Caledonia Mining Corporation Plc

BILBOES GOLD PROJECT

PRELIMINARY ECONOMIC ASSESSMENT

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DRA

ABBREVIATIONS, TERMS AND DEFINITIONS

Abbreviation	Description
3D	Three-dimensional
AACE	American Association of Cost Engineers
AARL	Anglo American Research Laboratory
AMIS	African Mineral Standards
amsl	above mean sea level
AMZIM	Anglo American Corporation of Zimbabwe Ltd
Baker Steel	Baker Steel Resources Limited
BFS	Basic Ferric Sulfate
BIOX	Biological Oxidation
Blanket	Blanket Mine
BMA	Bulk Modal Analysis
BMS	Base Metal Sulphides
BoQ	Bill of Quantities
BBWi	Bond Ball Work Index
Bilboes	Bilboes Holdings (Private) Limited
Bilboes Gold	Bilboes Gold Limited
Caledonia	Caledonia Mining Corporation Plc
CBE	Cost Baseline Estimate
CCD	Counter Current Decantation
CCE	Capital Cost Estimate
CCIC MinRes	Caracle Creek International Consulting MinRes
CIL	Carbon in Leach
CIM	Canadian Institute of Mining
CRMs	Certified Reference Materials
CSR	Corporate Social Responsibility
DCF	Discounted Cash Flow
DD	Diamond Drill
DEM	Digital Elevation Model
DRA	DRA Projects (Pty) Ltd
EC&I	Electrical, Control and Instrumentation
EHS	Environmental, Health and Safety
EMA	Environmental Management Agency
EMC	Eurus Mineral Consultants
EMP	Environmental Management Plans
EPCM	Engineering, Procurement, and Construction Management
EPO	Exclusive Prospecting Orders

Abbreviation	Description
ESIA	Environmental and Social Impact Assessment
EIA	Environmental Impact Assessment
ESMP	Environmental and Social Management Plan
ESSMS	Environmental, Social and Safety Management System
FEED	Front End Engineering Design
Fidelity	Fidelity Printers and Refiners (Private) Limited
FGR	Fidelity Gold Refinery (Private) Limited
FS	Feasibility Study
G&A	General and Administration Cost
GAT	Gat Investments (Private) Limited
GISTM	Global Industry Standards on Tailings Management
ICMM	International Council on Mining and Metals
IFC	International Finance Corporation
ILO	International Labor Organization
IMTT	Intermediated Money Transfer Tax
IRR	Internal Rate of Return
ISBN	Isabella North
ISBS	Isabella South
LBMA	London Bullion Market Association
LCR	Lab Coarse Duplicates
LG	Lerchs-Grossman
LoM	Life of Mine
LPR	Lab Pulp Duplicates
LRP	Livelihoods Restoration Plan
m/a	Million per annum
mamsl	Meter above mean sea level
MAP	Mean Annual Precipitation
MCC	Motor Control Centre
MEL	Mechanical Equipment List
MMC	Manhize Mineral Consultants
MRE	Mineral Resource Estimate
MSD-Z	Meteorological Services Department of Zimbabwe
NI43 101	National Instruments 43 101
NPV	Net Present Value
OPEX	Operating Expenditure
P&G	Preliminary and General
P&ID's	Piping and Instrument Diagrams

Abbreviation	Description
PAG	Potentially Acid Generating
PDC	Process Design Criteria
PEA	Preliminary Economic Assessment
PERC	Percussion
PF	Plant Feed
PFS	Prefeasibility Study
PGMs	Platinum Group Metals
Plant	Process Plant
PLC	Programmable Logic Controller
PLZ	Performance Laboratories Zimbabwe Limited
POX	Pressure Oxidation
PSD	Particle Size Distribution
PV	Prospecting Ventures
QA/QC	Quality Control and Quality Assurance
QC	Control Requirements
QCPs	Quality Control Plans
QP	Qualified Person
QS	Quality Assurance
RC	Reverse Circulation
RMR	Rock Mass Rating
RoM	Run of Mine
RoR	Rate of Rise
RQD	Rock Quality Designation
SADCAS	Southern African Development Community Accreditation Service
SEX	Sodium Ethyl Xanthate
EHS	Environment, Health and Safety
SIB	Stay In Business
SMBS	Sodium Meta Bi Sulfite
SMPP	Structural, Mechanical, Platework and Piping
SLR	SLR Consulting (Africa) (Pty) Ltd
tconc	Tonne Concentrate
TSF	Tailings Storage Facility
US$	United States Dollar
VAT	Value Added Tax
VFEX	Victoria Falls Stock Exchange
WAD	Weak Acid Dissociable Cyanide
WBS	Work Breakdown Structure

Abbreviation	Description
WGC	World Gold Council
WRD	Waste Rock Dumps
ZWS	Hazardous Waste Management
ZETDC	Zimbabwe Electricity Transmission and Distribution Company
ZINWA	Zimbabwe National Water Authority
ZiG	Zimbabwe Gold

SYSTEM OF UNITS

The international metric system of units (SI) will be used throughout the design in all documentation, specifications, drawings, reports and all other documents associated.

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1 SUMMARY

DRA Projects Pty (Ltd) (DRA) has been commissioned by Caledonia Mining Corporation Plc (Caledonia) to provide a Preliminary Economic Assessment (PEA) on the Bilboes Gold Project, Zimbabwe. The PEA was undertaken to determine the most appropriate production plan for a proposed Feasibility Study (FS).

The PEA reflects the work that has been done by Caledonia and its consultants over the period since the Bilboes Gold Project was acquired by Caledonia in January 2023. This work focussed on updating the feasibility study in respect of the project that was prepared by DRA on behalf of the previous owners of the project and which had an effective date of December 15, 2021 (the “former Feasibility Study”); the work also considered alternative development options for the project, which included multi-phase development and changes to certain aspects of the project. The main change to the project development plan that has been made relates to the proposed construction of the Tailings Storage Facility ("TSF"), which will now be constructed on a modular basis to reduce the initial capital expenditure and therefore improve the economic returns. The revised approach to the TSF constitutes a “significant change” to the project and requires the preparation of an entirely new technical and economic study. The work that has been carried out to date in respect of the revised approach to the TSF is to the level of a preliminary economic assessment and not to the level of a feasibility study. Due to the significance of the TSF to the overall project, the entire body of work that has been completed to date is therefore at the level of confidence of a preliminary economic assessment. The PEA therefore supersedes the former FS.

The PEA has been prepared in accordance with the disclosure and reporting requirements set forth in National Instrument 43-101 Standards of Disclosure for Mineral Projects (“NI 43-101”), Companion Policy 43-101CP, Form 43-101F1, and the Canadian Institute of Mining (CIM) Definition Standards for Mineral Resources and Mineral Reserves adopted by the CIM Council on May 10, 2014.

1.1 Project Area and Location

The Bilboes properties are located in the Matabeleland North Province of Zimbabwe (Figure 1-1). The Isabella-McCays properties are situated approximately 80 km north of Bulawayo while Bubi is situated approximately 100 km north of Bulawayo. Bubi is 32 km due north-east of Isabella.

Bilboes has rights to three groups of claims covering an area of 2,731.6 ha that consist of four open-pit mining properties in Matabeleland North Province of Zimbabwe. These open pits are referred to as Isabela North; Isabela South; McCays and Bubi.

Figure 1-1: Regional Location of Bilboes Gold

1.2 Accessibility, Climate, Local Resources, Infrastructure and Physiography

The Bilboes properties are located in the Matabeleland North Province of Zimbabwe. The Isabella-McCays properties are situated approximately 80 km north of Bulawayo while Bubi is situated approximately 100 km north of Bulawayo. Bubi is 32 km due north-east of Isabella.

Average daily temperatures range from 24°C in June, to 32°C in October and apart from the occasional heavy downpour in the rainy season, there are no climatic conditions that prevent all year-round exploration and mining.

The terms of the claims tenure system in Zimbabwe confer rights to use of the land surface for mining and construction of all related infrastructure such as housing, offices, plant, and tailings/waste disposal facilities subject to adherence to the environmental legislation. In 2019, Bilboes obtained rights for an additional 1,128 ha for a mine site at Isabella which will be adequate to cater for the additional sulphide mine infrastructure such as the sulphide plant, tailing's storage facility, waste dumps, housing, and additional office infrastructure. These existing structures will require to be upgraded for the proposed sulphide mining project.

There is sufficient underground water around the mines to run the current heap-leach operations, but additional drill holes and pumping capacity will be required for the proposed sulphide-mining project.

There are 33 kV power lines within 5 km and 25 km of the Isabella McCays and Bubi deposits respectively, that form part of the national grid, but new lines will have to be constructed to meet the increased capacity of the proposed exploitation of the sulphides. Generators at all mines allow continued production during load shedding. The capacity will need to be upgraded to cater for the sulphide operation. The properties lie between 1,150 m and 1,200 m above mean sea level (amsl). The area is covered by red and grey soils characteristic of greenstone rocks in Zimbabwe. Vegetation is dominated by scrubby Colophospermum Mopane, Acacia, and Combretum woodlands and minor occurrences of miombo with no extensive grasslands. Agricultural activities are restricted to ranching.

1.3 History

Initial exploration allowed the estimation of a small oxide resource and an open-pit; heap-leach mine was commissioned in 1989. Some 95,877 oz of gold were produced since 2003. Subsequent exploration extended Isabella and new discoveries were made at Bubi and McCays, which has yielded production of 9,136 kg of gold (293,729 oz) to December 2023. All mining has been from open pit oxide plant feed utilizing the heap leach extraction processing method.

Exploration for sulphide Mineral Resources began in 1994/95, with 17,650 m of exploratory drilling being completed by 1999, covering a strike length of 3,440 m. A maiden Mineral Resource estimate for the sulphide Mineral Resources was completed by SRK in 2009, containing 4.75 Mt of Inferred Mineral Resources grading 3.49 g/t. This estimate used a 2.0 g/t cut-off for delineation of the Mineral Resource estimation domains.

1.4 Geological Setting

The Bubi Greenstone Belt (Archean) which consists of volcanic rocks of the Upper Bulawayan Group and capped by sedimentary sequences of the Shamvaian Group, all of which have been metamorphosed into felsic and mafic schists, underlies the Bilboes properties. Gold deposits are concentrated at the interface between these two groups, where major structural breaks and splays provide pathways for hydrothermal vein mineralization.

Gold is associated with sulphides that is commonly found in hydrothermal systems. These include pyrite and arsenopyrite as major components, but copper, lead, zinc, antimony, are also present in some deposits. A common alteration associated with gold mineralization is silicification, with lesser sericite and chlorite alteration.

1.5 Deposit Types and Mineralization

Mineralization is hydrothermal and consists of silicified stockworks that host pyrite and arsenopyrite. The stockworks are characterized by a series of subparallel echelon zones. The gold is very finely dispersed within the sulphides and is refractory. All the deposits are oxidized with the sulphide interface occurring between 6 m and 50 m below surface.

1.6 Exploration and Drilling

Mapping has been conducted progressively at the Bilboes mines since commencement of oxide gold operations, with the latest exercise being conducted between January and September 2018.

Trenching was conducted across all deposits as part of exploration work for the purposes of defining near surface geology and mineralization envelopes within the oxide horizons. Channel sampling was also done in all accessible sections of the pits during 2017, which also assisted in the projection of mineralized envelopes in the oxide and transition plant feed horizons.

Ground Magnetics and Induced Polarization Geophysical surveys were conducted at the Isabella North deposit by PV as part of the oxide plant feed exploration in 1996. The anomalies were followed up with oxide trenching and drilling.

Drilling of the sulphides to provide data for the Mineral Resource estimate was completed in three Phases:

- Phase 1: Anglo American Corporation between 1994 and 1999 (123 drill holes, 17,650 m)
- Phase 2: Bilboes between 2011 and 2013 (234 drill holes, 40,762),
- Phase 3: Bilboes between December 2017 and November 2018 (307 drill holes, 34,988 m).

In addition, geotechnical (18 drill holes, 2, 500 m) drilling was undertaken. No geohydrological drilling was undertaken.

1.7 Sample Preparation, Analyses and Security

Logging and sampling procedures used followed Anglo American Corporation standard procedures. The geological logging included descriptions of lithologies, structures, alteration, and visible sulphide mineralization. The information was entered into core logging sheets and mineralized zones were identified. All geological boundaries were defined with reference to the drill length. On completion of assaying, the gold results for each sample were recorded on the log sheets for easy reference. Core recoveries were recorded, and any depth discrepancies were checked and corrected. Geotechnical logging, including the Rock Quality Designation (RQD) index and fracture spacing, was also undertaken.

The recovery of samples from the RC and core drill rigs was done in accordance with laid down procedures adequate for the purposes of reporting of Mineral Resources. After being reviewed the procedures for sampling, sample preparation protocol, sample handling and storage are considered to be adequate for the purposes of reporting of Mineral Resources.

At all times during sample collection, storage, and shipment to the laboratory facilities, the samples were in the control of Bilboes Gold.

1.8 Analysis

Samples were analysed for gold by Fire Assay on 50 g pulp aliquots and completed by Atomic Adsorption spectrophotometry method. Samples with grades at 3 g/t and above were repeated by the gravimetric finish. Performance Laboratory Zimbabwe (PLZ) in Harare, was selected as the primary laboratory, ZIMLABS Laboratory located in Harare and Antech Laboratories (Antech) located in Kwekwe were used for check analyses. All the laboratories that conducted the sampling and analytical work were independent of Bilboes Gold.

1.9 Quality Control and Quality Assurance

As part of their Quality Control and Quality Assurance (QA/QC) protocols to test for the precision of the analytical process, Bilboes inserted Certified Reference Materials (CRMs), blanks into their sampling stream, and created duplicates for re-analysis. During the 2017 Mineral Resource review of the Bilboes properties, DRA did a thorough review of the QA/QC protocols. The findings of that review concluded that the protocols employed at Bilboes were adequate and the database was deemed fit for the purposes of geological modelling and Mineral Resource estimations. The review was in respect of all protocols from commencement of drilling campaigns by Bilboes in 2011 till completion in 2018.

1.10 Data Verification

Before commencement of the 2017/2018 drilling, in addition to the Datamine™ software already in place, Bilboes acquired Fusion database software for the capture, storage and management of drillhole information. This software has built in data verification tools to minimize transcription errors. Bilboes standard operating procedure involves a thorough audit by a senior geologist of each drillhole's geology and sampling logs, from data logging through to capturing into the database and QA/QC checks.

Each hardcopy log is audited and signed-off by a senior geologist prior to being used in modelling and estimation. DRA visited the site during drilling and performed various checks to verify the integrity of the collar co-ordinates, logging and sampling procedures, and assay results and concluded that the data collection was consistent with industry standards.

1.11 Mineral Processing and Metallurgical Testing

The metallurgical test work campaign was concluded in different phases over a period extending from September 2013 to March 2019 and involved various laboratories and consultants as outlined in Table 1-1. The outcomes from the test work have been used to define the processing route, process design basis and gold recoveries.

Table 1-1: Test work Program Outline

Phase	Test work Description	Done By	Supervision and Oversight	Date
1A	Sample characterization detailing mineralogical and chemical analysis	Mintek, South Africa	Bilboes Gold, MMC and MDM Engineering	September 13 to December 13
1B	Comminution test work done on the two composites namely Composite 1 (Bubi ore) and Composite 2 (combination of Isabella and McCays plant feed)	Mintek, South Africa	Bilboes Gold, MMC and MDM Engineering	January 14 to April 14
2	Selection of a process route covering gravity amenability tests, flotation optimization and treatment of the sulphide flotation concentrates via POX, Bio-Oxidation and Ultra-fine grinding followed by cyanidation	Mintek and Suntech, South Africa	Bilboes and MMC	May 14 to September 14
3	Variability flotation tests and bulk flotation concentrate production for additional BIOX® and gold leach tests	Suntech and SGS, South Africa	Bilboes Gold, Minxcon and MMC	October 15 to August 16
4A	Laboratory and Pilot plant test work campaigns on the different plant feed types to generate additional flotation kinetics and grind data, bulk concentrates for BIOX® pilot plants, flotation design parameters and validate flowsheet	MMC at the client's project site in Zimbabwe	Bilboes and DRA	April 18 to September 18
4B	Review, modelling and simulation of laboratory and pilot plant test results	EMC, South Africa	Bilboes Gold, MMC and DRA	October 18 to March 19

1.12 Mineral Resource Estimate

The Mineral Resource Estimate (MRE) has been declared in terms of the CIM Standards Table 1-2.

The MRE is summarized in Table 1-2 using a cut-off grade of 0.9 g/t Au and constrained inside a Lerchs-Grossman (LG) optimized pit shell using US$ 2,400 per ounce gold price.

Table 1-2: Mineral Resource based on a 0.9g/t Au Cut-Off Grade

Base Case Mineral Resources (0.9 g/t Au) Reference Point: In Situ (31 December 2023)

Property	Classification	Tonnage (Mt)	Au (g/t)	Metal (kg)	Ounces (koz)
ISBS	Measured	1.325	2.34	3,104	100
	Indicated	5.211	2.17	11,299	363
	Total Measured and Indicated	6.537	2.20	14,403	463
	Inferred	1.335	1.80	2,404	77
ISBN	Measured	2.589	2.68	6,939	223
	Indicated	4.430	2.31	10,246	329
	Total Measured and Indicated	7.019	2.45	17,186	553
	Inferred	1.613	2.18	3,520	113
Bubi	Measured	1.288	1.95	2,518	81
	Indicated	14.006	2.19	30,708	987
	Total Measured and Indicated	15.294	2.17	33,225	1,068
	Inferred	5.116	1.80	9,208	296
McCays	Measured	0.925	3.05	2,821	91
	Indicated	3.874	2.37	9,193	296
	Total Measured and Indicated	4.799	2.50	12,014	386
	Inferred	1.054	2.16	2,274	73
Totals ISBS + ISBN + Bubi + McCays	Total Measured	6.128	2.51	15,382	495
	Total Indicated	27.522	2.26	61,446	1,976
	Total Measured and Indicated	33.650	2.30	76,828	2,470
	Total Inferred	9.118	1.99	17,406	560

- *CIM definitions (May 10, 2014) observed for classification of Mineral Resources.*
- *Mineral Resources are in situ.*
- *Block bulk density interpolated from specific gravity measurements taken from core samples.*
- *Resources are constrained by a Lerchs-Grossman (LG) optimized pit shell using Whittle software.*
- *Mineral Resources are not Mineral Reserves and have no demonstrated economic viability. The estimate of Mineral Resources may be materially affected by mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social, and governmental factors (Modifying Factors).*
- *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.*
- *Numbers may not add due to rounding.*

1.13 Mineral Reserve Estimates

No Mineral Reserve under the CIM Definition Standards (2014) was defined for the Bilboes Gold Project at this PEA level of study.

1.14 Mining Methods

The Bilboes Gold Project consists of four mining areas containing between one to three pits each. These areas are McCays, Isabella South, Isabella North and Bubi (Figure 1-2).

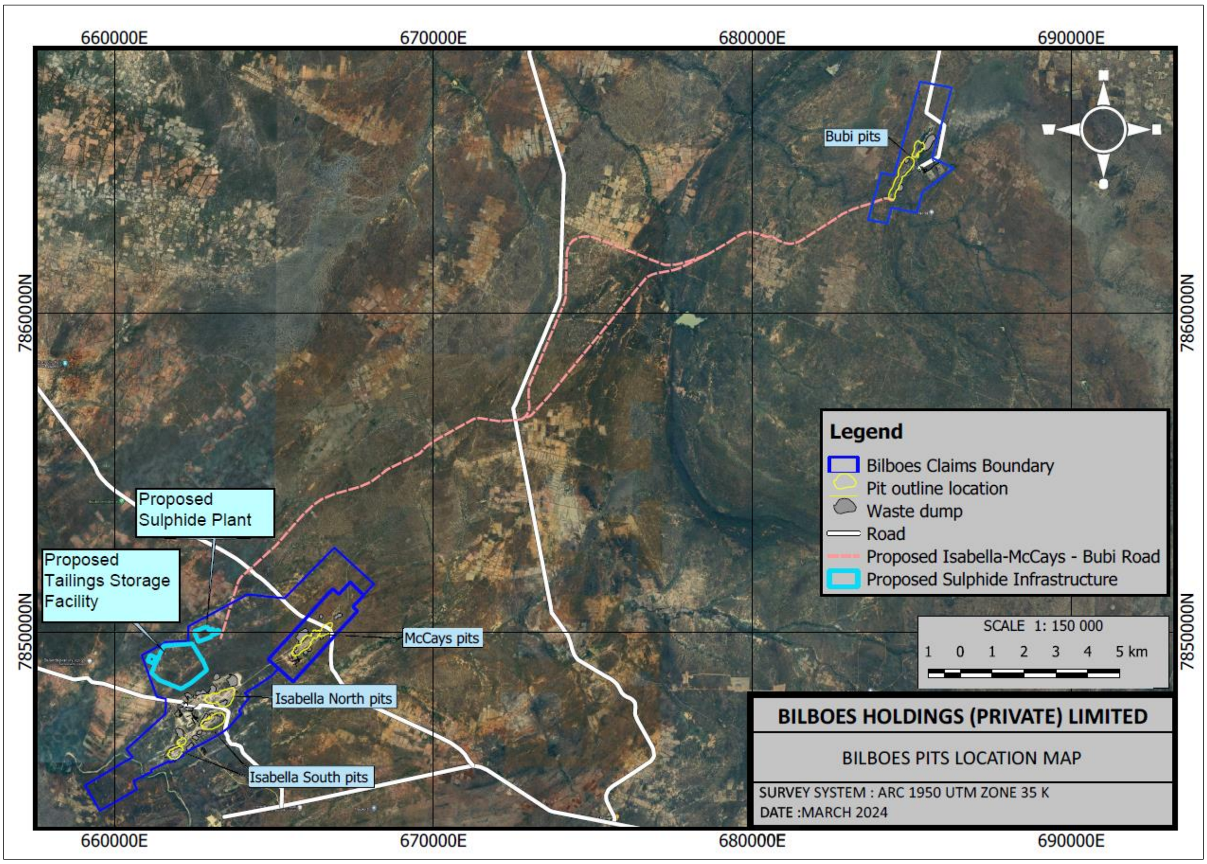

Figure 1-2: Block Plan Showing Bilboes Pits and Process Plant Location

Based on the analysis of the engineering geological aspects of the investigated deposits which included rock mass characterization, hydrogeology, intact rock properties and structural geology, a geotechnical model comprising design parameters was developed. Using these design parameters; kinematic, empirical and limit equilibrium analysis was conducted to determine the optimal slope configuration for the various deposits.

Based on the analysis conducted, it is understood that the capacity of the slopes should be affected by the following:

- Completely weathered slopes should be a maximum of 3 m in height, and it is recommended that the material is pushed back from the crest,

- For the transitional rock (highly to moderately weathered), by a combination of rock mass strength and adverse structural orientation. Inter-ramp heights of 60 m are achievable with inter-ramp angles between 45°and 50°,
- For the unweathered rock slopes adverse structural orientation should determine the slope angle which is achievable. Inter-ramp heights of 90 m are achievable with inter-ramp angles of between 50° and 55°, depending on the wall direction.

In this PEA the previous Base Case was revalidated with Phase 1 being a 240 ktpm gold processing plant treating Run of Mine (RoM) material from Isabella and McCays (after a short ramp-up period) before being upgraded for a Phase 2 to treat RoM material from the Bubi pit at 180 ktpm.

The inputs to the whittle optimization include revenue related financial parameters, geotechnical parameters, various waste mining costs and the process plant throughput. Dilution of 4% and mining losses of 5% loss were assumed.

The Life of Mine (LoM) schedule considers the blending requirement that a maximum of 50% of feed to plant be sourced from Isabella North and the remainder from Isabella South (preferred blend) or McCays. Irregular waste production profiles were smoothed to ensure the production profile is practically implementable.

1.15 Recovery Methods

Plant feed will be derived from two main mining areas, namely Isabella McCays and Bubi, with production throughput to be phased over LoM as described in each scenario.

Operations in the process plant can essentially be divided into the following sections:

- Comminution (plant feed size reduction by crushing and milling to facilitate liberation of the mineral particles for subsequent downstream concentration),
- Flotation (concentration of sulphides and gold into a small concentrate mass),
- Biological oxidation - BIOX® (destruction of the sulphides in the concentrate using oxidizing bacteria to expose the gold particles for downstream recovery),
- Carbon in leach (cyanidation leach of the BIOX® residue and recovery of the solubilized gold onto activated carbon),
- Carbon treatment,
- Electrowinning and smelting,
- Tailings handling.

The unit operations will be appliable to all three scenarios described in this PEA report. Further detail covering the test work and processing route can be found in the historical feasibility study reports. A simplified schematic flow diagram is presented in Figure 1-3.

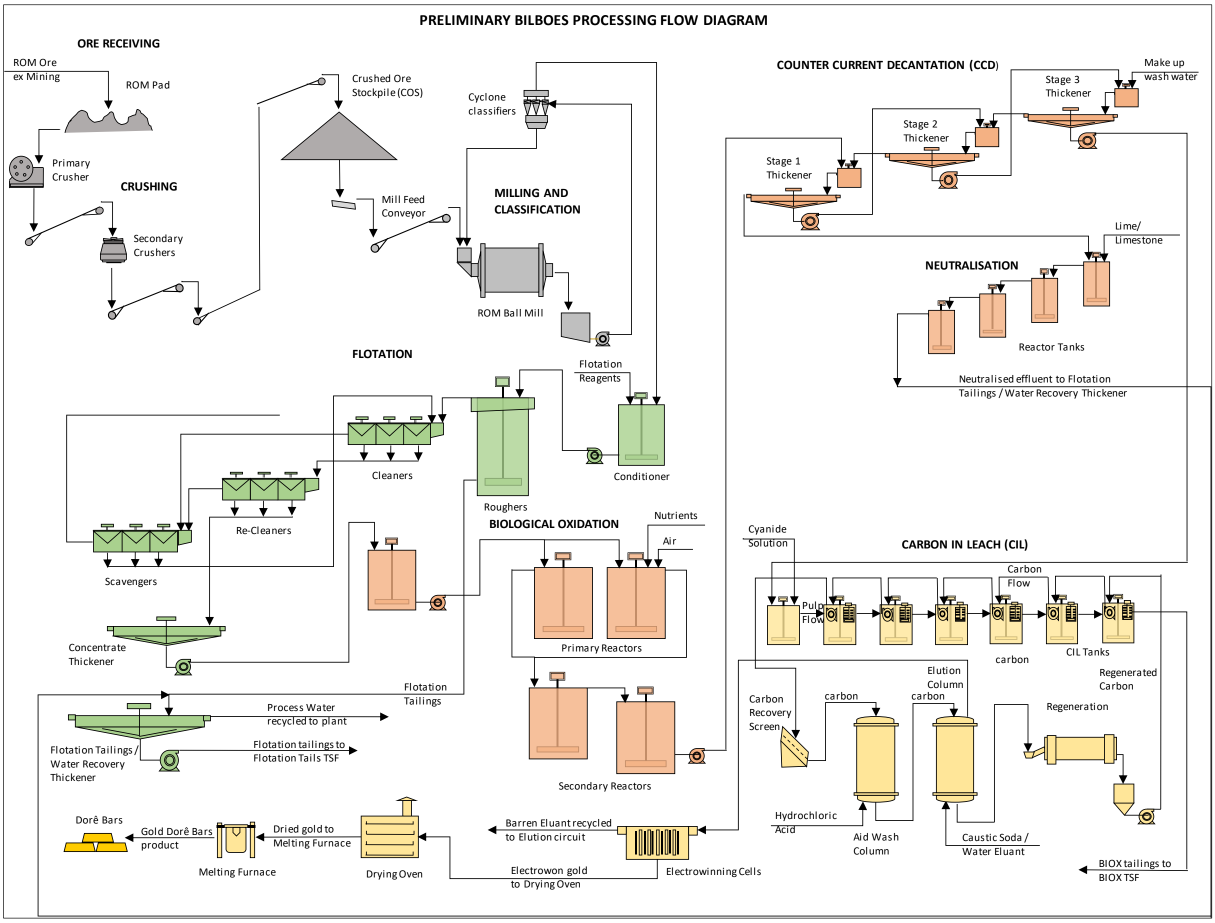

Figure 1-3: Bilboes Simplified Process Flow Diagram

1.16 Tailings Storage Facility

SLR Consulting (Africa) (Pty) Ltd (SLR) were engaged to optimize the TSF as a follow on to investigate a new concept design and associated costing based on a phased paddock approach for base case. The objectives were to minimize initial capital outlay and delay further expenditure according to a three-Phase build programme that aligned with the LoM production schedule.

1.17 Project Infrastructure

The overall site plan is shown in Figure 1-4 and includes major facilities of the Project including the Isabella North and South, McCays and Bubi open pit mines, gold processing plan, TSF, Waste Stockpiles, demarcated areas for mine buildings and accommodation facilities, main power line internal mine roads and access public roads.

Grid power will be supplied from the Zimbabwe National Grid by constructing a 70 km 132 kV Lynx line from Shangani Substation. To feed the line, a line bay will be constructed at Shangani. A mine substation will be constructed at Isabella. The estimate received is for a 132kV substation, equipped with a 50 MVA 132/33 kV step-down transformer. Raw water will be provided from open pit dewatering and the wellfield boreholes located across the mine license area.

