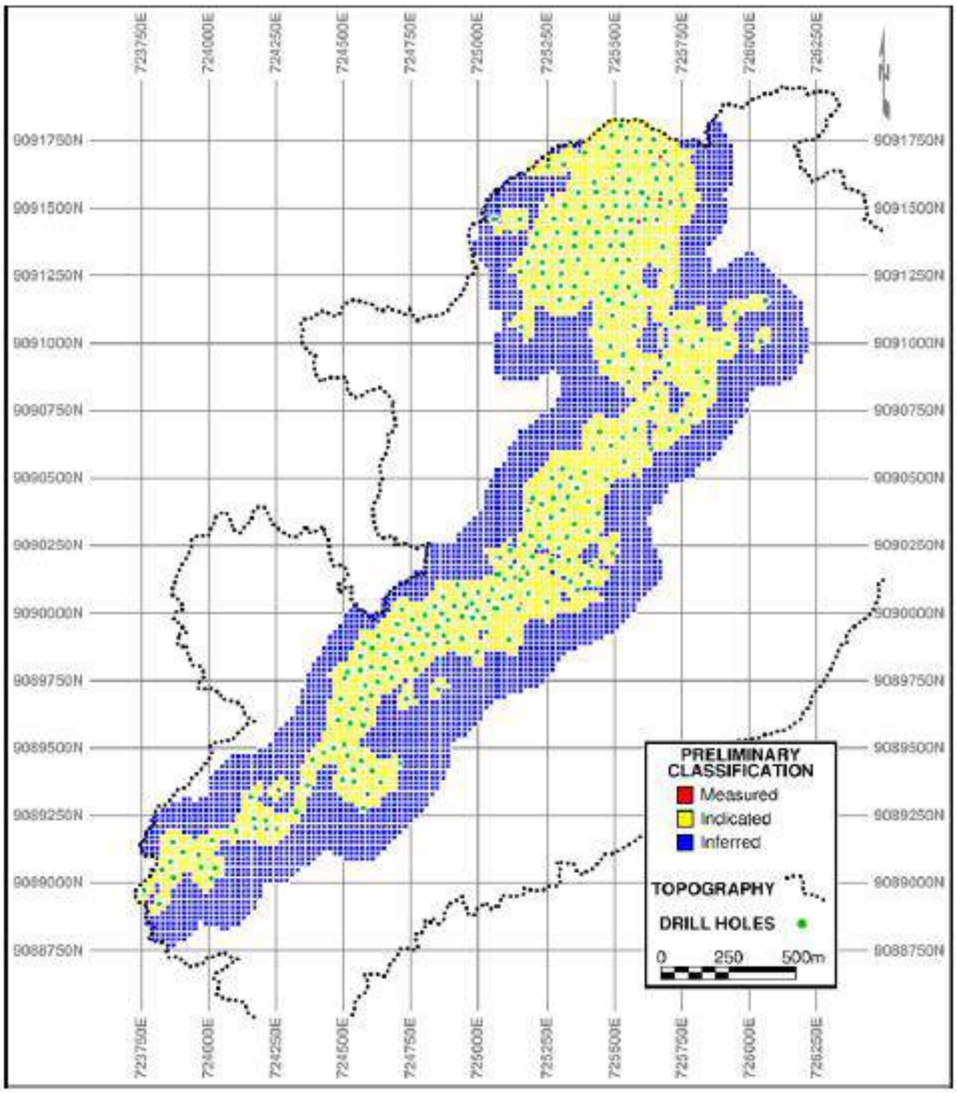


Figure 14.12 Preliminary classification codes on the 572 – 576m bench in Esperança South.

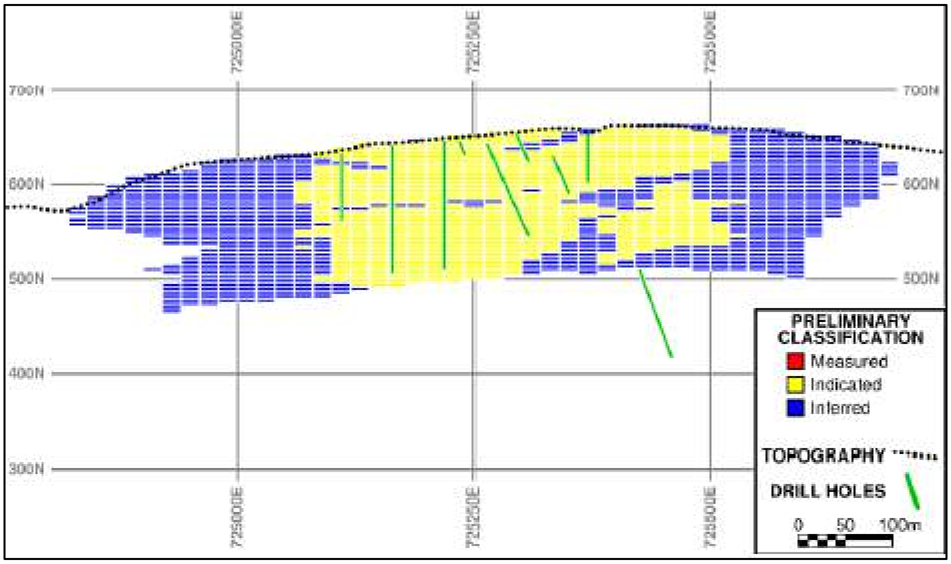


Figure 14.13 Preliminary classification codes on the cross-section at Y= 9090250N in Esperança South.

Adjustments to preliminary classification codes

Two adjustments were made to the preliminary classification codes prior to smoothing: blocks classified as Measured were recoded as Indicated, and lobes of Inferred blocks down-dip from garimpos were recoded as Indicated.

Blocks classified as Measured were recoded as Indicated because there are hardly any blocks that meet the Measured criteria in Table 14.4. On Figure 14.12, a few isolated red blocks can be seen at the north end of Esperança South; these happen to lie in just the right location to pick up data from four different drill holes and to have the average distance to the nearby data be less than ¼ the range of the variogram. But there are very few locations where this occurs. In the entire model, less than 0.1% of the blocks had preliminary classification codes of Measured. For this reason, none of the blocks properly meets the definition of Measured prescribed by the CIM Definition Standard.

The cross-section in Figure 14.14 shows an example of a lobe of Inferred (blue) blocks running down-dip from the surface location where small-scale artisanal mining once occurred; this is blown up and annotated below:

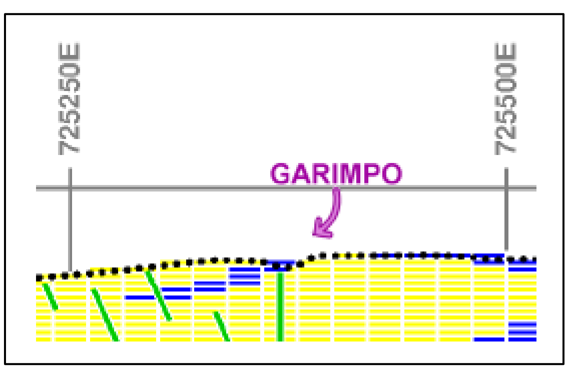


Figure 14.14 Inferred blocks un blue down dip from garimpos.

The garimpo is evident from the depression in the LIDAR topography and is also cataloged in the garimpo layer of the project's GIS data base. The inability of blocks in this lobe to meet the criteria for classification as Indicated is a consequence of the difficulty of drilling in some of the garimpos; it is not a reflection of lack of certainty about mineralization. Had the garimpo not been dug, the vertical hole nearest the garimpo would have shown strong mineralization in its top few samples, which would have connected down-dip to another hole that shows the same mineralization. With two holes available for estimation, the blocks between the surface and the hole almost 100m down-dip would have met the Indicated criteria in Table 14.4. But with the historical mining having removed the near-surface mineralization, there is a lack of data in the right location to support estimation down-dip.

Using the grid of bedding orientations (Figure 14.4), all the garimpos in the GIS data base were traced down-dip, up to half the range of the variogram. Any Inferred block along the down-dip extension of the garimpo was reclassified as Indicated. The existence of a block classified as Inferred entails that there must have been at least one drill hole available for estimation. The presence of the garimpo up-dip, and within half the range of the variogram, indicates that the lack of sample data from a second drill hole is due to historical mining having eliminated the possibility of drilling material that was almost certainly well mineralized.

Smoothing of preliminary classification codes

The blocks classified as Indicated were assigned an integer code of 2; the blocks classified as Inferred were assigned an integer code of 3. These integer codes were then spatially averaged within a 280×280×32m local neighbourhood. The size of the averaging region was determined by calculating the size of a flat-lying rectangular block that contains approximately three months of production, using the mining rates and stripping ratios documented in the PEA.

The final classification is the result of resetting the spatially-averaged values (which lie between 2 and 3) to 2 if they were below 2.5 and to 3 if they were above 2.5.

Figure 14.15 shows the map from Figure 14.12 after the smoothing and reclassification; Figure 14.16 shows the cross-section from Figure 14.13 after the smoothing and reclassification. Both examples show how the spatial averaging has made the classification more spatially coherent. The small, stranded islands of inconsistently classified blocks are gone, creating broad regions of Indicated and Inferred that conform better to the intention of the CIM Definition Standard.

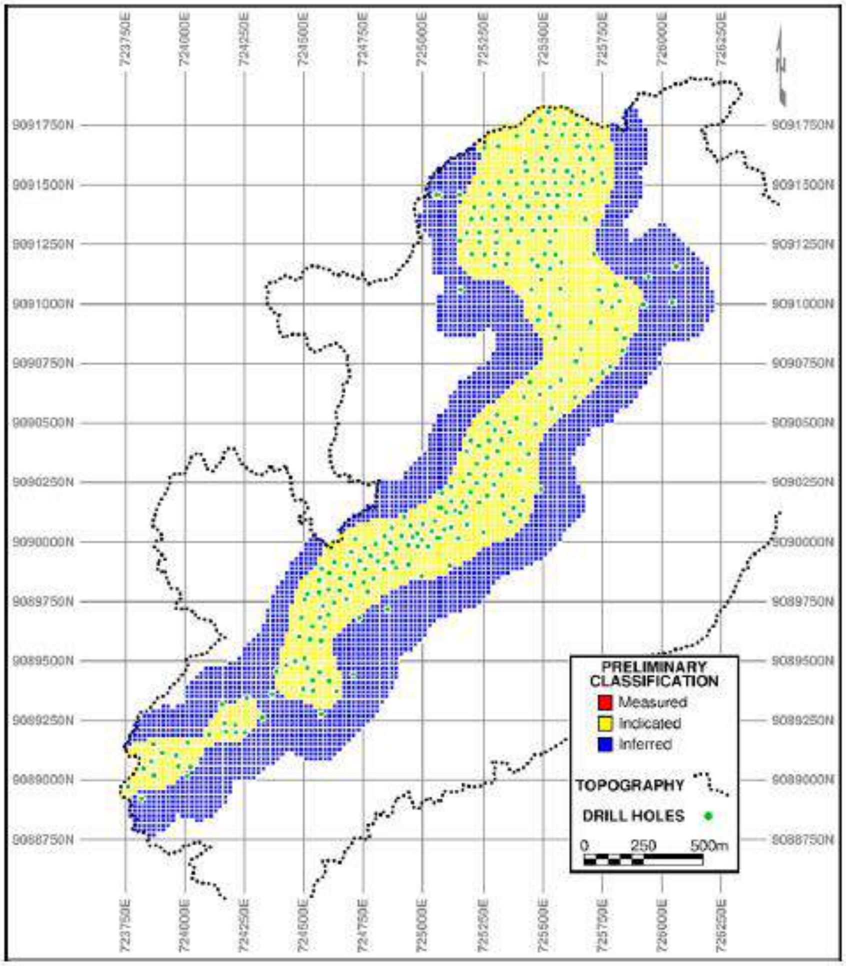


Figure 14.15 Final classification codes on the 572 – 576m bench in Esperança South.

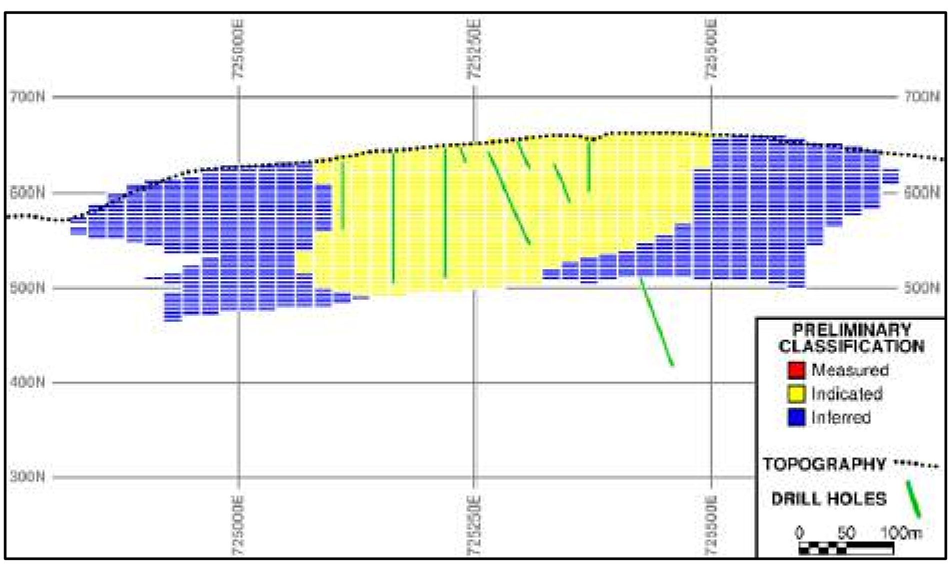


Figure 14.16 Final classification codes on the cross-section at Y= 9090250N in Esperança South.

14.7 Reporting Pit Shell

A reporting pit shell (Figure 14.17) was used to constrain resources, using the technical and economic parameters in Table 14.5. These parameters were chosen to reflect “reasonable prospects for economic extraction” during the coming decade since the project’s PEA has demonstrated that a ten-year life-of-mine is a reasonable assumption.

CAPEX	$184,000,000
Gold price	$2,000/oz
Maximum slope of pit walls	55°
Metallurgical recovery	98%
Ore loss during mining	5%
Dilution during mining	5%
Mining cost	$3/t
Processing cost	$12/t
Selling cost + G&A	13.60/oz
Cutoff grade	0.3 g/t Au

Table 14.5 Economic and technical parameters used to define the reporting pit shell.

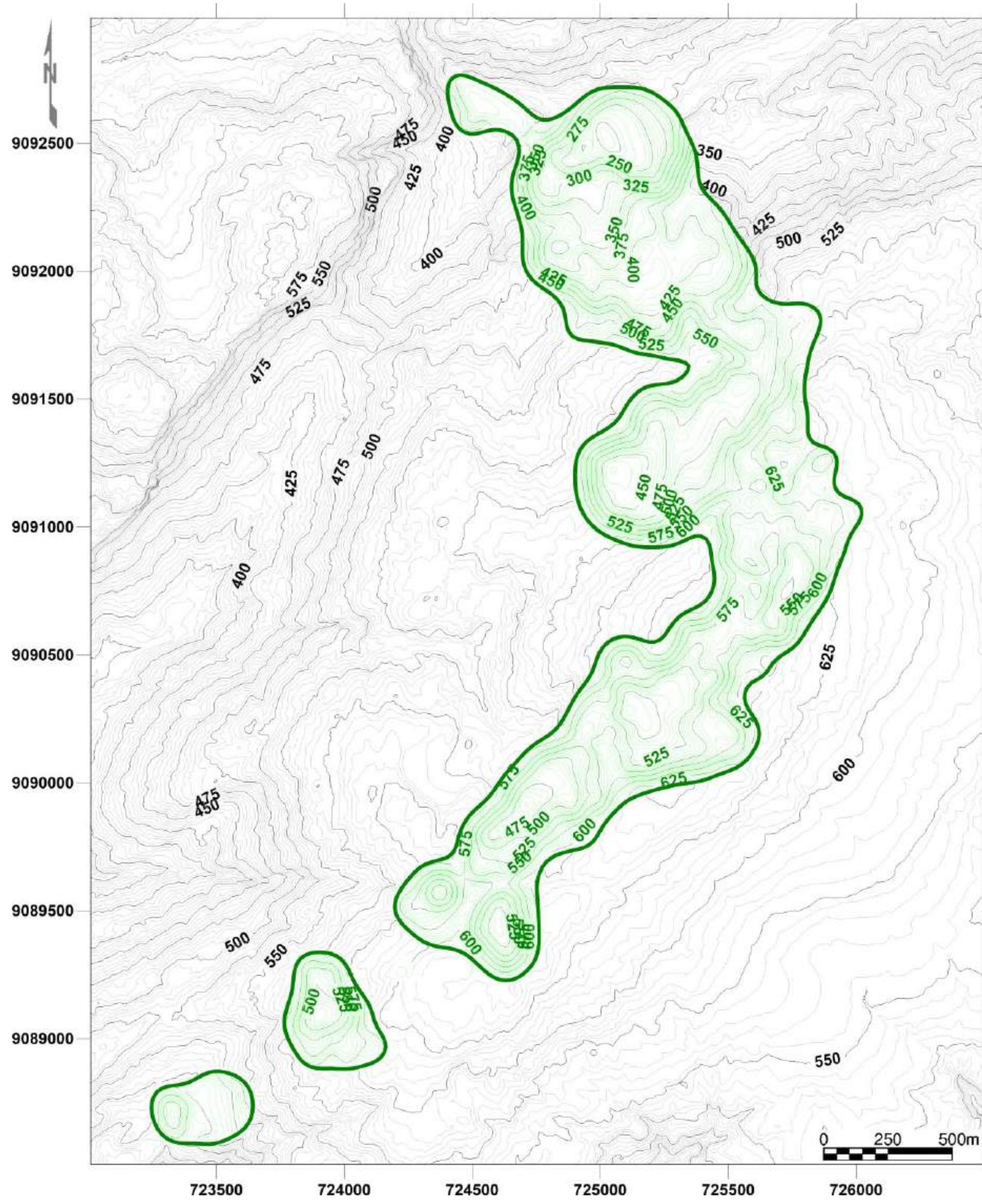


Figure 14.17 Contour map of pit shell used in Esperança South for reporting resources.

14.8 Block Model Validation

The block models created for each sub-area were checked visually against the original drill hole data and the litho-geochemical interpretation, in map view and on cross-sections.

For each 20x20x4 block penetrated by drill holes, its average grade was compared to the average grade of the assays that fall within the block (Figure 14.18). This check assists with the identification of specific blocks where the estimate differs noticeably from the assays inside the block. Examination of the details of several of the estimates that fall well off the main diagonal confirms that the differences are due to the litho-geochemical domains, which can limit the influence of an assay by limiting the volume it can affect, or by other assays outside the block that are nearby and strongly correlated.

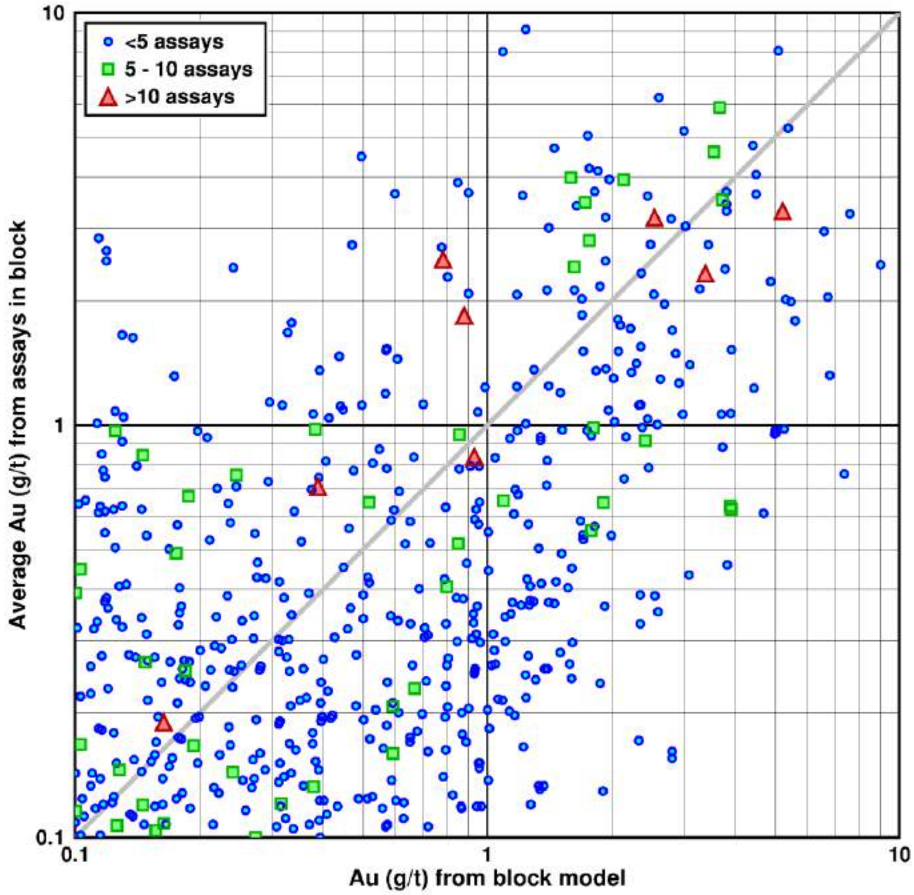


Figure 14.18 Comparison of MIK estimate of block average grade to the average of assays that fall within 20x20x4m blocks in Esperança South, with data colour-coded according to the number of assays in the block.

Swath plots were constructed that compare the proportion of material above cutoff in the drill holes to the proportion of resource tonnes in the resource block model, and that compare the estimates of resource grade above cutoff from the block model to the average assay grade above the same cutoff. Swath plots for Esperança South along the block models columns (Figure 14.19), its rows (Figure 14.20) and its levels (Figure 14.21) confirm that the MIK block model is consistent with the drill hole data both in terms of the proportion of tonnage above the reporting cutoff as well as the average grade above cutoff. Similar plots were constructed and reviewed for Esperança Center and Esperança East.

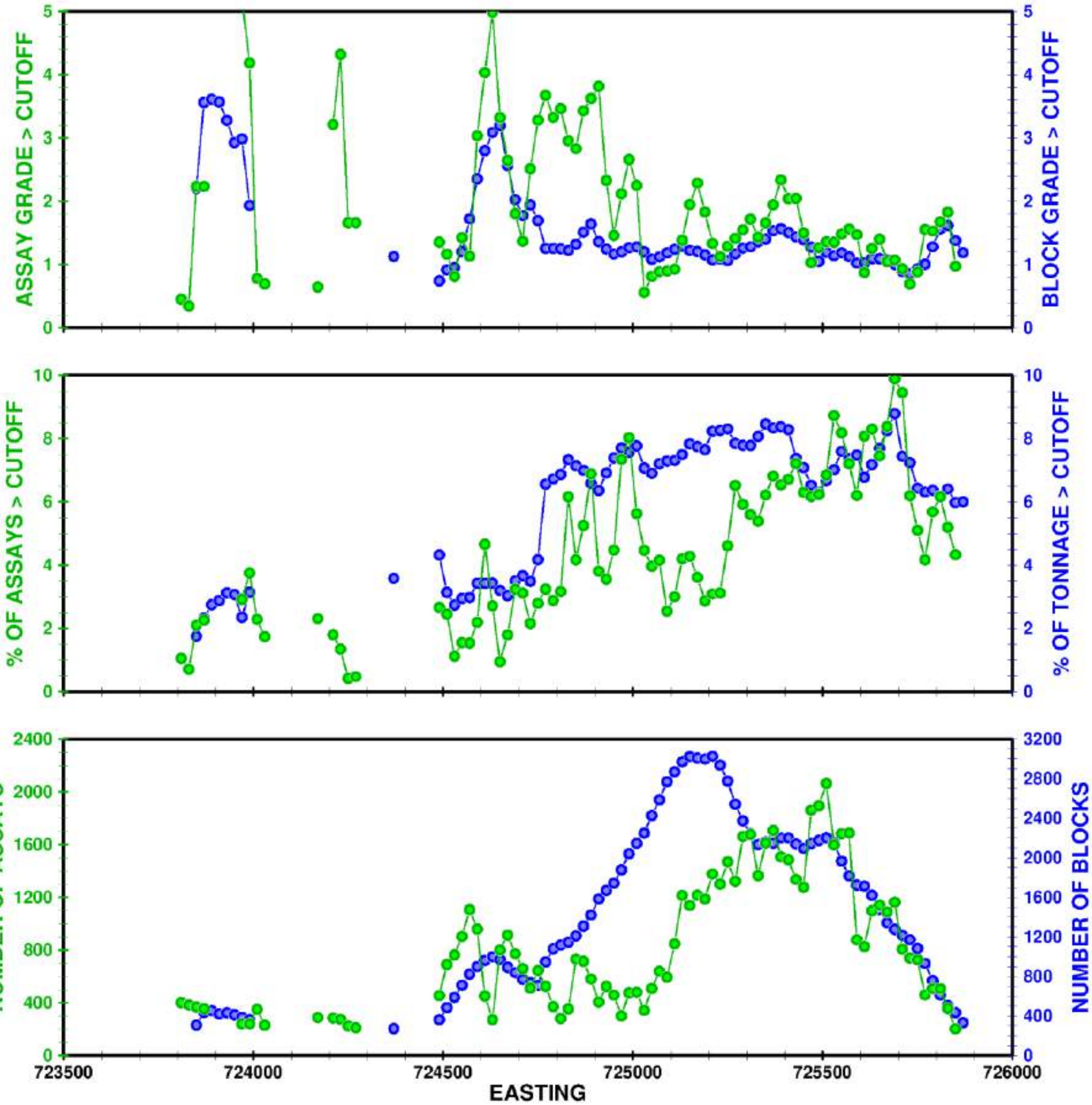


Figure 14.19 Swath plots along the columns of the Esperança South block model, showing grade above the resource cutoff (top), the proportion of tonnage above cutoff (middle) and the number of samples (bottom). Calculations from the drill hole assays are shown in green, and those from the block model are shown in blue.

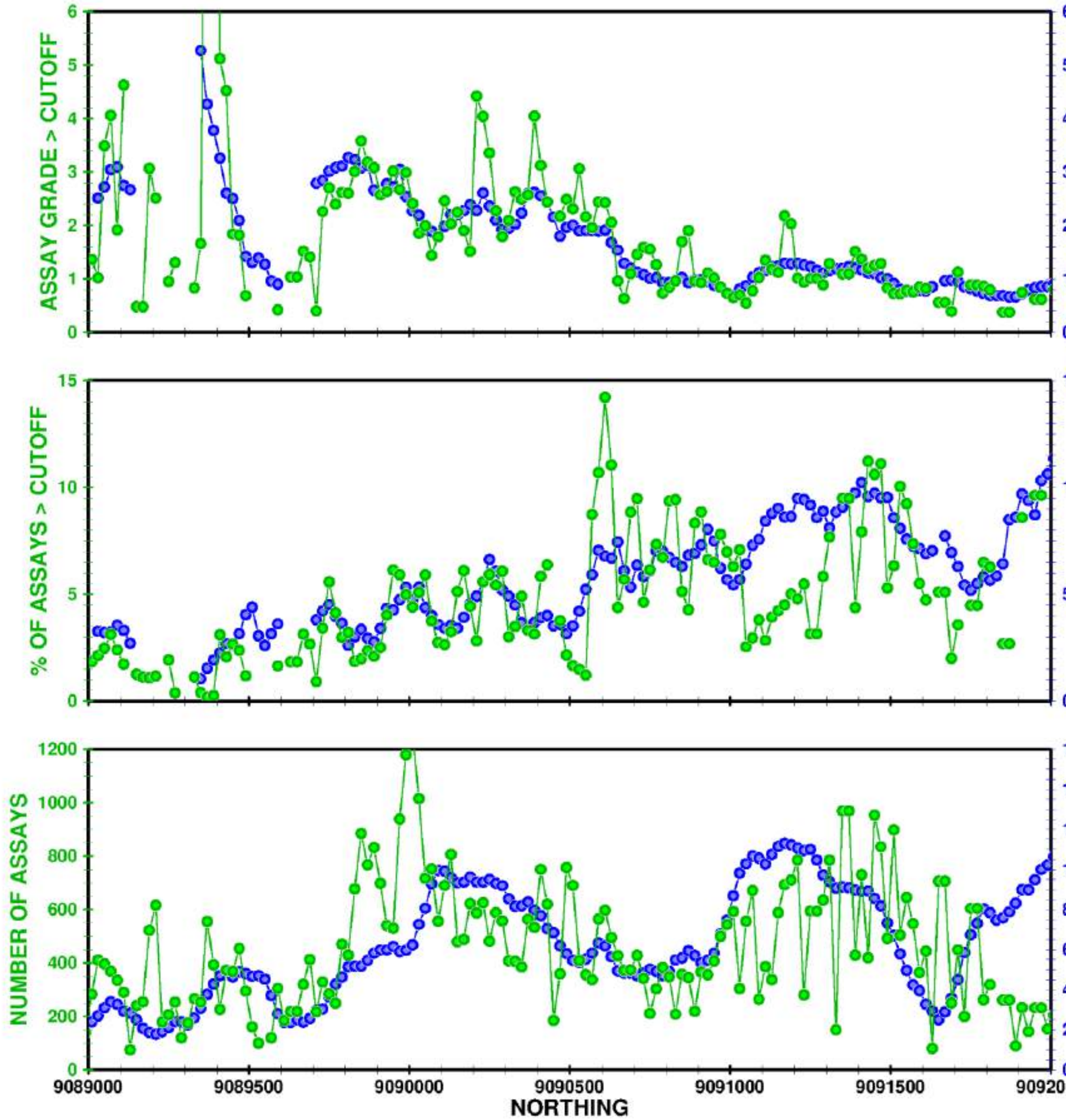


Figure 14.20 Swath plots along the rows of the Esperança South block model, showing grade above the resource cutoff (top), the proportion of tonnage above cutoff (middle) and the number of samples (bottom). Calculations from the drill hole assays are shown in green, and those from the block model are shown in blue.

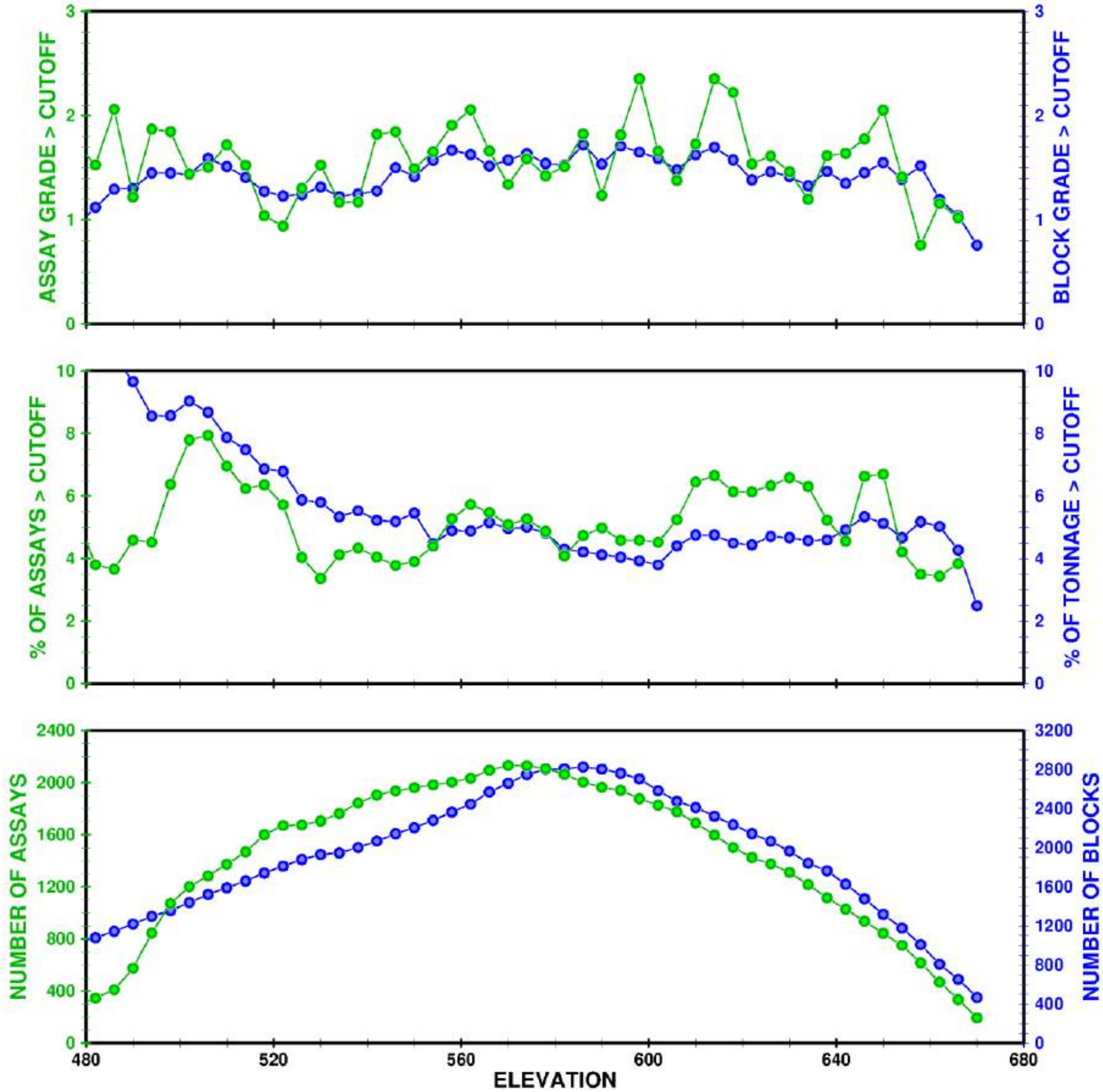


Figure 14.21 Swath plots along the levels of the Esperança South block model, showing grade above the resource cutoff (top), the proportion of tonnage above cutoff (middle) and the number of samples (bottom). Calculations from the drill hole assays are shown in green, and those from the block model are shown in blue.

14.9 Current Resource Estimate

The current resource estimates for the CDS Project are shown in Table 14.6.

Target	Classification	Tonnage (Mt)	Grade (g/t Au)	Metal Content (Moz)
Esperança South	Indicated	24.5	1.3	1.1
	Inferred	10.4	1.1	0.4
Esperança Center	Indicated	13.1	0.8	0.3
	Inferred	2.4	0.9	0.1
Esperança East	Indicated	2.4	1.1	0.1
	Inferred	9.4	0.9	0.3
CDS Project Total	**Indicated**	**40.1**	**1.2**	**1.5**
	Inferred	**22.2**	**1.0**	**0.7**

Notes:

1. *All figures have been rounded to the reflect the appropriate precision for the estimates. Summed amounts may not add due to rounding.*
2. *The mineral resource estimate was prepared in accordance with the CIM Definition Standard and CIM Best Practice Guidelines, using geostatistical methods, plus economic and mining parameters appropriate to the deposit during the next ten years.*
3. *The 0.3g/t cutoff corresponds to marginal cutoff grade for an open pit with processing + G&A cost of $US 12/t, metallurgical recovery of 98% and a gold price of $US 1,250/oz.*
4. *These are mineral resources and not reserves and as such do not have demonstrated economic viability.*
5. *The metal content estimates reflect gold in situ, and do not include considerations typically considered for reserves, such as external dilution, mining losses and process recovery losses*
6. *The QP responsible for resource estimates is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing or political factors that might materially affect these mineral resource estimates.*

Table 14.6 Mineral Resource estimate for the Castelo de Sonhos Project Gold for a reporting cutoff grade of 0.3g/t, with an effective date of December 31st, 2020.

Comparison to previous estimate

The project-wide totals for the previous resource estimate and for the updated current resource estimate are shown in Table 14.7.

	Classification	Tonnage (Mt)	Grade (g/t Au)	Metal Content (Moz)
Current Project Total	Indicated	40.1	1.2	1.5
	Inferred	22.2	1.0	0.7
Previous Project Total	Indicated	17.7	1.2	0.7
	Inferred	39.8	1.0	1.3

Table 14.7 Comparison of current and previous resource estimates for the Castelo de Sonhos Project.

The drilling program begun in the Fall of 2019 has achieved its primary purpose: the conversion of Inferred resources to Indicated resources. Previously, the split between the two categories was roughly 1/3 in Indicated and 2/3 in Inferred; the split is now reversed: 2/3 in Indicated and 1/3 in Inferred.