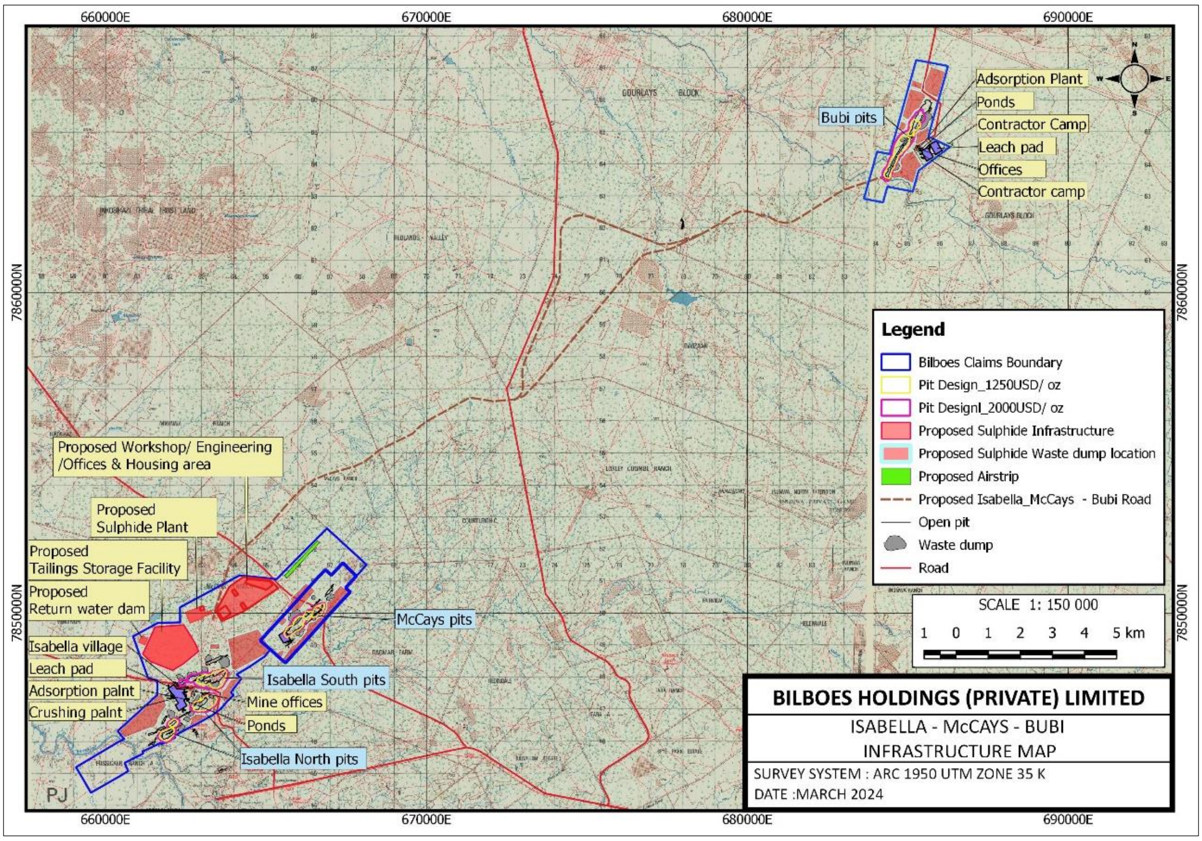

Figure 1-4: Overall Site Plan

1.18 Market Studies and Contracts

The Gold Trade Act empowers the Minister responsible for Finance to issue a Gold Dealers License which entitles entities to export and sell gold from Zimbabwe to customers of their choice. Prior to 1 June 2021, only Fidelity Gold Refinery (Private) Limited (FGR) had the Gold Dealership License and therefore all gold bullion was sold to FGR. With effect from 1 August 2021, all gold producers can directly sell any incremental production to customers of their choice using FGR's license to export. Caledonia's Blanket Mine is currently selling 75% of its gold to a customer of its choice outside Zimbabwe by exporting the gold using FGR's license. Sales proceeds from the exported gold are received directly into Blanket's bank account in Zimbabwe. As all Bilboes production is considered incremental, Bilboes will be able to sell its gold directly to customers of its choice or to continue selling to FGR.

Bilboes is confident that it will be able to export and sell its gold production on similar terms as those currently in place between FGR and Blanket.

1.19 Environmental

The Environmental and Social Impact Assessment (ESIA) and accompanying specialist studies were conducted in conformance with the relevant International Finance Corporation (IFC) Performance Standards and associated guidelines and in compliance with the legal framework of Zimbabwe. The Environmental Impact Assessment (EIA) (SLR, 2019) identified the following potential environmental impacts:

- The EIA (SLR, 2019) concluded that the proposed project presents several potential positive and negative impacts associated with the unmitigated scenario. With mitigation (in the residual impact scenario) some of the identified potential impacts can be prevented and the remainder can be managed and mitigated to remain within acceptable environmental limits so long as the mitigation set out in the Environmental and Social Management Plan (ESMP) is implemented and Bilboes develops, implements, and annually reviews the Environmental, Social and Safety Management System (ESSMS). Positive impacts can be enhanced by developing and implementing a Community Development Plan as set out in the ESMP.

  Bilboes is committed to implementing the mitigation measures within the ESMP together with the ESSMS which will be implemented as part of Bilboes on-going efforts to achieve continuous environmental improvement. The management system will contain plans and procedures to help manage environmental aspects and impacts and help ensure legal compliance. Requirements for post-closure monitoring to determine whether the mitigation and rehabilitation measures are effective would be incorporated into a final Closure Plan to be compiled for the operations prior to the commencement of decommissioning.

1.20 Project Permitting

An approved EIA is required in terms of the Environmental Management Act (Chapter 20:27) No. 13 of 2002 and the Mines and Minerals Act (Chapter 21:05) of 1996. The ESIA was undertaken for the project to satisfy the requirement and an ESIA Report was completed and submitted to the Environmental Management Agency (EMA) within the first quarter of 2020. Thereafter, public feedback meetings were held to disclose the findings of the ESIA Report to the identified stakeholders. A record of this disclosure process was compiled and submitted to the EMA. An EIA certificate was issued to Bilboes for the project in February 2021 and was valid for two years. The EIA certificate was renewed for one year to March 2024 and now to March 2025. The EIA certificate renewal process will continue annually for the duration of the operations, subject to conditions which include project update reports, compliance with Environmental Management Plans (EMP) outlined in the ESIA Report and notification to EMA for any changes in the project likely to alter the project as stipulated in the ESIA Report. Other project related licenses include air emissions (generators, smelter, incinerator), explosives (purchase and storage), firearms, medicines control, public health (medical examination), water abstract, hazardous substances (importation, transportation, storage and use) and solid waste disposal which are renewed quarterly or annually.

1.21 Social and Community Related Requirements and Plans

An ESMP has been developed which contains the environmental, social and safety management and monitoring commitments that Bilboes will implement to manage the negative impacts and enhance the positive impacts identified in the EIA. This will include:

- A Livelihoods Restoration Plan (LRP),
- Several Corporate Social Responsibility (CSR) programmes,
- Develop a fair and transparent labor, working conditions and recruitment policy,
- A local procurement policy will be developed and implemented,
- Develop a Stakeholder Engagement Plan,
- Addressing the social or community impacts.

1.22 Mine Closure

Generally accepted “good international practice” mine closure methods were used as the basis for the conceptual closure plan, as well as for determining the unit rates for the various closure components used in the LoM liability calculation. The mine closure methods also conform to the statutory requirements of Zimbabwe EMA, who are the regulatory body.

1.23 Capital Costs

DRA has developed and costed two distinct project phases:

- Phase 1: Processing 240 ktpm of milled plant feed from the Isabella McCays mining area, scheduled for years 1 to 6,
- Phase 2: Processing 180 ktpm of milled plant feed from the Bubi mining area, scheduled for years 6 to 10.

The estimate assumes that the project will be executed on an Engineering, Procurement, and Construction Management (EPCM) basis.

The mining costs are a combination of site establishment and pre-development during the production ramp up which consists of the first nine months of production.

The capital estimate is summarized in Table 1-3.

Table 1-3: Capital Summary per Project Phase

Description	Grand Total (Million US$)	Sub Total Phase 1 (Million US$)	Sub Total Phase 2 (Million US$)
Mining	25.54	25.54	0.00
Process and Infrastructure	311.82	267.63	44.19
Indirect Costs	31.79	29.57	2.21
Contingency	33.82	29.49	4.33
Total Project Costs	**402.97**	**352.24**	**50.73**

1.24 Operating Costs

The operating cost estimate has been completed from a zero base and presented in United States Dollar (US$). Costs associated with labor, materials and consumables have been included in this estimate.

1.24.1 Mining Contractor Costing

The average mining cost based on pricing received is US$ 2.65 /t including the plant feed transport cost from all mining areas process plant. The cost breakdown is shown in Table 1-4.

Table 1-4: Mining Contractor OPEX

Area	Cost per Total Tonne Mined (Ore and Waste) (US$)
G&A	0.29
Drill and Blast	0.45
Load and Haul Incl. Rehandle and Services	1.91
Total	2.65
Diesel Cost	1.52 (October 2023)

1.24.2 Process Plant Operating Cost

Operating costs have been estimated and based on the production profile for LoM. Steady state costs are presented for Phase 1 and Phase 2 in Table 1-5. Main drivers in costs include reagents and power which collectively account for more than 70% of total plant operating costs.

Table 1-5: Plant OPEX

Description	Unit	Phase 1: 240 ktpm IM	Phase 2: 180 ktpm Bubi
Variable	US$ m/a	37.93	53.33
Fixed	US$ m/a	12.31	17.17
Overview			
RoM	t/a	2,880,000	2,160,000
Total variable	US$ m/a	37.93	53.33
Total fixed	US$ m/a	12.31	17.17
Total	US$ m/a	50.24	70.49
Unit cost	US$/t RoM	17.44	32.64

1.24.3 General and Administration Cost

The General and Administration Cost (G&A) cost includes administrative personnel, general office supplies, safety and training, travel (both on site and off site), independent contractors, insurance, permits, fuel levies, security, camp power, camp costs, ICT, relocation, and recruitment.

Total G&A costs amount to US$ 4,912,650 per annum in phases 1 and 2.

1.24.4 Total Operating Costs Summary

The Bilboes Mines total operating costs have been estimated and based on the production profile over LoM. A summary of LoM operating costs is shown in Table 1-6.

Table 1-6: LoM Operating Cost Summary‡

Description	Cost (US$ m)	Unit cost (US$ / t RoM)
Mining	596.13	25.54
Process Plant	564.31	24.18
G&A	47.17	2.02
Total	1,207.61	51.74

1.25 Economic Analysis

The financial model has been prepared on a 100% equity project basis and does not consider alternative financing scenarios. A discount rate of 10% has been applied in the analysis. The outcomes are presented on a pre-tax and post-tax basis. A static metal price of US$ 1,884/oz has been applied. All-in sustaining costs have been reported as per the World Gold Council (WGC) guideline dated November 2018 and are exclusive of project capital, depreciation, and

‡ Due to rounding, numbers presented in this table may not add up precisely to the totals provided.

amortization costs. Capital payback is exclusive of the construction period and referenced to the start of first production. Key financial outcomes are shown in Table 1-7.

Table 1-7: Project Economics Summary

Description	Units	Value
Financial Outcomes (Post-tax, Constant Model Terms)		
NPV @ 10%	US$ m	308.73
IRR	%	33.99
Peak Cash Funding	US$ m	309.18
AISC	US$/oz	967.90
Payback (UNDISCOUNTED) - From Production Start	years	1.9

A data table analysis has been conducted to specifically illustrate the influence of changes in gold pricing and discount rates on the project's economic outcomes and is presented in Table 1-8. The yellow highlight in the table below indicates the current base case scenario. The NPV and payback period (undiscounted, from production start) are presented on a post-tax basis.

Table 1-8: Data Table Analysis

NPV (Post-tax), USD M

Gold Price, USD/Ozt	Discount Rate, % 15	12.5	10	7.5	5
1,500	31	59	94	137	191
1,700	116	157	206	267	342
1,884	194	246	309	385	480
2,000	243	302	373	460	567
2,200	327	398	484	588	717
2,400	411	494	594	717	867
2,600	495	590	705	845	1016

Payback Period (Post-tax), years

Gold Price, USD/Ozt	Payback Period (Post-tax), years
1,500	3.6
1,700	2.5
1,884	1.9
2,000	1.8
2,200	1.6
2,400	1.5
2,600	1.3

1.26 Adjacent Properties

Several small mines and two larger ones have operated in the past in the area around the Isabella property and within the Isabella and Gwizaan EPOs but all of these had been dormant for at least 15 years prior to the renewal of exploration activity in the area in the early 1980s. The Motapa, Fossicker and Jupiter Mines pits are situated immediately to the south of the Bilboes Project and trend in the same general strike of Isabella, McCays and Bubi pits.

The Isabella EPO 1726 surrounds Isabella McCays while the Gwizaan EPO 1646 surrounds Bubi as well as a cluster of other Bilboes exploration claims namely When, Sandy and Ferroro. Several high quality geological and aeromagnetic targets are located within the major northeast-southwest trending deformation zones that transect the EPOs along the Peter-Pan, Courtleigh and Gabriella-Mulungwane shear zones. These targets in addition to the existing exploration claims offer potential for organic growth of Bilboes Mineral Resources.

1.27 Other Relevant Data and Information

None

1.28 Interpretation and Conclusions

1.28.1 Mineral Resource Estimate

- The data collected during the exploration, drilling and sampling programmes, including surveying, drill hole logging, sampling, geochemical analysis, and data quality assurance, was collected in a professional manner and in accordance with appropriate industry standards by suitably qualified and experienced personnel.
- The geological modelling and Mineral Resource estimate were undertaken utilizing recognized deposit and industry strategies/methodologies for the type of deposit of the Bilboes Mine.
- The Mineral Resource is constrained in an optimized pit shell. This together with the assumptions relating to mining, processing, infrastructure, and market factors supports the "reasonable prospects for eventual economic extraction".
- Based on an assessment including: - data quality and integrity, data spacing, confidence in the grade interpolation, confidence in the geological interpretation and confidence in the estimate the relevant Qualified Person (QP) believes the Mineral Resource estimate is robust.

1.28.2 Mining Engineering

- Both the modelling and the grade interpolation have been conducted in an unbiased manner and the resulting grade and tonnage estimates should be reliable within the context of the classification applied.
- The open pit modelling is based on suitably supported assumptions and parameters and completed utilizing appropriate industry standards suitable for the Bilboes Project.
- The economic modelling is supported by technical studies in mining, processing, infrastructure, environmental, social, and marketing. Based on the inputs from these disciplines, the financial model demonstrates an economically viable mine. The economic analysis is based on a gold price of US$ 1,884/oz.
- The sensitivity analyses demonstrates that the profitability of the project is most sensitive to revenue related factors such as gold price and recovery.

1.29 Recommendations

- Based on the study work completed it shows an attractive economic outcome. It is recommended that the Bilboes Project enters into a feasibility study phase.

2 INTRODUCTION

Caledonia is a Zimbabwean focused exploration, development and mining corporation. Caledonia owns a 64% stake in the gold-producing Blanket Mine ("Blanket"), and 100% stakes in the Bilboes oxide mine, the Bilboes Project, and the Motapa and Maligreen gold mining claims, all situated in Zimbabwe. Caledonia's shares are listed on the NYSE American LLC ("NYSE American"), depositary interests in Caledonia's shares are admitted to trading on AIM of the London Stock Exchange plc and depositary receipts in Caledonia's shares are listed on the Victoria Falls Stock Exchange ("VFEX") (all under the symbols "CMCL").

Caledonia commissioned DRA to prepare a PEA for the Bilboes Project.

2.1 Scope of the Report

The PEA has been prepared in accordance with the disclosure and reporting requirements set forth in National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101"), Companion Policy 43-101CP, Form 43-101F1, and the CIM Definition Standards for Mineral Resources and Mineral Reserves adopted by the CIM Council on May 10, 2014 (CIM Standards).

The purposes of this PEA are as follows:

- Present the results of a PEA for the implementation of open pit mining to recover the gold mineralization,
- Propose additional work required for feasibility level studies,
- The PEA is not at the level of a FS.

All measure units used in this Report are metric unless otherwise noted and currency is expressed in US$. The Mineral Resources are estimated in accordance with the 2014 CIM Definition Standards for Mineral Resources and Mineral Reserves.

2.2 Principal Sources of Information

The sources of information include historical data and reports compiled by previous consultants and researchers of the Project and supplied by Caledonia, as well as other documents cited throughout the report and referenced in Section 27. The relevant QPs have relied on various email exchanges with Caledonia representatives, excel spreadsheets, and previously completed reports.

The relevant QPs' opinions contained herein are based on information provided to the relevant QPs by Caledonia throughout the course of the investigations. The relevant QPs have relied upon the work of other consultants for social, environmental and tailings storage facility aspects of the project, as noted in Section 2.2. The relevant QPs have relied on Caledonia's personnel for details on Project history, regional geology, geological interpretations, and information related to ownership and environmental permitting status.

The relevant QPs have not performed an independent verification of land title and tenure information as summarized in Section 4 of this report, which was verified separately by Caledonia.

This report has been prepared using the documents noted in Section 27 (References). The relevant QPs used their experience to determine if the information from previous reports was suitable for inclusion in this technical report and adjusted information that required amending. This report includes technical information that required subsequent calculations to derive subtotals, totals, and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, the relevant QPs do not consider them to be material.

2.3 Participants, Qualifications, and Experience

The participants consist of technical experts brought together by DRA to conduct the PEA and who are considered QPs in terms of the requirements of the CIM Standards, and their individual areas of responsibility are listed as follows:

Desmond Subramani, Principal Consultant at Caracle Creek International Consulting MINRES (Pty) Ltd (CCIC MinRes).

(HB.Sc., Pri.Sci.Nat.)

Site Visits, Data validation, Mineral Resource Estimate, Reporting

David Thompson, Principal Mining Engineer at DRA Global

(B-Tech, Pr. Cert Eng, SACMA)

Mining Methods, Mining Capital and Operating Costs and reporting

Aveshan Naidoo, Specialist Engineer at DRA Global.

(BSc Chemical, MBA, PrEng)

Metallurgy, valuation, reporting

2.4 Independence

Neither DRA, nor the key personnel nominated for the work, has any material interest in Caledonia or any of its affiliates or associates. The work, and any other work done by DRA for Caledonia, is strictly in return for professional fees. Payment for the work is not in any way dependent on the outcome of the work, or on the success or otherwise of Caledonia or any of its affiliates or associates' own business dealings. There is no conflict of interest in DRA undertaking the independent MRE as contained in this document.

2.5 Site and Technical Visits

The following personal inspections / site visits were completed on the Bilboes properties Table 2-1.

Table 2-1: Summary of Site Visits and Personal Inspections

Name and Surname	QP	Date
Sivanesan (Desmond) Subramani	QP (Geology)	20 and 22 March 2018, 26 September 2018
David Thompson	QP (Mining)	21 and 22 February 2018

After discussion with the mine and based on the lack of any significant mine production or construction, it was deemed that site visits in 2023 would not add any value to the work completed.

3 RELIANCE ON OTHER EXPERTS

This report was prepared by DRA for Caledonia as a National Instrument 43-101 Technical Report, in accordance with Form 43-101 F1. The quality of information and conclusions contained herein are consistent with the level of effort involved in DRA's services and based on:

- Information available at the time of preparation by Caledonia,
- Third party technical reports prepared by Government agencies and previous tenement holders,
- along with other relevant published and unpublished third-party information.

This report is intended to be used by Caledonia subject to the terms and conditions of its contract with DRA. This contract permits Caledonia to file this report as a Technical Report with Canadian Securities Regulatory Authorities pursuant to National Instrument 43-101, Standards of Disclosure for Mineral Projects. Any other use of this report by any third party is at that party's sole risk.

A final draft of this report was provided to Caledonia along with a written request to identify any material errors or omissions, prior to lodgment.

Neither DRA, nor the authors of this report, are qualified to provide extensive comment on legal facets associated with ownership and other rights pertaining to Caledonia's mineral properties described in Section 4. DRA did not see or carry out any legal due diligence confirming the legal title of Caledonia to the properties.

Similarly, neither DRA nor the authors of this report are qualified to provide extensive comment on environmental issues associated with Caledonia's mineral properties, as discussed in Section 4. DRA has relied on work completed by SLR for the TSF, Geotechnical Engineering, Environmental and Social aspects.

DRA relied upon Bilboes Exploration Manager for the information in respect of the Prospecting Permits and Environmental Permits.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Property Description and Location

The Bilboes properties are located in the Matabeleland North Province of Zimbabwe. The Isabella-McCays properties are situated approximately 80 km north of Bulawayo while Bubi is situated approximately 100 km north of Bulawayo. Bubi is 32 km due north-east of Isabella.

Figure 4-1: Regional Location of Bilboes Gold[§]

4.2 Mining Tenure

The Isabella-McCays-Bubi properties comprise 130 claim blocks covering an area of 2,731.6 ha as shown in Table 4-1.

Table 4-1: Bilboes Claims

Group of Claims	Mining District	Province	No. of Blocks	Area (ha)	Coordinate East[**]	Coordinate North
Calcite and Kerry (Isabella Mine)	Bulawayo	Matabeleland North	49	1,894.4	662,106	7,846,712
Ruswayi (McCays Mine)	Bulawayo	Matabeleland North	33	330	666,339	7,849,975

[§§] Source: Burger et al, 2017

[**] Coordinates are in UTM Arc 1950 Zone 35K, Clarke 1880 spheroid format.

Group of Claims	Mining District	Province	No. of Blocks	Area (ha)	Coordinate East**	Coordinate North
Chikosi (Bubi Mine)	Bulawayo	Matabeleland North	48	507.2	684,838	7,865,515
Total			**130**	**2,731.6**		

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The Government, as of 2019, had amended the mining laws, thereby decriminalizing the operation of small-scale miners to allow more locals to participate in the exploitation of the country's mineral wealth. More emphasis is being placed on the "use it or lose it" regulations, which allow the government to repossess unused mining claims from holders.

4.3 License Status

Bilboes consists of 130 claim blocks wholly owned by Bilboes Gold. Of the 130 blocks, 49 gold and base metal blocks and a Special Mine site (to accommodate the plant, TSF, additional offices and housing) belong to the Isabella mining area while McCays comprises of 33 gold blocks (Figure 4-2) and Bubi consists of 48 gold blocks (Figure 4-3). The rights were obtained through certificates of Registration After Transfer from Prospecting Ventures, an exploration entity owned by AMZIM which had pegged these claims after carrying out exploration work. Bilboes also thereafter registered additional claims in the surrounding area. The claims are protected annually against forfeiture through gold production and exploration work and Bilboes has exclusive rights to subsurface areas to produce gold from these properties. The rights do not expire if the annual protection fees are paid when they become due.

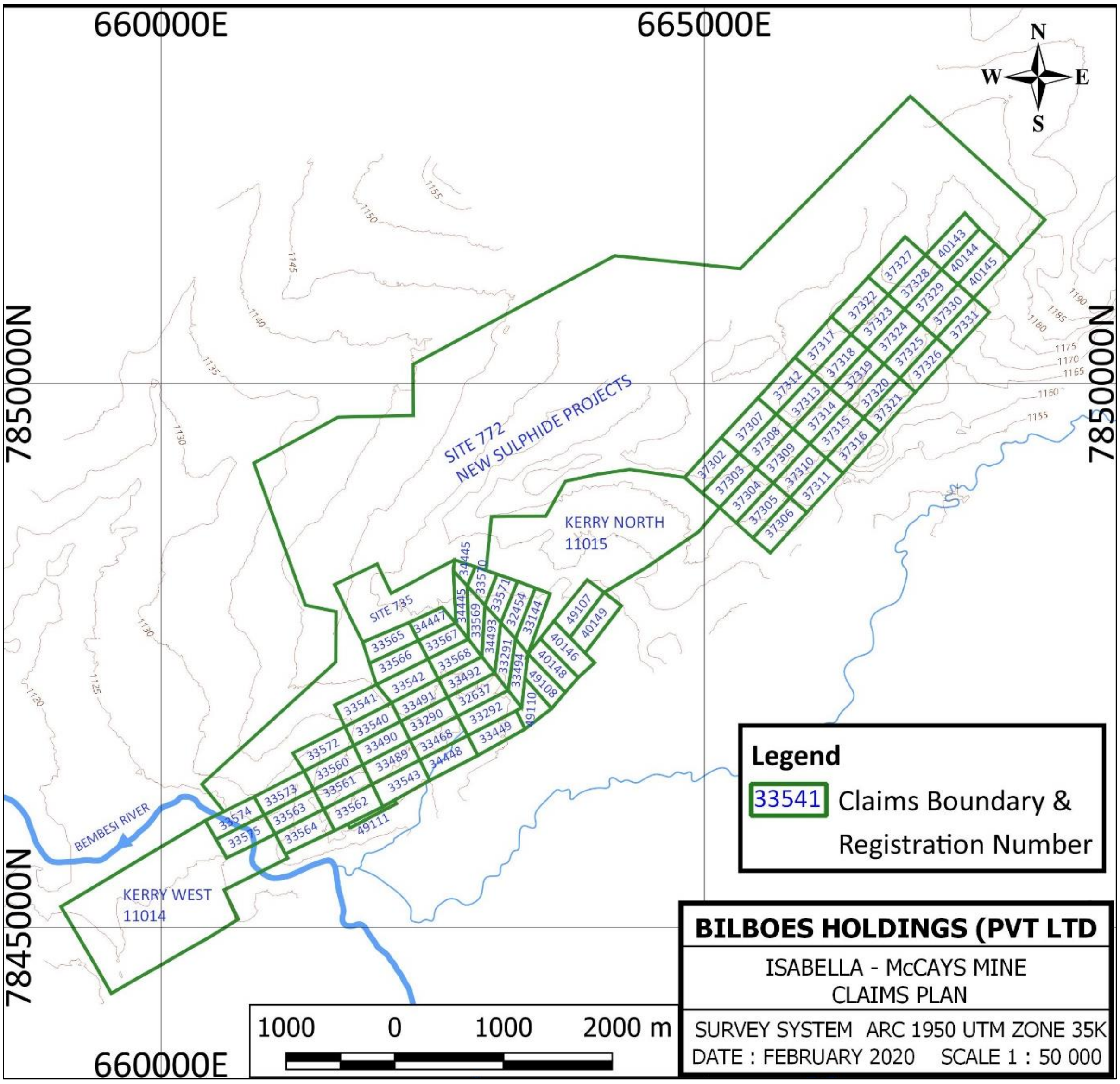


Figure 4-2: Isabella-McCays Mine Claims Map

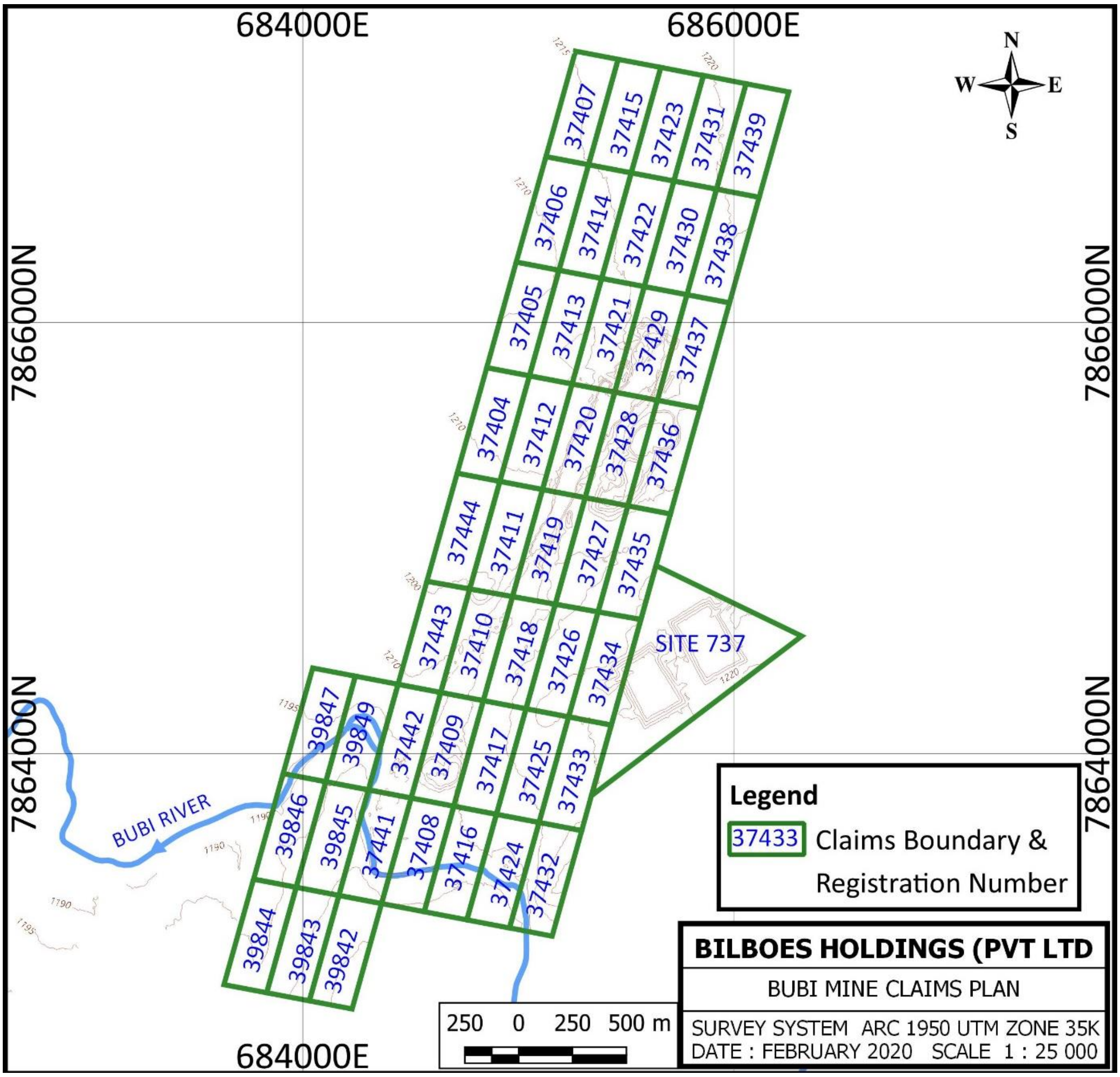


Figure 4-3: Bubi Mine Claims Map

Bilboes has been operating in Matabeleland since 1989. It holds the necessary mining permits and complies with the terms of the Mines and Minerals Act and allied regulations with respect to all of their claims and in particular that all of the registration certificates are valid, and the protection certificates are up to date. Bilboes thus requires no further permits to explore or produce from the current operational areas, but further permits will be required for the proposed haul road between Bubi and Isabella plant.

Further exploration outside the current claims will require approvals by the EMA who may request an EIA study.

SLR based in South Africa in partnership with the local GryinOva Environmental Consultants conducted an ESIA study for the project and an EIA certificate of approval was issued by EMA in February 2021 and the certificate was valid for two years and subject to renewal on an annual basis for the duration of the operations. The current EIA certificate expires in March 2025. The conditions of renewal are notification to the agency of any changes in the project, compliance with the approved environmental plan and submission of progress reports on the project. There is no reason that the renewal will not be granted.

Other project related licenses include air emissions (generators, smelter, incinerator), explosives (purchase and storage), firearms, medicines control, public health (medical examination), water abstract and hazardous substances (importation, transportation, storage and use), solid waste disposal which are renewed when they become due either quarterly or annually. The renewal conditions involve payment of applicable fees to the regulatory bodies of US$ 70,000 per year.

Bilboes also holds 3,935 ha of additional claims and 51,900 ha of exploration licenses referred to as EPOs around Isabella-McCays-Bubi and the Gweru area. These claims and EPOs have highly prospective targets which offer Bilboes excellent prospects for organic growth. The company has applied for an extension of the EPOs tenure for a further three years after the initial three-year tenure expired in July 2021. The decision on the EPO applications is pending.

4.4 Holding Structure

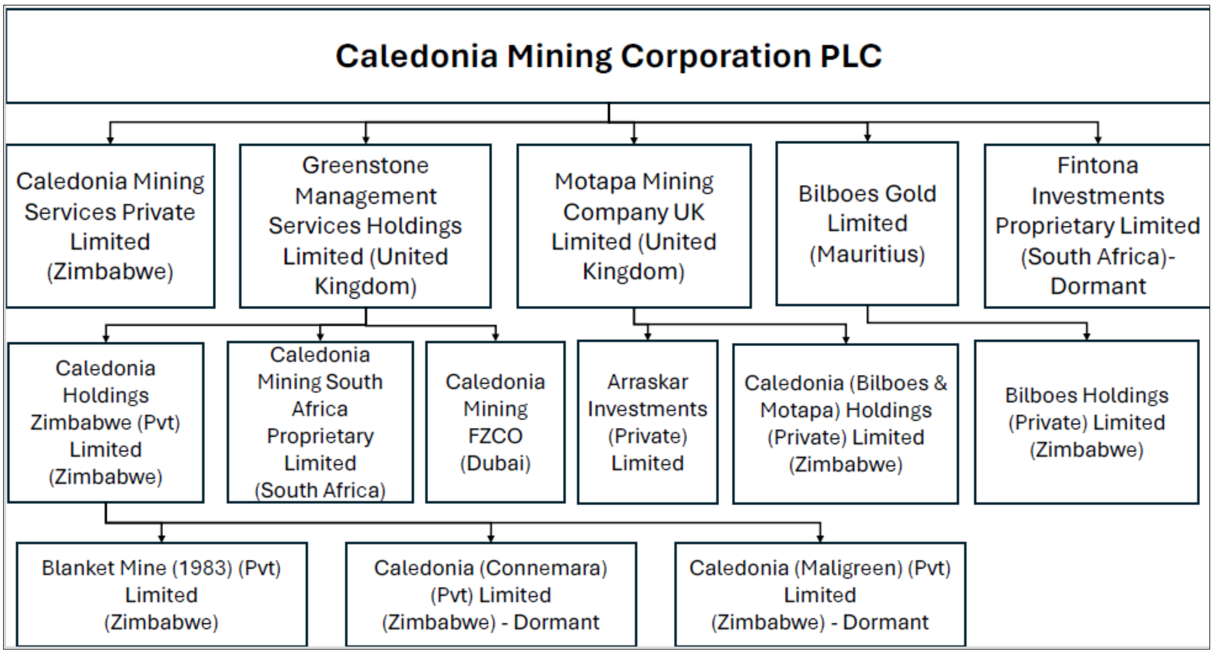


Figure 4-4: Holding Structure

4.5 Royalties and Agreements

The information below relates to the fiscal year 2023 and is in Zimbabwe Gold (ZiG), unless otherwise stated. An appropriate exchange rate to the US$ will be applied at the time of any transaction.

4.5.1 Royalties, Taxes and Economic Climate in Zimbabwe

The tax regime in Zimbabwe has remained relatively stable and favorable over the past few years compared to other jurisdictions in the region. Those taxes, royalties, duties etc, directly affecting the mining industry are considered below.

4.5.2 Royalties

- Royalties are levied on gross revenue from the sale of gold,
- Royalties are levied at source hence payments made by FGR (the entity that buys a portion of the gold produced by Blanket Mine, another operating subsidiary of Caledonia) are net of royalties. To the extent that Bilboes exports 100% of its production, an alternative collection mechanism for royalties will have to be agreed.
- From 1 January 2020, mining royalties are an allowable expense in the determination of taxable income,
- For primary gold producers a two-tier system that is based on gold prices is applicable. For gold prices below US$ 1,200/oz the rate is 3% and for gold prices above US$ 1,200/oz the rate is 5%.

4.5.3 Customs Duties

- Maximum applied on cost of imports : 10%
- Capital equipment imports : 0%

4.5.4 Value Added Tax

- Locally procured and imported inputs and equipment : 15%
- Exports are zero rated and input Value Added Tax (VAT) is fully recoverable in most cases or can be used to set off against other tax liabilities. No output VAT is levied on gold sales as they are zero-rated. Silver is subject to VAT at 15%.

4.5.5 Withholding Taxes

- Supplies by unregistered traders (without Tax Clearance Certificate) : 30%
- Non-Resident Shareholders' Tax on dividends* : 5 - 15%
- On fees, royalties, dividends, and interest : 15%
- Services from non-residents : 515%
- Lower withholding taxes may be obtained in terms of double tax agreements.

*dividend payments to non-residents in countries with a Double Tax Agreement with Zimbabwe (e.g., the United Kingdom) incur withholding tax at 10%.

4.5.6 Corporate Tax

- On taxable profits:

  25% flat rate [plus 3% AIDS levy] to make effective rate 25.75%,

- Capital redemption allowances in year incurred.

  : 100%,

- Deduction limits on passenger vehicles

  :US$ 10,000, or ZiG equivalent at prevailing bank rates,

- Deduction limits on employee housing

  : US$ 25,000, or ZiG equivalent at prevailing bank rates

- Deduction limits on donations to medical centers

  : US$ 100,000 per annum, or ZiG equivalent at prevailing bank rates

- Deduction limits on donations to research and development institutions

  :US$ 100,000 per annum, or ZiG equivalent at prevailing bank rates

- Pre-production operating expenditure

  : 100% in first year of production

- Carry forward of losses

  : Indefinite for mining operations.

4.5.7 Ring Fencing

Each mining location is ring fenced and only costs applicable to that location are deductible.

4.5.8 Employment Levies

- National Social Security : 4.5% of an employee wage rate.
- The cap is declared monthly : ZiG 5 010.83 per month.
- Workmen’s compensation : 1.77% base earnings
- Manpower Development Levy : 1% of the gross earnings
- Standards Development Levy : 0.5% of the gross earnings

4.5.9 Electricity Levies

Rural Electrification Levy : 6% of electricity bill.

4.5.10 Rural Council Levies

- Unit tax: ZiG 158.62 / unit,
- The number of units for each company is dependent on number of employees with the first 100 employees making a unit and any other 50 employees thereafter forming units.

4.5.11 Other Relevant Points

- Administration fees in excess of 1% of other tax-deductible expenses are disallowed and taxed as a dividend.
- Capital gains tax (Table 4-2)

Table 4-2: Capital Gains Tax

Acquired	Rate	Currency
Before 22 February 2019	5% of gross capital amount	ZiG
	5% of foreign currency gross capital amount	US$
On or after 22 February 2019	20% of capital gain	ZiG
	20% of foreign currency capital gain	US$

- Capital gains withholding tax:
  - On listed marketable securities: 1.5%
  - On listed marketable securities held for less than 6 months: 4%
  - On unlisted marketable securities: 5%
  - On immovable property acquired before 22 February 2019: 5%
  - On immovable property acquired after 22 February 2019: 15%

Note: In respect of any sale of a specified asset that is purported to have been sold in ZiG, it shall be presumed that the specified asset was paid for in a foreign currency at the United Sates dollar market valuation of the specified asset on the date of sale, and that the capital gains tax thereon shall be paid in United States dollars accordingly, unless the seller provides documentary proof satisfactory to the commissioner of taxes that the specified asset in question was sold for ZiG.

Deferment of VAT collection on imported capital equipment is as per

Table 4-3:

Table 4-3: Vat Collection

Value of Equipment (US$)	Deferment period (Days)
100,000 to 1,000,000	90
1,000,001 to 10,000,000	120
10,000,001 and above	180

- Mining claims fees are based on land area. The Mines and Minerals Act provides for maintenance of mining title through payment of annual protection fees. The protection fee for a gold / base metal block is US$ 150 per 5 ha per annum. EPOs have a two to three-year tenure and can be renewed for an additional period to a cumulative maximum of six years subject to approval by the Ministry of Mines and Mining Development's Mining Affairs Board and a renewal fee of US$ 1,500 is required with the application. The annual rental fee US$ 0.08 per ha in the first year, US$ 0.11 in the second year and US$ 0.15 in the third year. A company is allowed to peg claims during the tenure of the EPO subject to the following conditions:

  - That the area to be pegged is not prohibited from pegging under the Mines and Minerals Act after the acquisition of a prospecting licenses at US$ 75 per gold / base metal block,
  - Appointment of an Approved Pegger for the requisite groundwork and filing of paperwork for registration,
  - Payment of registration fees of US$ 300 for a base metal block and US$ 563 for a special base metal block,
  - Approval by the Ministry of Mines for erection of permanent beacons around the blocks as per Mines and Minerals Act,
  - EIA fees charged based on a sliding scale from 0.8% to 1.2% of the relevant project cost,
  - Payroll tax (Pay as You Earn) is deducted from employees' earnings and paid to the government. The tax-free band has been increased to ZiG 16,272 per annum or ZiG 1,356 per month. The upper income tax bands moved to ZiG 488 160 per annum or ZiG 40,680 per month. The effective maximum rate of tax (including AIDS levy) is 41.2%.

- Exemption of customs duty import tax and surtax on all capital goods during exploration phase of a mining project and for a period of up to five years from date of grant of a mining title, during the development phase of the mining project.
- A 2% Intermediated Money Transfer Tax (IMTT) charged per e-commerce ZiG denominated transaction. Any transaction exceeding equivalent in ZiG of US$ 500,000 has a maximum tax of US$ 10,150 (at the Interbank Rate) payable in ZiG.
- IMTT (Outbound Foreign Payment Tax) at a rate of 2% for every outbound foreign payment or partial payment made. This tax applies to each transaction that is subject to the tax thin capitalization regulations: offshore borrowings require Reserve Bank of Zimbabwe approval, and interest paid on borrowings of a debt-to-equity ratio of up to a maximum of three to one is tax deductible. Beyond the maximum allowable ratio any interest paid is assumed to be a dividend pay-out and is not tax deductible and is also liable to withholding tax at the non-resident tax rate.
- Rebates of Duty.

The following tax rebates are allowed:

- ➢ Rebate of duty on goods for the prospecting and search for mineral deposits.
- ➢ Rebate of duty on goods imported in terms of an agreement entered pursuant to a special mining lease.
- ➢ Rebate of duty on goods imported temporarily for an approved project.
- ➢ Rebate of duty on goods for incorporation in the construction of approved projects.
- ➢ No export duties for all mineral commodities.
- ➢ Rebate of duty extended to capital equipment imported by mining and manufacturing sectors for values above US$1 million, effective 1 January 2016.

4.5.12 Political Risks

Political uncertainties are risks, which may lead to unfavorable legislative and taxation framework changes, exchange control restrictions, international monetary fluctuations, civil unrest, or any other political instability. All the properties belonging to Bilboes are protected in respect of the Mines and Minerals Act. All the blocks of claims are registered with the Mining Commissioner's office and are regularly inspected in compliance with the mining regulations and preserved against forfeiture.

4.5.13 Indigenization and Economic Empowerment

The Indigenization and Economic Empowerment Act was amended in 2018 to remove the requirement for gold mining companies to have a required level of local ownership. Moreover, in the mid-term budgetary review statement of 2019 the Indigenization and Economic Empowerment Act was repealed and replaced by the Economic Empowerment Act, which is consistent with the current thrust "Zimbabwe is Open for Business".

All new foreign investment into Zimbabwe requires an investment license issued by the Zimbabwe Investment Authority in terms of the Zimbabwe Investment Authority Act.

4.6 Environmental Liabilities

No encumbrances or environmental liabilities are known, and DRA have placed reliance on a legal due diligence conducted by Scanlen and Holderness, a firm of legal practitioners in Harare, Zimbabwe.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Access

Isabella McCays and Bubi are approximately 80 km and 100 km directly north and northeast respectively of Bulawayo, the second largest city of Zimbabwe with an approximate population of 700,000 (2013). All the mines are accessed via public roads and although these are of variable quality, they are accessible by all types of vehicles. Isabella is 110 km (1.5 hours) whilst Bubi is 140 km (2 hours) by road from Bulawayo. Bubi can also be accessed by road from Isabella (70 km in 1 hour).

5.2 Climate

Despite lying in the tropics, the climate is subtropical due to its relatively high altitude. The mean annual temperature is 19°C. Three broad seasons are prevalent: a dry, cool winter season from May to August; a dry, hot early summer from late August to Early November and a wet, warm summer from early November to April. Rainfall during the wet season averages 594 mm. The climatic conditions allow for year-round exploration and mining activities.

5.3 Physiography

The properties lie between 1,150 m and 1,200 m above mean sea level (amsl). The area is covered by red and grey soils characteristic of greenstone rocks in Zimbabwe. Vegetation is dominated by scrubby Colophospermum Mopane, Acacia, and Combretum woodlands and minor occurrences of miombo with no extensive grasslands. Agricultural activities are restricted to ranching.

5.4 Local Resources and Infrastructure

The terms of the claims tenure system in Zimbabwe confer rights to use of the land surface for mining and construction of all related infrastructure such as housing, offices, plant, and tailings/waste disposal facilities subject to adherence to the environmental legislation. In 2019, Bilboes obtained rights for an additional 1,128 ha for a mine site at Isabella which will be adequate to cater for the additional sulphide mine infrastructure such as the sulphide plant, tailing's storage facility, waste dumps, housing, and additional office infrastructure.

There is sufficient underground water around the mines to run the current heap-leach operations, but additional drill holes and pumping capacity will be required for the proposed sulphide-mining project. This issue was identified in the Pre-Feasibility stage of the project, along with water-use permits.

There are 33 kV power lines within 5 km and 25 km of the Isabella McCays and Bubi deposits respectively, that form part of the national grid, but new lines will have to be constructed to meet the increased capacity of the proposed exploitation of the sulphides. A 70 km kV Lynx line will be constructed from Shangani Substation to a substation which will be constructed at Isabella. An alternative 88 kV power line, which is sufficient for the sulphide project, is located at Turk Mine about 40 km from Isabella McCays and 60 km from Bubi, but this line has recently had an increased consumer load.

Workshops, offices, and housing amenities are available for heap leach extraction, and these will require to be upgraded for the proposed sulphide mining project.

The mines have cell phone and internet connectivity and utilize a two-way radio system.

Generators at all mines allow continued production during load shedding. The capacity will need to be upgraded to cater for the sulphide operation.

6 HISTORY

6.1 Project History

Initial exploration allowed the estimation of a small oxide Resource and an open-pit, heap-leach mine was commissioned in 1989. Subsequent exploration extended the Isabella Resource and new discoveries were made at Bubi and McCays, which has yielded 9,136kg of gold (293,729 oz) to December 2024 with95,877 oz of this being produced since the takeover of the company by GAT Investments (Pvt) Ltd (“GAT") in 2003. All mining has been from open-pit oxide plant feed utilising the heap leach extraction processing method.

Exploration for sulphide Mineral Resources began in 1994/95, with a sum of 17,650 m of exploratory drilling being completed by 1999, covering a strike length of 3,440 m. A maiden mineral Resource estimate for the sulphide Mineral Resources was completed by SRK in 2009, containing 4.75 Mt of Inferred Mineral Resources grading 3.49 g/t. This estimate used a 2.0 g/t cut-off for delineation of the Mineral Resource estimation domains.

6.2 Ownership

Anglo American Corporation of Zimbabwe Ltd (AMZIM), formed Bilboes Holdings (Pvt) Ltd, which acquired the Isabella claims in 1982 and subsequently discovered the Bubi and McCays claims. Bilboes was purchased by GAT in 2003. The Bilboes properties are wholly owned by Bilboes Holdings (Pvt) Ltd, which is 100% owned by Bilboes Gold, which was acquired by Caledonia on 6 January 2023. Prior to its acquisition by Caledonia, Bilboes was a private company owned by three shareholders, Gat Investments (Private) Limited (Gat Investments), Baker Steel Resources Limited (Baker Steel), and Infinite Treasure Limited (Infinite Treasure).

6.3 Exploration

Soil sampling, trenching and geological mapping have been progressively carried out since exploration and oxide mining commenced in 1982. Soil sampling was used to identify areas for trenching and mapping. Trenches were sampled at 1 m to 2 m intervals and analysed using the bottle roll method. These assays were used to guide the interpretation and projection of oxide mineralisation along strike and at depth. The assays from trench sampling were however not used in grade estimation.

Ground Magnetics and Induced Polarisation geophysical surveys have been conducted at Isabella, as part of the oxide plant feed exploration since 1996.

6.4 Mineral Resource

In 2009, SRK undertook a MRE for the sulphide properties based on the drill holes and geological interpretations supplied by Bilboes Gold.

Geological models were created for all these deposits, excluding the oxide portions, to a depth of up to 150 m. Solid models were created from the wireframes generated and assays for gold within these were used for geostatistical modelling and resource estimation. The Mineral Resource of 5.2 Mt containing 533,000 oz was declared to 100 m below surface with mineralization from 3.5 Mt containing 240,000 oz being declared from 100 – 150 m below surface. The grade estimation for the Sulphide Projects was based on a 2.0 g/t cut-off mineralized envelope. In general, the drill coverage was poor, with drill spacing ranging from 25 m (Bubi) to up to 100 m for McCays. In most cases there was only one hole per drill line.

Classification of the anomalies was based on the quality of the estimate, which in turn was based on grade continuity and data spacing and was done according to the guidelines contained within the JORC code (2012).

Estimates were validated by visually comparing the drill hole grades to the block model grades for each section line in Datamine Studio™ (Datamine).

The results of the estimation for the classification as an Inferred Mineral Resource (Table 6-1).

Table 6-1: Sulphide Inferred Mineral Resources as of 2009

Deposit	Cut-Off (g/t)	Tonnes (Mt)	Au (g/t)	Content (koz)
Bubi	2.00	1.435	2.68	124
Calcite	2.00	0.500	4.96	80
Castile	2.00	0.902	4.32	125
Diana	2.00	0.915	3.49	103
Maria	2.00	0.177	3.10	18
McCays	2.00	0.821	3.20	84
Total / Average		**4.750**	**3.49**	**534**

Subsequent to the 17,650 m core drilling by AMZIM in the period 1994 to 1999, additional exploration work under Bilboes resumed in 2011 through to 2016 where an additional 20,527 m of core and 20,235 m of RC drilling was completed bringing the total metreage to 58,412 m. The drilling culminated in an interim Mineral Resource update by Mr. Arimon Ngilazi and Dr Anthony Martin in 2017.

These results are presented in Table 6-2 and Table 6-3, respectively.

Table 6-2: Sulphide Mineral Resources as of 31 March 2017, 0.0 g/t Au Block Cut-Off Applied

Property	Indicated				Inferred			
	Mass (Mt)	Au Grade (g/t)	Au (kg)	Au (Moz)	Mass (Mt)	Au Grade (g/t)	Au (kg)	Au (Moz)
BUBI	29.96	2.20	65,912	2.12	9.05	1.90	17,195	0.55
ISBN	12.07	2.19	26,433	0.85	1.55	2.01	3,116	0.10
ISBS	7.90	2.43	19,197	0.62	0.51	2.62	1,336	0.04
MCCAYS	3.48	2.44	8,491	0.27	7.07	1.97	13,928	0.45
Total	**53.41**	**2.25**	**120,034**	**3.86**	**18.17**	**1.96**	**35,575**	**1.14**

Table 6-3: Sulphide Mineral Resources as of 31 March 2017, 0.9 g/t Au Block Cut-Off Applied

Property	Indicated				Inferred			
	Mass (Mt)	Au Grade (g/t)	Au (kg)	Au (Moz)	Mass (Mt)	Au Grade (g/t)	Au (kg)	Au (Moz)
BUBI	28.05	2.27	63,674	2.05	8.66	1.93	16,714	0.54
ISBN	9.94	2.53	25,148	0.81	1.29	2.27	2,928	0.09
ISBS	7.05	2.60	18,330	0.59	0.44	2.86	1,258	0.04
MCCAYS	2.55	3.19	8,135	0.26	5.58	2.38	13,280	0.43
Total	**47.60**	**2.42**	**115,286**	**3.71**	**15.97**	**2.14**	**34,181**	**1.10**

6.5 Historical Production

6.5.1 Oxide Mineralization

6.5.1.1 Isabella

There are early records of insignificant gold production for the Isabella Mine prior to 1982. In its first year of operation the Isabella open pit operation produced 170 kg of gold from a monthly rate of 15,000 t of plant feed. At start of production there were three pits with a Mineral Reserve life of 18 months and, as of 31 December 2023, the Mine had treated 6.6 Mt of oxides at 1.15 g/t (243 koz) and recovered 150 koz of gold inclusive of re-leached gold from the old heap leach pads. The bulk of the production from Isabella was from uncrushed plant feed with only 37 koz of gold being recovered from 2.5 Mt of crushed oxide plant feed after the installation of a crushing plant in 2007.

6.5.1.2 Bubi

Bubi was commissioned in 1997 at 25,000 t per month of oxide plant feed and produced 9.5 koz of gold in its first year. Mining activities were suspended at Bubi Mine in 2007 after running out of oxide plant feed. Gold production from that period to 2013 has been from re-leaching of the old heaps. Progressively inclusive of re-leached gold from the old heap leach pads, the mine has produced 85 koz of gold as at end of December 2023 from 4.3 Mt of oxide plant feed at 1.00 g/t (138 koz). All the plant feed at Bubi Mine was treated without crushing. There has not been any mining at Bubi from 2005 after the exhaustion of oxides until the commencement of re-leaching activities at the beginning of 2019.

6.5.1.3 McCays

As a result of regional exploration by Prospecting Ventures (PV), an AMZIM exploration company based in Zimbabwe at the time, a new gold deposit was discovered at McCays in 1997. In 1998 production from an open pit, heap-leach mine started. Further exploration work within the claims area during the operational phase of the mine was added to the Reserves until depletion and temporary closure in 2002. No mining activities took place between 2002 and 2012 at McCays. Gold production was through re-leaching from the year 2004 until 2009. No gold production occurred from 2010 to 2012. Activities commenced after the recapitalization of Bilboes in 2013. Cumulative gold production from inception at McCays was (57 koz) as of 31 December 2023. This included the re-leached gold from the old heap leach pads from treating 2.2 Mt of oxide plant feed at 1.15 g/t (80 koz). Inclusive of this, an estimated 24 (koz) of gold was recovered from 1,032,374 t of crushed oxide plant feed after the installation of a crushing plant in 2013. The oxides at McCays are finished and only re-leaching activity is taking place.

6.5.2 Production Summary

Prior to the open-pit exploitation of the Isabella Mineral Resource by Bilboes Gold, the Calcite Mine (underground and now part of the Isabella strike) produced 559 kg of gold at an average recovered grade of 8.2 g/t.

The production from Bilboes mines including when Mine from inception to 31 December 2023 is presented in Table 6-4.

Bilboes has produced some 95,877 oz of gold from the four mines since the takeover of the company in 2003 to 31 December 2023.

Table 6-4: Production Data from Bilboes Mines to 31 December 2023

	Start-up Date	Plant feed treated (kt)	Grade (g/t)	Au Recovered (koz)
Isabella	1989	6,575	1.15	150.3
Bubi	1997	4,342	1.00	84.6
McCays	1998	2,176	1.15	57.0
When	2005	184	0.78	1.9
Total		**13,278**	**1.09**	**293.7**

7 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geological Setting

Geology in Zimbabwe can be divided into three main areas: the Archean, the Proterozoic, and the Phanerozoic (Figure 7-1).

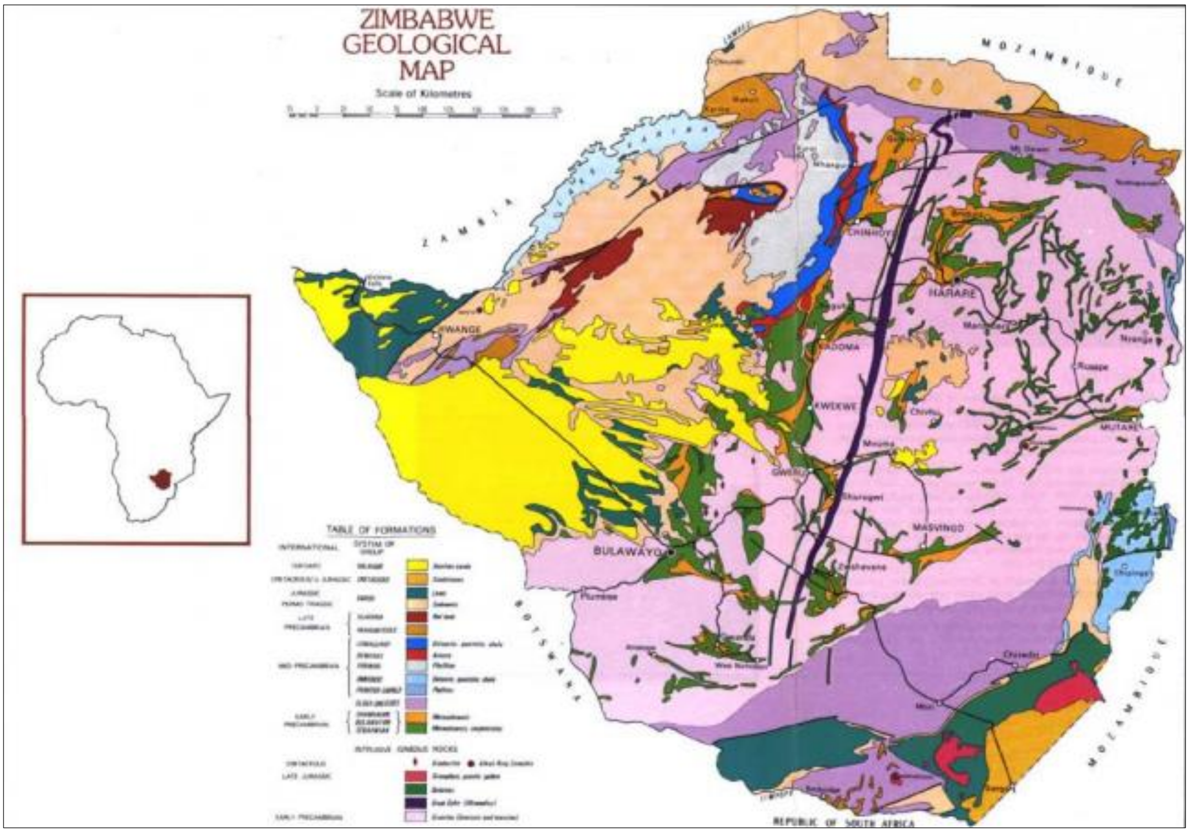


Figure 7-1: Geological Map Zimbabwe (taken from Mugumbate, unknown year)

7.1.1 The Archean

Rocks from the Archean era in Zimbabwe occupy most of the Zimbabwe Craton, an ancient stable continental block. This is the basement and primarily comprises granites and gneisses with remnants of volcano-sedimentary piles known as Greenstone Belts. Greenstone Belts cover approximately 60% of the land surface of Zimbabwe. The Greenstone Belts are renowned for their rich variety of Mineral Resources as shown in Figure 7-2.