15. MINERAL RESERVES ESTIMATES

Mineral Reserves have not yet been estimated for the Castelo de Sonhos Gold Project.

16. MINING METHODS

This section contains the same information as that provided in the same section of the 43-101 Technical Report filed on SEDAR by TriStar, entitled "Castelo de Sonhos Gold Project, Pará State, Brazil Amended Independent Technical Report – Preliminary Economic Assessment" with an effective date of September 14, 2018. The QP taking responsibility for this section also took QP responsibility for the same section in the previous report and is of the opinion that the information remains relevant and current despite the fact that it pre-dates the current resource estimate. Work is already underway on the Pre-Feasibility Study (PFS) for Castelo de Sonhos; the technical and economic analysis presented in the PFS will be based on new resource estimates, will not assign any economic value to Inferred resources, and, when published, will entirely replace the PEA analysis.

GE21, based on the Mineral Resource declared in this report prepared a Preliminary Economic Assessment ("PEA") aiming to assess the economic viability of the Castelo de Sonhos Project.

A PEA is preliminary in nature, it includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the PEA will be realized.

The economic analysis was based on potentially recoverable resources.

The Castelo de Sonhos Project will be an open pit operation utilizing a contract mining fleet of hydraulic excavators, front-end loaders and 36 tonne haul trucks, associated with correspondent ancillary equipment. The mine planning model adopted is a "diluted" model, adding approximately 0% dilution and 95% of recovery to the source model.

The disposal of waste rock will be executed on an area close to the pit. The site shall be adequately prepared to include drainage at its base and channels to direct the flow of water with the aim of aiding geotechnical stability and mitigating the erosion of the stockpiled material.

The operation of this phase, in accordance with the ascending method, shall begin during the construction of the heap at the base of this area. Waste rock will be disposed by truck, which will then be uniformly distributed and leveled by an operator using a tractor. The procedure is then repeated, stacking another bank above the original one, while maintaining a ramp for the trucks to be able to access the area.

16.1 Pit Optimization

The determination of the optimal pit was based on:

- The definition of the economic and geometric parameters in order to produce the economic function, cutoff grade and legal and property restrictions;
- A calculation of the interlocking of optimal pits using Geovia Whittle 4.3 software;
- The selection of the minimum optimal pit with enough mineralized material to supply a production of 3.0Mtpa during Life of Mine (LOM).

The economic and geometric parameters were defined from a combination of first principles and GE21's database of projects of similar scale and characteristics.

The determination of the geometry of the mathematical pits was executed through the generation of an optimal sequence of pushbacks, which correspond to increments in the geometry of the pit resulting from the repeated use of the three-dimensional Lerchs & Grossman algorithm for different values of blocks that are obtained by varying the price of the product through the use of a revenue factor.

This sequence of pit expansions, or pushbacks, is the basis of open pit mine planning when using Whittle software, which projects the evolution of the geometry of the pit over time. The evolution of the mining process over time can be simulated with two criteria: the maximizing NPV approach or the maintaining production approach. The first attempts to maximize the operation's financial returns based on a sequence of pushbacks that optimize the cash flow; the latter aims to maintain the feed to the processing plant at a constant level.

The sequence of optimal pits was obtained by varying the revenue factor from 10% to 120% with respect to the product's selling price. To determine the evolution of the pits over time, an annual production scale of 3.0Mtpa of ROM was established, at an Annual Discount Rate of 10%. Table 16.1 presents the pit optimization parameters used to define the sequence of pits, and Figure 16.1 to Figure 16.3 show the evolution of optimization pushbacks graph with the chosen pit highlighted.

Table 16.1 Presents the pit optimisation results of the Castelo de Sonhos project.

	Item		**Unit**	**Value**
Physical	Economic Parameters	Sell Price	$/oz	1375
		Discount Tax	%	8
	Resources	Class	Indicated	
			Inferred	
	ROM	Density	g/cm^3	model
		Grade	%	model
	Mining	Recovery	%	95
		Dilution		0
	Block Model		**Unit**	**Value**
		X	m	10
		Y		10
		Z		4
	Slope Angle	Degree	°	55
	Metallurgical Recovery		%	98
	Cut-off Grade*	**Grade**	**Unit**	**Value**
		Au	g/t	0.35
Costs		ROM	$/t mov.	3
		Waste		3
		Process	$/t.	12
		Selling Cost and G&A	$/oz	13.6

*CutOff: Based GE21 calculation (process cost $12/t, Mining Cost $ 3/t G$A $ 13.6/oz recovery 98%: 0.35g/t

Table 16.1 Pit Optimization Parameters.

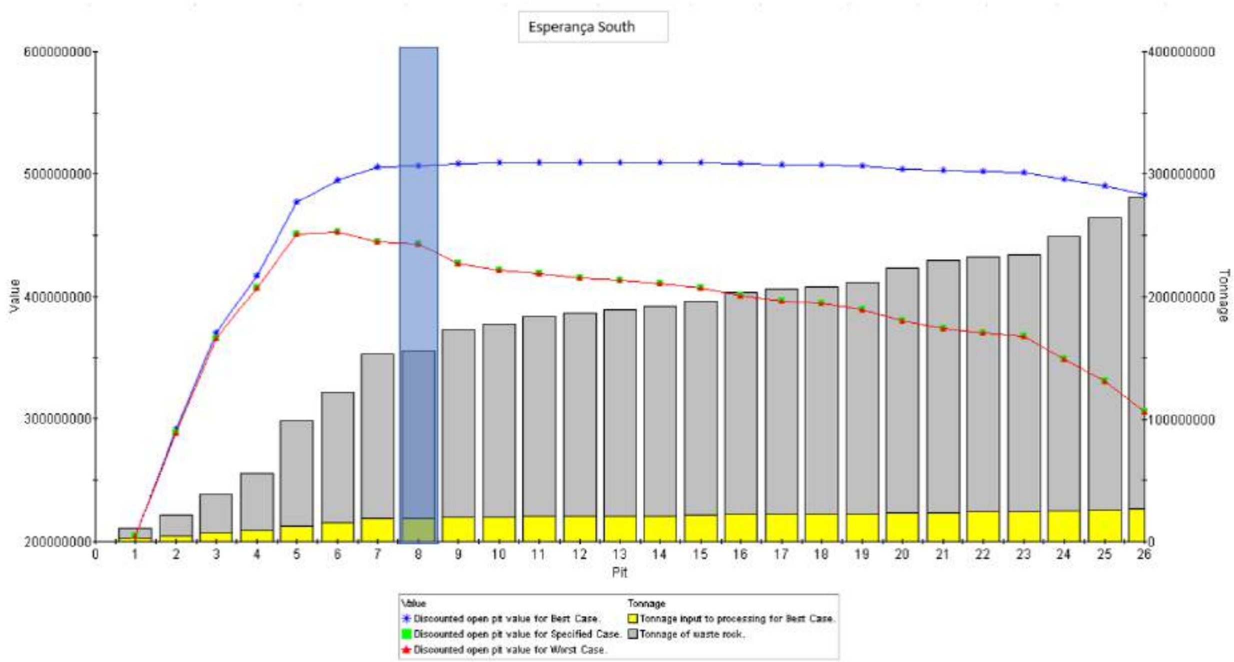


Figure 16.1 Pit Optimization Results – Esperança South.

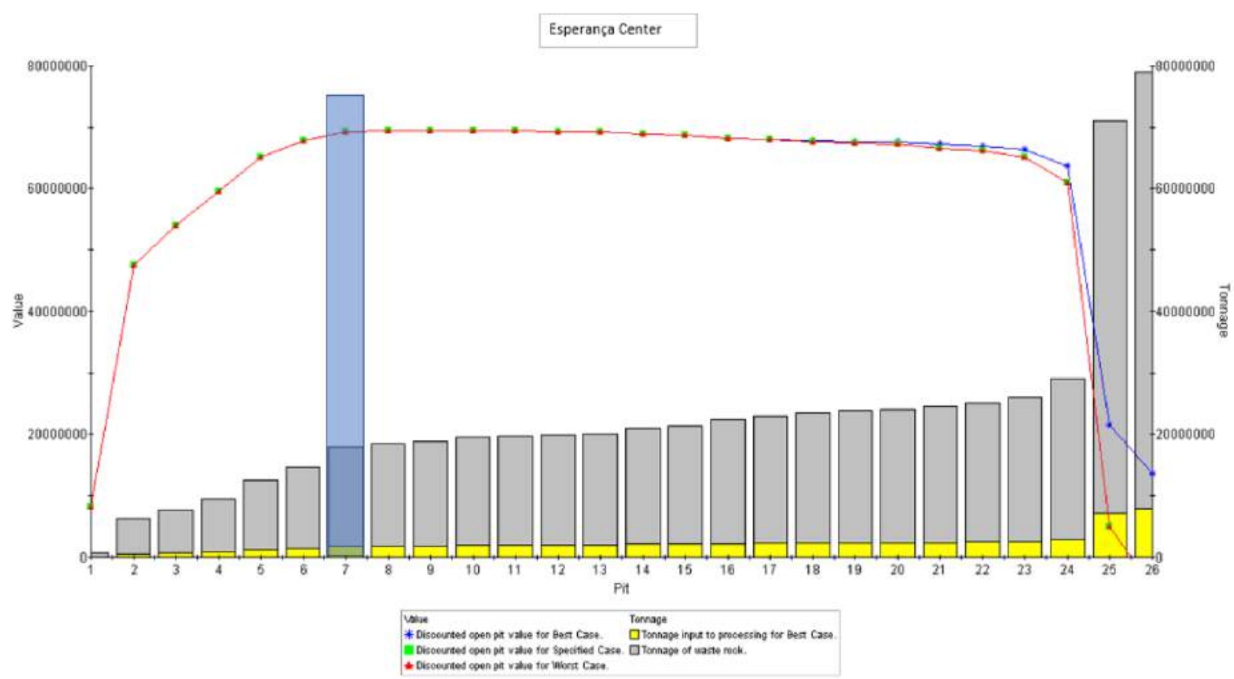


Figure 16.2 Pit Optimization Results – Esperança Center.

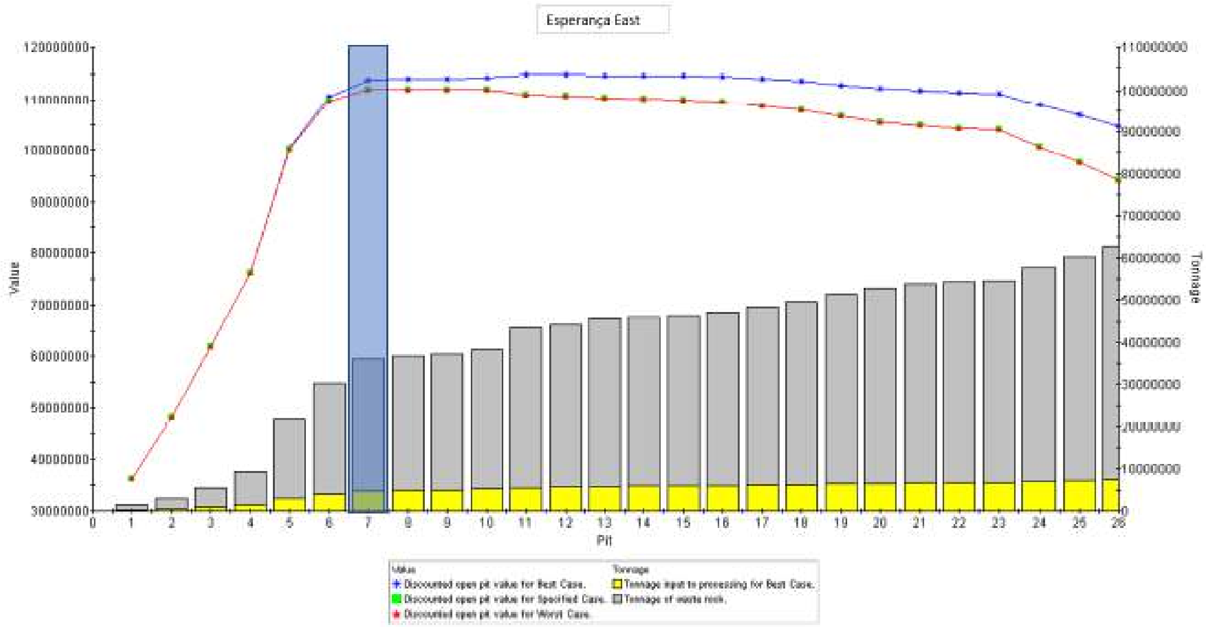


Figure 16.3 Pit Optimization Results – Esperança East.

Pit Optimization Mineable Resource						
Area	**Rock(Mt)**	**ROM(Mt)**	**Waste(Mt)**	**SR**	**Grade Au(g/t)**	**Koz**
Esp. South	156.0	18.8	137.2	7.30	1.50	906
Esp. Center	18.0	1.8	16.2	9.10	1.78	102
Esp. East	35.9	4.8	31.1	6.51	1.29	198
Total	**209.9**	**25.4**	**184.5**	**7.28**	**1.48**	**1 206**

Modifying Factors applied: Mining Recovery: 95% and Dilution: 0% -Block Model: 10m x 10m x 4m

Table 16.2 Resources in Optimized Pit after recovery and dilution factors have been applied.

16.2 Pit Design

The Mine Design or Pit Design, consists of projecting, based on an optimal pit, an operational pit that allows for the safe and efficient development of mining operations.

The methodology consists of establishing an outline of the toes and crests of the benches, safety berms, work sites and mining site access ramps while adhering to the geometric and geotechnical parameters that were defined. GE21, due the nature of the report does not project any ramp or primary access in the pit design. The assumptions that were adopted for the operationalization of the final pit shells for each period of mining were:

- Minimize the loss of mineralized material;
- Define the access routes to attain shorter average transport distances.

Table 16.3 presents the geometric parameters that were adopted to develop the mine design for each end of period. The data was obtained from similar projects in GE21's database. Figure 16.4 presents the Pit Design at the end of Year 9.

Pit design parameters

Overall Slope Angle	55°
Face Angle	79°
Bench Height ROM	8
Bench Height Waste	4
Berm width	4
Minimum bottom area	30m
Road Ramp width	12m

Table 16.3 Pit Design Parameters.

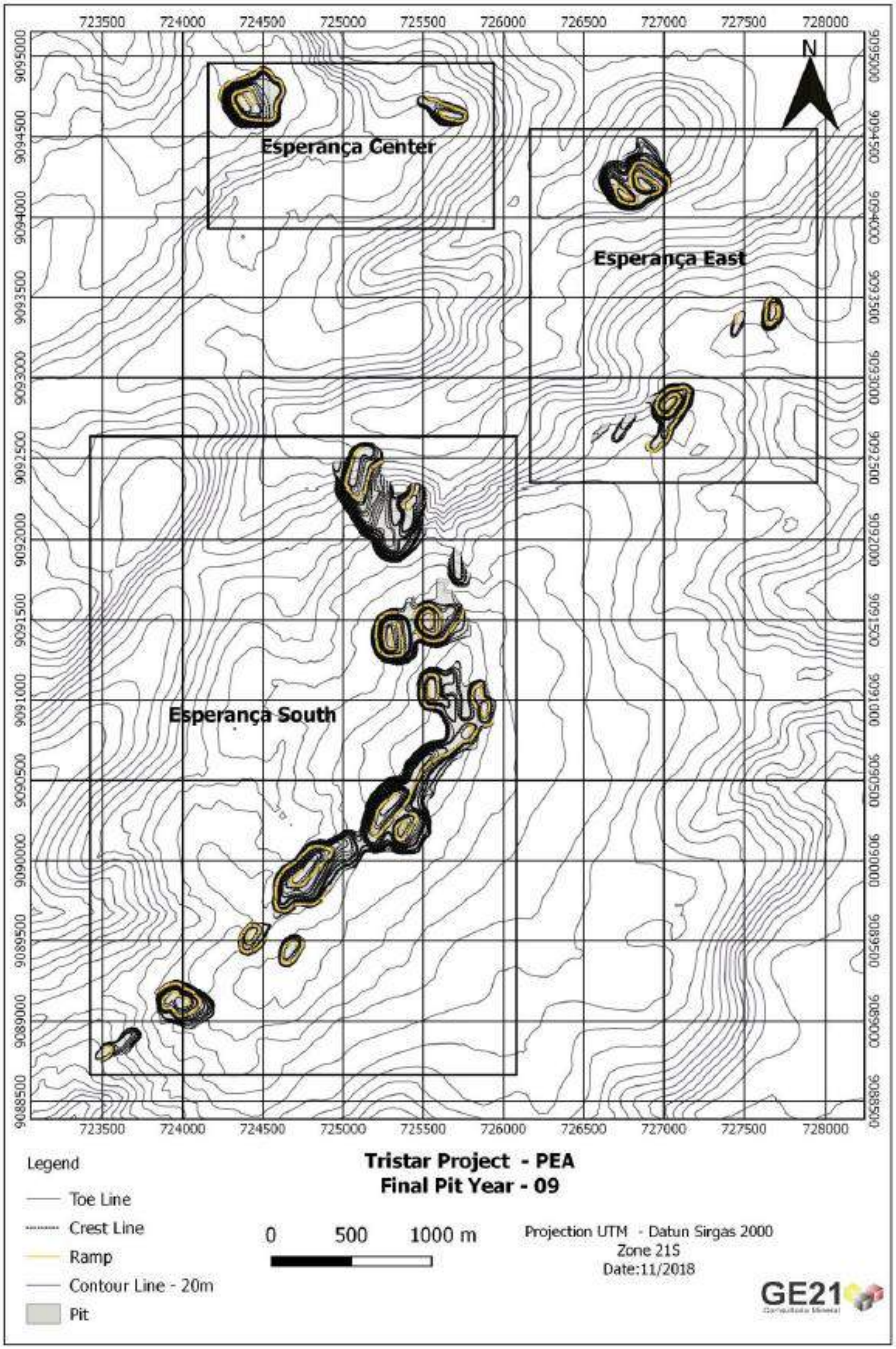


Figure 16.4 Year 09 Pit Design.

With recovery and dilution factors applied, the total resources available for mine scheduling are shown in Table 16.4.