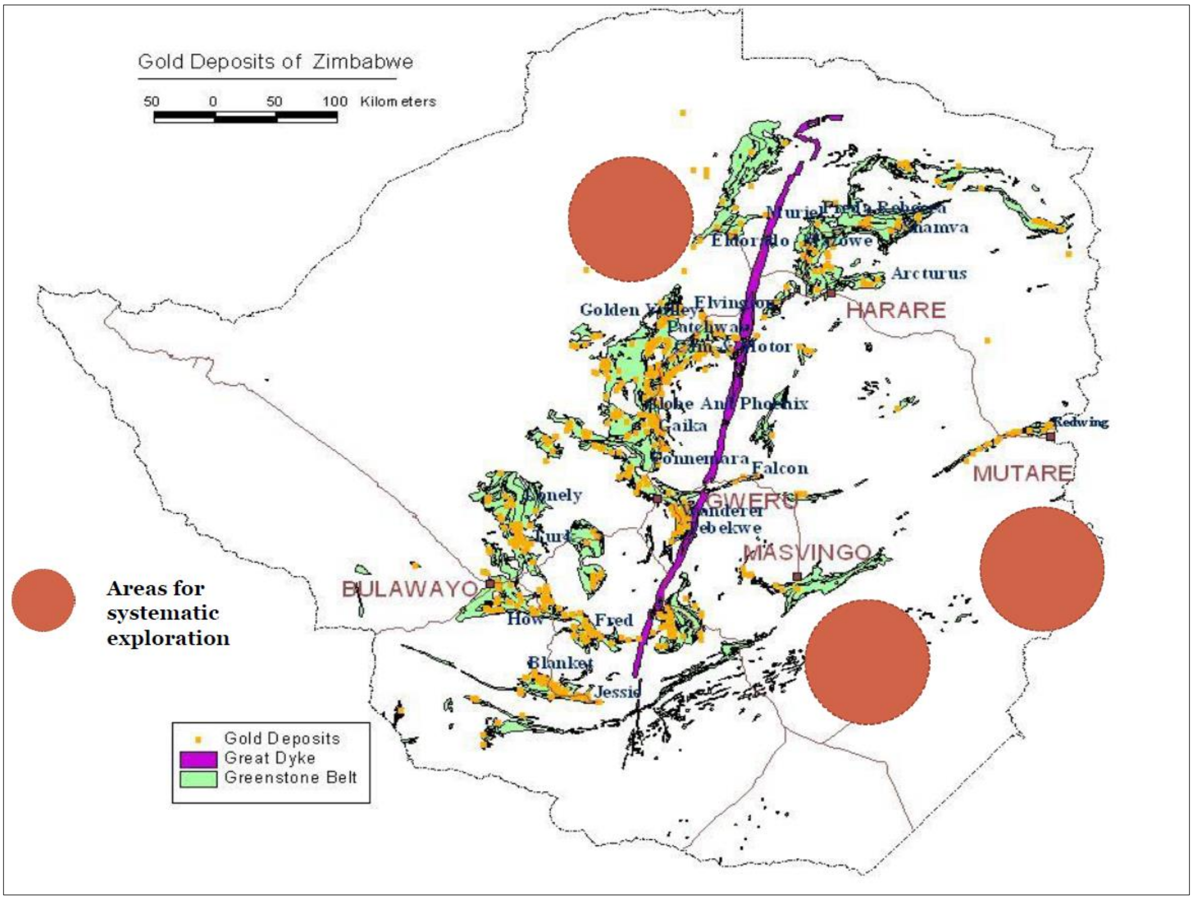


Figure 7-2: Greenstone Belts and known Gold Deposits in Zimbabwe (MuGandani, 2017)

7.1.2 The Proterozoic

In Zimbabwe, the Proterozoic era followed immediately after the emplacement of the Great Dyke intrusion at the end of the Archean era. The Great Dyke is a layered mafic to ultramafic intrusion akin to the Bushveld Complex in South Africa. It was emplaced at the end of the Archaean era at approximately 2,500 mega annum (ma). It has a strike length of 550 km and ranges in width from 4 km to 11 km. It cuts across the entire Zimbabwe Craton in a roughly N-S direction as shown in Figure 7-3. The Great Dyke hosts world-class reserves of Platinum Group Metals (PGMs) and chrome plant feed.

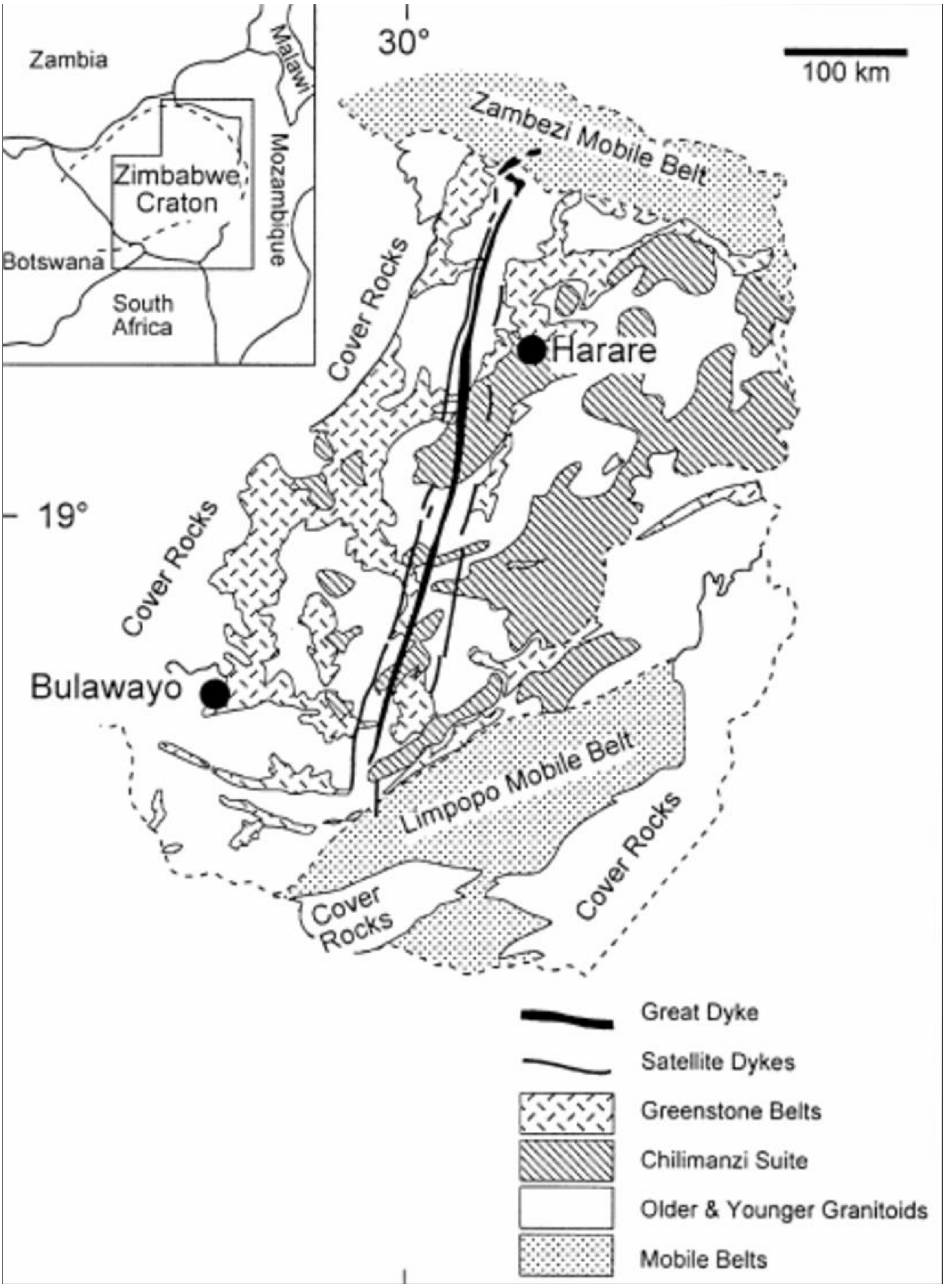


Figure 7-3: NNE Trending Great Dyke Cutting Across the Zimbabwe Craton (Mukaka *et al* 1998)

There are three metamorphic mobile belts that border the Craton to the north-east, south, and north-west. The neo-Archaean Limpopo mobile belt borders the Craton on the southern boundary. The paleo-Proterozoic Magondi mobile belt borders the Craton to the north-west while the neo-Proterozoic Zambezi mobile belt borders the Craton to the north (Figure 7-4). These metamorphic belts are hosts to economic metamorphic minerals. They also host several gemstones, precious, and base metals. To the east are the Umkondo group sediments which were deposited in a large basin and are capped by younger dolerite sills and basaltic flows. The Umkondo sediments host the Chiadzwa placer diamond deposits.

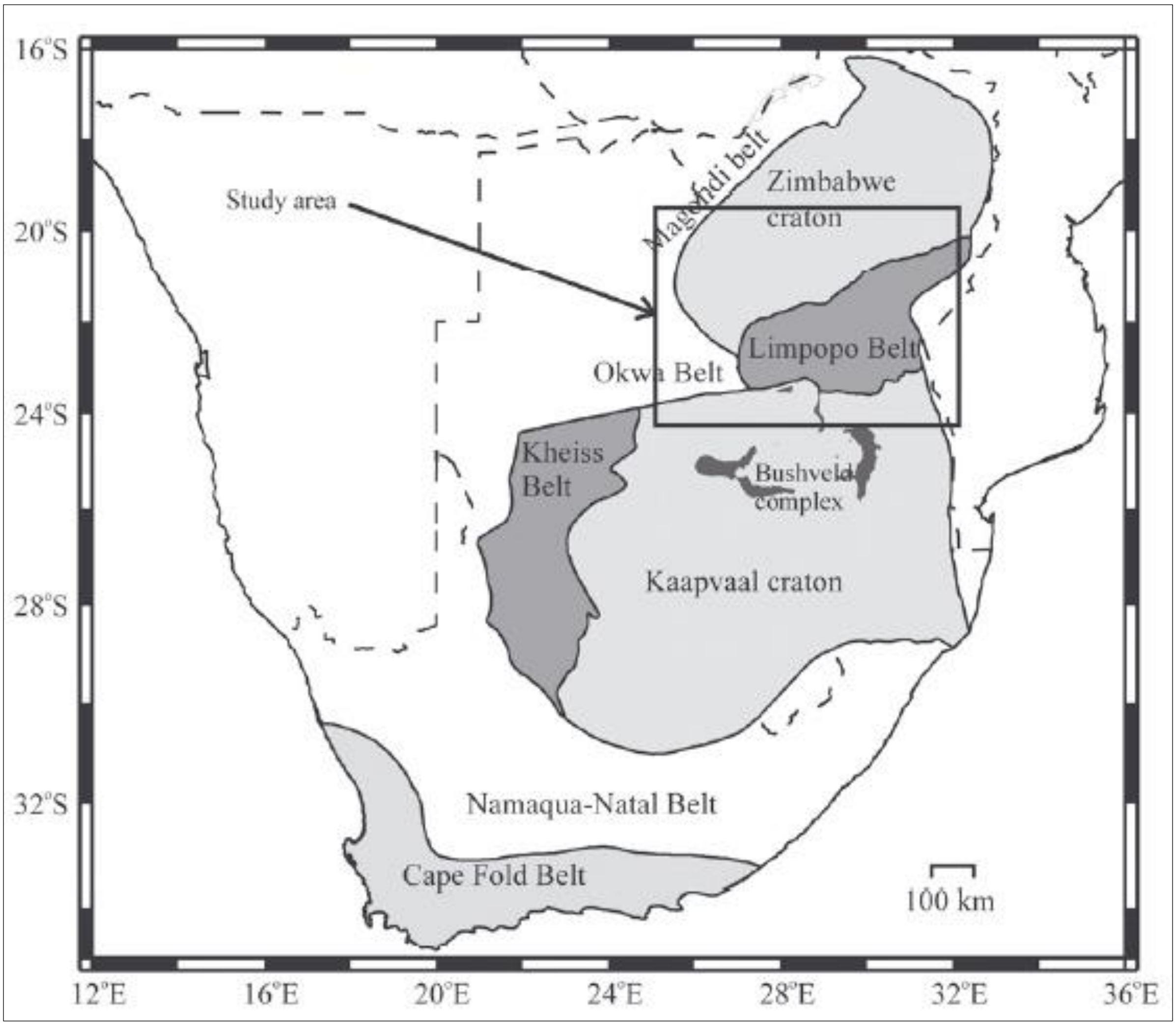


Figure 7-4: Geological Map showing the Zimbabwe Craton and Mobile Belts (Gore et al 2009)

7.1.3 The Phanerozoic

The Phanerozoic consists of several sequences of sedimentary rocks covering the peripheries of the Craton. Included in the Phanerozoic are sedimentary basins: the Permian - Triassic Jurassic Karoo Supergroup, Cretaceous sediments, and Tertiary to recent sand of the Kalahari Figure 7-5.

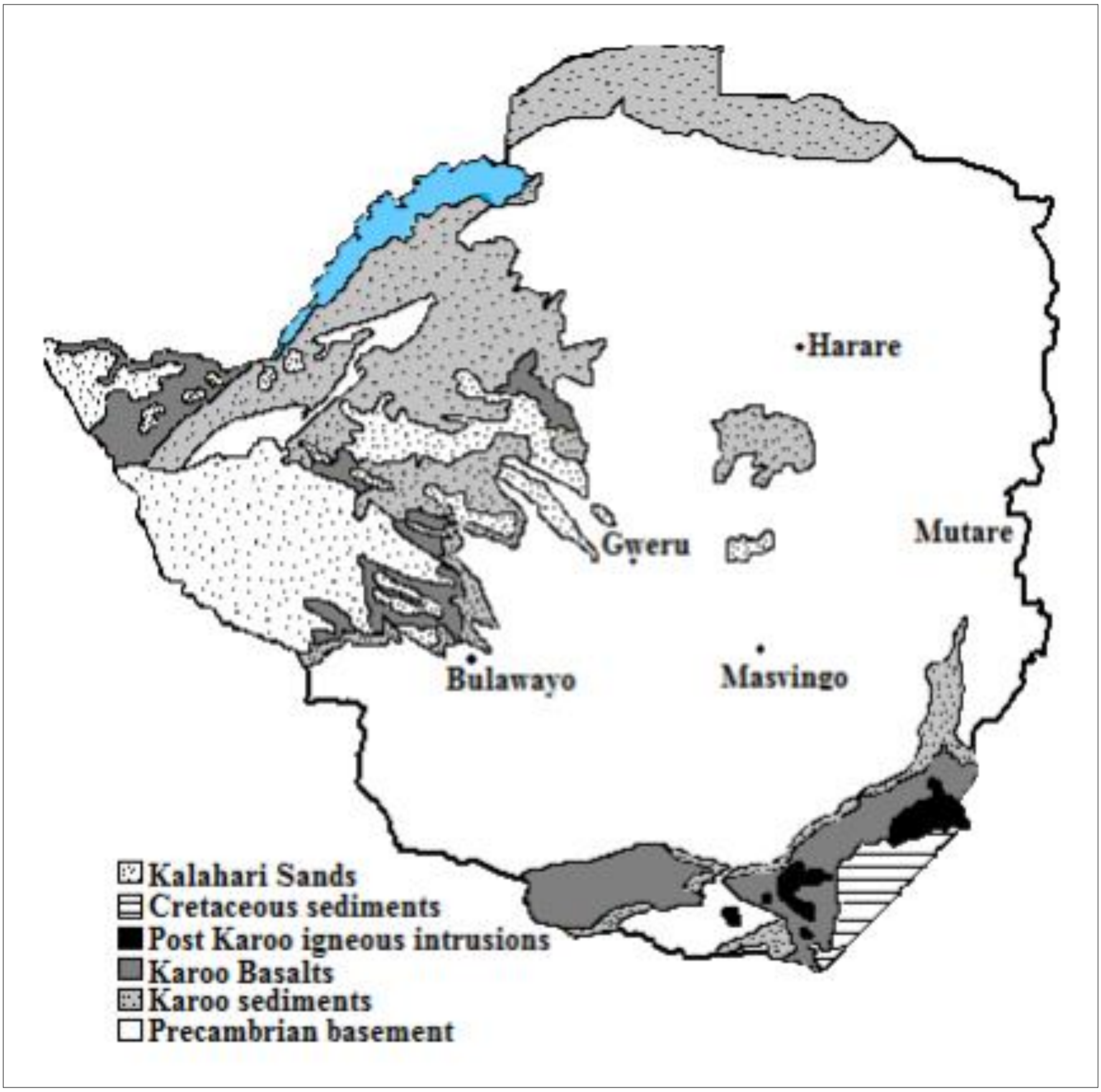


Figure 7-5: Sedimentary Basins of Zimbabwe (taken from Mugumbate, unknown year)

7.2 Regional Geology as it Relates to the Bilboes properties.

7.2.1 Stratigraphy

The Bilboes stratigraphic presentation is depicted in Figure 7-6.

Time (Ga)	Greenstone Sequences and associated Granitoids	Formations	lithologies
2.5	Granitoid Suits		Felsite, granodiorite, gneiss
2.6	Shamvaian Group	Ndutjana Fm	Arkose, greywacke, grit, conglomerate
2.65	Upper Bulawayan Group	Dagmar Fm	Calcareous grit, arkose, phyllite, BIF's, crystalline limestone
		Ednovean & Dollar Block Fm	Andesite, dacite, pyroclastics
		Courtleigh Volcanic Fm	Dacite, chert, tuff, agglomerate felsic intrusives
		Lonely Mine Fm	Basalt, andesite, Ferr. Shale, BIF's
		Isnagene, Ventnor, Bembesi River & Zwankendaba FMs	Basalt, andesite, dacite, rhyodacite, agglomerate BIF's, chert, crystalline limestone
		Sweetwater & Inyati Fms	Basalt, rhyodacite, pyroclastics
2.7	Lower Bulwayan Group	Eubi Source Fm	Mafic and ultramafic metavolcanics, tuffs
		Goodwood Fm	Felsic metavolcanics
2.8		Kenilworth Fm	Epidiorite, amphibolite schists

Adapted from Marwitz et al. (2010), Nisbet et al. (1981), Mhlanga, G. (2002), and Muirhead, JDG and Van Blerk, W.N. (1977)

Figure 7-6: Bilboes Site Stratigraphy

7.2.2 Local Geological Setting

The Bubi Greenstone Belt covering the Bilboes properties consists of volcanic rocks of the Upper Bulawayan Group capped by sedimentary sequences of the Shamvaian Group locally represented by Mdutjana and Dagmar Formations respectively (Figure 7-7). The deposits occur within the meta-volcanic and meta-sediments close to the contact between these two stratigraphic units.

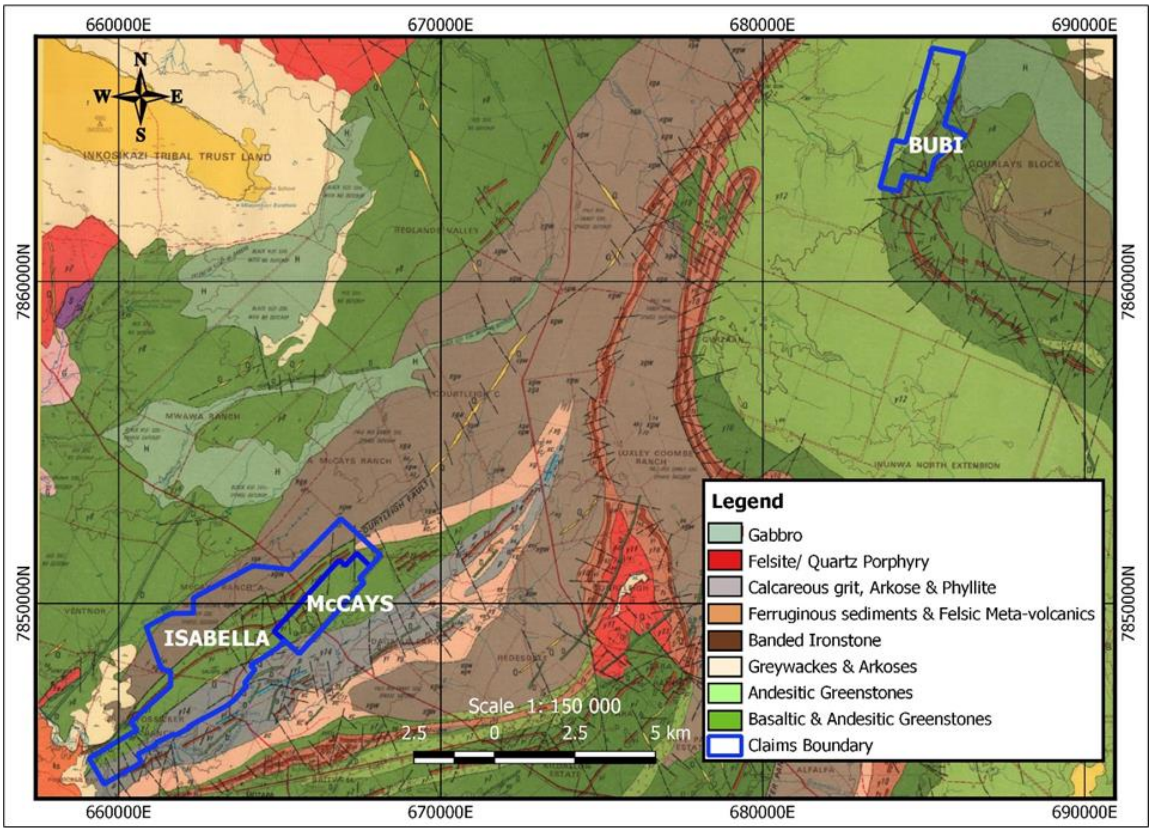


Figure 7-7: Regional Geological Map showing Bilboes Properties (from Ngilazi and Martin 2017)

7.3 Mineralized Zones

Mineralization at Bilboes four properties is Archaean lode, structurally controlled deposits. It consists of silicified stock-works/veins. The veins comprise pyrite and arsenopyrite. Gold is disseminated within the sulphide mineralization and is refractory. Pyrite is the dominant sulphide mineral, with minor arsenopyrite at Isabella and McCays, with the exception of the Isabella North orebodies where an equal proportion of pyrite to arsenopyrite is evident.

The mineralized zones are often subparallel to each other and are hosted in a much broader shear zone. The best mineralized zones are associated with brecciation and silicification.

The sulphide tends to weather readily, and all of the deposits are covered by oxide caps to a depth of 12 m to 50 m which are readily amenable to heap-leach extraction.

Orebody widths at Isabella and McCays range from 5 m to 20 m and are wider near surface. Individual orebodies have strike ranges from 75 m to 500 m and are typically in an en echelon pattern in a northwest to south-eastern pattern. The oxide cap is deepest at Isabella where the range is 12 m to 50 m. The overall mineralized strike is 4,400 m.

The oxide-sulphides interface at Bubi is shallow in the southwest at about 10 m to 12 m below surface and increases to 30 m in the central parts and to 40 m in the northeast. Orebody widths vary from 10 m in the southwest to as wide as 100 m in the central portions of the claims. The overall mineralized strike is 2,950 m.

8 DEPOSIT TYPES

Mineralization at Bilboes four properties is of the hydrothermal variety. It consists of silicified stock-works/veins. The veins comprise pyrite and arsenopyrite. Gold is disseminated within the sulphide mineralization and is refractory. The mineralized zones are often subparallel to each other and are hosted in a much broader shear zone. The best mineralized zones are associated with brecciation and silicification.

These deposits form from hot water circulates through fractures in Earth's crust. As the hot water moves, it leaches metals from surrounding rocks. Eventually, the metallic-rich fluids become supersaturated and precipitate plant feed minerals, including gold. The process involves hydrothermal fluid circulation and precipitation within a selected volume of rock.

The Bilboes deposit is an orogenic gold deposit. The gold in orogenic gold deposits is generally found in quartz veins or as disseminations within the host rock. The gold is often structurally controlled, meaning it is concentrated along faults, shear zones, or other structural features within the rocks. Orogenic gold deposits can be found in various geological settings, including continental margins, island arcs, and suture zones. Gold precipitates from hydrothermal fluids due to suitable physical and chemical processes.

9 EXPLORATION

9.1 Geological Mapping

Mapping has been conducted progressively at the Bilboes mines since commencement of oxide gold operations, with the latest exercise being conducted between January and September 2018. Below are some of the maps produced for Bubi (Figure 9-1) and the Isabella McCays area (Figure 9-2). Mapping was done to decipher surface and in-pit geological and geotechnical information, critical for structural and alteration interpretation of mineralized units and in aiding pit geotechnical slope stability studies.

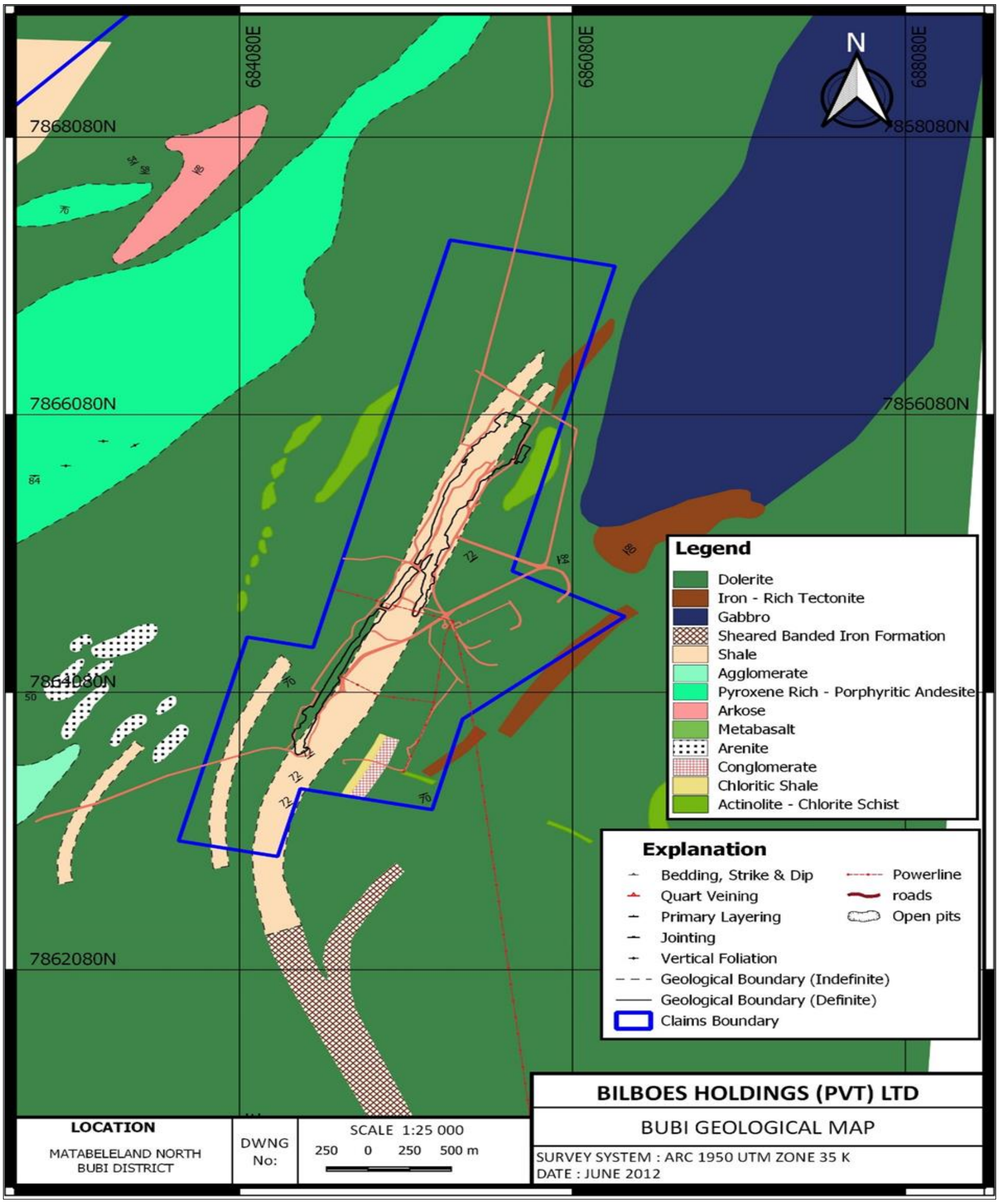


Figure 9-1: Map of the Surface Geology at Bubi

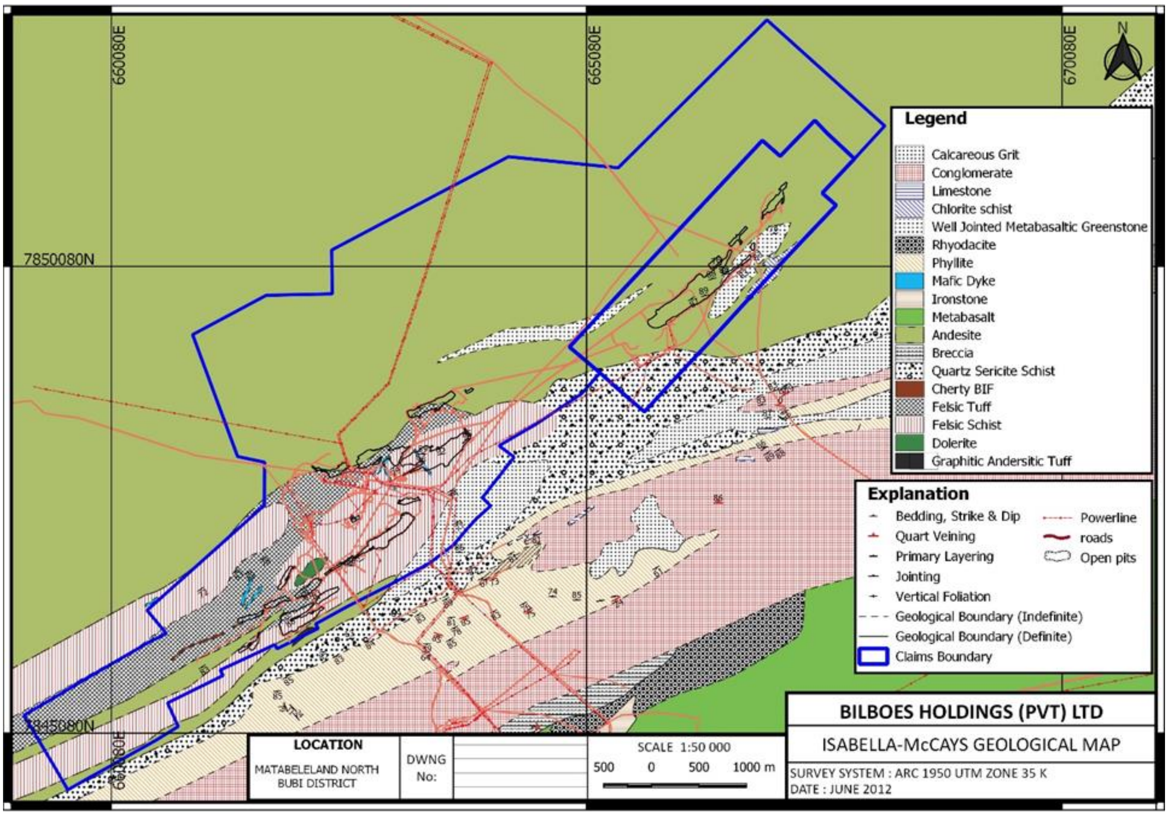


Figure 9-2: Map of the Surface Geology at Isabella McCays

9.2 Trenching

Trenching was conducted across all deposits as part of exploration work for the purposes of defining near surface geology and mineralization envelopes within the oxide horizons. The trenches were sampled generally on a 1 m to 2 m interval and analyzed by the bottle roll method (excluded fire assay of the residual tails). These assays were used to help in the projection of oxide plant feed envelopes and excluded from any Mineral Resource estimation. Channel sampling was also done in all accessible sections of the pits during 2017, which also assisted in the projection of mineralized envelopes in the oxide and transition plant feed horizons, but the assays were also not used for Mineral Resource estimation.