Pit Design - Results									
Area	Rock (Mt)	Waste (Mt)	Mineable Resource						SR
			Ind (Mt)	Au (g/t)	Inf (Mt)	Au (g/t)	Total (Ind+Inf)	Total Au(g/t)	
Esp. South	166.0	147.6	9.29	1.60	9.08	1.30	18.37	1.45	8.03
Esp. Center	18.4	16.7	1.17	1.96	0.59	1.27	1.76	1.73	9.47
Esp. East	37.7	33.1			4.60	1.28	4.60	1.28	7.21
Total	**222.1**	**197.4**	**10.46**	**1.64**	**14.27**	**1.29**	**24.73**	**1.44**	**7.99**

Table 16.4 Pit Design Results.

16.3 Mine Schedule

The mine production scheduling was generated in GEOVIA Minesched™ 9.1.0, where the following assumptions were used:

- Production rate: 3.0Mtpa;
- Au grade stabilization;
- Gradual decrease of stripping ratio;

The results of the Mining Schedule are summarized in Table 16.5.

	ROM		StockPile Balance		Feed Plant			
Periods	Mass (Mt)	Grade Au (g/t)	Mass (Mt)	Grade Au (g/t)	ROM (Mt)	Grade Au (g/t)	Waste (Mt)	Strip Ratio
Year 0 - Pre-Stripping			1.26	1.48			14.9	11.87
Year 1	3.1	1.83			3.1	1.83	26.4	8.45
Year 2	2.0	1.99	-1.26	1.48	3.3	1.79	26.1	13.05
Year 3	3.0	1.56			3.0	1.52	26.3	8.90
Year 4	3.0	1.64			3.0	1.52	23.7	8.03
Year 5	3.1	1.22			3.1	1.22	21.9	7.13
Year 6	3.0	1.24			3.0	1.24	19.0	6.32
Year 7	3.0	1.25			3.0	1.25	19.0	6.26
Year 8	3.0	1.14			3.0	1.14	19.0	6.36
Year 9	0.3	0.91			0.3	0.91	1.1	3.38
Total	**23.5**	**1.44**	**-**	**-**	**24.7**	**1.44**	**197.4**	**7.99**

Table 16.5 Mining Schedule Production.

Mine Schedule Design

The following Figure 16.5 through to Figure 16.9 present the end of periods, for Year's 1, 2, 3, 5 and the final pit design.

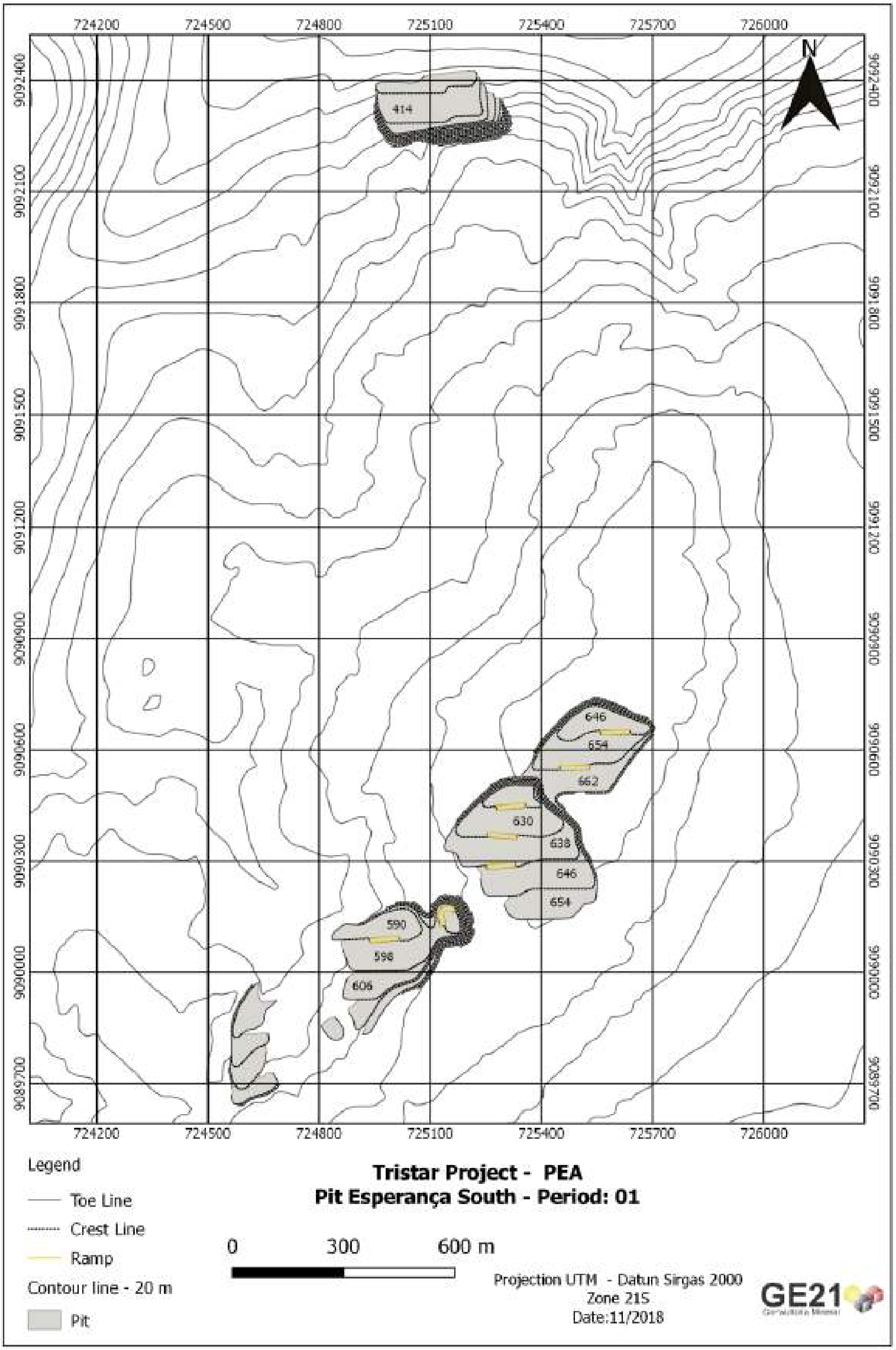


Figure 16.5 Pit design at end of Year 01.

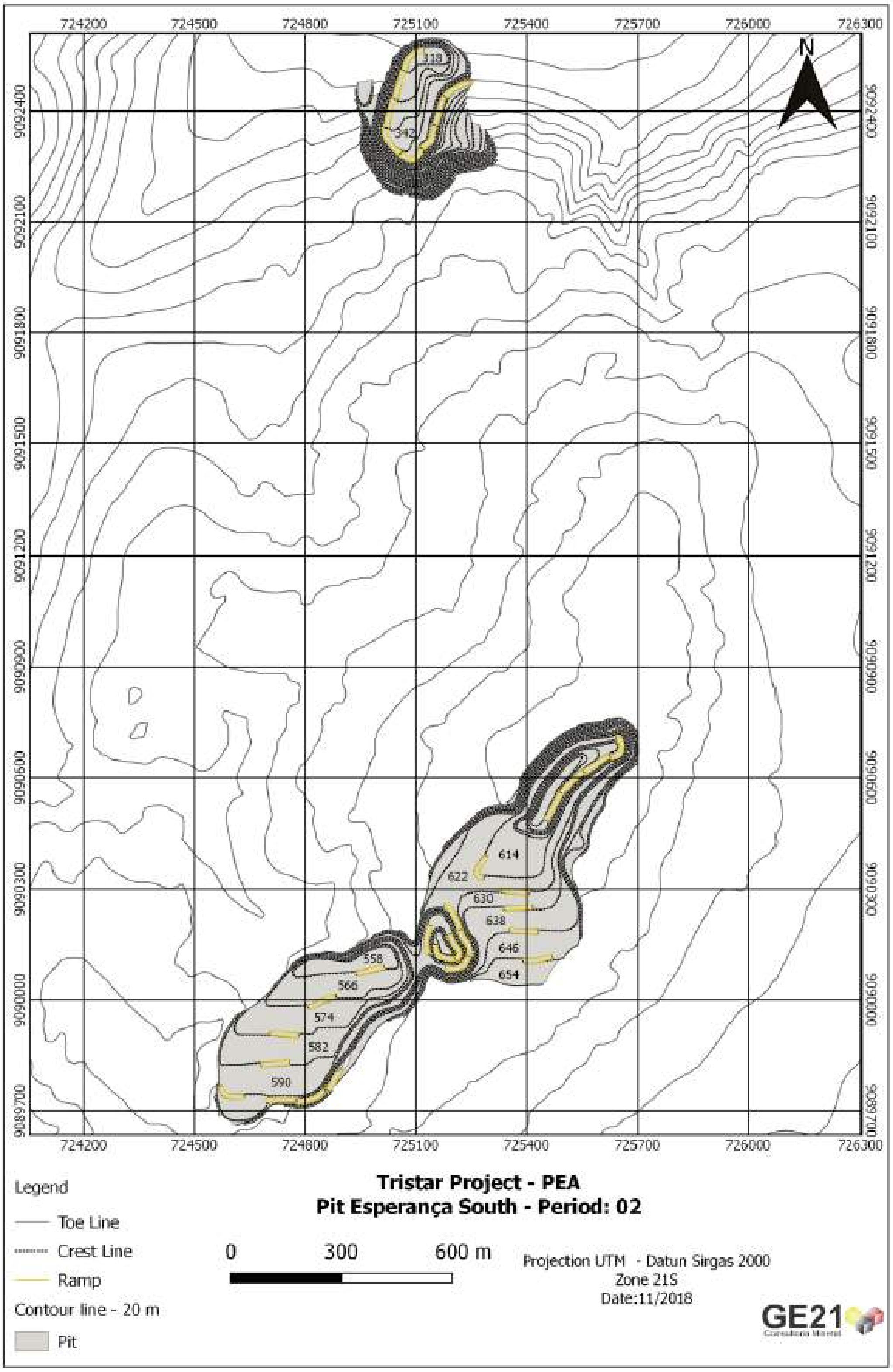


Figure 16.6 Pit design at end of Year 02.

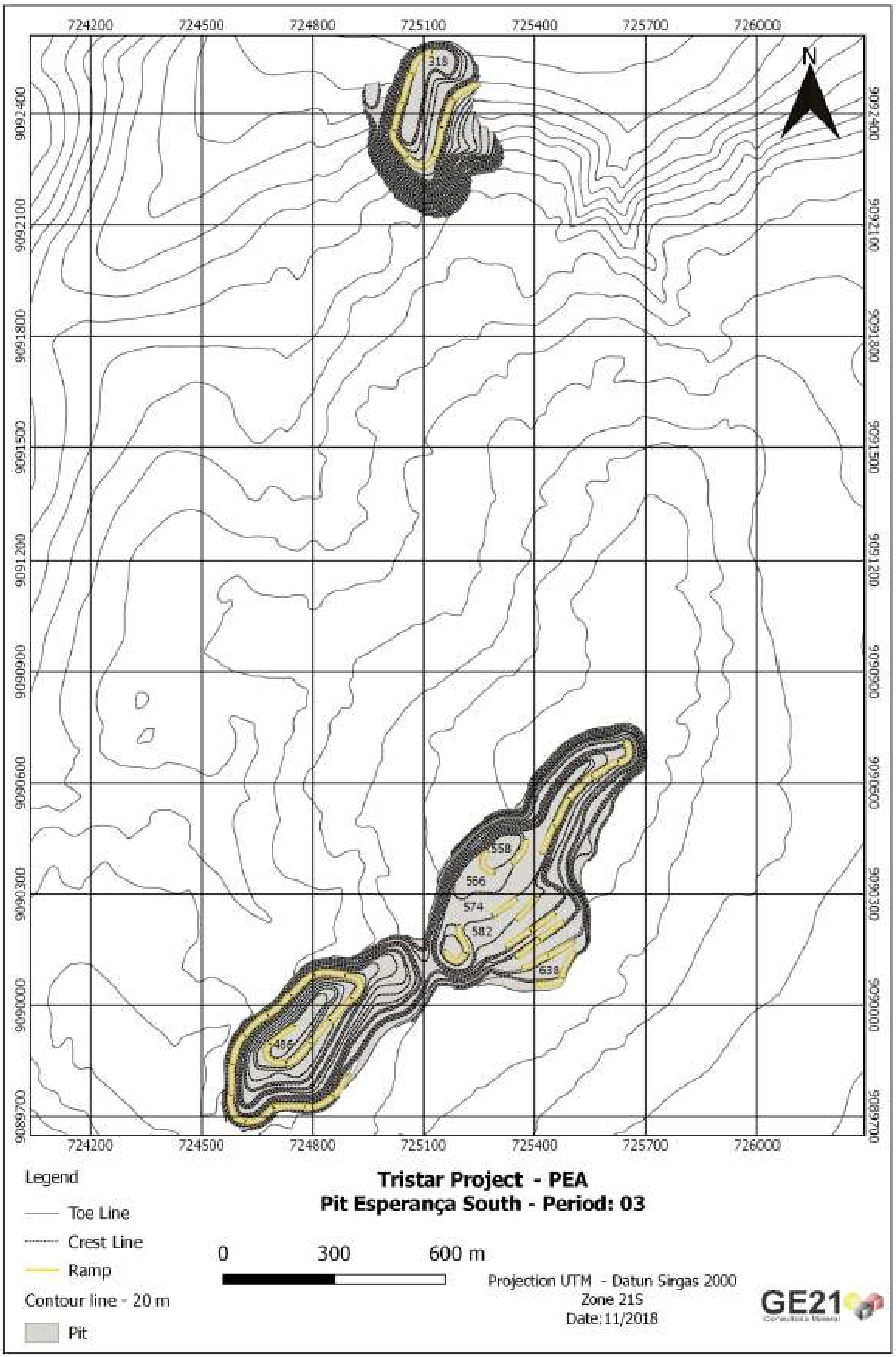


Figure 16.7 Pit design at end of Year 03.

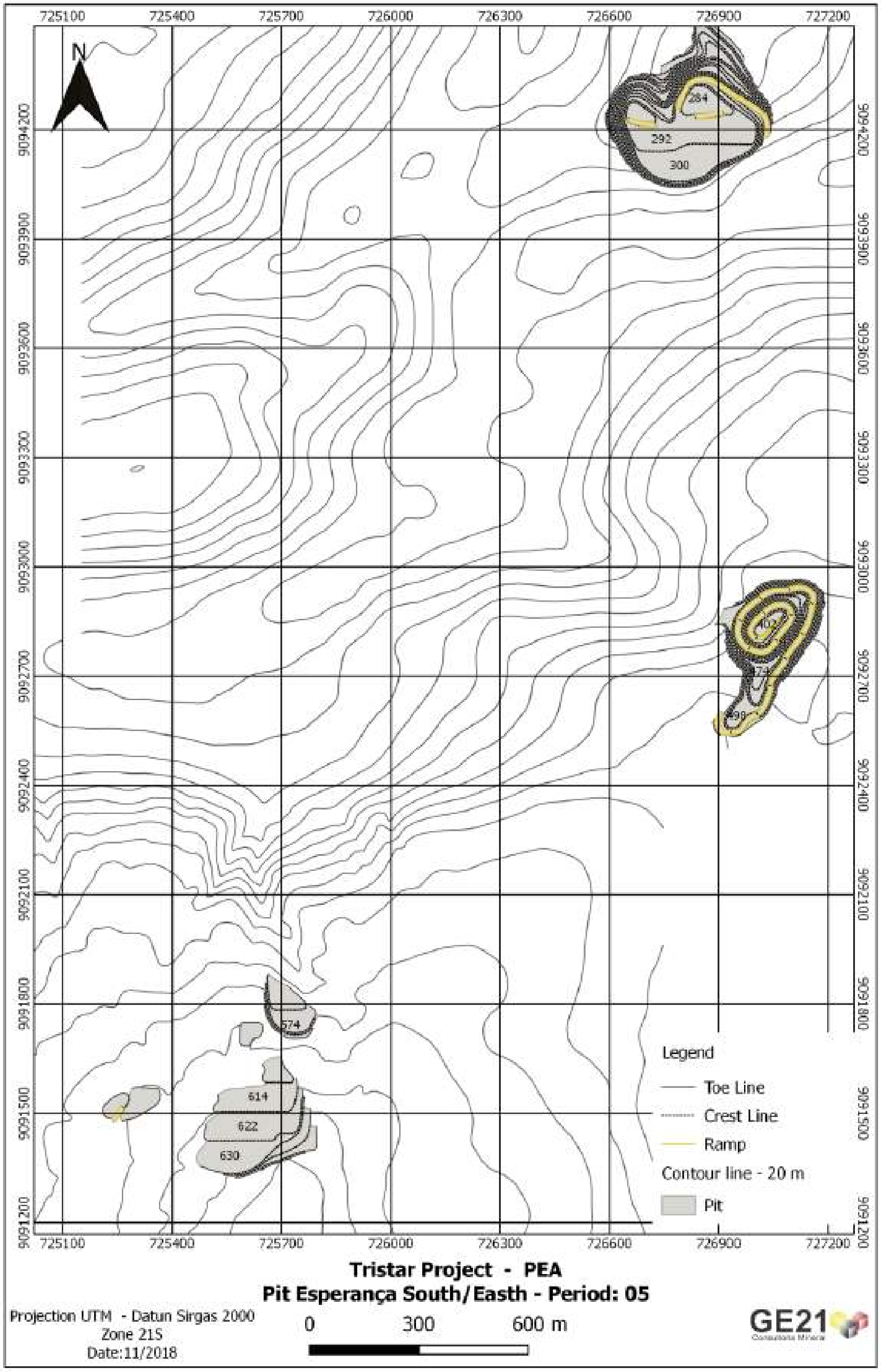


Figure 16.8 Pit design at end of Year 05.

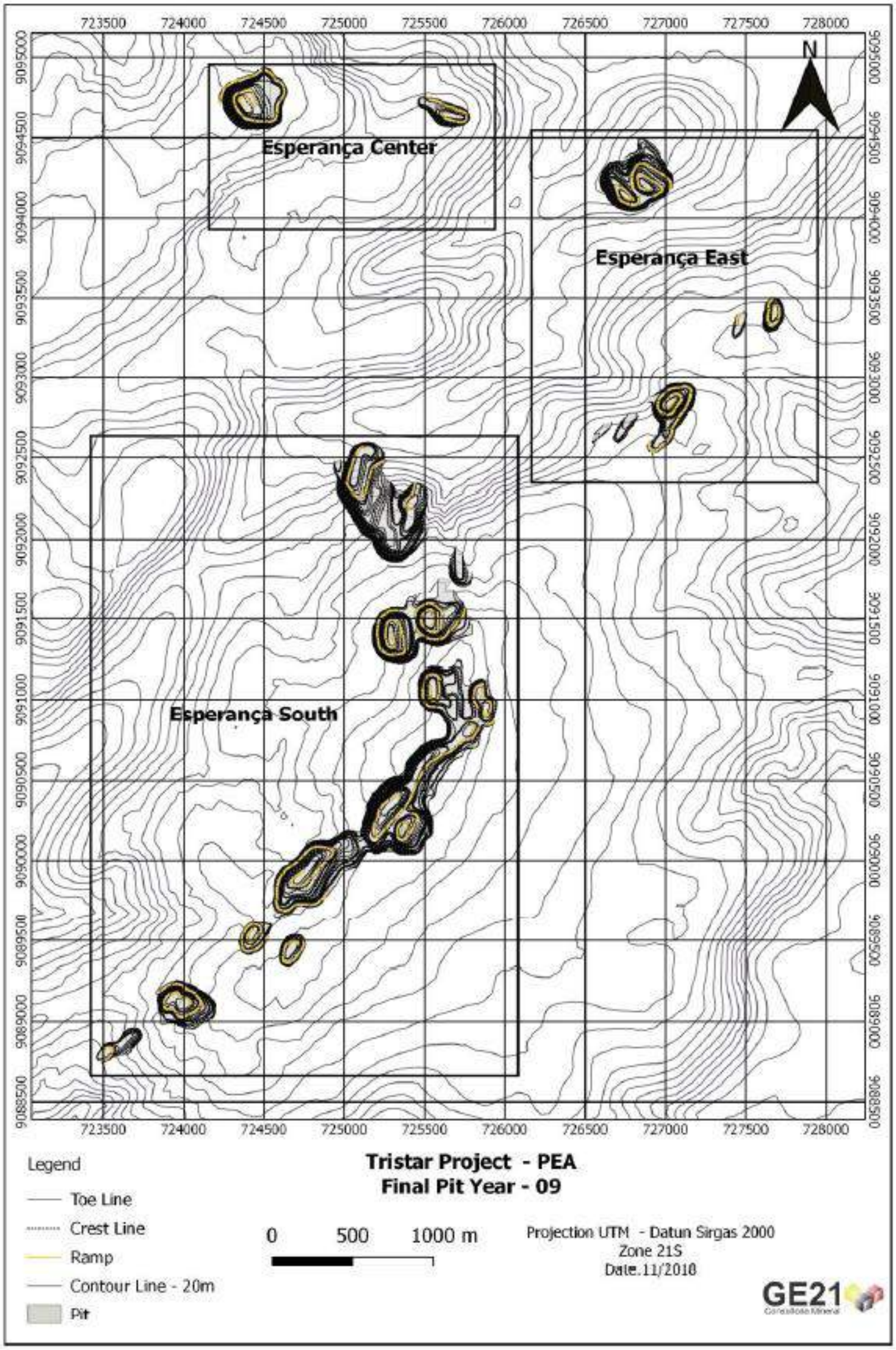


Figure 16.9 Pit design at end of Year 09.

16.4 Mine Fleet Dimensioning

The mining services will be outsourced and are based on a small-scale equipment projection to meet the selectivity requirements of the proposed mining. A CAT 345 hydraulic excavator equipped with a bucket with a volume of 3.1m^3 was selected, as well as Scania G440 40-tonne trucks, equipped with a hard rock type bucket. DX800 rotary type drills, with a 4" diameter drill bit, were selected for the perforation of the rock.

GE21 has estimated the required yearly mine fleet to achieve the mine schedule and the results are shown in Figure 16.10 to Figure 16.12 below.

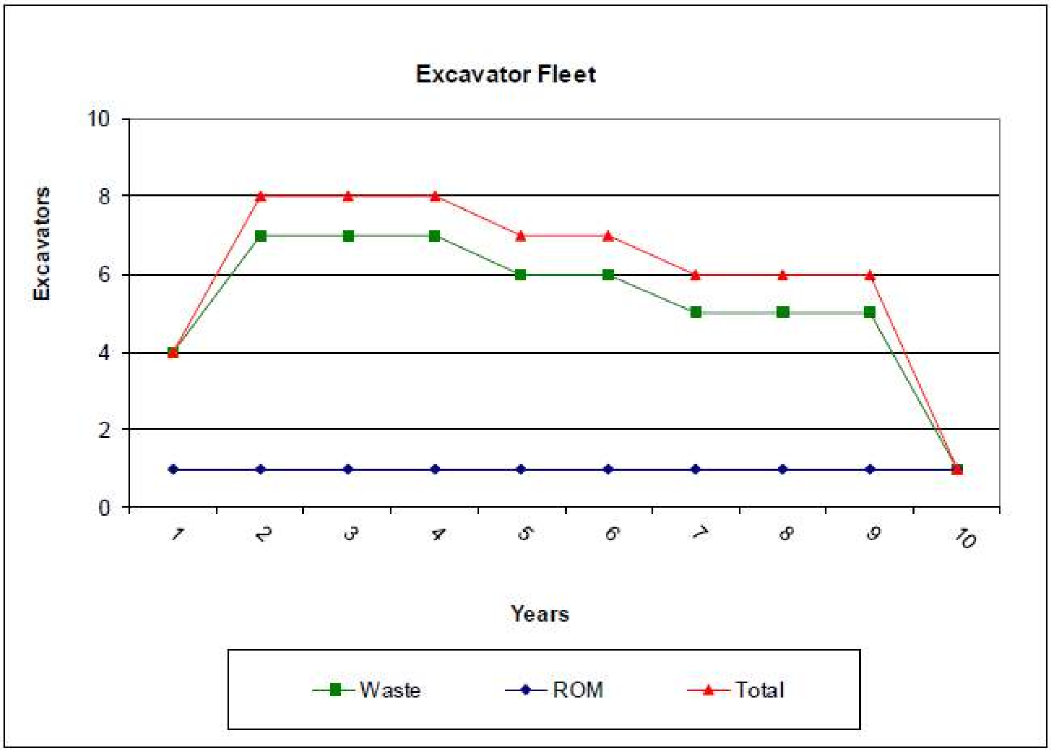


Figure 16.10 Annual excavator fleet requirements through LOM.

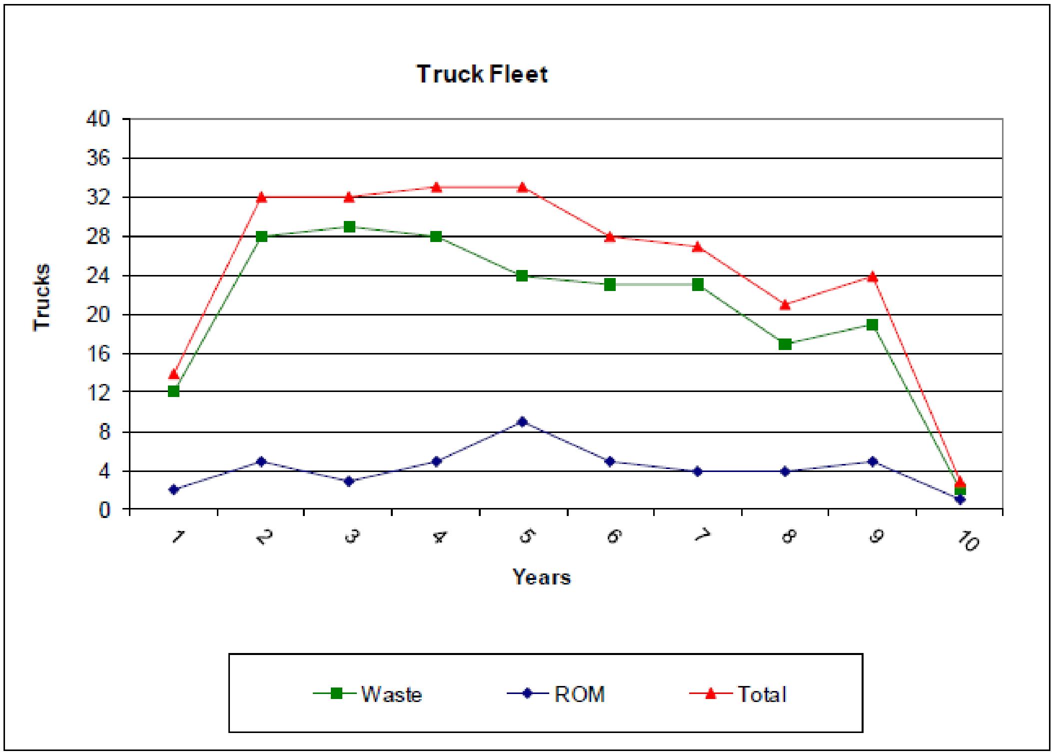


Figure 16.11 Annual Truck fleet requirements through LOM.

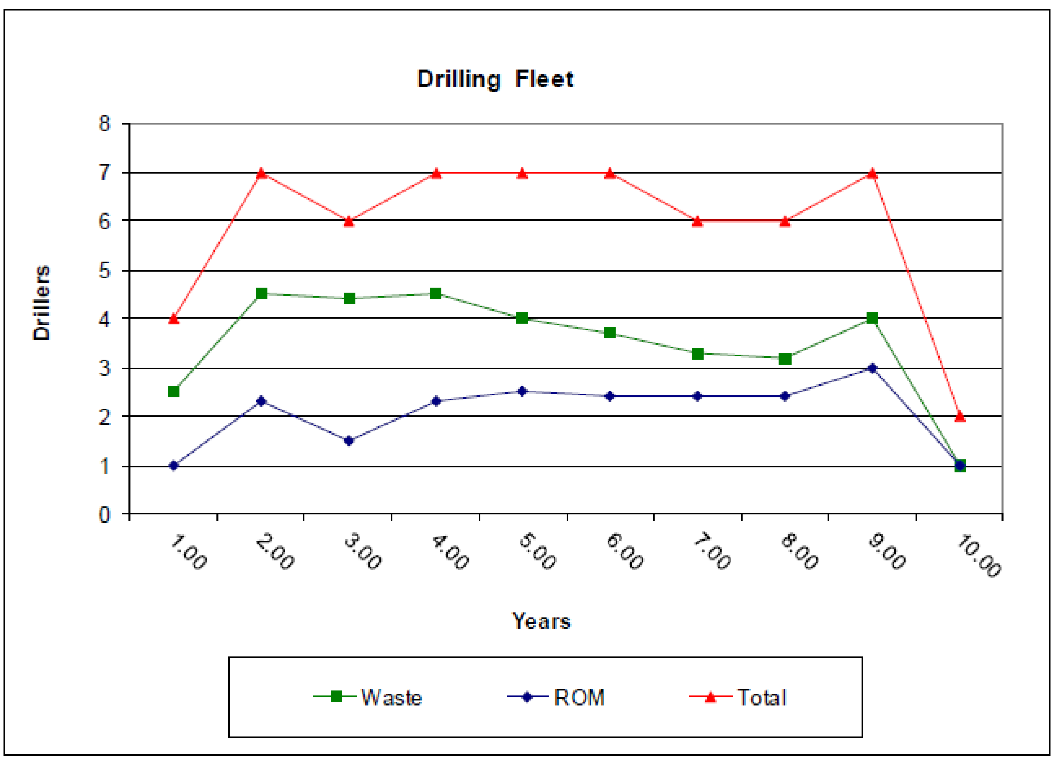


Figure 16.12 Annual Drill Rig fleet requirements through LOM.

17. RECOVERY METHODS

This section contains the same information as that provided in the same section of the 43-101 Technical Report filed on SEDAR by TriStar, entitled "Castelo de Sonhos Gold Project, Pará State, Brazil Amended Independent Technical Report – Preliminary Economic Assessment" with an effective date of September 14, 2018. The QP taking responsibility for this section also took QP responsibility for the same section in the previous report and is of the opinion that the information remains relevant and current despite the fact that it pre-dates the current resource estimate. Work is already underway on the Pre-Feasibility Study (PFS) for Castelo de Sonhos; the technical and economic analysis presented in the PFS will be based on new resource estimates, will not assign any economic value to Inferred resources, and, when published, will entirely replace the PEA analysis.

The following is the concept and studies related to the gold processing of TriStar Gold's Castelo dos Sonhos Project. This study involves the discussion of process tests, process route suggestion, flowchart and mass balance, equipment dimensioning and specification, and CAPEX and OPEX estimation.

The Castelo de Sonhos project beneficiation plant was developed considering a processing rate of 3Mt/y, which, for a regime of 7,500 effective hours per year of operation, implies a nominal hourly rate of 400t. The average ROM grade is 1.50g/t, which involves an average gold production of 150,000oz/year. The process tests provide for a minimum recovery of 95% of the current resources.

17.1 Flowsheet Development and Process Plant

The Castelo de Sonhos process plant is designed to treat 3Mt/y with an average gold grade of 1.50g/t. Although the testwork for whole leaching process has indicated extraction of 98%, a more conservative figure of 95% is recommended, considering scale-up factors from lab tests to industrial operation.

17.2 Process Flowsheet

Based in the preliminary testwork carried out in 2014 and 2017, a conventional CIP (carbon in pulp) plant is being proposed. The Figure 17.1 presents a proposed flowsheet for the process route of crushing-grinding-cyanidation-CIP-ADR.

The ROM is dumped in a hopper with capacity for 150t, equipped with a stationary grizzly with a square opening of 400mm. The coarse material, retained in this grizzly, is broken using a hydraulic hammer. The material passing through the grizzly is reclaimed by a 1.6m x 3.7m vibrating feeder, equipped with bars spaced at 150mm. The oversize feeds a primary jaw crusher, a 1005t/h capacity C-130, with opening at closed size of 150mm. The product of the primary crushing is joined to the material passing through the feeder and is conveyed to the coarse stockpile. The conveyor is equipped with auxiliary equipment, a belt scale, cross belt magnet and metal detector.

Two 1.6 x 3.7m vibrating extractors installed under the 40,000t capacity stockpile, reclaim the coarse ROM and feed a SAG mill through a 75m long, 914mm wide conveyor, at a production rate of 380tph.

The material extracted from the stockpile feeds an 8.5m x 3.6m (28ft x 12ft) EGL Semi Autogenous Mill (SAG) equipped with trommel, with an opening size of 1.5 inches. The oversize of the trommel feeds a cone crusher (pebbles) and the product is sent back to the SAG mill (circulating load).

The material passing on the trommel's sieve is discharged to a box and pumped to a cluster of cyclones. The cyclone underflow feeds a 5.5m x 7.5m (18' x 25') ball mill.

The cyclone overflow, with P80 finer than <75µm, is piped to the pre-lime tank. The 50% solids pulp is mixed with lime for 6h to reach a pH between 10.5 and 11.

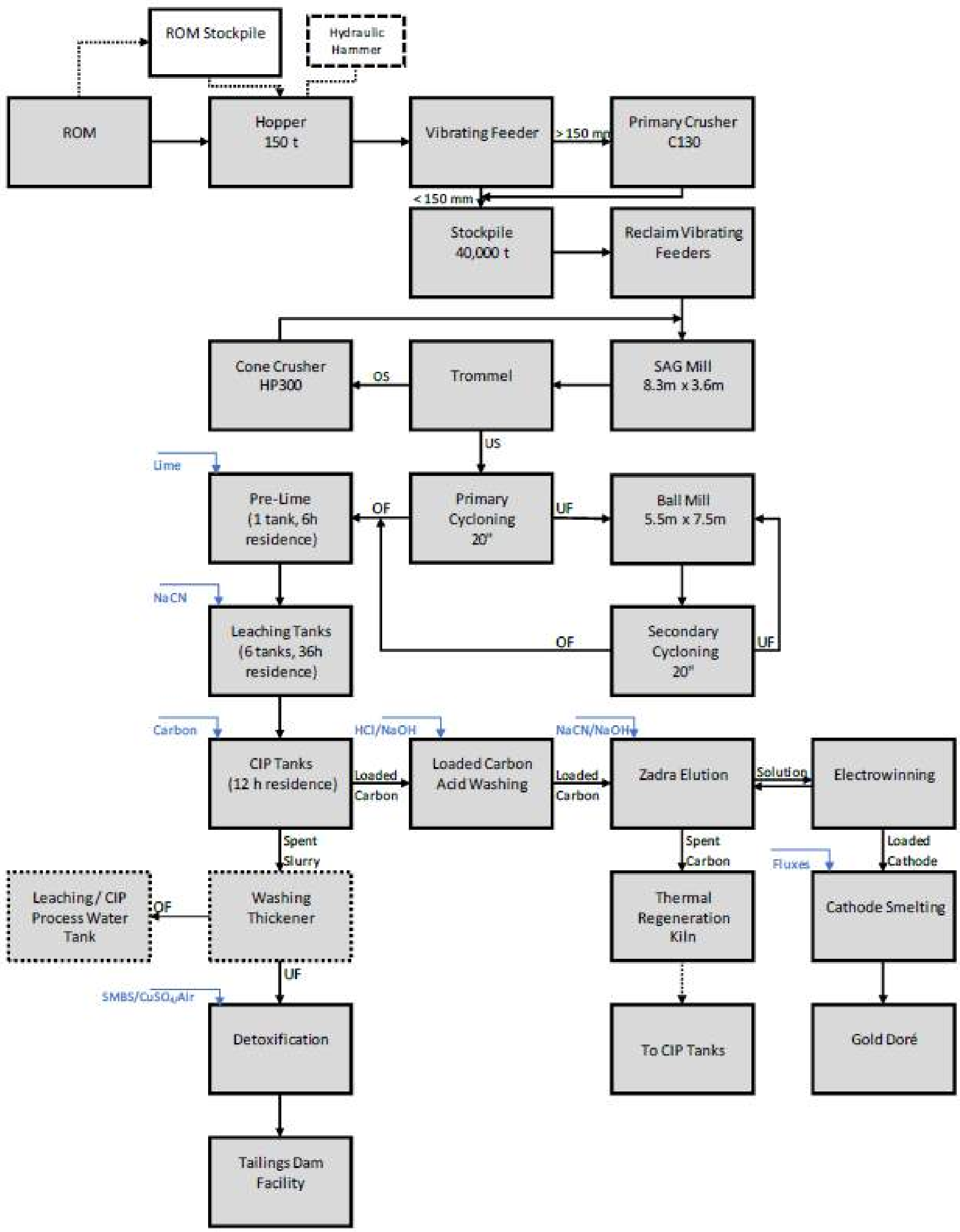


Figure 17.1 Simplified Block Diagram Proposed Flowsheet.