9.3 Ground Geophysical Surveying

Ground Magnetics and Induced Polarization Geophysical surveys were conducted at the Isabella North deposit by PV as part of the oxide plant feed exploration in 1996. The anomalies were followed up with oxide trenching and drilling. The oxide drilling data forms part of the depth interpretation of the Bilboes deposits from oxide through transitional and sulphide horizons. Further geophysical surveys were conducted in the Kerry West claims located west of the Isabella South claims and Kerry North claims, between Isabella North and McCays. Further drilling is outstanding on these targets and these offer potential for oxide and sulphide resources.

9.4 Prospecting and Sampling

Early exploration works targeted oxide mineralization and includes soil sampling, trenching, and drilling. Assays from this work were not used in the sulphide Mineral Resource estimate but were used to guide the interpretation of the plant feed outlines at depth.

10 DRILLING

10.1 Sulphide Exploration

Drilling of the sulphides to provide data for the Mineral Resource estimate was completed in three Phases:

- Phase 1: Anglo American Corporation between 1994 and 1999,
- Phase 2: Bilboes between 2011 and 2013,
- Phase 3: Bilboes between December 2017 and November 2018.

Phase 1: Anglo explored the sulphide potential beneath the oxides between 1994 and 1999. The results of widely spaced core drilling of the sulphides were used by Anglo American to estimate a non-compliant Mineral Resource for this mineralization and delineated 4.7 Mt at a grade of 3.49 g/t and containing 533,000 oz of gold over a 3,400 m strike to a vertical depth of 120 m from 17,650 m of core drilling.

Phase 2: Between 2011 and 2012, Bilboes completed further exploration on the sulphides with 20,437 m from 90 core holes and 20,325 m from 144 Reverse Circulation (RC) holes in 2013 and extended the strike to 7,400 m and achieved a vertical depth of 160 m for the mineralization.

Phase 3: An additional 34,988 m of drilling, split as 17,015 m from 129 core holes and 17,972 m from 178 RC holes was completed between December 2017 and November 2018. This was largely an infill drilling programme for a Mineral Resource upgrade across all deposits at Isabella, McCays and Bubi and achieved a vertical depth of 200 m.

The total project drilling conducted over the three Phases is 93,400 m of core and RC holes. Sulphide mineralization underlies all the oxide deposits at variable depths from 15 m to 50 m. Two exploration campaigns account for historical exploration of sulphide gold deposits at Bilboes Gold. Both exploration campaigns were headed by PV. The first drilling campaign occurred in 1994/5. During this campaign 24 drill holes were completed. In the second drilling campaign which took place in 1997/9, 99 drill holes were completed. A total of 123 holes with a total of 17,650 m (12,650 m core and 5,000 m percussion) were drilled at Isabella, McCays and Bubi, covering a strike of 3,440 m.

Drill holes depths varied between 70 m and 350 m for the core holes, with the holes being collared through percussion drilling to a depth of 50 m. The percussion holes were largely used to estimate the oxide Mineral Resource and to define the oxide/sulphide interface. Only core drill holes were included in the sulphide database. The drill line spacing varied between 25 m and 100 m with 25 m between holes along these lines.

The initial holes drilled by PV before 1995 targeted the Calcite (5), Castile (9) and McCays (10) deposits. The majority of these were drilled at 45° inclinations and from hanging wall positions of the mineralized zone. A few exceptions resulted from unavailability of a suitable collar position due to the open pits. Sampling was limited to the visually recognizable alteration zones resulting in approximately 30% of the total hole length being sampled.

At the Diana pit (Isabella Mine), 14 holes were drilled, two spaced at 10 m and two at 50 m with the rest spaced at approximately 25 m intervals. One hole was drilled on each line; all from the hanging wall with one from the footwall. The mineralized intersections occurred at 45 m to 95 m with one intersection at 125 m (DE15-530S). The footwall of the mineralization intersected was at 169 m to 182 m.

At Maria pit (Isabella) all six holes (1998-9) were drilled from the hanging wall with five holes spaced at 25 m and the rest at 50 m. The average intersection depths occurred at 45 m from surface and geological envelopes were modelled down to 100 m from surface. Two parallel, mineralized zones steeply dip at 70° to SE and the hanging wall plant feed body stretches along the entire length of the pit, but the footwall zone is restricted to the eastern end of the strike.

A total of 15 holes were drilled along the Calcite strike from the footwall and two from the hanging wall at 50 m to 120 m line spacing. The deepest intersection occurred at 130 m from surface and the intersection depths ranged from 50 m to 120 m. The eastern end of the strike remains open.

The Castile drilling intersected two mineralized zones that were modelled to 110 m from surface, but the mineralization remains open on all sides. Two holes intersected a significant parallel mineralization (6.68 g/t over 10.59 m and 4.90 g/t over 9 m) in the footwall of the two main zones. Both holes ended in mineralization and require further investigation in future. These holes have not been investigated in the 2017/8 drilling campaign because they lie outside of the proposed open pit.

The 25 holes at Bubi covered a strike of 900 m on lines 25 m apart except for two holes which were spaced at 50 m and 100 m. All the holes (but one) were drilled from the hanging wall in the same SE direction inclined at 45°. Three distinct, parallel zones were identified but these were discontinuous along strike and the mineralization remained open ended towards the southern strike of 1,500 m. The oxide cap is at 15 m to 30 m from surface and only 10 m in the southern strike. Drilled intercepts start at 20 m to 80 m and the deepest occurs at 130 m. The geological models were done to a vertical depth of 170 m from surface.

At McCays 23 holes were drilled in the pit and two mineralized zones were defined along strike but broken up mid-way. Drill spacing was at 50 m to 100 m with a few lines having two holes each. All holes were drilled from the hanging wall but at varying inclinations from 45° to 60°. The geological models were created to 160 m vertical depth with average intersections occurring at 75 m. Two of the holes at McCays had deep (but low grade) intersections that do not form part of the established pattern of mineralization.

A summary of the drilling completed is presented as Table 10-1, Table 10-2 and Table 10-3 with the drill hole distribution being presented in Figure 10-1.

Table 10-1: Phase 1 Drilling 1994 - 1999

Mine	Deposit	Core		RC		Core + RC			
		No. of Holes	Drilled length (m)	No. of Holes	Drilled length (m)	No. of Holes	Drilled length (m)	Depth Achieved (m)	Total Strike (m)
Isabella	Isabella North	31	4,800	-	-	31	4,800	150	890
	Isabella South	44	5,650	-	-	44	5,650	150	650
McCays	McCays	23	4,000	-	-	23	4,000	350	1,000
Bubi	Bubi	25	3,200	-	-	25	3,200	120	900
Total		**123**	**17,650**	**-**	**-**	**123**	**17,650**	**165**	**3,440**

Table 10-2: Phase 2 Drilling 2011 - 2017

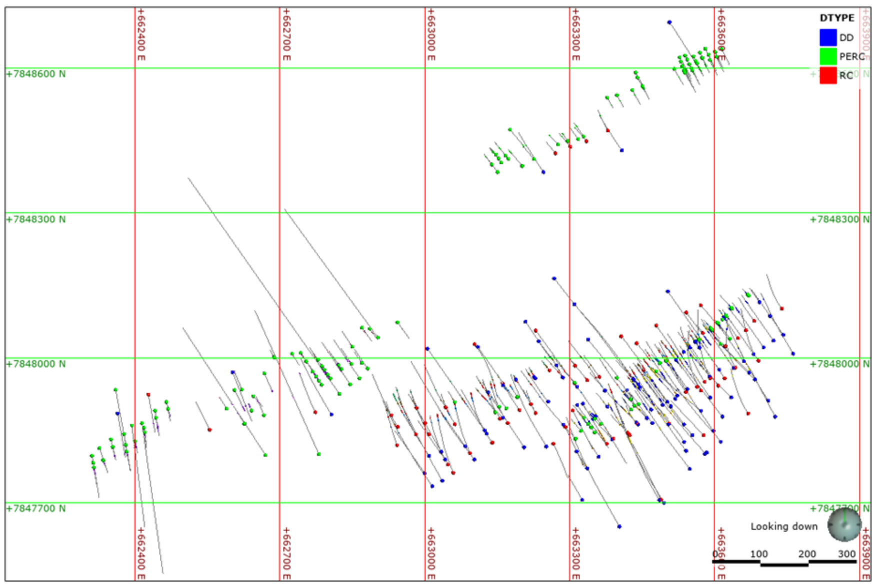
Mine	Deposit	Core		RC		Core + RC			
		No. of Holes	Drilled length (m)	No. of Holes	Drilled length (m)	No. of Holes	Drilled length (m)	Depth Achieved (m)	Total Strike (m)
Isabella	Isabella North	32	8,625	27	4,848	59	13,473	184	1,300
	Isabella South	16	3,622	48	6,667	64	10,289	120	1,700
McCays	McCays	11	2,313	10	1,645	21	3,958	150	1,400
Bubi	Bubi	31	5,877	59	7,165	90	13,042	200	3,000
Total		**90**	**20,437**	**144**	**20,325**	**234**	**40,762**	**170**	**7.400**

Table 10-3: Phase 3 Drilling 2018

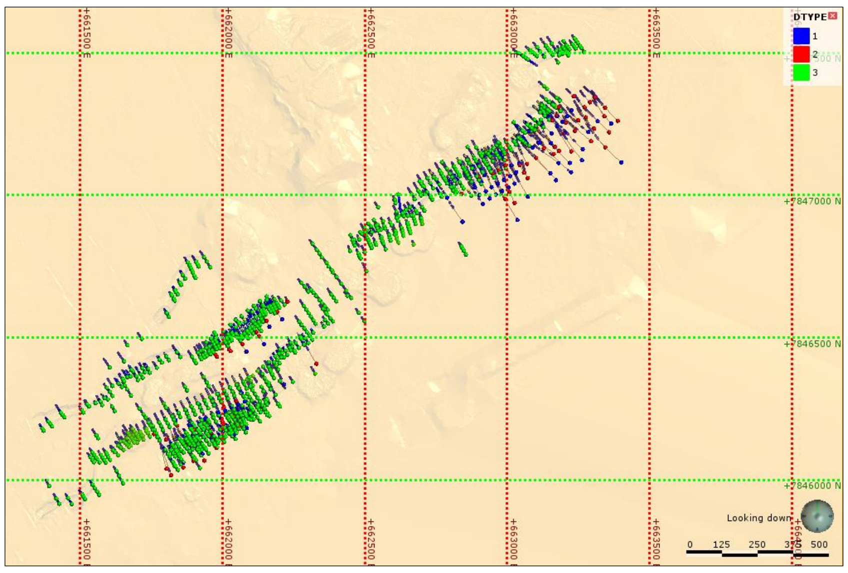
Mine	Deposit	Core		RC		Core + RC			
		No. of Holes	Drilled length (m)	No. of Holes	Drilled length (m)	No. of Holes	Drilled length (m)	Depth Achieved (m)	Total Strike (m)
Isabella	Isabella North	40	6,294.0	36	4,440	76	10,734	184	1,300
	Isabella South	20	2,541.0	28	3,133	48	5,674	120	1,700

Mine	Deposit	Core		RC		Core + RC			
		No. of Holes	Drilled length (m)	No. of Holes	Drilled length (m)	No. of Holes	Drilled length (m)	Depth Achieved (m)	Total Strike (m)
McCays	McCays	57	6,193.0	76	6,545	133	12,738	150	1,400
Bubi	Bubi	12	1,988.0	38	3,854	50	5,842	200	3,000
Total		**129**	**17,016.0**	**178**	**17,972**	**307**	**34,988**	**170**	**7,400**

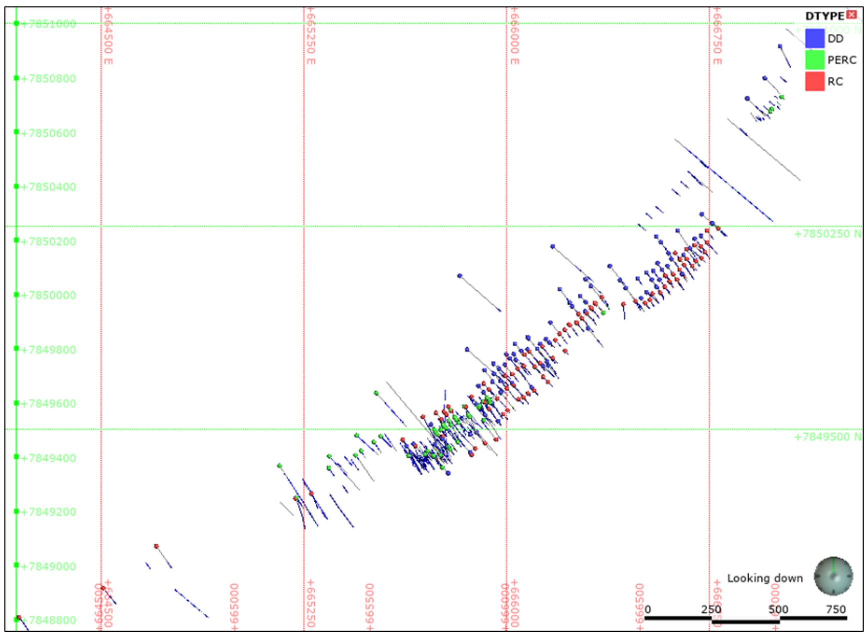
Isabella North (ISBN)



Isabella South (ISBS)



Bubi



McCays

green = Percussion drilling

blue = Diamond Drilling

red = Reverse Circulation drilling

Figure 10-1: Plans Showing the Drilling for the Various Areas

10.2 Hydrology and Hydrological Drilling

The project site falls within the Bembezi river sub-catchment which drains north towards the Zambezi River. The Gwayi catchment largely comprises the Northern Matabeleland area of hydrological zone A.

Daily and monthly rainfall were obtained from the Nkayi station from the Meteorological Services Department of Zimbabwe (MSD-Z) for 38 hydrological years (from 1980 to June 2018) and were analysed to determine the long-term monthly averages, minimum and maximum monthly rainfall. The Mean Annual Precipitation (MAP) is 657.0 mm, the wettest hydrological year saw 53% more rainfall than the MAP and the driest hydrological year saw only 60% of the MAP. The driest period was associated with the drought experienced in the 1990s.

Data from the Nkayi station was adopted as the design data owing to the weather station having an acceptable length of record of monthly rainfall data and being located closest to the site and at a similar altitude.

Ten years of monthly pan evaporation measurements for Bulawayo Goertz were provided by the MSD-Z. A pan coefficient of 0.75 was adopted for the conversion of Epan measurements to a reference evapotranspiration.

The annual maximum rainfall analysis for various duration storm events (from 24 hours up to 7 days) was undertaken on the 38 years of daily rainfall records supplied by the MSD-Z. The Generalized Extreme Value (GEV) distribution was then fitted to the annual maximum series to estimate storm depths for events with an annual probability of occurrence of up to 1:10,000 (0.01%).

No hydrological drilling has been undertaken. For pits that contained water ingress, a bathymetric survey was done to determine pit bottom.

10.3 Geotechnical Drilling

A total of 18 geotechnical drill holes: ten at the Isabella McCays and five at Bubi, varying in depth from a minimum of 120 m to a maximum of 260 m were logged. The cumulative length of the drill holes at Isabella McCays Isabella McCays was about 1.67 km; and those at the Bubi was about 0.88 km.

SLR Consulting (Africa) (Pvt) Ltd, from South Africa was contracted by Bilboes to conduct a detailed geotechnical study across all the sulphide deposits. SLR Rock Engineers visited site at various stages of the geological drilling campaign during 2018 with the following tasks being conducted: review of geological and geotechnical data; geotechnical logging of core and the collection of intact rock samples for testing. Structural data was collected by both the Acoustic and Optical Televiewer from the geotechnical boreholes. Packer testing was also conducted in each borehole to determine the hydrogeological parameters of the rock mass, for groundwater modelling. Based on the analysis of the geological aspects of the deposits which included rock mass characterization, hydrogeology, and structural geology, a geotechnical model was developed for pit design parameters. Using these design parameters, kinematic, empirical and limit equilibrium analysis was conducted to determine the optimal slope configuration for the various deposits.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Logging and Sampling Procedure

There are no written accounts of the historic sampling procedures, but Mr. Chimedza, who has been employed by Bilboes since 1996, was closely involved with the exploration of the sulphide deposits. He confirms that the sampling of the core followed Anglo American Corporation standard procedures. This was considered to have been sufficiently accurate for the purpose of reporting of Inferred MRE contained in the 2009 Mineral Resource declaration.

The geological logging included descriptions of lithologies, structures, alteration, and visible sulphide mineralization. The information was entered into core logging sheets and mineralized zones were identified. All geological boundaries were defined with reference to the drill length. On completion of assaying, the gold results for each sample were recorded on the log sheets for easy reference. Core recoveries were recorded, and any depth discrepancies were checked and corrected. Geotechnical logging, including the RQD index and fracture spacing, was also undertaken.

Bilboes has hardcopy and digital datasets of all information except for the geotechnical logs for which only hard copies are available.

Core was fitted together, and a longitudinal line drawn to guide splitting. Within the mineralized zones sample intervals were marked between 0.5 m and 1.0 m, taking cognizance of geological and structural boundaries, and sampling was continued at 1 m intervals to 5 m on either side of the mineralization.

All the visually recognizable mineralized portions of the drill holes were cut, half core sampled, and assayed with well over 10,000 samples being assayed for gold.

11.2 Sampling

The recovery of samples from the RC and core drill rigs was done in accordance with laid down procedures adequate for the purposes of reporting of Mineral Resources. Once field measurements, markings and numbering and recording of critical information were completed, the core samples were transported daily from the drill site to the core yard and RC samples to secure metal containers to ensure security and avoid tampering, damage, loss, or contamination. The core was adequately secured to prevent damage, loss, or mix-up during transportation. Wet RC samples were collected in calico bags to allow water to drain out and minimize sample loss prior to sun drying in metal trays in a securely fenced section of the core shed which was free from dust ingress and other forms of contamination. Core samples were half split using a core saw and the samples averaged 2 - 3 kg. The core sizes were largely NQ with a few HQ cores being encountered at the start of drill holes. RC samples were collected by way of a Jones riffle splitter and the aliquots also averaged 2 - 3 kg. After sampling, excess cores and RC samples have been stored at the mine in secure sample containers and the core shed and have been retained for future use. All samples were labelled appropriately prior to dispatch. No further sample preparation was done at site and the half cores and riffle split RC samples were transported to the external accredited Laboratory. Transportation of samples to the Assay Laboratories was done utilizing Bilboes vehicles accompanied by a senior member of the technical team followed the laid down chain of custody procedure between the company and the Lab to ensure sample security in transit and proper handover-takeover. Transportation of samples to the Lab was done on the same day within working hours with no unnecessary stopovers along the way to reduce risk of loss, contamination, or damage.

DRA reviewed the procedures for sampling, sample preparation protocol, sample handling and storage and are of the view that these are adequate for the purposes of reporting of Mineral Resources. Bilboes and an independent SRK consultant also visited and inspected the laboratories used in the analyses and can confirm that these also followed the correct procedures for sample preparation.

11.3 Analysis

Independent Southern African Development Community Accreditation Service (SADCAS) accredited laboratories were used in the analyses of samples. Samples were analyzed for gold by Fire Assay on 50 g pulp aliquots and completed by Atomic Adsorption spectrophotometry method. Samples with grades at 3 g/t and above were repeated by the gravimetric finish.

Performance Laboratories Zimbabwe (PLZ) in Harare, was selected as the primary laboratory (accreditation number T0533) ZIMLABS Laboratory located in Harare (accreditation number T0339), and Antech Laboratories (Antech) located in Kwekwe (accreditation number T0411) were used for check analyses. All Laboratories are in Zimbabwe and have all since migrated to the SADCAS which accreditation is in accordance with ISO/IEC 17025 system. Current accreditation is:

- PLZ - TEST-500070 issued on 3 June 2022,
- ZIMLABS - TEST-50010 issued on 20 February 2015,
- Antech - TEST-50030 issued on 1 June 2023.

11.4 Sample Security

At all times during sample collection, storage, and shipment to the laboratory facilities, the samples were in the control of Bilboes Gold. The samples were then trucked to Performance Laboratories in Harare for geochemical analysis.

During the 2018 drilling and sampling campaign, all analytical results were emailed by Performance Laboratories to Bilboes Gold. Comparisons were done between the drilling database received from Bilboes and the assay results received from Performance Laboratories to verify the database.

All the laboratories that conducted the sampling and analytical work were independent of Bilboes Gold. Performance Laboratories in Zimbabwe is an entity of SGS. SGS produces impartial results that are considered suitable for Mineral Resource estimation.

12 DATA VERIFICATION

12.1 Historical Data

DRA's engagement with Bilboes began with a review of the previous Mineral Resource estimate. During the review process, rigorous tests were conducted to verify the integrity of the Bilboes database. A recommendation from the review process by DRA was to implement a commercial data management software, to which Bilboes complied by acquiring Datamine™ Fusion database software for the capture, storage, and management of drill hole information. This Fusion database was implemented prior to the start of the 2018 drilling campaign.

12.2 2017/2018 Drilling Campaign

Before commencement of the 2017/2018 drilling campaign in addition to the Datamine™ software already in place Bilboes utilized Fusion database software for the capture: storage and management of drill hole information.

The 2018 drilling programme contained 41 RC and 55 Diamond Drill (DD) holes for ISBN, 27 RC and 20 DD holes for Isabella South (ISBS), 76 RC and 55 DD holes for McCays, and 40 RC and 13 DD holes for Bubi. With regards to the 2018 data, DRA visited the site during drilling and performed various checks to verify the integrity of the collar co-ordinates, logging and sampling procedures, and assay results. Collar locations in the field were clearly marked. The mineralization zones were observed in the cores as well as from outcrops in the surface mining pits.

The core logging and sampling processes at the core storage facility were observed to be consistent with industry standards. Each hardcopy log is audited and signed-off by a senior geologist prior to being used in modelling and estimation.

12.3 Quality Control

As part of their QA/QC protocols to test for the precision of the analytical process, Bilboes inserted CRMs, blanks into their sampling stream, and created duplicates for re-analysis. During the 2017 Mineral Resource review of the Bilboes properties, DRA did a thorough review of the QA/QC protocols. The findings of that review concluded that the protocols employed at Bilboes were adequate and the database was deemed fit for the purposes of geological modelling and Mineral Resource estimations. The review was in respect of all protocols from commencement of drilling campaigns by Bilboes in 2011 till completion in 2018.

CRMs were sourced from African Mineral Standards (AMIS) in South Africa, Geostats in Australia, and Rocklabs in New Zealand. Silica powder from AMIS and local dolerite were used as blanks. Bilboes utilized two types of duplicate materials: a Lab Pulp Duplicate (LPR) and a Lab Coarse Duplicate (LCR). In a batch of twenty samples, at least four out of the twenty samples were control samples. This represents an insertion ratio of at least 20%. If more than 20% of CRM results in a batch returned results that fell outside the allowable deviation of the recommended value, all results from that batch were failed and re-analyzed.

12.3.1 Blanks

For the 2018 sampling campaign, Silica powder and local dolerite were used as blank material. AMIS0415, AMIS0439, and AMIS0484 were used as silica blanks. During the 2017 review by DRA, 272 blanks were present in the database. An additional 859 blanks were added to the database for the 2018 campaign, taking the total number of blanks to 1,131.

A detection limit of 0.02 g/t was set for the exercise while the upper acceptable limit was set at 0.1 g/t for the silica blanks and 0.15 g/t for the field blank. All samples for AMIS0415 and AMIS0439 plotted the allowable upper limit of 0.1 g/t. Only one sample returned a gold value more than the 0.1 g/t allowable upper limit for AMIS0484. Similarly, with the field blank, only one sample returned a gold value more than the allowable 0.15 g/t upper limit.

12.3.2 Standards

CRMs were sourced from AMIS in South Africa and Geostats Pty Ltd in Australia for the previous drilling campaign. For the 2018 drilling campaign, CRMs were sourced from AMIS - AMIS0440, AMIS0441, AMIS0473, AMIS0525, and AMIS0526. These represent the grade distribution observed at Bilboes Gold. AMIS0473 has a recommended grade of 0.41 g/t, for AMIS0526 the recommended grade is 1.03 g/t, 1.74 g/t for AMIS0440, 2.44 g/t for AMIS0441, and 8.04 g/t for AMIS0525.

Most of the control samples of AMIS0440 plot within three standard deviations of the recommended mean value of 1.74 g/t. Some seventeen samples plot outside the allowable three standard deviations limit. This is to be expected of a low/middle grade CRM.

All the control samples representing CRM AMIS0441 plot within three standard deviations of the recommended mean value of 2.44 g/t with most samples lying within two standard deviations.

For AMIS0473 all the control samples lie within one standard deviation of the mean of 0.41 g/t. For AMIS0525 all the control samples, bar one, plot within two standard deviations of the mean value of 8.04 g/t. However, a slight positive bias is observed for AMIS0525 with a majority of the samples lying above the recommended mean value. Five samples lie outside three standard deviations of the recommended mean value of 103 g/t for CRM AMIS0526.

12.3.3 Duplicates

Two types of duplicates were employed in the 2011 to 2018 drilling and sampling campaigns i.e., Lab repeats and field duplicates. The former is made up of LPR and LCR. There were 721 LPRs and 875 LCRs in the database for the 2018 campaign. The majority of samples were within a 15% margin. Samples that fell outside of the 15% margin could be attributed to the inherent nugget effect of the deposit.

12.3.4 Umpire Labs

Performance Laboratories was used as the primary laboratory for analysis in the recent drilling campaigns from 2011 to 2018. To check the reliability of the results obtained from Performance Laboratories, ZIMLABS and Antech Lab were used as umpire laboratories. The results show the acceptable correlation between the primary laboratory and the umpire laboratories.

12.4 QP Commentary

The data collected during the exploration, drilling and sampling programmes, including surveying, drill hole logging, sampling, geochemical analysis, and data quality assurance, was collected in a professional manner and in accordance with appropriate industry standards by suitably qualified and experienced personnel.

The data was reviewed and validated by the relevant QP who concluded that the data is suitable for the construction of the geological model and Mineral Resource declaration.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Test Work Programme Overview

The metallurgical test work was concluded in different Phases over a period extending from September 2013 to March 2019 and involved various independent laboratories and consultants as outlined in Table 13-1.

Table 13-1: Test Work Program Outline

Phase	Test work Description	Done By	Supervision and Oversight	Date
1A	Sample characterization detailing mineralogical and chemical analysis	Mintek, South Africa	Bilboes Gold, MMC and MDM Engineering	September 13 to December 13
1B	Comminution test work done on the two composites namely Composite 1 (Bubi plant feed) and Composite 2 (combination of Diana, Calcite, Castile, Maria and McCays orebodies)	Mintek, South Africa	Bilboes Gold, MMC and MDM Engineering	January 14 to April 14
2	Selection of a process route covering gravity amenability tests, flotation optimization and treatment of the sulphide flotation concentrates via POX, Bio-Oxidation and Ultra-fine grinding followed by cyanidation	Mintek and Suntech, South Africa	Bilboes and MMC	May 14 to September 14
3	Variability flotation tests and bulk flotation concentrate production for additional BIOX® and gold leach tests	Suntech and SGS, South Africa	Bilboes Gold, Minxcon and MMC	October 15 to August 16
4A	Laboratory and Pilot plant test work campaigns on the different plant feed types to generate additional flotation kinetics and grind data, bulk concentrates for BIOX® pilot plants, flotation design parameters and validate flowsheet	MMC at the client's project site in Zimbabwe	Bilboes and DRA	April 18 to September 18
4B	Review, modelling and simulation of laboratory and pilot plant test results	EMC, South Africa	Bilboes Gold, MMC and DRA	October 18 to March 19

Phases 1 to 3 constituted preliminary test work and Phase 4 (Pilot plant), supplementary laboratory test work, modelling, and simulation of the Pilot plant test work.

13.2 Discussion of the Results

13.2.1 Chemical Analyses

The mineralogical and chemical analyses of the plant feed conducted on the individual and composite samples is summarized as follows:

- Gold content in the samples varied from 1.8 mg/kg to 6.8 mg/kg.

- All samples contained high concentrations of Si, Al, Ca, Fe and As. Total sulfur concentrations in the samples varied from 1.2% to 5.3% and significant amounts of it were sulphide species.

The total carbon in the plant feed was detected at 1.3% - 5.3% and was mainly present as carbonate. Organic carbon was low for all samples tested, indicating low potential for preg-robbing. Carbon (as carbonate) content was high, especially for Bubi and McCays pits (double amount in comparison to other composite samples). Carbonate concentrations of between 7.4% and 18.4% were detected in the samples.

The total sulfur content in the samples was found to be mainly in the sulphide form with the lowest content of 0.69% in the McCays plant feed and the highest content of 2.65% in the Bubi plant feed. The concentration of elemental sulfur and sulfate was very low. High As content was detected in all samples which highlighted the importance of investigating as behavior during the processing steps and to consider possible environmental issues in deciding on process route and economics. The As content in the McCays plant feed was disproportionately higher than the other pits.

13.2.2 Mineralogical Characterization

Diagnostic leach results showed that gold recovery via direct cyanidation was low, varying from 25% to 50% and Au locked in sulphides and carbonate minerals varied from 46% to 72%.