The slurry from pre-lime is conducted by gravity to five agitated leach tanks in cascade, each one with capacity for 3,334m^3 of 50% in solids slurry. The leaching time in this phase is around 36h. Cyanide is added in the first tank where it is required to maintain the NaCN concentration. Slurry is transferred from one tank to the next by gravity. The mechanical arrangement allows bypassing among the tanks for maintenance or process requirements.

From the 5th tank, the slurry is diluted for 45% solids and feeds five CIP (Carbon in Pulp) tanks, each one with capacity of 1,200m^3, in cascade. Each tank is equipped with a recessed impeller vertical pump and a hoister for screen handling for maintenance. The slurry residence time during adsorption is around 12h, totaling 48h of leaching and adsorption. Activated carbon, size ranging in between 8x16 mesh (2.36 - 1.18mm), is added to the tanks at a rate ranging from 18 to 20g carbon/l slurry. These tanks are equipped with 0.8mm opening Kemix MPS1200 interstage screens. The slurry flows through the screen to the following tank and the carbon remains in the tank, retained by the screen. Daily, or when required by the process, the pulp with carbon is pumped to an inclined screen. The retained, loaded carbon, is stored in a tank and transferred by recessed pumps to an acid washing facility at a designed rate of 4.0t/day. The undersize slurry goes back to the tank.

The tailings from the 6th CIP tank are discharged in a safety, high-frequency Derrick screen to prevent the loss of loaded carbon, and the passing feeds a 25m thickener. The thickened solid is pumped to detoxification. The thickener overflow is pumped to a storage tank and distributed to the consumption points in a leaching/CIP circuit. The underflow is pumped to two 785m^3 capacity cyanide destruction agitated tanks, assuring a residence time of around 3h. SMBS (sodium metabisulfide) and CuSO4 (copper sulfate) are added to these tanks to oxidize cyanide under intensive aeration, to assure complete oxidation of cyanide.

The neutralized slurry is pumped to a conventional tailings facility.

The loaded carbon stored in a bin is pumped to the acid washing facility. A diluted solution of HCl (hydrochloric acid, 3%w/w) is pumped through the bed of carbon for 1h. This process aims to remove scaling and any base metals adhered to the carbon, improving the performance of the next phase – elution. After this time, carbon is neutralized by circulating a diluted solution of NaOH (sodium hydroxide, 5%w/w) through the carbon bed until it reaches a pH over 8. Both spent solutions (HCl and NaOH) are pumped to the detox area. Hot acid washing at 80°C will be an option, if necessary, to speed-up the reaction. In this case a dilution of concentrated acid with hot water from the boiler is considered.

The washed carbon is then transferred by recessed impeller pumps to the elution columns. For this study, the Zadra process is being considered because of its easier operation compared to the AARL method. A 1.5m diameter and 9m height strip column is filled with 4t of loaded carbon. A hot solution at 130°C with NaCN (0.1%w/w) and NaOH (1%w/w) is pumped upwards through the column at high pressure (3bar). The effluent from the column, the rich solution, passes through a plate and frame heat-exchanger where the temperature is cooled to 80°C and feeds the electrowinning cell. The gold in solution is reduced electrochemically and plated in the cathodes. The barren solution is pumped back to the elution column, passing before to the exchanger heater, where the temperature is raised to 130°C. Eventually the NaCN and NaOH concentrations are adjusted to maintain the kinetics of the stripping rate. This is a continuous process and lasts around 10h-12h. After each cycle, part of the solution is purged to the CIP tank and replaced by fresh solution.

The solution is heated in a heat exchanger fueled by hot water heated in a gas-fired boiler.

After the elution cycle, carbon is rinsed with water and transferred by recessed impeller horizontal pumps to the thermal regeneration. Elution column is filled with a new charge. The spent carbon is dewatered in a horizontal screen and feeds a propane fired horizontal kiln, with a capacity of 7.0t/day. The carbon is heated to 700°C for around 7min and discharged to a quench tank. Regenerated carbon is pumped back to the last CIP tank after screening for fines removal.

Fresh carbon is pre-conditioned in a preparation tank, under agitation, for 24h. After this cycle, the new carbon is transferred by eductor to the sizing screen, where the fines are discharged to a fines tank and the material retained on the 0.8mm opening is discharged by gravity to the last CIP tank.

After the elution cycle, or when required by process, the cathodes loaded in metallic gold are discharged twice a week. The cell is emptied, and the cathode removed to a tank where it is washed under high-pressure water. The gold is displaced from the stainless-steel wool and settles to the bottom. This sludge is pumped to a press filter, dried and smelted in a gas-fired furnace. The gold is stored in the vault and the slag stored in drums for further treatment.

Process Flowsheet Comments and Suggestions

The process flowsheet was developed considering a conventional whole rock cyanidation and recovery. It seems to be the more conservative approach, but confirmation testwork needs to be done. For the next phase, some trade-offs among process routes options are recommended, searching for the best technical and economical route. At first, the following studies would aggregate value to the project:

Introduction of a gravity concentration step in the circulating load of the ball mill. The high recovery indicates that over 50% of the gold is recoverable through gravity concentration. The anticipation of gold recovery through gravity concentration is recommended, both for a technical and economical point of view.

As the mineralization seems to be medium-low hardness, the study of a conventional comminution route instead of SAG mill is recommended – primary, secondary, and tertiary crushing feeding a single ball mill. As the project already considers a primary jaw crusher and a cone crusher, only a third crusher would be added, eliminating SAG. It implicates a significant Capex and Opex reduction. Additional testwork to confirm the crushability and grindability of the material is fundamental for this option.

In case the SAG option is preferred, a single SAG should be studied, eliminating the ball mill. Due to the medium hardness, there is good probability that the single SAG could produces a low P80 grind.

To reduce cost, quick lime addition to the ball mill should be studied, considering its lower cost.

The CIP and CIL routes should be evaluated. Considering the long residence time, the CIP option is preferable to CIL because of the lower inventory of carbon and smaller elution/regeneration plant.

<u>Reagents Facility</u>

The reagents used in the process will be stored and prepared in a reagent plant facility, near the consumption plant. The layout will consider the compatibility among the reagents and a contention area able to store 10% over the volume of the biggest tank in the area.

<u>Sodium Cyanide – NaCN</u>

NaCN is a very toxic salt and special care should be taken in its storing and handling. For strategic reasons, a stock of at least 30 days is recommended. Based on a consumption of 120g/t, a stock of 46t is required.

The product will be received in bulk bags of 1t each, wrapped in plastic and inside a wooden box. They are disposed in a dedicated covered shed, equipped with NaCN gas detectors and security doors to prevent the entrance of unauthorized people.

The area is composed of a shed, with a capacity of 80 boxes and package residues, an agitated preparation tank and an agitated distribution tank. The preparation tank is equipped with bag-cutters on the top.

The bulk bags are reclaimed from the shed by a forklift and delivered to the preparation tank area. The bag is unpacked by trained operators and lifted by electrical hoist, where it is cut and discharged in alkalinized water. After emptying, the bag is removed and stored in the shed.

The prepared solution in concentration of 20%w/w is stored in the distribution tank and pumped by dosing pumps to the consumption points (cyanidation and elution).

Hydrated Lime

Hydrated lime will be received in bulk bags with a capacity of 1t and stored in a covered shell. A forklift transfers the bags to the preparation tank and, using an electric hoist, the bag is discharged in the preparation tank where a 20%w/w emulsion is prepared and pumped to an agitated storage and distribution tank. This emulsion is distributed to the consumption points in a ring-shaped pipe. The continuous pumping prevents the sedimentation of the emulsion.

The storage tank has capacity to 50t, which allows 20 days of storage. A minimum stock of 25t must be kept in the warehouse to supply the plant in case of shortage.

Caustic Soda

The consumption of soda is estimated to be 250g/t of treated carbon, including elution and acid washing. The product will be received in bags and transferred to the distribution tank.

The solution is pumped to the consumption points at elution and acid washing.

The total consumption, elution and acid washing, is around 900kg/day or 3.8t of emulsion at 20%w/w. The capacity of the preparation/storage tank is sufficient to keep around 10 days of stocking.

A safety stock of 20 days, or 18t is recommended.

Hydrochloric Acid

The hydrochloric acid (HCl), 33%w/w, will be delivered in isotank trucks with a capacity of 20,000l, and pumped to the storage tank, 38m^3 capacity. The solution is pumped to the consumption point in the acid washing of carbon.

Considering a daily consumption of 1,800t of solution at 33%, storage capacity is sufficient for 25 days of operation. A minimum stock of 36t of solution is recommended.

Activated Carbon

Activated carbon is delivered in 1m^3 bulk bags, 450kg each. The bags are stored on pallets, in an open area, paved with crushed stone.

When required, the bags are transported by forklifts to the preparation tank, where they are lifted by hoist and discharged into an agitated tank.

Copper Sulfate

Copper sulfate (CuSO4), will be delivered in bags of 25kg and stored in the reagents shed. The bags are transferred to a 38m^3 preparation tank, equipped with agitator and a 5%w/w solution is pumped to the consumption points.

Considering the daily consumption in the detox area of 650kg/day, the preparation and distribution tank is sufficient for 3 days of operation.

A minimum strategic stock of 13t is recommended.

Sodium Metabisulfite

Sodium metabisulfite is delivered in 1t capacity bulk bags and stored in the covered reagents shed. The bags are transferred to the preparation area using a forklift, and lifted to the top of the $230m^3$ capacity preparation tank by electrical hoists.

A 5%w/w emulsion is prepared in the agitated tank and pumped by dosing pumps to the detox area. Considering the daily consumption of $66m^3$ of solution at 5%, the tank is sufficient for 3.5 days of operation.

A minimum strategic stock of 65t is recommended.

Flocculant

Flocculant will be delivered in powder, packaged in 25kg bags and prepared in a $25m^3$ conditioning tank, at a concentration of 5%w/w, and pumped to a $25m^3$ capacity storage. The solution is pumped by dosing pumps to the thickener.

Compressed Air Plant

A complete compressed air plant will be constructed to attend to the requirements of process and utilities. The plant is composed of:

- Two utility air compressors, $250m^3/h$ at 690kPa outlet pressure, air cooled single stage rotary screw type with aftercooler, oil-free intake filter system, and controls. One operating, one standby.
- Two instrument air compressors, $100m^3/h$ at 690kPa output pressure air cooled single stage rotary screw type with aftercooler, oil-free intake filter system, and controls.
- One utility air receiver, $1.5m^3$ capacity, operating pressure of 862kPa, carbon steel including relief valve, pressure gauge and drain valve.
- One instrument air dryer, refrigerant type, integral with compressor.
- One instrument air receiver, $1.5m^3$ capacity, operating pressure of 862kPa, carbon steel including relief valve, pressure gauge and drain valve.

The air is transferred to the consumption points by pipes and control valves.

Fresh Water Catchment and Distribution System

The fresh water is pumped from wells to the potable water and fire suppression systems. They are composed of:

- Four wells, estimated depth of 50m;
- Four fresh water well pumps, $113m^3/h$ at 50m TDH, submersible vertical turbine. Two operating, two standby;

- One fresh-water collection tank, 30 minutes retention 5.5m diameter 6m high, open top, carbon steel;
- Two Fresh water transfer pumps 227m^3/h at 207KPa, double suction, dual volute horizontal centrifugal c/w drive components and motor on common base frame. One operating, one standby;
- One fresh-water storage tank, 2h retention, 748m^3/h, 10m diameter x 10.5m high, open top carbon steel;
- Two fresh-water distribution pumps, 187m^3/h at 207 kPa, double suction, dual volute horizontal centrifugal c/w drive components and motor on common base frame. One operating, one standby;
- One potable water treatment plant, package unit comprising tanks, filters, interconnecting piping, pumps and valves, chlorination system, electric sw/gear and starters, automatic control system;
- One potable water tank, 2.5m diameter x 3m high, closed top, carbon steel;
- Two potable water distribution pumps, 75 x 50mm horizontal, centrifugal carbon steel pump c/w drive components and motor on common base frame. One operating one standby;
- One fire water system, package unit comprising self-starting electric and diesel driven centrifugal pumps, electric jockey pump, interconnecting piping, valves, electricals w/gear and starters, automatic control system and all installed in a weatherproof enclosure.

Process Water System

The process water is recovered from the tailings dam, where pumps installed in a barge, reclaim the supernatant clean water, pumping it back to the plant. The system is composed of the following steps/equipment:

- One barge, anchored in the edges by cables, where the pumps are mounted;
- Two reclaim water pumps, 264.6m^3/h, SG 1.0 TDH 12m, barge mounted, fixed speed vertical turbine pumps, cast iron construction, one operating one standby;
- Three reclaim water booster tank, 5.5m diameter, 6m high open top carbon steel;
- Six reclaim water booster pumps, 250mm x 150mm fixed speed horizontal, split case, double suction pump, cast iron construction. 264.6 m^3/h, SG 1.0 TDH 75m, two operating, two standby;
- One process water tank, 17m diameter, 9m tall open top carbon steel;
- Two process water distribution pumps, 300mm x 250mm fixed speed horizontal split case double suction pump, cast iron construction. 926 m^3/h, SG 1.0 TDH 25m, one operating one standby.

Comments and Recommendations

The flowsheet development test program has covered several diverse concentration techniques and could lead to options that could be recommended for the final plant flowsheet.

Several results and constraints guided the circuit selection:

- Although the sample has showed a medium hardness, a SAG mill was selected to minimize the high Capex for a traditional primary/secondary/tertiary crushing unit. For the next phases tests to define the breakability and grindability of the ROM are recommended.
- Although the screen fire-assay has showed a small coarse portion, the response to gravity methods is very good. A trade-off study including gravity circuit should be considered in the next phase. The results suggest that more than 70% of the gold could be recovered.
- A trade-off and simulations for comminution circuit are highly recommended. The hardness and abrasiveness of the ROM suggest that a single SAG can be used, instead SAG/ball. Another option is the adoption of a conventional crushing system (primary, secondary and tertiary) feeding a single ball mill. It would reduce the CAPEX and OPEX costs.
- The SAG capacity can be improved by opening the circuit. A trade-off considering the pebble crusher product feeding directly to the ball mill is recommended.
- A leaching and CIP process is preferred to only a CIL circuit because of the lower carbon inventory, higher carbon loading and smaller elution circuit. A residence time of 48h, considering leach and CIP tanks, was considered.

The reagents plant facility is of paramount importance in the plant operation. Most of the reagents are prepared and distributed to a single tank. As the operation continues, the preparation of reagent while pumping from the tank is quite difficult and dosing mistakes are common. For reagents of continuous consumption, the use of at least two tanks – one for reception and preparation and the other for storage and distribution is highly recommended.

18. PROJECT INFRASTRUCTURE

This section contains the same information as that provided in the same section of the 43-101 Technical Report filed on SEDAR by TriStar, entitled "Castelo de Sonhos Gold Project, Pará State, Brazil Amended Independent Technical Report – Preliminary Economic Assessment" with an effective date of September 14, 2018. The QP taking responsibility for this section also took QP responsibility for the same section in the previous report and is of the opinion that the information remains relevant and current despite the fact that it pre-dates the current resource estimate. Work is already underway on the Pre-Feasibility Study (PFS) for Castelo de Sonhos; the technical and economic analysis presented in the PFS will be based on new resource estimates, will not assign any economic value to Inferred resources, and, when published, will entirely replace the PEA analysis.

18.1 Mine Drainage and Pumping Station

The region where the Project is located is surrounded by drainage and as observed in nearby places, the water table is close to the surface. The pits are expected to extend below the water table; however, a more detailed study of the local hydrogeology should be carried out for the correct dimensioning of the drainage system.

The water to be pumped will be sent to the sediment basin and used in the treatment. When more water is being pumped than is needed for treatment, the excess volume should be sent to the natural drainage, respecting the appropriate environmental impact control criteria.

18.2 Power Supply

The 138Kv power line will be connected to the national grid by a 230kV transmission line in the Mato Grosso State, called the "Braço Norte". It is expected to build about 16km of line in the 69Kv capacity, a substation and an internal distribution network, with capacity of 13.8Kv.

18.3 Water Supply

The raw water required for the plant will come from the sediment basin, the tailings dam and, if necessary, the Curuá river. This water will be used for the preparation of reagents, seal of pulp pumps and for fire suppression.

18.4 Security Building

The high security building will be constructed of a single storey prefabricated building, the gold production will leave the project by helicopter. The heliport will be located close to the security building.

18.5 Communication System

The communications systems will include internet, radio communication, telephone with all necessary hardware, software, data, and procedures required to generate information to support day to day operations.

18.6 Master Plan

Figure 18.1 shows the Master Plan elaborated for the Castelo dos Sonhos Project, containing the location and main structures of the project:

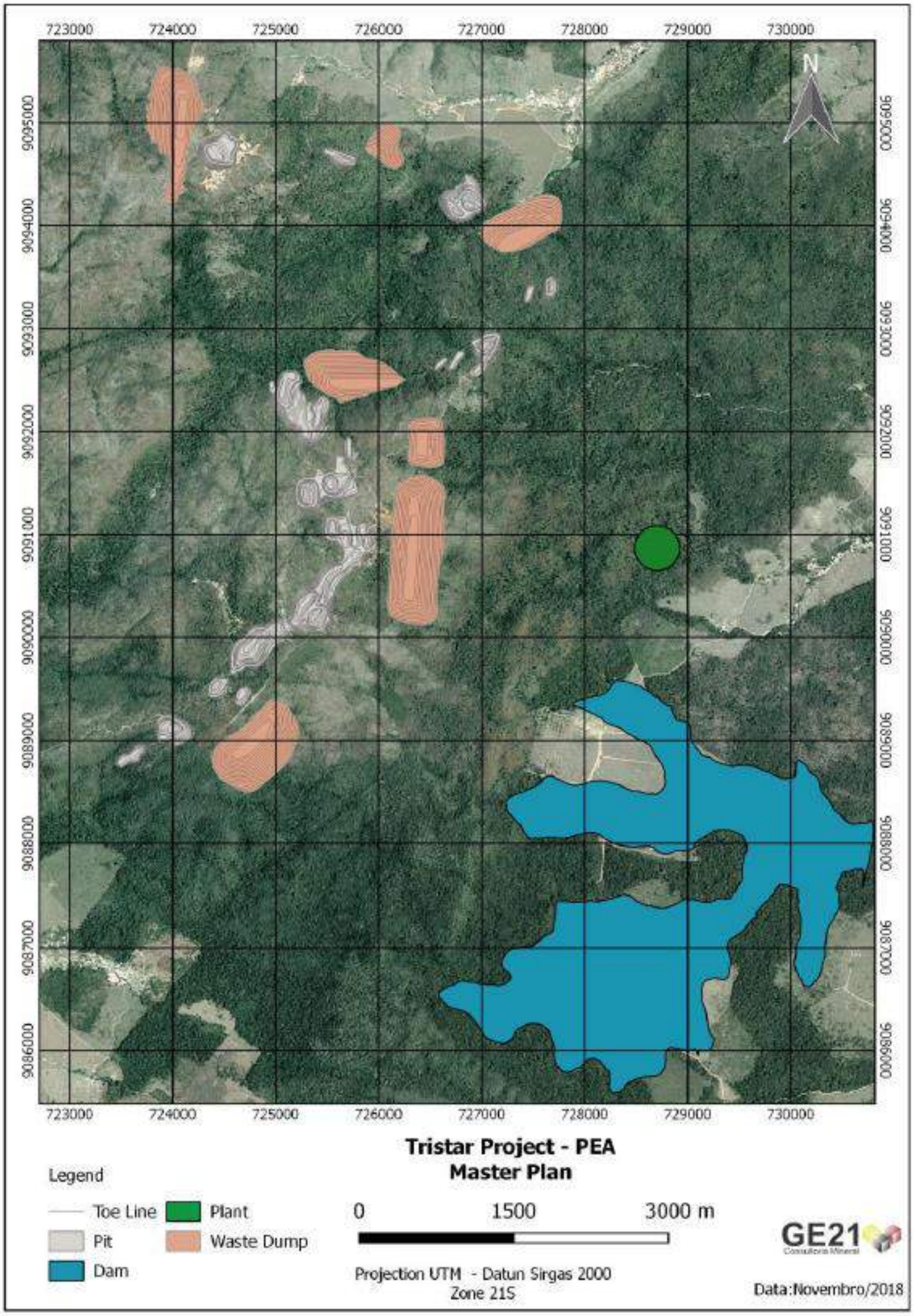


Figure 18.1 Master Plan.

19. MARKET STUDIES AND CONTRACTS

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The investment bank Goldman Sachs predicts gold prices to fall to $1,200 U.S. dollars per ounce by mid-2018 amid falling concerns of market participants, as marketplace fears generally make gold a haven for investors. Due to rising demand from emerging markets, the bank expects the price to rise to $1,375 by the end of 2020.

The analysts claim that the uncertainty among market participants had decreased due to the successful implementation of the tax reform and the apparently smooth transition to a new Fed chair.

The main factors for their short-term negative outlook for the gold price are the robust growth of the gross domestic product of the developed countries, further interest rate hikes by the US Federal Reserve, no deterioration in geopolitical risks and the expected absence of a recession in 2018 and 2019.

In the long term, analysts expect gold demand to rise on strong growth in emerging markets, and the 'wealth' channel to eventually dominate the demand for gold.

Time Frame	Gold Price Forecast	Trend
Q1 2018	US$ 1,225	↘
mid 2018	US$ 1,200	↘
Q4 2018	US$ 1,225	↗
end of 2020	US$ 1,375	↗

Source: Kitco News

Figure 19.1 Forecast of gold price.

For the Economic Model, GE21 used the value of $ 1250/oz.

20. ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1 Overview of Regulatory Framework for Environmental Licensing

In Brazil, the process of environmental licensing is decentralized. Any activity that might impact the environment must conform to the Brazilian federal government's National Environment Policy and obtain the proper licenses. The National Environmental Council (*Concelho Nacional do Meio Ambiente*: CONAMA) is the federal agency that has the power to pass nationwide environmental regulations. For mining activities, CONAMA has established an environmental licensing process that must be followed throughout the country; but it falls to other federal, state or municipal agencies to be the responsible authority that reviews license applications and decides whether or not to grant the licenses. In the case of TriStar's Castelo de Sonhos Project, the responsible authority is Pará State's Secretariat of the Environment and Sustainability (*Secretaria de Estado de Meio Ambiente e Sustentabilidade*: SEMAS).

Three licenses are required by mining projects in Brazil:

- the Preliminary License (*Licença Prévia*: LP)
- the Construction or Installation License (*Licença de Instalação*: LI)
- the Operating License (*Licença de Operação*: LO)

These licenses are sequential: the LP must be obtained before an application for the LI can be made; the LI must be obtained before an application for the LO can be made; and the LO must be obtained before a mine can go into production.

Preliminary License

The LP evaluates the environmental feasibility of a proposed mining project. If the application is in accordance with environmental legislation and requirements, the LI ratifies the project's location, scale and implementation plan, and establishes basic requirements and conditions to be met in the project's next stages. Three documents must be filed to support the LP application for a mining project:

- an Environmental Impact Assessment (EIA)
- a Report on Environmental Impact (*Relatorio de Impacto Ambiental*: RIMA)
- a Plan for the Recovery of Degraded Areas (abbreviated as PRAD in Portuguese)

Together, the EIA and the RIMA provide the information that will be used by the responsible authority to decide whether to grant the Preliminary License. The EIA is a technical/ scientific report, while the RIMA is a public consultancy document, written in simple and clear language for non-experts, that aims to acquaint the local community with the project and its potential impacts. Well before applying for a Preliminary License, the applicant receives from the responsible authority the Terms of Reference for the EIA/RIMA. The Terms of Reference are project-specific regulations that provide general guidelines for technical activities, define the affected areas, and specify field studies and data collection that must be planned and executed by a qualified multidisciplinary team, independent of the applicant.

Installation License

The LI authorizes the construction of the mine's infrastructure in accordance with the specifications contained in the implementation plan ratified by the Preliminary License, including measures for environmental monitoring and for mitigating adverse environmental effects. An Environment Control Plan (*Plano de Controle Ambiental*: PCA) must be filed in support of the LI application. This document sets forth all measures that will be taken to reduce negative environmental impacts and to improve positive impacts, and must be consistent with the EIA and RIMA reports accepted and approved for the Preliminary License.

Operating License

An LO is required before a mine extracts, processes or sells any commodity. It is issued after the responsible authority has inspected the mine infrastructure, has confirmed that all required monitoring systems are operational, and has verified that all the measures designed to mitigate environmental impact have been properly implemented.

20.2 Recent Environmental Permitting Activities

TriStar launched its environmental permitting activities in August 2019 by hiring a Vice President for Sustainability who is responsible for issues related to environmental management, licensing and permitting, community engagement and organizational development. In the Fall of 2019, TriStar identified several Brazilian consulting firms and organizations who had the qualifications and specialized expertise to be part of the independent multidisciplinary team required for planning and executing the necessary field studies. Meetings were held in Belo Horizonte so that TriStar could evaluate candidates and conduct due diligence investigations of them.

In March 2020, SEMAS issued the Terms of Reference for the EIA/RIMA for the Castelo de Sonhos Project. With those regulations in place, TriStar and its EIA team have been working steadily to begin the required environmental and socio-economic baseline studies, most of which require data to be gathered over a one-year period that cycles through seasonal fluctuations. Highlights of these activities are summarized below:

May 2020 – An assessment was done of the Terms of Reference and the regulatory environment for the construction of tailings dams in Pará State to clarify the roles of various stakeholders and the issues they may raise during the permitting process.

June 2020 – TriStar collaborated with its EIA team to develop common and consistent COVID health and safety protocols for site visits, inter-state travel and travel required within the region surrounding the Castelo de Sonhos plateau for the purposes of field studies and data collection.

August 2020 – A high-resolution aerial photography and LIDAR topography survey was done of the project site and surrounding area to support detailed mapping for future EIA and licensing activities.

September 2020 – TriStar contracted an Environmental Manager to oversee EIA activities, facilitate regulator engagement, and address issues related to land and social engagement.

September 2020 – A study was done to catalog the environmental considerations arising from the Economic Utilization Plan (*Plano de Aproveitamento Econômico*: PAE) approved for four of the project's mineral concessions.

September 2020 – Scope and deliverables proposed by environmental consultants were reviewed and assessed, with the following groups being contracted to form the independent EIA team:

- Sete Soluções e Tecnologia Ambiental to coordinate the EIA and to perform many of its environmental and socio-economic studies

- Water Service and Technologies (WST) to develop the EIA's conceptual hydrogeological model, including quarterly monitoring of groundwater levels and flow rates in creeks, streams and rivers
- ALS Environmental to collect samples of surface water and groundwater, and to analyze them to establish a baseline for hydrogeochemistry and environmental quality characteristics during the wet and dry seasons
- Servitec-Foraco to drill six monitoring wells and install piezometers needed for the EIA's hydrogeological monitoring and studies
- Ecoar Monitoramento Ambiental Ltda. to establish baseline measurements for air quality, noise and vibration during the wet and dry seasons
- Prospecto Engenharia e Consultoria Ambiental Ltda. to plan and execute the speleological (cave) study required for the EIA

November 2020 – Sete and WST visited the project site to kick off the EIA field studies.

January 2021 – The first three monitoring wells were drilled by Servitec-Foraco and piezometers were installed under supervision of WST.

January 2021 – Sete's socio-economic team started stakeholder mapping for the areas affected by the project.

January 2021 – Sete undertook studies of water, soil and rock on the CDS plateau to begin the evaluation of environmental risks.

January 2021 – Ecoar gathered monitoring data on air quality during the wet season, and conducted baseline measurements of noise and vibration.

February 2021 – The final three monitoring wells were drilled by Servitec-Foraco and piezometers were installed under supervision of WST, including two in an alternative site for the tailings dam.

February 2021 – ALS collected and analyzed initial surface water and groundwater samples during the wet season, including some that required special transportation arrangements to ensure that they were analyzed within 24 hours of collection.

February 2021 – ALS collected and analyzed samples from the camp's drinking water taps for tests of potability mandated by the Ministry of Health, and for assessing the efficiency of treating camp water with chlorine tablets.

February 2021 – WST conducted its first campaign of measuring flow rates in creeks, streams and rivers on and around the plateau for baseline hydrogeological studies.

February 2021 – WST began collecting data on fluctuations of groundwater levels in monitoring wells to support development of the EIA's hydrogeological model.

February 2021 – Sete conducted surveys of vegetation cover and land use in the areas defined as being directly affected by a mining project on the plateau.

February 2021 – Sete requested from SEMAS the necessary authorization to capture, collect, rescue, transport and release certain animals to support the study of the plateau's fauna.

February 2021 – TriStar made a formal request to SEMAS to include two additional mineral concessions in the Terms of Reference so that all areas covered by the PAE submitted to the federal mining agency, ANM, can be assessed together.

21. CAPITAL AND OPERATING COSTS

This section contains the same information as that provided in the same section of the 43-101 Technical Report filed on SEDAR by TriStar, entitled "Castelo de Sonhos Gold Project, Pará State, Brazil Amended Independent Technical Report – Preliminary Economic Assessment" with an effective date of September 14, 2018. The QP taking responsibility for this section also took QP responsibility for the same section in the previous report and is of the opinion that the information remains relevant and current despite the fact that it pre-dates the current resource estimate. Work is already underway on the Pre-Feasibility Study (PFS) for Castelo de Sonhos; the technical and economic analysis presented in the PFS will be based on new resource estimates, will not assign any economic value to Inferred resources, and, when published, will entirely replace the PEA analysis.

The costs for the project include the initial capital cost (Initial CAPEX) and the operational cost (OPEX). All costs are expressed in US Dollars and the exchange rate used is US$1,00 = R$3,80.

The Capital Expenditure (CAPEX) estimated for the project was based on the following items:

- Mine Development,
- Mine Infrastructure (buildings, power and transmission line, security and others),
- Tailings Dam,
- Processing Plant, and
- Working Capital.

21.1 Mining CAPEX and OPEX

GE21 estimated CAPEX of Mine Development, Mine Infrastructure, Tailings Dam, Working Capital based on similar projects.

Table 21.1 shows the estimated CAPEX of the mine.

	$ (M)
Mine Infrastructure	7.1
Tailings Dam	5.2
Mine development	0.3
Total Mining Capex	**12.6**

Table 21.1 Mining CAPEX.

The average operating cost was estimated and is based on actual mining projects in Brazil with similar operation where the roads, climate, infrastructure and topography, haulage distances, load/haul costs, production scale and other characteristics are similar to those envisaged for the Castelo de Sonhos project. The level of confidence is consistent with the current phase of the study.

The OPEX costs presented in Table 21.2 were estimated according to the values used in similar project operations.

Item	Value
Mine ($/t mined)	1.20
Drilling and Blast – ROM and Waste ($/t mined)	0.78
Payroll, Topography Ancillary equipment, etc. $M /year	0.19
TOTAL Cost Per Tonne Mined ($/t)	2.17

Table 21.2 Mining OPEX.

21.2 Plant CAPEX and OPEX

CAPEX and OPEX of Beneficiation plant was estimated by GE21's data base and similar projects.

The plant CAPEX was estimated at $123 million, as detailed in Table 21.3.

Item	Cost
	M $
Mechanical Equipment	25.72
Electrical Equipment	6.43
Electrical Materials	3.21
Instrumentation	1.28
Electromechanical Assembling	7.35
Steel Structure	4.73
Platework	9.47
Piping	2.63
Earthworks	4.86
Concrete	11.84
Laboratory	0.54
Fresh Water Distribution	0.56
Plant Air	0.13
Engineering, EPCM, SHEC, Contigency	34.18
First Fill and Owner Cost	1.99
Total	114.9

Table 21.3 Plant CAPEX.

For the calculation of the OPEX presented in Table 21.4, the following assumptions were considered:

- Metal Production = 150k oz/year
- Feed grade Au g/t = 1.5
- Metallurgical Recovery Au = 95%
- Plant Consumption = 29.64 kw/h
- Cost kw/h = $0.10

Table 21.4 shows the estimated unit costs that make up the OPEX of the plant.

	Specific Consumption		Annual Consumption		Specific Price (R$)	$/t
Reagents						
Sodium Cyanide	120	g/t	360 000	kg	9.31	0.29
Lime	300	g/t	900 000	kg	0.64	0.05
Activated Carbon	30	g/t	90 000	kg	9.61	0.08
SMBS	400	g/t	1 200 000	kg	1.29	0.14
Hydrocloric Acid	450	g/kg$_{Carbon}$	591 300	kg	0.95	0.05
Caustic Soda	250	g/kg$_{Carbon}$	328 500	kg	3.34	0.10
Copper Suphate	80	g/t	240 000	kg	7.50	0.16
Flocullant	20	g/t	60 000	kg	11.78	0.06
Fuel Gas	22.53	kg/h	148 022	kg	2.96	0.04
Fluxes Reagents						0.03
Subtotal Reagents						**0.99**
Grinding Media	850	g/t	2 550 000	kg	4.8	1.07
Liners						
SAG	2	Sets/y	2.0	sets	1 400 000	0.25
Ball Mill	2	Sets/y	2.0	sets	850 000	0.15
Cone Crusher	8	Sets/y	8	sets	25 000	0.02
Jaw Crusher	6	Sets/y	6	sets	20 000	0.01
Subtotal Liners						**0.42**
Wearing Material						
Belt Conveyors	0.15	R$/t			0.15	0.04
Cyclones Spares	0.12	R$/t			0.12	0.03
Screens Sieves	0.11	R$/t			0.11	0.03
Others	0.29	R$/t			0.29	0.08
Subtotal Wearing Materials						**0.18**
Laboratory Cost						**0.12**
Equipment renting						
Wheel loader						0.14
Light Vehicles						0.02
Crane						0.08
Platform Truck with Crane						0.05
Subtotal						**0.29**
Power						
Estimated Drawn Power	**29.64**	**kWh/t**			**0.38**	**2.96**
Tailings Dam Operation						**0.30**
Maintenance (Estimated)						**1.80**
Manpower (estimated)						**1.11**
Refining and Transport						0.75
TOTAL						**9.99**

Table 21.4 Plant OPEX (M US$).

21.3 General and Administration Costs

G&A was estimated to be $2M/year

21.4 Total CAPEX

The total Capex estimated for the Castelo de Sonhos Project is summarized in Table 21.5.

Item	M $
Plant	114.97
Mine	0.33
Pre production	36.0
Infrastructure	7.13
Dam	5.23
Land payments	7.58
Working Capital	12.76
Total	**184.0**

Table 21.5 Capex Summary.

22. ECONOMIC ANALYSIS

This section contains the same information as that provided in the same section of the 43-101 Technical Report filed on SEDAR by TriStar, entitled "Castelo de Sonhos Gold Project, Pará State, Brazil Amended Independent Technical Report – Preliminary Economic Assessment" with an effective date of September 14, 2018. The QP taking responsibility for this section also took QP responsibility for the same section in the previous report and is of the opinion that the information remains relevant and current despite the fact that it pre-dates the current resource estimate. Work is already underway on the Pre-Feasibility Study (PFS) for Castelo de Sonhos; the technical and economic analysis presented in the PFS will be based on new resource estimates, will not assign any economic value to Inferred resources, and, when published, will entirely replace the PEA analysis.

22.1 Taxes

The tax due for the Project was estimated taking into consideration the existing tax laws applied to revenues forecasted for the project.

- CFEM – Financial Compensation for the Exploitation of Mineral Resources

Financial Compensation for the Exploration of Mineral Resources (CFEM) is the consideration paid to the Government of Brazil for the extraction and economic exploration of Brazilian mineral resources.

CFEM focuses on net sales of the raw mineral product, or the intermediate cost of production when the mineral product is consumed or transformed in an industrial process.

The CFEM rate for this project is 1.5%.

- Income Tax:

A tax rate of 25% is applied to pre-tax profit but this value has a 75% discount due to the tax incentive offered by Sudam (Superintendência do Desenvolvimento da Amazônia).

- Social Contribution:

The social contribution tax is 9% calculated based on Real Profit.

The Income Tax legislation allows for eventual tax losses calculated in previous periods to be offset against the profits subsequently calculated from the legal entity taxed by the Real Profit.

The compensation for such losses is limited to 30% of the actual profit before compensation.