Bulk Modal Analysis (BMA) showed that quartz, feldspar, and mica were present in major to intermediate amounts in all the samples, followed by major to minor amounts of carbonates. Sulphide minerals, pyrite and arsenopyrite, were present in minor to trace amounts throughout all samples. All other mineral Phases are present in trace amounts in all samples.

The Au bearing minerals identified in this study were electrum (AuAg) and native gold (Au). Native gold and electrum are variably distributed throughout all samples.

Most Au-bearing grains reported to the 0 µm -10 µm size class fraction and a smaller quantity in the 10 µm -15 µm size class fraction.

Pyrite was the dominant Base Metal Sulphides (BMS) mineral present as majority of the samples followed by arsenopyrite (from 5 to 58%) and trace amounts of other sulphides (sphalerite, pentlandite, chalcopyrite, chalcostibnite, ullmannite, gersdorfiite and galena)

The majority of all BMS mineral grains (>50 mass%) in all samples reported to the finer, 0 µm -21 µm size classes, with lesser amounts reporting to the coarser size classes.

The majority (>80 mass%) of pyrite, arsenopyrite and other sulphides had free surface with lesser amounts being associated with other mineral Phases in all the samples examined.

13.2.3 Comminution

Comminution test work showed that Isabella and McCays samples with Bond Ball Work Index (BBWi) values ranging from 15.70 kWh/t to 17.81 kWh/t and A*b values ranging 27.50 to 32.80 could be classified as being hard, while Bubi plant feed with a BBWi value of 21.45 kWh/t and A*b value of 19.0 was very hard. All samples were characterized as being moderately abrasive with Ai indices ranging from 0.22 to 0.42.

13.3 Process Route Identification

13.3.1 Gravity Tests

Gravity amenability tests indicated poor gold recoveries and varied from 14% to 22% at 0.5% mass pull. Gravity separation at higher mass pull provided higher gold recovery but still was not a feasible option.

13.3.2 Preliminary Flotation

Initial milling and flotation results indicated high gold recoveries of 89% - 97% with high mass pulls ranging from 10%- 15%, low concentrate grades of 12 g/t - 20 g/t Au and unacceptable high levels of carbonates in the range of 7% - 13% which were bound to negatively affect the down-stream gold recovery process. The test work established that the plant feed can be easily floated with good recoveries at grinds ranging from 80% of 106 µm - 75 µm and that flotation optimization with respect to mass pulls, concentrate grade and other concentrate quality metrics was required.

13.3.3 Flotation Optimization

Subsequent flotation optimization tests involving the addition of depressant, and 1 and 2 cleaning stages improved the overall flotation performance with recoveries ranging from 88% to 94%, with mass pulls ranging from 4% - 12%, concentrate grades of 50 g/t – 120 g/t Au and acceptable carbonates levels in the range of 4% - 10%.

The optimum flotation conditions determined are presented in Table 13-2.

Table 13-2: Optimum Flotation Conditions

Description	Value
Grind	80% - 75 µm
Reagents Dosages – g/t	-
Copper Sulfate	80 g/t
Sodium Ethyl Xanthate	100 g/t
Sodium Carbonate	200 – 350 g/t
Starch	70 – 125 g/t

Description	Value
XP200 Frother	35 – 60 g/t

13.3.4 Gold Dissolution from Flotation Concentrates

Direct cyanidation of the flotation concentrate resulted in a 27% gold dissolution.

Ultra-fine grinding (80% -20 µm) followed by cyanidation and oxygenation resulted in a marginal improvement in gold dissolution from 27% to 30%.

A single Pressure Oxidation (POX) test was done on concentrate with the main objective to oxidize 100% of the sulphide which then resulted in a further 98% gold dissolution by cyanidation of the POX leach residue. Formation of Basic Ferric Sulfate (BFS) resulting in high lime and cyanide consumption in the downstream processing (cyanidation) was observed. A significant amount of arsenic was also detected in the POX filtrate.

BIOX® of the concentrate provided 99% sulphide decomposition with 97% gold dissolution by cyanidation of the bio-residue. Formation of iron and cyanide complexes was observed. The solid residue after cyanidation of the bioleach product was stable with respect to arsenic.

Based on the above results, historical test work and consideration of environmental impacts and risk minimization by adopting commercially established and proven processes, the process route identified for additional evaluation was flotation, pre-treatment of the concentrate by Bio-oxidation followed by cyanidation.

13.4 Variability Testing

Variability flotation test work on the plant feed indicated an average recovery of 89.2%, a recovery range of 83.4% - 95.9% and recovery standard deviation of 3.4% for Isabella McCays plant feed and average recovery of 86.6%, a recovery range of 80.5% - 94.2% and recovery standard deviation of 4.4% for Bubi plant feed.

13.5 Pilot Plant Test Work

The pilot plant test work was conducted over a period of three months from July 2018 to September 2018, with the follow up laboratory test work being conducted between September 2018 and January 2019.The pilot plant utilized a total of 20 t of the Isabella McCays plant feed and 15 t of Bubi plant feed.

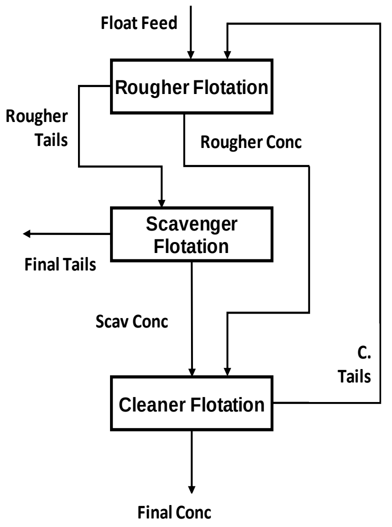
13.5.1 Pilot Plant Operation and Flowsheets

The flowsheets evaluated during the pilot plant campaigns are shown Figure 13-1.

Flowsheet 2 was ultimately adopted as the preferred flowsheet based on better recoveries and concentrate grades.

Reagent addition was as per optimum flotation conditions outlined above.

Flowsheet 1



Flowsheet 2

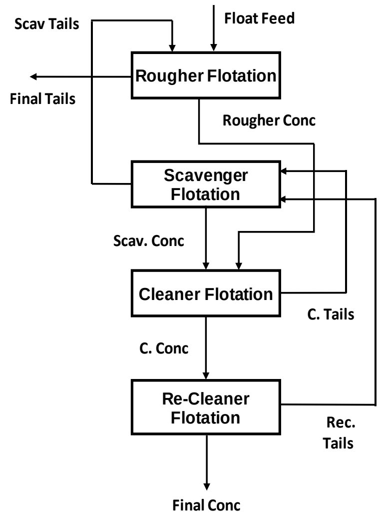


Figure 13-1: Pilot Plant Campaign Flowsheets

13.6 Pilot Plant Results

13.6.1 Recoveries and Mass Pulls

The Isabella McCays plant feed gold recoveries ranged from 85.9% to 91.0% and the mass pulls ranged from 3.8% to 6.0% with a weighted average of 88.4% recovery and 5.0% mass pull. The Bubi plant feed recoveries ranged from 85.9% to 88.8% and mass pulls ranged from 7.8% to 15.2% with averages of 87.5% recovery and 10.0% mass pull.

13.6.2 Chemical Analyses of Bulk Concentrates

The analyses of the individual and blended concentrates produced from the pilot plant operation for the BIOX® process piloting was within the limits of the BIOX® process requirements.

13.6.3 Additional Laboratory Test Work and Simulation

Due to constraints on the classification circuit, the grind on the flotation feed ranged from 63% to 68% - 75 µm against a targeted grind of 80% - 75 µm. This outcome was addressed by conducting additional comparative laboratory flotation tests at these grinds to validate the effect of grind with modelling and simulation applied to the actual pilot plant recoveries to derive expected recoveries at the target grind as explained in the latter section.

13.6.4 Flotation Rate and Comparative Grind Tests

To determine the expected pilot plant recoveries at the target grind of 80% - 75 µm, comparative flotation rate tests were conducted on the individual plant feed at the pilot plant grind of 65% - 75 µm and the target grind. The results showed that the target finer grind of 80% - 75 µm consistently resulted in higher recoveries in comparison to the pilot plant grind of 65% - 75 µm with recovery increments ranging from 0.2% - 4.7% on all plant feed types.

13.6.5 Modelling and Simulation

13.6.5.1 Grind and Recoveries

Eurus Mineral Consultants (EMC) were engaged to review and conduct modelling and simulation on the laboratory and pilot plant test work results.

The comparative results of the simulated pilot plant recoveries at 80% - 75 µm and the actual recoveries at 65% - 75 µm are presented in Table 13-3. The results indicate an expected recovery improvement of 3.1% and 4.2% on the Isabella McCays and Bubi plant feed with grind improvement from 65% - 75 µm to 80% - 75 µm respectively.

Table 13-3: Comparative Pilot Plant Simulated Recoveries

Ore Source	Head g/t	65% - 75 µm (Pilot Plant)			80% - 75 µm (Simulation)			Var:(80% - 75 µm) -(65% - 75 µm)		
		% Mass Pull	Conc g/t	% Rec	% Mass Pull	Conc g/t	% Rec	% Mass Pull	Conc g/t	% Rec
Isabella North	2.00	4.2	41.3	86.1	4.4	40.5	89.2	0.2	-0.8	3.1
Isabella South	2.54	5.1	45.4	90.3	5.2	44.6	92.0	0.2	-0.8	1.7
McCays	2.20	5.5	33.7	83.7	5.9	33.3	88.8	0.4	-0.4	5.1
Isabella McCays Total*	2.20	4.7	41.0	86.9	4.9	40.3	90.0	0.3	-0.7	3.1
Bubi	2.59	8.7	26.0	86.9	9.2	25.6	91.1	0.6	-0.4	4.2

***Based on ISBN-50%, ISBS-30%, McCays-20%**

13.6.5.2 Flotation Residence Times

The modelling and simulation were also applied to derive requisite flotation residence times for the proposed Flowsheet 2 (Table 13-4).

Table 13-4: Flotation Residence Times

Flotation Stage	Residence Time-Mins
Rougher	84
Cleaner	68
Re-Cleaner	46
Cleaner and Re-Cleaner Scavenger	55

13.6.6 Projected Operational Gold Recovery

The following observations from the test work programme results provide evidence of expected higher operational recoveries than the average expected 90.0% and 91.1% derived for the Isabella McCays and Bubi plant feed , respectively.

Both Isabella McCays and Bubi plant feed indicated a positive correlation of head grade and recoveries. With pilot plant head grades being slightly lower than the planned LoM grades, actual plant recoveries can be expected to be better than pilot and simulated recoveries at the same grind.

Laboratory test work and plant simulation results showed marginal improvement in recoveries ranging from 0.3% to 0.9% with finer grinding from 80% - 75 µm to 90% - 75 µm. Although marginal and subject to further validation and analysis of economic benefits, the trend provides a basis for additional optimization prior to implementation or continuous improvement during the operational Phase.

Comparative simulation of the proposed flotation circuit comprised of a rougher, cleaner scavenger and a common 2-stage cleaning and a flowsheet comprising a rougher, cleaner scavenger and separate 2 -stage showed marginal recovery improvement of 0.5% to 0.8% with the latter indicating potential to improve recoveries with flowsheet reconfiguration subject to validation and analysis of economic benefits.

Statistical analysis of results from all laboratory and pilot plant test work results showed expected recoveries of 90.2% and 92.1% and recovery ranges of 85.4% - 95.1% and 89.2% - 95.0% at one standard deviation for the Isabella McCays and Bubi, respectively.

13.6.7 Improvements in Flotation Gold Recovery

It is anticipated that with better knowledge of the recovery relationships, optimal milling and flotation design, steady state operation, higher head grades with continuous improvement and the benefits of the economies of operating experience, the downside recoveries can be avoided and that the operational recoveries ranging from a minimum of the expected values of 90.0% and 91.1% for Isabella McCays and Bubi respectively to a maximum of 95.0% for both plant feed may be realized.

13.7 BIOX®

13.7.1 Test Work

The test work was conducted on plant feed samples from Isabella McCays and Bubi deposits to develop test work data to design a gold processing plant. Summary of the test work results is presented in Table 13-5.

Table 13-5: Summary of the Test Work Results

BIOX® Test work on Sulphide Concentrate			
		Isabella McCays	Bubi
Sulphide oxidation	%	89.6	90.0
Gold recovery	%	88.8	95.7
NaCN consumption	kg/t_{conc}	16 - 18	18 - 20
Lime consumption	kg/t_{conc}	5 - 15	5 - 15

BIOX® pilot plant test work programs were completed on composite Isabella McCays and Bubi concentrates produced during the on-site flotation test work programs. The pilot plant programs have provided details of sulphide oxidation performance under various operating conditions for each concentrate, as well as the relationship between gold dissolution and sulphide oxidation. This data has been used to specify certain design criteria for a full-scale BIOX® plant treating both concentrates. Associated metallurgical test work programs focusing on unit processes such as liquid – solids separation, neutralization and BIOX® product CIL were also completed on slurries generated during each pilot plant campaign.

13.7.1.1 Isabella McCays

The Isabella McCays bulk concentrate sample had a gold grade of 49.9 g/t and a sulphide sulfur grade of 18%. The mineralogical assemblage comprised of 28.5% pyrite, 22.2% arsenopyrite and 0.02% stibnite. The continuous BIOX® pilot plant operated on this sample for a period of 103 days and the run included detailed sampling Phases at 6.5- and 6-days retention times.

The BIOX® test work indicated the following:

- An average BIOX® sulphide oxidation of 89.6% was achieved at a 6-day retention time and a feed slurry solids concentration of 20%,
- This resulted in an average Carbon in Leach (CIL) gold dissolution of 88.8% on the BIOX® product solids,

- The lower-than-expected sulphide sulfur oxidation levels in the pilot plant overflow product slurry are believed to be due to short-circuiting of unoxidized/partially oxidized solids between the reactors,
- The BAT BIOX® tests completed on the various Isabella McCays concentrate samples achieved sulphide oxidation levels in the range 86.4 to 99.3% and yielded gold dissolutions in the range 92.3 to 97.9%.

The continuous neutralization pilot run conducted on an Isabella McCays BIOX® liquor sample produced a suitable effluent since the As(T) concentration in the neutralized solution was at 0.5 ppm and the TCLP testing of the residue showed a final As(T) leachate of <3 ppm, below the stipulated 5 ppm requirement. Continuous neutralization tests are recommended to optimize the use of the Isabella McCays float tails for Stage 1 pH control with respect to high Fe concentration in TCLP extract for the batch neutralization tests.

The settling behavior and flocculent requirement for the various Isabella McCays process slurries were found to be comparable to projects with a similar concentrate mineralogy previously evaluation during BIOX® test work programs.

13.7.1.2 Bubi

The Bubi bulk concentrate sample had a gold grade of 28 g/t and a sulphide sulfur grade of 27.1%. The mineralogical assemblage comprised of 57.2% pyrite and 9.00% arsenopyrite. The continuous BIOX® pilot plant operated on this sample for a period of 235 days and the run included detailed sampling Phases at 6.5 and 6-day retention times.

The BIOX® test work indicated the following:

- An average BIOX® sulphide oxidation of 90% was achieved at a 6.5-day retention time and a feed slurry solids concentration of 20%,
- This resulted in an average CIL gold dissolution of 95.7% on the BIOX® product solids,
- The BAT tests completed on the Bubi concentrate sample achieved sulphide oxidation levels in the range 97 – 98% and yielded gold dissolutions in the range 92.3 to 96.8%.

The continuous neutralization pilot run conducted on a Bubi McCays BIOX® liquor sample produced a suitable effluent since the As(T) concentration in the neutralized solution was at 0.5 ppm and the TCLP testing of the residue showed a final As(T) leachate of < 0.4 ppm, below the stipulated 5 ppm requirement. Continuous neutralization tests are recommended to optimize the use of Bubi/Isabella McCays float tails for Stage 1 pH with respect to high Fe concentration in TCLP extract for the batch neutralization test.

The settling behavior and flocculent requirement for the various Bubi process slurries were found to be comparable to that achieved on the Isabella McCays process slurries. The test work indicated higher settling area requirement of 4,00 $m^2/t/h$ for the Bubi BIOX® product compared to the 2,90 $m^2/t/h$ for the Isabella McCays BIOX® product.

14 MINERAL RESOURCE ESTIMATE

The MRE was prepared by DRA in terms of CIM Standards.

Leapfrog Geo™ software was used to construct volumetric solids for the zones of weathering, structural discontinuities, and mineralization. Three-dimensional (3D) resource modelling, using geostatistical techniques for grade estimation, was done in Datamine Studio RM™. The key assumptions and methodologies used for the mineral resource estimates are outlined.

14.1 Topography

A 3D Digital Elevation Model (DEM) was provided by Bilboes Gold. The points were generated from an airborne photogrammetric survey conducted in 2018 incorporating the existing rock dumps, heap leach pads, and mining pits. For pits that contained water ingress, a bathymetric survey was done to determine pit bottom.

14.2 Geological Database

The database comprised of DD, RC and Percussion (PERC) holes, summarized in Table 14-1.

At Isabella South (ISBS), drill holes dip between 40° and 60° towards the NW. At Isabella North (ISBN), drill holes dip between 45° and 60° towards the NW/SE while at McCays, they dip at 60°towards the SE. At Bubi, the majority of drill holes dip at approximately 60° towards the SE.

Table 14-1: Summary of Drill Holes

Property	DD Holes		RC Holes		Perc Holes		Total	
	No. of Holes	Meters	No. of Holes	Meters	No. of Holes	Meters	No. of Holes	Total Meters
ISBS	68	10,233.74	72	9,636	957	34,312	1,097	54,181.74
ISBN	105	19,574.97	67	9,279	765	34,325	937	63,179.01
BUBI	68	11,500.02	90	10,376	1,663	65,532	1,821	87,408.02
McCays	89	12,565.49	88	8,931	298	20,055	475	41,551.49

14.3 Bulk Density

For drilling campaigns prior to 2011, density measurements were taken at irregular intervals. During the 2011 to 2018 drilling campaigns, every metre of core was sampled, and submitted for density measurements. The Archimedes method of density measurement was used. A summary of these measurements per project area are presented in Table 14-2.

Table 14-2: Summary of Density Measurement per Resource Area

Resource Area	No of Measurements	Minimum (g/cm^3)	Maximum (g/cm^3)	Mean (g/cm^3)
ISBS	2,599	2.01	3.39	2.76
ISBN	3,604	2.00	3.94	2.78
McCays	3,967	2.18	3.93	2.8
Bubi	7,152	2.25	4.65	2.83

To check the reliability of the density measurements that were done in-house, 36 samples from Bubi, 25 from ISBS, 25 from ISBN and 15 from McCays were submitted to an independent third-party laboratory at the Institute of Mining Research, University of Zimbabwe. The in-house measurements compare well with the check analysis.

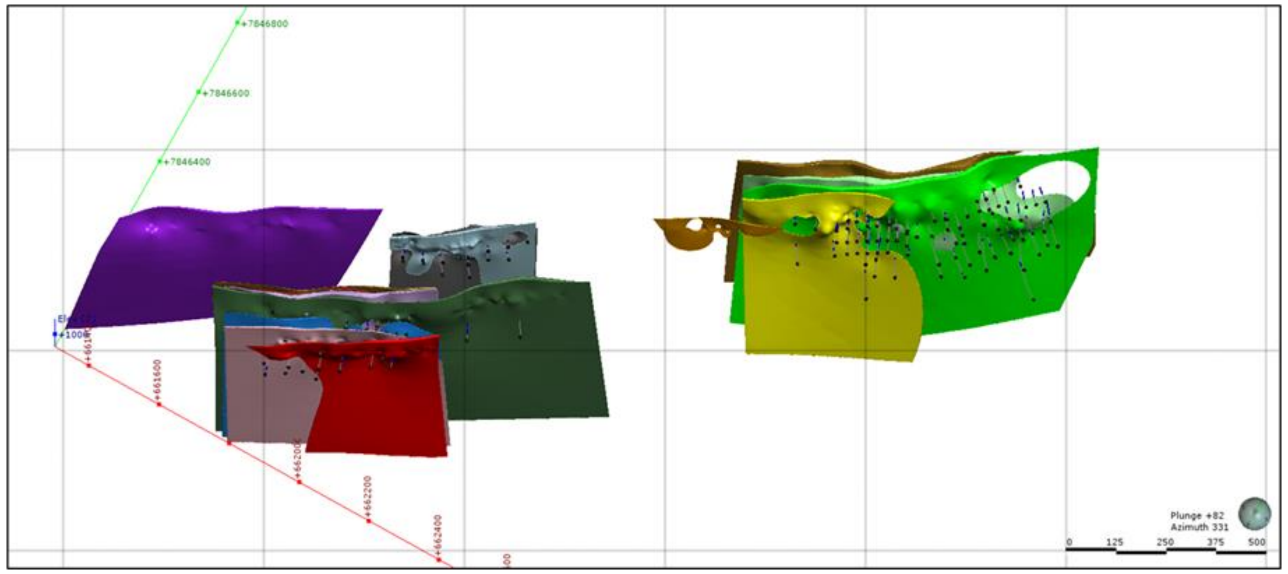
14.4 Geological Model

Mineralization at Bilboes is classified as Archaean hydrothermal alteration within broad shear zones. Discrete mineralized zones have been observed from the oxide open cast mining. A summary of the mineralized zone is presented in Table 14-3 and displayed in Figure 14-1.

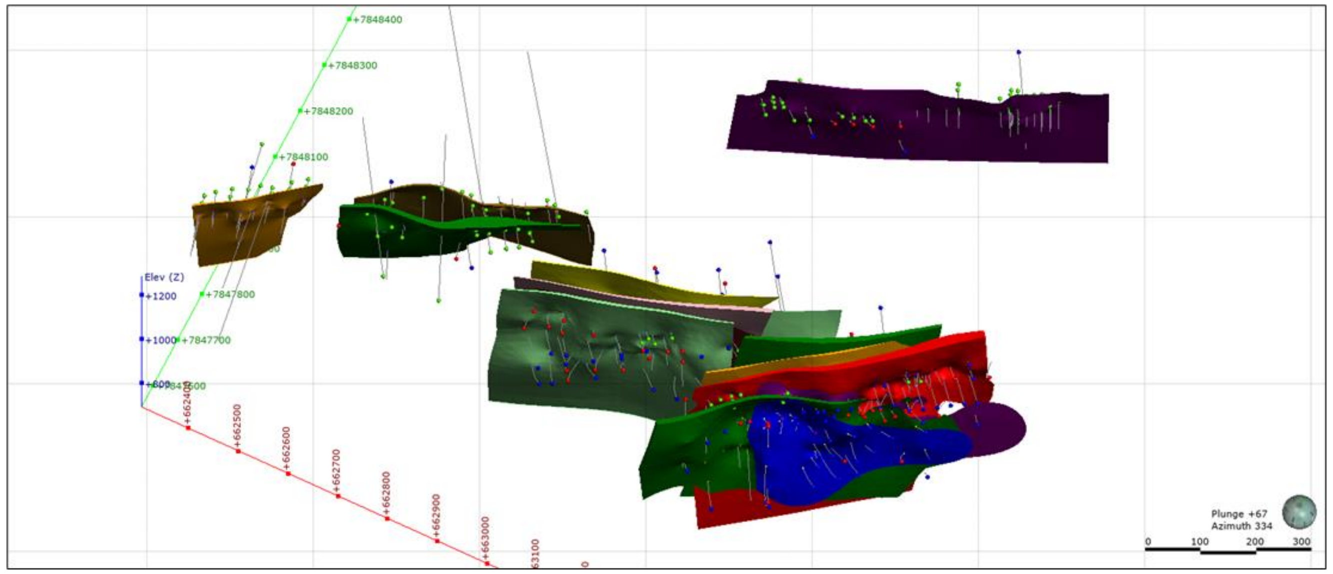
Table 14-3: Summary of the Geological Parameters for the Geological Models

Resource Area	Strike	Dip (°)	No of Mineralized zones
ISBS	NE	~65° to 75° towards the SE	16
ISBN	NE	79° to 85° towards the SE	16
Bubi	NE-SW	SE at approximately 75°	10
McCays	NE-SW	73° towards the NW	16

ISBS

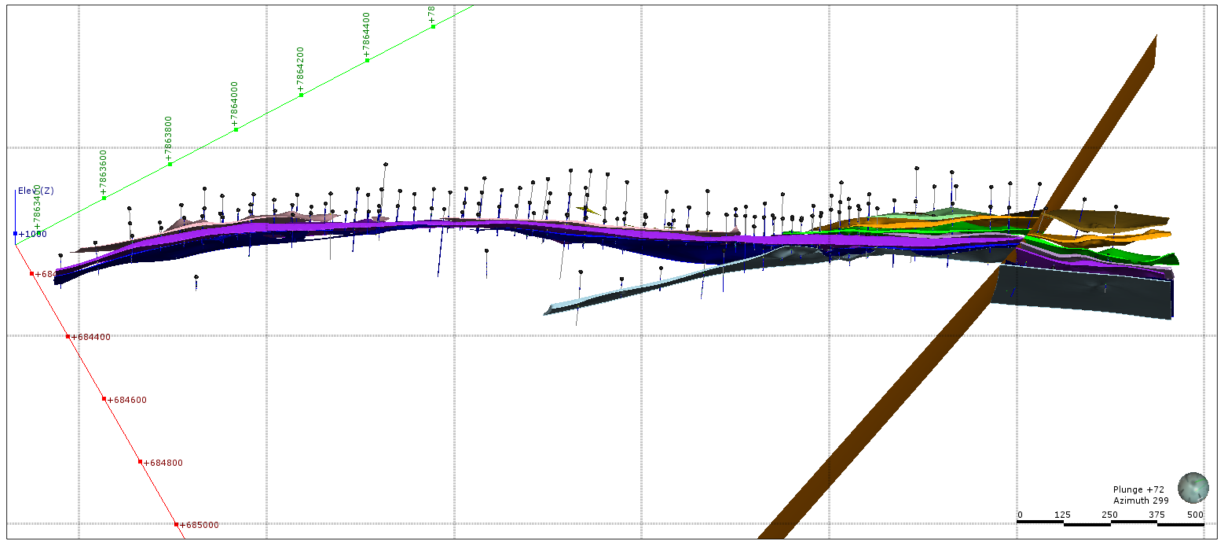


ISBN



;

Bubi



McCays

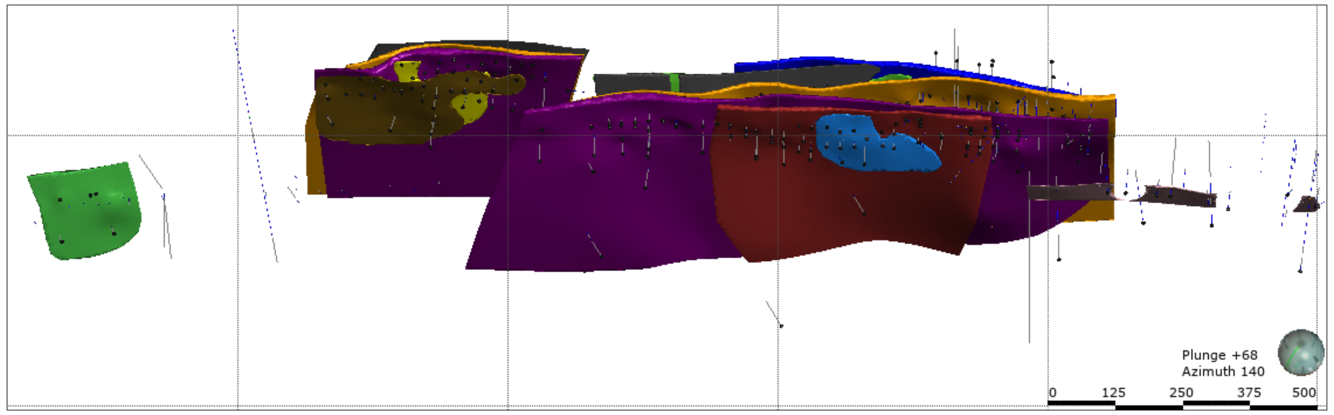


Figure 14-1: Views of the Mineralization Zones

14.5 Weathering and Oxidation

Oxidation profiles are important in determining the different rock mass densities of 'plant feed' and 'waste' and the metallurgical processing method, costs, and recoveries important during mine planning. The geological models included a transitional zone, as illustrated in purple in Figure 14-2.