22.2 Discounted Cash Flow

A Discounted Cash Flow – DCF – base case scenario was developed to assess the project based on economic financial parameters, on the results of the mine scheduling and on the Sustaining CAPEX and OPEX estimate.

The Project base case estimates a Net Present Value of $264 million, at a Discount Rate of 5% per year post tax, as presented in Table 22.1 and Table 22.2 below.

Cash Flow	1	2	3	4	5	6	7	8	9	10	Total
Total Mined (Mt)	**16 165.8**	**29 525.3**	**28 107.6**	**29 233.3**	**26 678.3**	**24 973.4**	**22 042.5**	**22 010.4**	**21 970.8**	**1 437.0**	**222 144.1**
ROM	-	3 122.8	2 000.3	2 953.3	2 953.3	3 073.4	3 010.5	3 030.4	2 985.7	328.3	23 458.0
ROM - Au (g/t)	-	1.8	2.0	1.5	1.5	1.2	1.2	1.3	1.1	0.9	1.43
StockPile	1 256.47	-	1 256.47	-	-	-	-	-	-	-	1 256.47
StockPile - Au (g/t)	1.49	-	1.49	-	-	-	-	-	-	-	1.49
Waste (Kt)	14 909.3	26 402.4	26 107.3	26 280.0	23 725.0	21 900.0	19 032.0	18 980.0	18 985.1	1 108.7	197 429.7
Plant Feed (Kt)	-	3 122.8	3 256.8	2 953.3	2 953.3	3 073.4	3 010.5	3 030.4	2 985.7	328.3	24 714.5
Plant Feed Grade		1.83	1.79	1.52	1.52	1.22	1.24	1.25	1.14	0.91	1.43
Product - Au (KOz Troy)	**-**	**174.071**	**178.366**	**137.108**	**137.108**	**114.804**	**114.201**	**115.698**	**103.96**	**9.10**	**1 084.42**
OPEX (US$ x1000)	**(36 296.3)**	**(94 341.3)**	**(92 635.4)**	**(92 492.6)**	**(89 216.4)**	**(85 722.3)**	**(78 729.6)**	**(77 218.9)**	**(77 769.1)**	**(7 064.3)**	**(731 486.1)**
Mine	**(34 453.0)**	**(61 340.4)**	**(58 451.0)**	**(60 725.3)**	**(57 627.9)**	**(52 763.6)**	**(46 596.7)**	**(44 908.4)**	**(45 755.5)**	**(3 573.1)**	**(466 195.0)**
Loading and Haulage (US$ x1000)	(17 228.7)	(33 695.7)	(31 912.1)	(33 308.4)	(32 203.9)	(28 669.3)	(24 788.6)	(23 125.3)	(24 003.3)	(1 529.3)	(250 464.6)
Payroll and Auxiliary Equipments (US$ x1000)	(4 615.0)	(4 615.0)	(4 615.0)	(4 615.0)	(4 615.0)	(4 615.0)	(4 615.0)	(4 615.0)	(4 615.0)	(923.0)	(42 458.0)
Drilling and Blasting (US$ x1000)	(12 609.3)	(23 029.7)	(21 923.9)	(22 802.0)	(20 809.1)	(19 479.2)	(17 193.1)	(17 168.1)	(17 137.2)	(1 120.8)	(173 272.4)
Mine closure (US$ x1000)	(1 131.6)	(2 066.8)	(1 967.5)	(2 046.3)	(1 867.5)	(1 748.1)	(1 543.0)	(1 540.7)	(1 538.0)	(100.6)	(15 550.1)
Process	-	**(28 934.2)**	**(30 216.8)**	**(27 720.9)**	**(27 720.9)**	**(29 210.6)**	**(28 589.9)**	**(28 769.8)**	**(28 475.6)**	**(3 161.2)**	**(232 799.9)**
Plant	-	(28 934.2)	(30 216.8)	(27 720.9)	(27 720.9)	(29 210.6)	(28 589.9)	(28 769.8)	(28 475.6)	(3 161.2)	**(232 799.9)**
G&A	**(711.7)**	**(2 000.0)**	**(2 000.0)**	**(2 000.0)**	**(2 000.0)**	**(2 000.0)**	**(2 000.0)**	**(2 000.0)**	**(2 000.0)**	**(229.4)**	**(16 941.1)**
Gross Revenue (US$ x1000)	**-**	**217 588.5**	**222 957.7**	**171 385.3**	**171 385.3**	**143 504.9**	**142 751.0**	**144 622.6**	**129 949.6**	**11 380.3**	**1 355 525.2**
Refining and transport - US13/oz	-	(2 262.9)	(2 318.8)	(1 782.4)	(1 782.4)	(1 492.5)	(1 484.6)	(1 504.1)	(1 351.5)	(118.4)	(14 097.5)
CFEM (1.5% sobre Receita Bruta)		(3 263.8)	(3 344.4)	(2 570.8)	(2 570.8)	(2 152.6)	(2 141.3)	(2 169.3)	(1 949.2)	(170.7)	(20 332.9)
ROYALTIES FOR LAND OWNER (1%)		(2 153.3)	(2 206.4)	(1 696.0)	(1 696.0)	(1 420.1)	(1 412.7)	(1 431.2)	(1 286.0)	(112.6)	(13 414.3)
Working Capital Recovery										12 768.3	
EBITDA (US$ x1000)	**(36 296.3)**	**115 567.1**	**122 452.8**	**72 843.5**	**76 119.8**	**52 717.5**	**58 982.9**	**62 299.1**	**47 593.8**	**16 682.6**	**588 962.8**
Depreciation & Amortisation (US$ x1000)	-	(15 776.0)	(15 822.7)	(15 525.4)	(15 700.9)	(15 298.9)	(15 292.9)	(15 307.9)	(15 190.4)	(14 328.3)	**(138 243.4)**
EBIT (US$ x1000)	**(36 296.3)**	**99 791.1**	**106 630.1**	**57 318.1**	**60 418.9**	**37 418.5**	**43 690.0**	**46 991.2**	**32 403.3**	**2 354.4**	**408 064.1**
Tax losses at beginning		(36 296.3)	(6 359.0)	-	-	-	-	-	-	-	**(42 655.2)**
Taxes losses added	(36 296.3)	-	-								
Utilisation	-	29 937.3	6 359.0								**36 296.3**
Balance brought forward	(36 296.3)	(6 359.0)	-								**(42 655.2)**
Base for tax	-	69 853.8	100 271.2	57 318.1	60 418.9	37 418.5	43 690.0	46 991.2	32 403.3	2 354.4	**450 719.4**
AIR (25% sobre Exc R$ 0.24 mi/ano do EBIT) 75% off (SUDAM Incentive)	-	(4 365.9)	(6 266.9)	(3 582.4)	(3 776.2)	(2 338.7)	(2 730.6)	(2 937.0)	(2 025.2)	(147.1)	**(28 170.0)**
CSLL (9% sobre EBIT)	-	(6 286.8)	(9 024.4)	(5 158.6)	(5 437.7)	(3 367.7)	(3 932.1)	(4 229.2)	(2 916.3)	(211.9)	**(40 564.7)**
Operating profit (US$ x1000)	**(36 296.3)**	**89 138.4**	**91 338.8**	**48 577.1**	**51 205.0**	**31 712.2**	**37 027.2**	**39 825.1**	**27 461.8**	**1 995.3**	**381 984.7**
Depreciation & Amortisation (US$ x1000)	-	15 776.0	15 822.7	15 525.4	15 700.9	15 298.9	15 292.9	15 307.9	15 190.4	14 328.3	138 243.4
Free Operating cash flow (US$ x1000)	**(36 296.3)**	**104 914.42**	**107 161.5**	**64 102.5**	**66 905.9**	**47 011.2**	**52 320.1**	**55 133.0**	**42 652.3**	**16 323.6**	**520 228.1**
CAPEX (US$ x1000)	**(148 039.8)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**(148 039.8)**
Mine	(332.0)	-	-	-	-	-	-	-	-	-	(332.0)
Plant	(114 979.0)	-	-	-	-	-	-	-	-	-	(114 979.0)
Infraestructure	(7 138.0)	-	-	-	-	-	-	-	-	-	(7 138.0)
DAM	(5 234.0)	-	-	-	-	-	-	-	-	-	(5 234.0)
Conditional land payments	(7 588.5)	-	-	-	-	-	-	-	-	-	(7 588.5)
Worhing Capital	(12 768.3)	-	-	-	-	-	-	-	-		(12 768.3)
Cash flow (US$ x1000) post tax	**(184 336.1)**	**104 914.4**	**107 161.5**	**64 102.5**	**66 905.9**	**47 011.2**	**52 320.1**	**55 133.0**	**42 652.3**	**16 323.6**	**372 188.3**

Table 22.1 Discounted Cash Flow.

CAPEX ($ M)	184
NPV ($ M)@5%	264
IRR (%)	43.3
Payback time (years)	1.9

Table 22.2 Discounted Cash Flow Result.

22.3 Sensitivity Analysis

A sensitivity analysis was undertaken to evaluate the impact of the resulting economic indicators for the following attributes within the cash flow:

- WACC
- Sell price
- Mine OPEX
- Plant OPEX

The WACC, OPEX, NPV, was evaluated by varying its value from -15% to +15%. Figure 22.1 shows the sensitivity analysis developed by GE21.

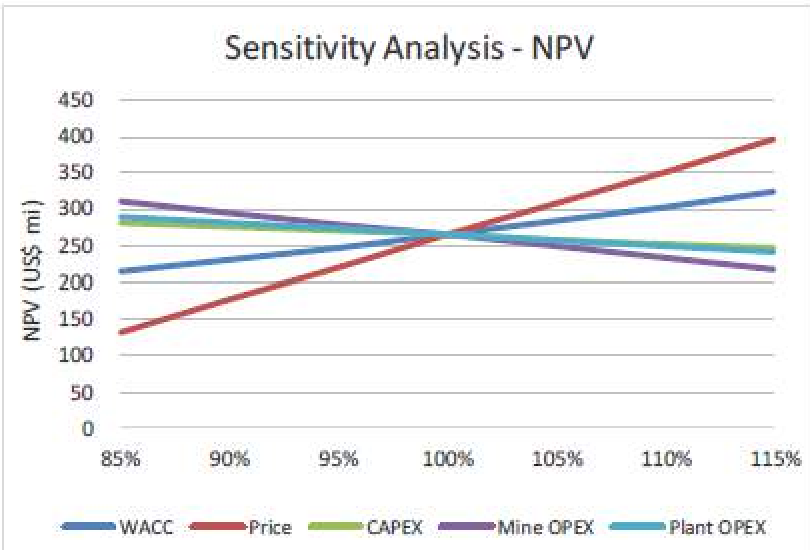

Figure 22.1 NPV Sensitivity Diagram.

GE21 concluded based on in Sensitivity Analysis that project profitability is most affected by the concentrate price and WACC.

23. ADJACENT PROPERTIES

There are no other known mineral deposits on land adjacent to the Castelo de Sonhos concessions. On TriStar's mineral concessions, and adjacent to the areas covered by the current resource block model, drilling is currently underway to test the potential for significant gold mineralization at depths beyond those that an open pit could reach but that might be amenable to underground mining methods.

24. OTHER RELEVANT DATA AND INFORMATION

24.1 COVID-19

Brazil has been hit particularly hard by the novel coronavirus and its variants that cause COVID-19. The major adverse effects of the global pandemic on the Castelo de Sonhos project are:

- Foreign consultants have difficulty visiting the project site, which can cause delays when their presence on site is important or necessary.
- Drilling can be delayed if entire drill crews become infected.
- The ALS laboratory in Lima, Peru, and its preparation labs in Brazil have experienced shutdowns, causing the turnaround time for assays on drilling samples to be much longer than usual.

TriStar, its consultants and contractors have developed operational health and safety procedures to prevent the spread of COVID-19 amongst the professional staff, the site's support staff, the contractors who have work to do on the plateau and in the surrounding area, and residents in the local community. To date, these procedures have proved effective, with no TriStar staff having contracted COVID-19.

TriStar's site staff are in contact with health officials in the region so that the project can be closely aware of the capacity of the region's health care infrastructure to cope with new cases.

Despite the many challenges posed by the pandemic, TriStar has been able to continue to drill and to conduct field studies important for the project's next milestone, the Pre-Feasibility Study. Brazilian politicians and business leaders have spoken about the importance of the mining sector in rebuilding the economy crippled by the pandemic. TriStar's interactions with state agencies, which have become more frequent now that the project has begun its Environmental Impact Assessment, remain good and cooperative.

25. INTERPRETATION AND CONCLUSIONS

25.1 Improved confidence

Since the completion of the Preliminary Economic Assessment (PEA) in 2018, TriStar's primary objective has been to improve confidence in the mineral resource estimates to increase the reserves available for the Pre-Feasibility Study's (PFS) assessment of technical and economic viability. This objective has been met, with most of the mineral resources now in the Indicated category. It is recommended that the resource block model be updated again prior to the PFS so that it can incorporate data from holes drilled in 2021.

The reserves available for PFS studies will benefit from additional drilling along the western edge of the resources currently classified as Indicated, in the area along the high-wall of the open pit where stripping costs eventually overtake revenue generated by mining and processing the gold in the dipping band of conglomerates. The PFS must regard all Inferred resource blocks as waste that carries no economic value; this will limit the down-dip reach of an open-pit because the gold in the well-mineralized central band of the conglomerate will not be able to support the stripping cost of Inferred blocks above. Additional drilling along the high-wall will allow more resources to be classified as Indicated, which will assist a proper assessment of the revenue−cost trade-off of extending the open pit further down the dipping band of well-mineralized conglomerates.

25.2 Improved geological model

Much of the improvement in the resource block model is due to a model that captures details of local variation in bedding orientations; this comes from the 3D model of litho-geochemical units that used machine learning tools to integrate 2D maps of surface geophysics with down-hole analysis of clusters of similar multi-element geochemistry. The use of artificial intelligence methods has made possible a more detailed and informative geological model; this work should continue and should be updated when the next resource update is being done.

The ability of cluster analysis of multi-element geochemistry to enhance the understanding of stratigraphy raises the possibility of introducing portable XRF technology (pXRF) to the Castelo de Sonhos project. The rapid screening of samples by pXRF could be useful to surface reconnaissance studies, to drill hole logging and, eventually, to grade control.

25.3 Improved grade interpolation method

Upcoming studies of the technical viability of mining will be improved by a resource block model that uses larger blocks than have been used previously and that estimates the gold grade distribution of selective mining units (SMUs) within each large block. Not only will this avoid the high degree of smoothing in previous small-block block models, it will also enable more reliable assessments of mineralised material loss and dilution.

An additional methodological improvement that should be implemented in the next resource update is to base the classification of resources on the quarterly and annual uncertainties on tonnage, grade and metal content. Conditional simulation provides a way of evaluating quarterly and annual uncertainties, and leads to a classification system that is grounded in the practical realities of production planning and mine planning, instead of one based on block-by-block interpolation metrics that are not linked directly to factors that affect the production uncertainties that the project now begins to assess as it moves into its PFS. The classification procedure used in the current model, the smoothing of block-by-block interpolation metrics, is good during the exploration phase of a project but, as with other aspects of project development, can be replaced with other methods better suited to the issues that arise in feasibility studies.

26. RECOMMENDATIONS

The QPs are of the opinion that TriStar should advance the Castelo de Sonhos Gold Project to a Pre-Feasibility Study (PFS) in mid-2021, using all the drill hole data acquired during the first half year, along with a revised litho-geochemical interpretation that also makes use of new information not available at the effective date of this report.

The QPs recognize that practical and logistical constraints created by the COVID-19 pandemic will make it difficult to implement all of these for the PFS; but they are of the opinion that the following recommendations for studies and data acquisition programs will improve the PFS or, if they cannot be completed before the PFS, will improve the full Feasibility Study.

26.1 Recommendations Related to Geology

1. Update the 3D model of litho-geochemistry units and erosional surfaces using new multi-element chemistry and gold assays not available at the end of 2020, and incorporating information on bedding direction from available optical televiewer (OTV) images.
2. Incorporate into the project's maps a revised soil anomaly map that incorporates all soil samples, including those from 2019 and 2020 that expand soil sample coverage into areas left blank on previous maps.
3. Integrate the Barrick stream sediment samples with the drainages that can now be resolved with high precision using the LIDAR topography to explore the possibility of identifying well-mineralized source rocks that have not yet been drilled.
4. Extend the machine-learning analysis of dykes and dyke margins to include OTV images, and gold assays from drillholes and soil samples to enable 3D modeling of dykes into the interior of the plateau, with the goal of identifying other locations where gold may be enriched by dykes or intrusions.

26.2 Recommendations Related to Mineral Resources

5. As laboratory capacity and productivity allow during COVID-19 restrictions, complete Leachwell analyses for all sample intervals in significant intervals calculated at 0.1g/t, including one sample on either side of these significant intervals.
6. Perform an extensive campaign of density test work to improve the density of information across the deposit, including in the friable upper arenite that will account for much of the stripping along the high-walls of the open pits.
7. Continue to expand the total mineral resource with:
    a. holes that extend current resources into adjacent areas where the deposits remain open along strike and down-dip
    b. holes that infill 100m drilling to improve the classification of resources from Inferred to Indicated
    c. holes that test resource potential in the interior of the plateau, particularly at depths beyond the reach of open-pit operations.
8. For the PFS, classify resources using the conditional simulation approach that links resource confidence to the uncertainties on quarterly and annual production.

26.3 Recommendations Related to Metallurgy and Processing

9. Include in the PFS a trade-off study of the technical and economic viability of pre-concentration by gravity and flotation and leaching of concentrates, with recovery around 94%, versus whole ROM leaching, CCD and Merrill Crowe recovery.
10. Complete an options analysis for tailings disposal. This should look at a comparison between a standard tailings storage facility and a form of thickened or dry-stack tailings facility.

26.4 Recommendations Related to Reserves

11. Complete the closely-spaced 10x10m drilling so that the data from that area can serve as the basis for studies of mineral loss, mining dilution and grade control.
12. Conduct field trials of portable XRF analysis and other rapid screening technologies for the purpose of improving grade control through improved local delineation of sedimentary packages and erosional surfaces.
13. Develop a costed plan for conducting, after the PFS but before the FS, a test mining or bulk mining exercise in the area with 10x10m drilling.

26.5 Cost of Recommendations

The anticipated cost for implementing all recommendations, including the planning of a test mining program, but not the execution of it, is $US 4,500,000.

27. REFERENCES

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