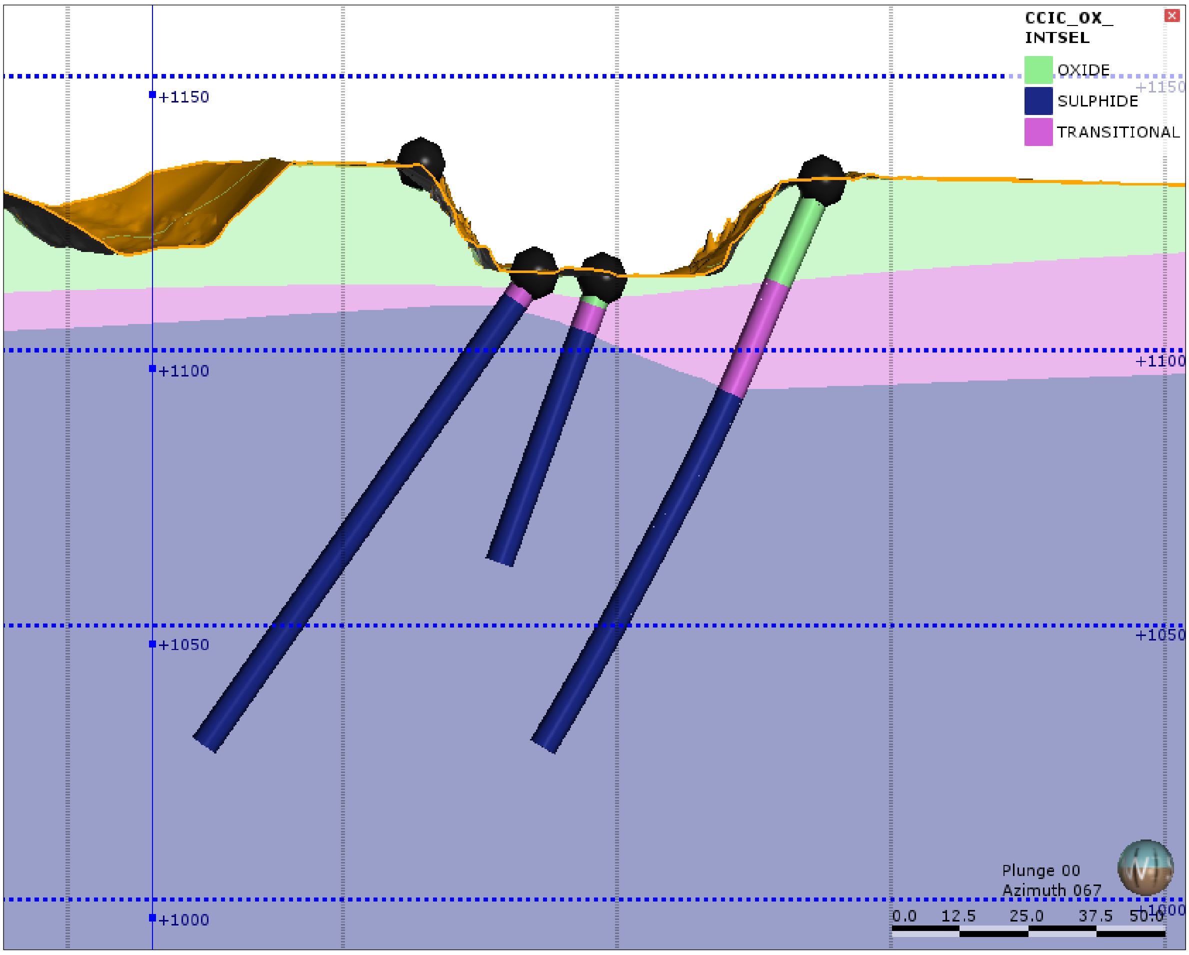


Figure 14-2: Section View showing Oxidation Profile at ISBS

In areas with limited DD or RC drilling, percussion drilling data was used to inform the mineralized zones during the geological modelling process. Where percussion holes were used for geological modelling, they were also included in the estimation.

Oxidation of the "plant feed zones" is a result of chemical alteration that postdates mineralization. The moderately weathered part of the Transitional Zone was historically mined as part of Oxide Zone because the two zones were considered economically viable by heap leaching. The weakly weathered material was mined together with the fresh sulphide plant feed. For these reasons, the moderately weathered Transitional Zone was estimated together with the Oxide Zone. All DD and RC samples that occur within a mineralized zone, irrespective of whether they are located in the Oxide, Transitional, or Sulphide Zone, were used to estimate grade in all three zones. Percussion samples that occur in the Transitional and Oxide parts of the model were used to estimate grade in the moderately weathered Transitional and Oxide parts of the model.

14.6 Compositing

For all four properties, the predominant sampling interval was 0.5 m and 1.0 m; hence a composite length of 1.0 m was used. The statistics for the Au grade before and after compositing were reviewed to ensure that a bias had not been introduced into the database.

14.7 Variography

For ISBS, a reliable semi-variogram was obtained for the Castile Main mineralized zone, because this zone contained the most samples. These variogram model parameters were used for all other zones in the Castile area (northern part of the project).

For the southern part of the project (Maria area), samples from these zones were grouped together to increase the number of sample pairs, while paying attention to the across strike direction to ensure that samples from one zone do not form pairs with samples from another zone.

At Bubi, the Main zone produced a reliable semi-variogram. All the other zones used these variogram parameters for estimation.

For McCays, a reliable semi-variogram was obtained for Main-1 and footwall West mineralized zones, which occur in fault block 2 and fault block 3, respectively. The variogram obtained within fault block 2 was applied to all mineralized zones within block 2, similarly the variogram obtained within fault block 3 was used for zones within that block. For the remaining mineralized zones, the variogram for the mineralized zone with a similar orientation was selected.

Diana Main was the zone that produced a robust semi-variogram in ISBN and was used for all other mineralized zones within ISBN. Table 14-4 contains the normalized variogram parameters used for the estimation.

Table 14-4: Variogram Parameters used for Grade Estimation

Property	Zone	Normalized Variogram Parameters								
		Nugget (Co)	Spherical Range 1				Spherical Range 2			
			X1	Y1	Z1	C1	X2	Y2	Z2	C2
ISBS	Castile Main	0.26	4.1	4.1	4.1	0.56	42	42	14.2	0.19

Property	Zone	Normalized Variogram Parameters								
		Nugget (Co)	Spherical Range 1				Spherical Range 2			
			X1	Y1	Z1	C1	X2	Y2	Z2	C2
	Maria Area	0.44	3.2	3.2	3.2	0.28	20.8	20.8	6.3	0.28
ISBN	Diana Main-1	0.31	17	17	4	0.32	36	36	7	0.38
Bubi	Main Zone	0.32	10.6	10.6	4.1	0.41	70	70	12.3	0.27
McCays	Main-1	0.26	4	4	4	0.51	30	30	5	0.23
	FW West	0.19	8	8	1	0.2	30	30	6	0.61

14.8 Top Capping

The top capping strategy considered various criteria to determine the optimum values.

Based on the above criteria, it was determined that Au values should remain uncapped. Top and bottom capping for density values was however necessary.

14.9 Grade Estimation

14.9.1 Krige Neighborhood Analysis

The aim of Krige Neighbourhood Analysis is to determine the optimal theoretical search and estimation parameters during Kriging to achieve an acceptable Kriging Variance and Slope of Regression whilst ensuring that none or a minimal number of samples are assigned negative Kriging Weights.

The search parameters used are presented in Table 14-5.

14.9.2 Estimation Method

The method of estimations for Au was Ordinary Kriging while density was estimated using Inverse Power of Distance with a Power of two. Estimations were undertaken using the Estimate process in Datamine. The boundaries between the waste/ore were treated as hard boundaries. Parental cell estimation was used.

Dynamic Anisotropy was used to search for samples during estimation to account for the change in dip of the mineralized zones.

Table 14-5: Summary of Search Parameters

Project	Search Method	Search Distance Along Axis (M)			3-1-3 Rotation Around Axis (°)			Search Volume Factor		Number of Samples					
										S vol 1		S vol 2		S vol 3	
		X (Strike)	Y (Down-Dip)	Z (Across Strike)	Z (3)	X (1)	Z (3)	S vol 2	S vol 3	Min	Max	Min	Max	Min	Max
ISBS	Dynamic Anisotropy (Rectangular)	60	40	6	150	62	0	2	50	24	48	12	60	12	72
ISBN	Dynamic Anisotropy (Rectangular)	70	50	20	140	80	0	1.5	5	24	54	20	60	2	72
Bubi	Dynamic Anisotropy (Rectangular)	100	40	20	300	80	0	2	50	24	60	12	60	12	72
McCays	Dynamic Anisotropy (Rectangular)	60	60	20	320	78	0	1.5	5	6	30	6	30	1	70

14.9.3 Block Model Parameters

The block model parameters are presented in Table 14-6. Sub-cell splitting was used to ensure that the volumes are adequately represented in the block model. Zonal control was applied during grade estimation to ensure that samples from one zone were not used to estimate in another zone.

Table 14-6: Block Model Configuration

Field	Description	ISBS	ISBN	Bubi	McCays
XMORIG	Block Model Origin X Coordinate	661,200	662,100	684,150	665,100
YMORIG	Block Model Origin Y Coordinate	7,845,850	7,847,600	7,863,300	7,849,200
ZMORIG	Block Model Origin Z Coordinate	750	690	900	730
XINC	Parent Block Dimension in the X direction	20	20	20	10
YINC	Parent Block Dimension in the Y direction	10	10	10	10
ZINC	Parent Block Dimension in the Z direction	5	5	5	5
NX	Number of Parent cells in the X direction	115	92	98	220
NY	Number of Parent cells in the Y direction	180	118	300	190
NZ	Number of Parent cells in the Z direction	90	112	70	100

14.10 Model Validations

Model validation included the following:

- Visual comparisons of the estimated grades against the composite sample grades,
- Statistical comparisons for the mean of estimated grades against the mean of the composited samples,
- Trends (or swath analysis checking) to ensure that the regional grade trends from the drill holes were preserved in the model. The ordinary kriging algorithm calculates the best estimate by minimizing the estimation error (kriging variance). This results in smoothing of the block estimates, compared to the samples. The objective of this exercise was therefore to ensure that both regional and local trends were best preserved.
- Filtering out the upper and lower deciles of the sample distribution and comparing that to the same for the estimated blocks. This was to assess whether there was over or under extrapolation.
- The means between sample and model estimates compared favorably.

Block on block analysis (Swath plots) compares local trends in the samples against model estimates. The approach was to divide the study areas into 50 m* 50 m* 20 m blocks in the X, Y and Z direction respectively, and to select samples within each block, and compare their mean against the mean of the model. Sample and model mean compared favorably.

14.11 Reconciliation

Compared to the October 2021 MRE for the Measured and Indicated categories, which was prepared in accordance with CIM Standards, there is a 3.1% decrease in tonnage and 0.8 % decrease in grade. Tonnage for the Inferred category has decreased by 2.8%, and the grade has increased by 0.7%. Reasons for the change is due to in-fill grade control drilling as well as mining depletions in the Oxide zone exclusively.

14.12 Resource Classification

Mineral Resource classification used a “Checklist” approach, where various criteria were considered and rated. These included:

- Data quality and integrity,
- Data spacing for confidence in geological interpretations and grade interpolation,
- Confidence in the geological interpretation from a regional and local perspective, and how that interpretation influences the controls for Au mineralization,
- Reliability of the estimate in the mined-out areas,
- Geostatistical confidence in grade continuity,
- Geostatistical parameters such as kriging variance, kriging efficiency and search distances, to measure the relative confidence in the block estimates.

All the above criteria were linked to drill hole spacing as the minimal qualifier for consideration. Areas with drillholes spacing less than 25 m; blocks estimated with at least 6 drillholes and with a relative ordinate kriging variance of less than 0.20 were considered for classification of Measured Mineral Resources; areas with drillholes spacing less than 50 m blocks estimated with less than four drillholes and with a relative ordinary variance of less than 0.3 were considered for classification of Indicated Mineral Resources. Areas with drill hole spacing less than 100 m was considered for Inferred Mineral Resources. The drill spacing distance buffer was created in Leapfrog Geo™. A checklist used for the assessment of the Mineral Resources during classification criteria is summarized in Table 14-7.

To determine what qualifies as surface mineable resources, whittle shells used a gold price of US$ 2,400/oz were used. Details of the additional Whittle parameters are presented in Table 14-7 Mineral Resources within these shells were considered to have the potential for eventual economic extraction by open cast mining methods.

Table 14-7: Checklist Criteria for Resource Classification

Items	Discussion	Confidence
Drilling Techniques	Diamond drill holes	High
	Reverse Circulation drilling	Medium
	Percussion drilling (predominantly in the oxidized zone)	Low
Logging	All drill holes were logged by qualified geologists using standardized codes. Completed logs are checked and signed off by the senior geologist prior to capture into the database. The logging was of an appropriate standard for mineral resource estimation.	High
Drill Sample Recovery	Recoveries recorded for every core run.	High
Sampling Methods	Half core sampled at 1 m intervals for diamond drilling. Sampling occurs wherever there is evidence of alternation.	High
	Portion of the rock chips collected at 1 m intervals sampled for RC drilling and Percussion drilling.	Medium
Quality of Assay Data and Laboratory Tests	An external independent commercial laboratory has been used for all analytical test work for diamond and RC drilling. Appropriate sample preparations and assaying procedures have been used. Duplicate samples and industry CRMs were inserted within the sampling stream. The data has been declared fit for the purposes of geological and mineral resource modelling.	High
	Percussion drilling used Bottle-Roll Analysis that was performed in-house. Analytical results are considered of low reliability because the method can only measure acid soluble gold.	Low
Verification of Sampling and Assaying	Data integrity checks performed by DRA and Bilboes have confirmed data reliability.	High
Location of Data Points	Drill hole collar location and orientation were surveyed by a qualified surveyor.	High
Tonnage Factors (Density)	The Archimedes method of density determination was used in-house. Verification analysis was performed at the University of Zimbabwe and. The comparison of the in-house density determination and the check analysis compare favorably.	High
Data Density and Distribution	Diamond and RC drilling was done at 25 m X 25 m on well informed areas, 50 m X 50 m on moderately informed areas, and 100 m X 100 m on less informed areas. The level of data density is sufficient to place Mineral Resources into the Measured, Indicated, and Inferred categories, respectively.	High
Database Integrity	Data is stored in Datamine™ Fusion Database.	High
Geological Controls on Mineralization	Geological setting and mineralization are very well understood. Mineralization is constrained to shear zones within a broad hydrothermal alteration halo.	High
Statistics and Variography	Anisotropic spherical variograms were used to model the spatial continuity for the main mineralization domains.	Medium
Top or Bottom Cuts	No cutting was applied to the Au estimation. Top and bottom cuts were applied to the density during estimation.	High

Items	Discussion	Confidence
Data Clustering	Drill holes were drilled on an approximately regular grid, with decreasing regularization at depths.	Medium
Block Size	Determined by QKNA. 20 mE x 10 mN x 20 mRL 3D block model constructed for ISBS, ISBN, and Bubi. For McCays the blocks were 10 mE x 10 mN x 5 mRL.	High
Search Distance	Determined with the aid of QKNA as well as drilling spacing.	High
Grade Estimation	Au estimated using Ordinary Kriging. Density estimated using Inverse Distance to the power if two.	High
Resource Classification	Reported on a checklist bases with the drilling space.	High
Metallurgical Factors	Metallurgical parameters were considered during the whittle optimization process, based on comprehensive test work and pilot plant.	High
Block Cut-offs	0.9 g/t Au is used for block cut-offs. Other sensitivities at 0.0 g/t, 0.5 g/t and 1.5 g/t Au cut-off have also been presented.	High

This MRE was constrained to a Lerchs-Grossmann pit shell using 0.9 g/t Au as the cut-off grade (Table 14-8). A gold price of US$ 2,400/oz scenario assessment was also completed to determine surface infrastructure boundaries to ensure that no potential future resource is sterilized through siting of future infrastructure.

Table 14-8: Summary of Optimization Parameters used for the Lerchs-Grossmann Shells

Parameter	Description	Unit	Bubi	Isabella	McCays
Optimization Parameters	Oxide Slope Angle - Weathered	Degrees	30	30	30
	Trans Slope Angle	Degrees	48	48	48
	Fresh Slope Angle	Degrees	51/55	51/55	48/51/55
	Production Rate	Ktpm	180	240	240
	Gold Price	US$/oz	2,400	2,400	2,400
	Discount Rate	%	10.0%	10.0%	10.0%
Mining Costs	Ore Cost	US$/t Mined	3.30	3.20	3.20
	Waste Cost	US$/t Mined	2.30	2.30	2.30
	Fixed Cost and Other	US$/t Ore	10.25	4.05	3.09
Processing Costs	Processing Cost (Sulphide)	US$/t Treated	32.81	19.02	10.02
	Recovery - Sulphides	%	88.90%	83.60%	83.60%
Financial Parameters	Royalties	%	5.00%	5.00%	5.00%
	Taxes	%	25.00%	25.00%	25.00%

14.13 Declaration

The Mineral Resource Estimate is summarized in the following table using a cut-off grade of 0.9 g/t Au and constrained inside a Lerchs-Grossman (LG) optimized pit shell using US$ 2,400 per ounce gold Table 14-9.

Table 14-9: Mineral Resource based on a 0.9g/t Au Cut-Off Grade

Base Case Mineral Resources (0.9 g/t Au) Reference Point: in Situ (31 December 2023)					
Property	**Classification**	**Tonnage (Mt)**	**Au (g/t)**	**Metal (kg)**	**Ounces (koz)**
ISBS	Measured	1.325	2.34	3,104	100
	Indicated	5.211	2.17	11,299	363
	Total Measured and Indicated	**6.537**	**2.20**	**14,403**	**463**
	Inferred	1.335	1.80	2,404	77
ISBN	Measured	2.589	2.68	6,939	223
	Indicated	4.430	2.31	10,246	329
	Total Measured and Indicated	**7.019**	**2.45**	**17,186**	**553**
	Inferred	1.613	2.18	3,520	113
Bubi	Measured	1.288	1.95	2,518	81
	Indicated	14.006	2.19	30,708	987
	Total Measured and Indicated	**15.294**	**2.17**	**33,225**	**1,068**
	Inferred	5.116	1.80	9,208	296
McCays	Measured	0.925	3.05	2,821	91
	Indicated	3.874	2.37	9,193	296
	Total Measured and Indicated	**4.799**	**2.50**	**12,014**	**386**
	Inferred	1.054	2.16	2,274	73
Totals (ISBS + ISBN + Bubi + McCays)	Total Measured	6.128	2.51	15,382	495
	Total Indicated	27.522	2.26	61,446	1,976
	Total Measured and Indicated	**33.650**	**2.30**	**76,828**	**2,470**
	Total Inferred	9.118	1.99	17,406	560

- *CIM definitions (May 10, 2014) observed for classification of Mineral Resources.*
- *Mineral Resources are in situ.*
- *Block bulk density interpolated from specific gravity measurements taken from core samples.*
- *Resources are constrained by a Lerchs-Grossman (LG) optimized pit shell using Whittle software.*
- *Mineral Resources are not Mineral Reserves and have no demonstrated economic viability. The estimate of Mineral Resources may be materially affected by mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social, and governmental factors (Modifying Factors).*
- *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.*

- *Numbers may not add due to rounding.*
- *The Mineral Resource Estimate has been depleted to reflect mining up to 31 December 2023.*
- *Effective Date of Mineral Resource Estimate is 31 December 2023.*

14.14 QP Commentary

The relevant QP is of the opinion that all issues relating to technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work.

15 MINERAL RESERVE ESTIMATES

No Mineral Reserve under the CIM Definition Standards (2014), was defined for the Bilboes Project at this PEA level of study.

16 MINING METHODS

16.1 Hydrological and Geotechnical Investigation

16.1.1 Hydrogeology

Little was known of the hydrogeology for either the Isabella-McCays or Bubi Mines. There are some hydrogeological boreholes drilled around the Isabella-McCays pits, however there are no existing records for these boreholes, therefore no historical water levels or groundwater quality baseline could be determined.

The only levels measured and recorded are related to the geotechnical boreholes drilled around the Isabella-McCays and the Bubi open pits, where packer-testing was performed.

The estimation of an initial general hydraulic head over the entire area was done using the correlation between the elevation and hydraulic head values measured in each of the geotechnical boreholes.

Nine geotechnical boreholes were selected for packer testing. The interval selection was based on the presence of discontinuities determined on the televiewer log along the borehole interval.

The results of the packer testing have been incorporated in the numerical model.

16.1.2 Conclusion and Recommendations

The numerical simulation for Isabella – McCays Mines and Bubi Mine lead to the following conclusion that each model indicates that a cone of drawdown will develop as a result of the mining activities. The open pits simulated act as hydrogeological sinks and groundwater inflows into the open pits will need to be pumped out for the duration of mining. After mining activities stop, the groundwater levels start to recover due to the formation of the pit lakes and the decrease of the hydraulic gradients towards the open pits.

The following shows the maximum drawdown at the end of mining and the recovery of the groundwater levels vs. time (Table 16-1)

Table 16-1: Isabella – McCays – Bubi – Predicted drawdown vs. time

Isabella - McCays drawdown vs. time		Bubi drawdown vs. time	
Year	Max. Drawdown (m)	Year	Max. Drawdown (m)
7	112	6	85
25	43	25	77
50	33	50	45
75	21	75	10
100	13	100	9

16.1.3 Major Rock Domains

Following the geotechnical logging of the drill holes, the following major rock domains were encountered (Table 16-2).

Table 16-2: Percentage Rock Types at Different Mining Pits

Rock Type	Percentage Rock (%)			
	Isabella South	Isabella North	McCays	Bubi
Arkose	26	14	-	-
Chlorite Schist	23	-	-	-
Schist	16	-	-	-
Felsic Schist	35	83	-	-
Mafic Schist	-	2	21	13
Meta-Basalt	-	1	65	28
Banded-Iron Formation (BIF) / Chert	-	-	4	-
Meta-Andesite	-	-	10	55
Saprock	-	-	-	4

16.2 Rock Mass Classification

The rock mass quality for the different Bilboes pits (Isabella South, Isabella North, McCays and Bubi) was assessed using the Rock Mass Rating (RMR) RMR89 classification system developed by Bieniawski (1976, 1989). The results of the rock assessments show that the rock mass for all the four mining pits is considered to be fair to good.

16.3 Geotechnical Conclusions and Recommendations

Based on the analysis of the engineering geological aspects of the investigated deposits which included rock mass characterization, hydrogeology, intact rock properties and structural geology, a geotechnical model comprising design parameters was developed. Using these design parameters; kinematic, empirical and limit equilibrium analysis was conducted to determine the optimal slope configuration for the various deposits.

Based on the analysis conducted, it is understood that the capacity of the slopes should be affected by the following:

- Completely weathered slopes should be a maximum of 3 m in height, and it is recommended that the material is pushed back from the crest,
- For the transitional rock (highly to moderately weathered), by a combination of rock mass strength and adverse structural orientation. Inter-ramp heights of 60 m are achievable with inter-ramp angles between 45° and 50°,

- For the unweather rock slopes adverse structural orientation should determine the slope angle which is achievable. Inter-ramp heights of 90 m are achievable with inter-ramp angles of between 50° and 55°, depending on the wall direction.

The controls on slope design are listed for the Bilboes pits with comments on the reliability of the data and descriptions of how the design issues were addressed for the purposes of the slope design (Table 16-3).

Table 16-3: Slope Design

Slope Design Issue	Confidence	Mitigation
Faulting Faults were inferred to be sub-vertical; however, the width of fractured / disturbed ground either side of the faults is not understood.	Moderate	Kinematics was used to assess the stability of inter-ramp and overall slope. Inter-ramp and slope angles are restricted to between 50 and 55° and 45 to 50° respectively to ensure sub-vertical faults do not daylight
Rock Fabric Large amounts of structural data were collected, defining the local occurrence, intensity, and orientation (dip and dip direction) of the structures	High	Good practice to collect and expand on the structural data collected to ensure that unknown structures are defined
Soil and Intact Rock Properties Intact samples of rocks were collected and tested.	Moderate	Good practice to have an ongoing soil and rock testing program to build on the database
Rock Mass Characterization Rock mass characterization was conducted and generally is representative of rock mass conditions.	High	Rock mass characterization should be ongoing to expand on the rock mass database.
Groundwater The groundwater studies were conducted by SLR and included in the limit equilibrium analysis	High	All excess water inflows can be sent to local PCDs and then used as process water make up.

The detailed pit slope design should require the following phasing once a final pit shell and pit stages are defined and inter-related.

- Additional intact strength testing is required for the rock and soil formations,
- Additional structural data needs to be collected from the pits using a televiewer,
- Continual collection of rock mass data from drilled core,
- Conducting of additional stability analysis using the new pit shells, generated from with recommended slope angles recommendations presented on this document, and the revised geological and geotechnical models,
- Developing the Ground Control Management Plan,

- Projecting major structures onto the pit Phases and final pit for geotechnical review and development of remedial measures and the timing of their implementation as required,
- Defining the locations of the initial vibrating wire piezometers, the initial prisms, survey stations and trial horizontal drains and their specifications and the target dates for their installations.

16.4 Mining Pit Locations

The Bilboes Project consists of four mining areas containing between one to three pits each. These areas are McCays, Isabella South, Isabella North and Bubi as shown in Figure 16-1 and Figure 16-2.

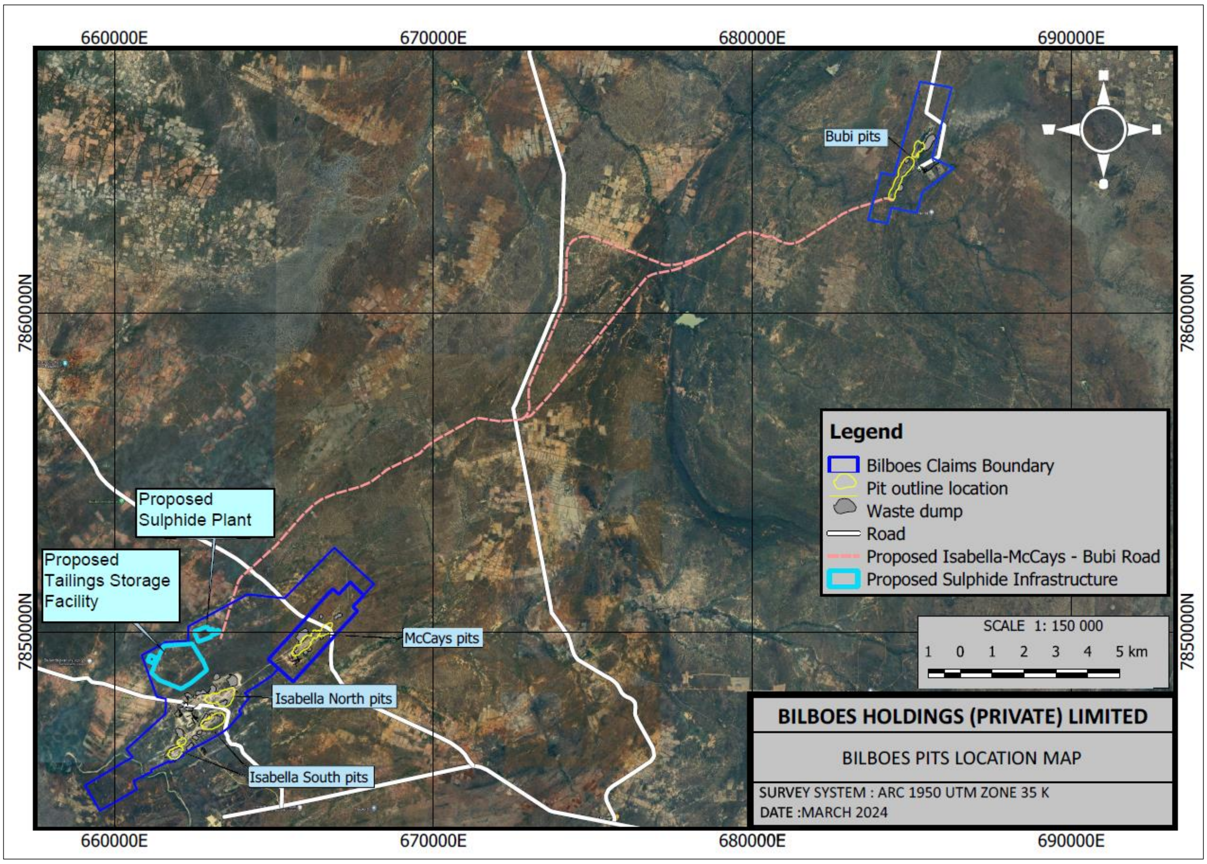


Figure 16-1: Block Plan Showing Bilboes Pits and Process Plant Location

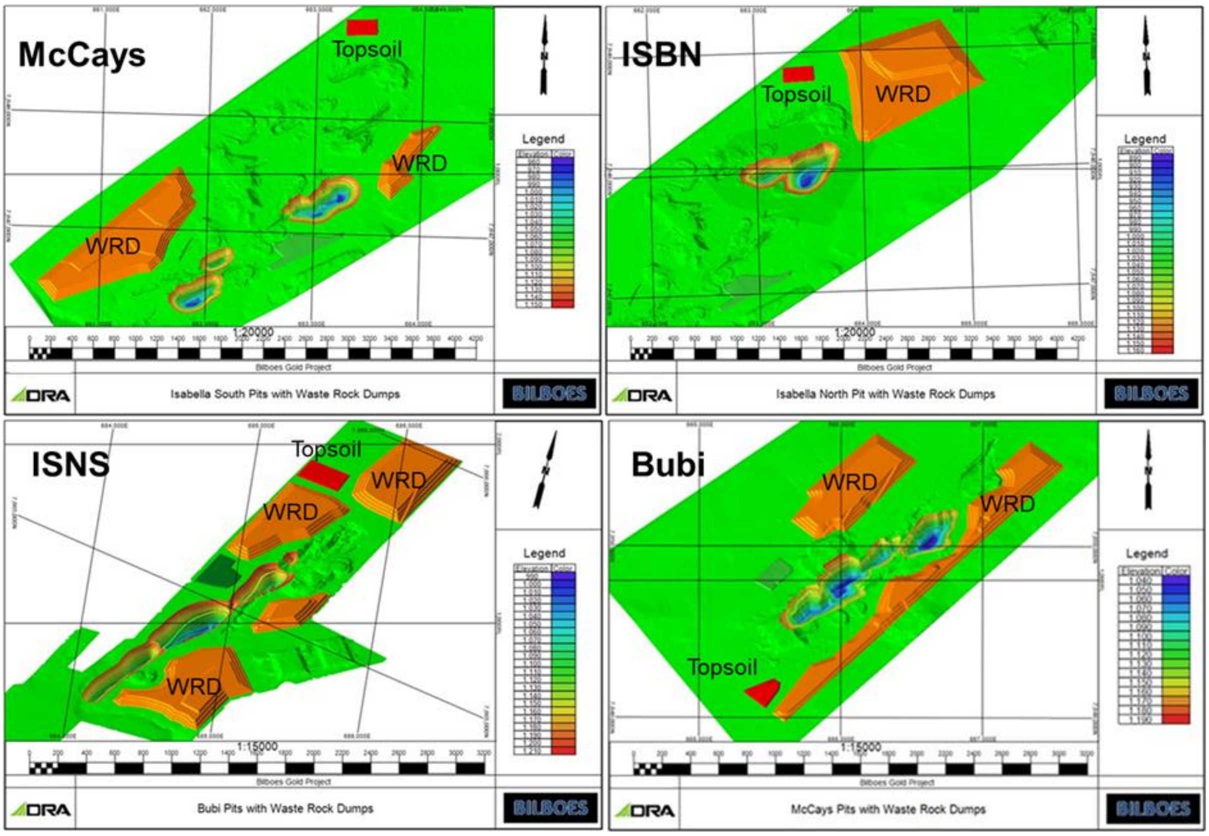


Figure 16-2: Block Plan Showing Bilboes Pits Location

16.5 Mining Strategy

The LOM schedule considers the blending requirement that a maximum of 50% of feed to plant be sourced from Isabella North and the remainder from Isabella South (preferred blend) or McCays.

- A mining contractor will be used for all open pit mining related earthmoving activities.
- All deposits will be mined utilizing conventional truck and shovel method.
- Transitional and fresh materials and waste will be drilled and blasted.
- Free dig and blasted waste will be loaded, hauled with 60 tonne haul trucks and dumped to designated waste dump locations which will be systematically dozed and levelled to allow dump to be raised to design heights.
- Free dig and blasted materials will be loaded and hauled with 40 or 60 tonne haul trucks to the plant feed RoM pad. There it will either be directly tipped into the crushing facility or placed on the RoM pad stockpile areas.

In this PEA the previous Base Case was revalidated with Phase 1 being a 240 ktpm gold processing plant treating ROM material from Isabella and McCays (after a short ramp-up period) before being upgraded for a Phase 2 to treat ROM material from the Bubi pit at 180 ktpm.

16.5.1 TSF Optimization

SLR were engaged to investigate a new concept design and associated costing based on a Phased paddock approach for base case. The objectives were to minimize initial capital outlay and delay further expenditure according to a three-Phase build programme that aligned with the LoM production schedule.

16.6 Whittle Optimization Input Parameters

A summary of the input parameters for the Whittle Pit optimization are presented in the section. This will define the ultimate pit limit and optimize the scheduling of the mining sequence, ensuring the economic viability of the pit.

16.6.1 Financial Parameters

The financial parameters used in the pit optimization are summarized in Table 16-4

Table 16-4: Whittle Optimization Input Parameters: Financial Parameters

Financial Parameters for Net Commodity Price	Unit	US$ 1,950	US$ 1,650	US$ 1,800
Date of Information:	**March 2023**	**High Case**	**Low Case**	**Base Case**
Base Currency	US$	0	0	0
Annual Discount Rate (%)	(%)	10.0%	10.0%	10.0%
Commodity Price	US$/oz	1,950	1,650	1,800
Royalties	(%)	5%	5%	5%
Refining Cost (% of Commodity Price)	%	1.0%	1.0%	1.0%
Total Selling Cost	US$/oz	117.00	99.00	108.00
Nett. Commodity Price	US$/g	58.93	49.87	54.40

16.6.2 Geotechnical and General Parameters

The geotechnical and general input parameters used in the pit optimization are summarized in Table 16-5.

Table 16-5: Whittle Optimization Input Parameters: Geotechnical and General Parameters

Geotechnical Parameters	Unit	Value	Value	Value	Value
Primary Zone		**ISBN**	**ISBS**	**McCays**	**Bubi**
Inter-Ramp Slope Angle					
Oxide	Degrees	30	30	30	30
Trans	Degrees	48	48	48	48
Fresh	Degrees	51/55	51/55	48/51/55	51/55

Geotechnical Parameters	Unit	Value	Value	Value	Value
Bench Face Slope Angle					
Oxide	Degrees	55	55	55	55
Trans	Degrees	90	90	90	90
Fresh	Degrees	90	90	90	90
Ramp Specifications – 60t truck					
Single Lane Width	m	12.5	12.5	12.5	12.5
Dual Lane Width	m	18.6	18.6	18.6	18.6
Design gradient (%)	(%)	10%	10%	10%	10%
Dilution and Mining Recovery	Unit	Value	Value	Value	Value
Mining Dilution	(%)	4%	4%	4%	4%
Mining Recovery	(%)	95%	95%	95%	95%
Distance ex-pit to Plant	km	2.5	3.5	2.6	28
Mining Cost Parameters	Unit	Value	Value	Value	Value
Reference Level Elevation (RL)	RL	1,151	1,135	1,163	1,195
Mining Cost Adjustment Factor (MCAF)	US$/vert. meter	0.006	0.006	0.006	0.006

16.6.3 Waste Rock Cost - Mining

Different waste mining costs were used in Whittle for each production tonnage scenario. This was done to emulate the impact of fixed G&A costs on the overall cost per tonne of rock mined. The waste mining cost for Base Case is shown in Table 16-6.

Table 16-6: Whittle Optimization Input Parameters: Waste Mining Cost

Waste Mining Cost - Primary Zone	Units	ISBN	ISBS	McCays	Bubi
Oxide - free dig	US$/tonne	2.10	2.10	2.10	2.33
Trans and Fresh - including drill and blast – 240 (180) ktpm	US$/tonne	2.68	2.68	2.68	3.03

16.6.4 Process Plant Throughput

Similarly to the waste mining cost, different costs were used for rock fed to plant (plant feed (PF)). Due to the reduced confidence by the Bilboes Owner's team, all oxide mineralized material was reclassified as waste rock, mined, and discarded as such. The Whittle input parameters for Base Case is shown in Table 16-7.

Table 16-7: Process Plant Throughput

Mining Cost Parameters	Unit	ISBN	ISBS	McCays	Bubi
Total Plant Feed Mining Cost	**US$/tonne**				
Trans and Fresh – 240(180) ktpm	US$/tonne	3.50	3.50	3.50	3.95
Extra Plant Feed Mining Cost (haul cost to plant)	**US$/tonne**				

Mining Cost Parameters	Unit	ISBN	ISBS	McCays	Bubi
Trans and Fresh – 240(180) ktpm	US$/tonne	1.00	1.40	1.04	9.24
Mill throughput Requirement					
LOM throughput Requirement – 240 (180) ktpm	Mtpa	2.88	2.88	2.88	2.16
Processing Cost Parameters	**Unit**	**Value**	**Value**	**Value**	**Value**
Processing Cost Base					
Trans and Fresh – 240(180) ktpm	US$/tonne	19.86	19.86	19.86	35.65
GA's – 240(180) ktpm	US$/tonne	2.59	2.59	2.59	3.46
Total Processing Cost					
Trans and Fresh – 240 (180) ktpm	US$/tonne	22.45	22.45	22.45	39.11
Whittle Processing Cost					
Trans and Fresh – 240 (180) ktpm	US$/tonne	23.45	23.85	23.49	48.35
Process Recovery					
Trans and Fresh - BIOX & CIL Mean Recovery	(%)	83.6	83.6	83.6	88.9

16.7 Plant Feed Dilution and Plant Feed Loss

Dilution of 4% and mining losses of 5% were assumed as the plant feed domains and are continuous and will be clearly delineated and marked. Sampling of blast holes would be the basis for grade control in this analysis. The accuracy of the resulting plant feed/waste boundary is limited by the resolution of the grade control, which is a function of the density of the drilling pattern. The lower the flitch height, the smaller the pattern, the smaller the distance between "plant feed holes" and "waste holes" and hence the smaller the potential for plant feed loss/ plant feed dilution. These dilution and loss percentages are accepted as being in line with smaller flitch heights, such as the 5 m flitches associated with this mining operation. The Bilboes team has many years of experience in mining the various pit oxide rock and believes that the transitional and fresh plant feed will be more easily visually identifiable for grade control drilling and selective mining.

16.8 Whittle Optimization Results

The results of the Whittle optimization are presented in Table 16-8.

Table 16-8: Whittle Optimization Results

All Run Results Max Profit	Abb	Units	US$ 1,800	US$ 1,950	US$ 1,650
Parameter			**5% loss & 4% dilution**		
O-P Discounted Cashflow		US$M	847.9	1,012.2	684.0
Life of Mine	LOM	Year	9.2	10.0	8.4
Mineable Inventory	PF	Mt	23.3	25.2	21.5
Measured & indicated	PF	Mt	23.3	25.2	21.5

All Run Results Max Profit	Abb	Units	US$ 1,800	US$ 1,950	US$ 1,650
Inferred	PF	Mt	0.0	0.0	0.0
Unclassified	PF	Mt	0.0	0.0	0.0
Mineable Inventory	Waste	Mt	201.3	220.8	184.0
Strip Ratio	SR	tw:tpf	8.63	8.76	8.56
Head grade	Au	g/t	2.38	2.33	2.44
Au Recovery	Au	%	85.9%	85.9%	85.9%
Au Metal Recovered	Au	kg	47,718	50,369	45,065
Measured & indicated	Au	kg	47,718	50,369	45,065
Au Metal Recovered	Au	oz	1,534,185	1,619,389	1,448,866
EBIT before CAPEX		US$M	1,036	1,259	825

16.9 Whittle Production Schedule Results

The resultant production schedule results for the optimized PEA production for the Base Case, is summarized in Figure 16-3 and Figure 16-4. The LoM schedule considers the blending requirement that a maximum of 50% of feed to plant be sourced from Isabella North and the remainder from Isabella South (preferred blend) or McCays. Irregular waste production profiles were smoothed to ensure the production profile is practically implementable.

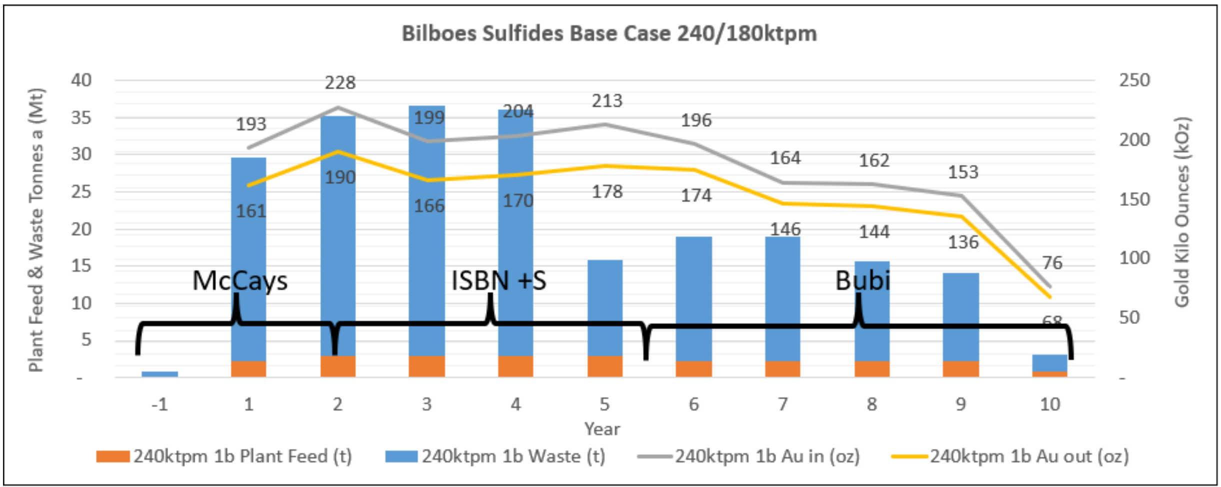


Figure 16-3: Base Case Production Schedule with Plant Feed Grade 240/180 ktpm

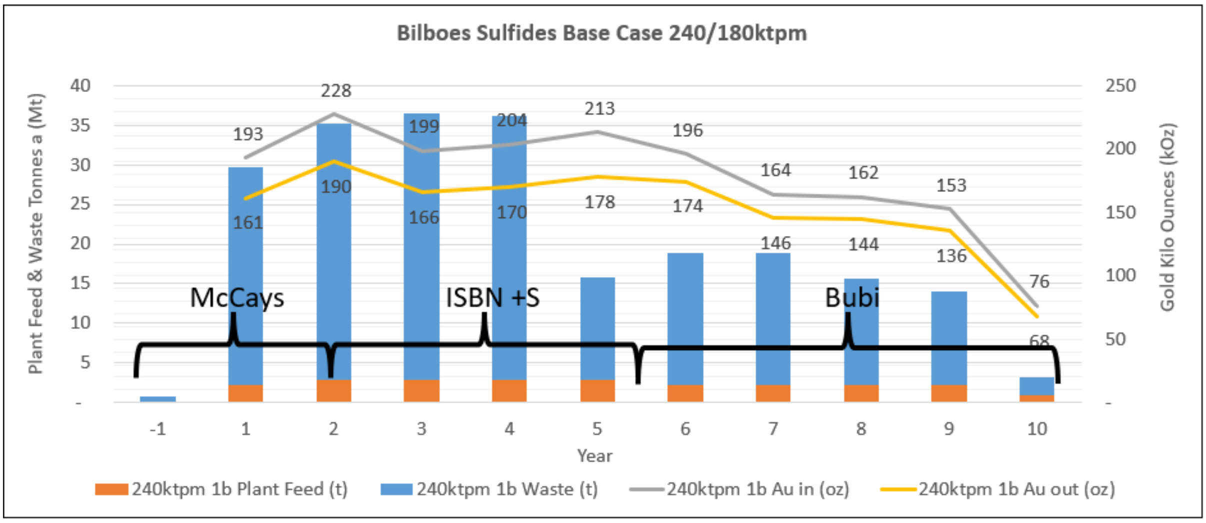


Figure 16-4: Base Case Production Schedule with Gold Ounces in and Out 240/180 ktpm

16.10 Sensitivity analysis

Two production scenarios were also tested to try to reduce the capital cost of the project.

16.10.1 Scenario 80 ktpm then 60 ktpm Bubi

This scenario looked at an initial production of 80 ktpm with a standalone 80 ktpm plant which was not designed to allow further expansion. This was considered the smallest Phase 1 "start-up" plant module, with material being sourced from Isabella and McCays, providing an even lower initial capital option. The mining plan initially targeted 80 ktpm from McCays, followed by blending the feed with material from Isabellas' and then mining 60 ktpm from Bubi. This option aimed at the lowest initial capital cost possible.

16.10.2 Scenario 80 ktpm then 160 ktpm then 120tpm Bubi

This scenario looked at doubling up of initial production to 160 ktpm with a modular plant to achieve a throughput of 160 ktpm process capacity. The mining plan initially targeted McCays, followed by blending the feed with material from Isabellas and then Bubi at a reduced rate of 120 ktpm. This option aimed at the lowest initial capital cost, followed by higher production from Year seven onwards.

16.11 Sensitivity Results

Table 16-9 presents the results from some of the scenarios tested.

Table 16-9: Sensitivity Results

Parameter	Abb	Units	Base Case			Scenario 80/60 ktpm			Scenario 80/160/120 ktpm		
Gold Price	GP	US$/oz	US$ 1,800	US$ 1,950	US$ 1,650	US$ 1,800	US$ 1,950	US$ 1,650	US$ 1,800	US$ 1,950	US$ 1,650
Production Rate	PR	Ktpm	240ktpm / 180ktpm Bubi			80ktpm – 60ktpm Bubi			80 - 160 - 120ktpm		
Discounted Cashflow	DCF	US$ m	847.9	1,012.20	684	478.8	563.5	390.3	593.1	712	486.9
Life of Mine	LoM	Year	9.2	10	8.4	27.4	29.8	25	18.2	19.8	16.5
Mineable Inventory	Ore	Mt	23.3	25.2	21.5	23.1	25	21.2	23.1	25	21.2
Measured & Indicated	Ore	Mt	23.3	25.2	21.5	23.1	25	21.2	23.1	25	21.2
Mineable Inventory	Waste	Mt	201.3	220.8	184	198.3	217.7	180	198.3	217.7	180
Strip Ratio	SR	t:t	8.63	8.76	8.56	8.59	8.7	8.48	8.59	8.7	8.48
Head grade	HG	g/t	2.38	2.33	2.44	2.39	2.33	2.45	2.39	2.33	2.45
Au Recovery	Au	%	85.90%	85.90%	85.90%	85.90%	86.00%	85.90%	85.90%	86.00%	85.90%
Au Metal Recovered	Au	kg	47,718	50,369	45,065	47,395	50,102	44,641	47,395	50,102	44,641
Measured & Indicated	Au	kg	47,718	50,369	45,065	47,395	50,102	44,641	47,395	50,102	44,641
Au Metal Recovered	Au	koz	1,534.19	1,619.39	1,448.87	1,523.79	1,610.80	1,435.23	1,523.79	1,610.80	1,435.23

16.12 Mining Contractor Production Costs

The resultant production costs for the optimized PEA production trade-offs for Base Case-240 ktpm - 80 ktpm are summarized in Table 16-10.

Table 16-10: Adjudicated Mining Contractor Cost

Adjudicated Cost per Area (US$/t)	Base Case Contractor Cost 240 - 180 ktpm (US$/t)	Base Case Annual Contractor Cost 240 – 180 ktpm (US$ m)
Time Related P&G	0.29	65.8
Load-Haul-Dump	1.88	421.9
Total Drilling Cost	0.32	72.9
Total Blasting Cost	0.13	28.2
Plant feed Re-handle at ROM Tip	0.02	4.9
Services & Rehab Cost (Allowance)	0.01	2.4
Total Bilboes Mining	2.65	596.1

16.12.1 Production Fleets Required

The scheduling is driven by the excavating capability during each period (i.e. the product of the number of excavators and their productivity).

For scheduling purposes, it was assumed that 100t excavators with 6 m^3 bucket will be deployed on waste and 75t excavators (4 m^3 bucket) on plant feed. These excavators will be loading trucks with a payload capacity of 60 tonnes and 40 tonnes respectively. The first principal productivity calculations for determining period by period material movement were based on Caterpillar 390, Caterpillar 374 excavators and Caterpillar 773 dump trucks and Caterpillar 740 articulated dump trucks respectively.

16.12.2 Waste Rock Dumps

The Waste Rock Dumps (WRD) were staged appropriately to minimize haul distances throughout the LoM.

The WRD construction and final landform are based on the following criteria:

- The maximum height of waste dumps is currently set at 40 m above ground level.
- A swell and re-compaction factor of 30% was utilized to calculate a material placement density of waste on the waste dumps.
- Dump bench face angle is designed at 30° during construction, with 10 m berms separating benches. During the rehabilitation Phase, the WRD side slopes will be progressively dozed down into continuous slopes without benches, as required for

agricultural use. After rehabilitation, the final landform slope will not exceed 19° overall slope angle.

- The waste dumps will be built with a minimum 1:100 gradient on the top surface to ensure effective water shedding.
- All dump locations were selected outside the boundaries as indicated by the Whittle gold price scenario of US$ 2400/oz. Future prospecting zones were also considered so as not to sterilize any potential resource.
- The minimum operating width on the waste dump is 40 m.
- All the waste dumps were designed with ramps of 10% gradient.
- It has been assumed that all waste is benign and does not require any neutralizing treatment, or containment.

17 RECOVERY METHODS

17.1 Process Test work Results

Extensive test work (Section 13) has been undertaken. The plant feed (fresh sulphide) is refractory to normal free milling processing due to the ultrafine gold particles being largely encapsulated (and generally appearing in solid solution) within the sulphide minerals. As a result, the selected process encompasses a biological sulphide destruction step (Outotec proprietary BIOX® process) to liberate the gold particles and allow dissolution by a cyanide solution in the CIL circuit. The test work results were used to derive the Process Design Criteria (PDC) for the processing plant as depicted in Table 17-1.

Table 17-1: Process Plant Design Criteria

Description	Unit	Design	Remarks
Plant Annual RoM Throughput			
Phase 1 Isabella McCays	tpa	2,880,000	Years approx. 1-6
Phase 2 Bubi	tpa	2,160,000	Years approx. 6-10
Plant Monthly RoM Throughput			
Phase 1 Isabella McCays	tpm	240,000	
Phase 2 Bubi	tpm	180,000	
Head Grade Analysis			
Transitional plant feed Gold			
Isabella Mc Cays	g/t	1.94	Average
Bubi	g/t	1.61	Average
Sulphides plant feed Gold			
Isabella McCays	g/t	2.42	Average
Bubi	g/t	2.42	Average
Ore Characteristics			
Density			
Isabella McCays	t/m^3	2.77	Average
Bubi	t/m^3	2.85	
BBWi (Bond ball work index)			
Isabella McCays	kWh/t	17.00	Average
Bubi	kWh/t	21.45	
Ore Product Sizes			
Crushed plant feed (P80) (80% passing size)	mm	13	
Milled plant feed (P80) (80% passing size)	microns	75	
Flotation Mass Pull			
Isabella McCays	%	5	
Bubi	%	10	

17.2 Process Flow Description

Plant feed will be derived from two main mining areas, namely Isabella McCays and Bubi, with production throughput to be Phased over the LoM based on tonnage, proximity to the process plant and metallurgical characteristics. Bubi plant feed, destined to be processed over the latter part of the LoM will be trucked approximately 23 km to the processing plant which will be situated at the Isabella McCays complex. The envisaged phasing is as depicted in Table 17-1.

Operations in the process plant can essentially be divided into seven main sections. Comminution (plant feed size reduction by crushing and milling to facilitate liberation of the mineral particles for subsequent downstream concentration),

- Flotation (concentration of sulphides and gold into a small concentrate mass),
- Biological oxidation - BIOX® (destruction of the sulphides in the concentrate using oxidizing bacteria to expose the gold particles for downstream recovery),
- Carbon in leach (cyanidation leach of the BIOX® residue and recovery of the solubilized gold onto activated carbon),
- Carbon treatment,
- Electrowinning and smelting,
- Tailings handling.

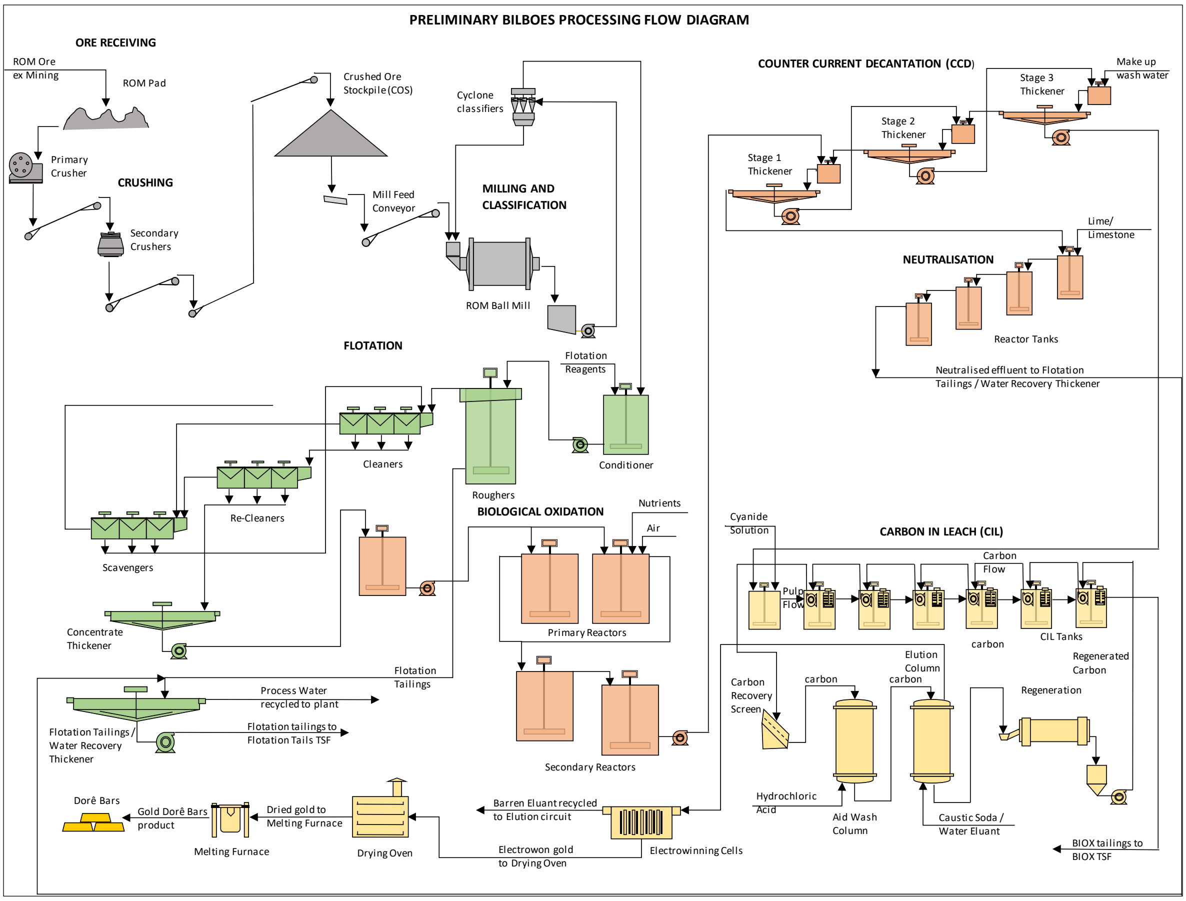


Figure 17-1: Bilboes Simplified Process Flow Diagram

17.2.1 Comminution

17.2.1.1 Crushing

The crusher circuit has been designed to process the full LoM design monthly tonnage (240 ktpm ISBM). When processing Bubi plant feed to the crushing circuit monthly throughput will reduce to approximately 180 ktpm due to the harder nature of the Bubi plant feed. Plant feed with a top size of approximately 900 mm is received from the open pit mining operations at the RoM Pad by haul truck. The plant feed may be stockpiled on the RoM Pad (for blending or delayed feeding purposes) or directly tipped into the primary jaw crusher. The crusher circuit comprises primary jaw and secondary cone stages to produce a product with P80 of 30 mm for stockpiling on the crushed plant feed stockpile ahead of the milling circuit. Total capacity of the crushed plant feed stockpile is approximately 26 kt with a live capacity of 8 kt (24 hours). In times of plant feed shortages, the excess stockpile capacity may be processed using dozers and loaders to feed through the crushed plant feed stockpile chutes.

17.2.1.2 Milling and Classification

The crushed plant feed is withdrawn from beneath the crushed plant feed stockpile and fed onto the mill feed conveyor by vibratory feeders. The mill feed conveyor discharges directly into the single ROM Ball Mill feed hopper. The conveyor is fitted with a weightometer to measure the throughput as well as controlling the speed of the vibratory feeder to give the set tonnage to the mill. The ball mill is a grated discharge mill with steel liners and utilizing steel balls as the grinding media. Milled slurry discharges via a trommel screen into the mill discharge sump and is pumped to the cyclone classification circuit. The cyclone overflow containing the fine particles gravitates to the flotation conditioning tank in the flotation section. The coarse particles exit in the cyclone underflow stream and return to the ball mill. Product size from the milling section is 80% passing 75 µm. During processing of the Bubi plant feed monthly milling throughput will reduce to 180 ktpm due to the harder nature of the Bubi plant feed.

17.2.2 Flotation

Cyclone overflow from the milling section discharges into the flotation conditioning tank where it is adjusted with process water to the set flotation feed density. Flotation reagents are also added in this tank and the slurry is allowed to condition for a set period prior to being pumped to the flotation cells. The circuit will operate at natural pH and be configured in a rougher, cleaner, recleaner and cleaner scavenger format to facilitate maximum gold and sulphide recoveries while minimizing the carbonate recovery to the concentrate. Sodium Ethyl Xanthate (SEX) is used as the collector for the sulphide minerals, copper sulfate as an activator for the sulphide minerals while starch and sodium carbonate are used as depressants for the carbonates. The rougher tails, forming the tailings product, are dewatered in the water recovery thickener circuit, and pumped to the flotation tailings storage facility. The recleaner concentrate forms the concentrate and is pumped to the concentrate thickener for dewatering ahead of processing in the biological oxidation section. Supernatant water from the tailings and concentrate thickeners is recycled to the milling and flotation sections. The supernatant solution is recycled back to the process plant.

17.2.3 Biological Oxidation (BIOX®)

In the BIOX® section bacterial oxidation of the sulphide minerals occurs, (by mesophilic bacteria, operating in the range of 15°C – 45°C) resulting in liberation of the included gold particles for further downstream recovery.

17.2.3.1 Biological Leaching

Dewatered flotation concentrate is pumped to the BIOX® surge tank where it is diluted to the required density of approximately 18% solids. The slurry is then fed to the primary reactors (in parallel), with slurry overflowing to the secondary reactors (in series). Oxygen and carbon dioxide (air), nutrients, defoamer and sulfuric acid are added to the tanks. The required bacteria cultures are contained within the tanks; oxygen, solids feed rate, pH and temperature control are essential to ensure the bacterial activity level is maintained. Bacterial oxidation of the sulphides optimally takes place at a pH of 1.5 - 2.2 and a temperature of approximately 42°C. As the concentrate contains a relatively high amount of carbonate the addition of sulfuric acid will be required to maintain the required pH. Temperature is maintained by the circulation of cooling water via cooling coils within the reactors. Aeration of the tanks (oxygen supply) is by medium pressure air blowers (240 kPa). Air hold-up in the tanks is approximately 17% of live volume. Total required residence time in the reactors is 6.5 days. The oxidized slurry product exits the final Stage 2 reactor and is pumped to the Counter Current Decantation (CCD) section for separation of the acidic liquid and oxidized solids components.

17.2.3.2 Counter Current Decantation

A three stage CCD (counter current decantation) circuit allows for removal of the acidic solution components from the oxidized solids. The thickener underflow solids are progressively washed of acidic solution in an up-flow manner from Thickener 1 to 3, exiting as Thickener 3 underflow, while the acidic solution is progressively concentrated in a down flow manner exiting as Thickener 1 overflow. Make up water is added to the feed of Thickener 3 to maximize the washing efficiency. The Thickener 3 underflow slurry (washed oxidized product) is pumped to the CIL section for final gold recovery, while the Thickener 1 overflow acidic solution is pumped to the neutralization section for precipitation of the acidic and other acidic deleterious components.

17.2.3.3 Neutralization

The neutralization circuit comprises eight stages, where the acidic solution is initially neutralized to a pH of approximately 4.5 with limestone (Stage 3) and then to a pH of 7 (Stage 7) with lime. The acidic components and solubilized arsenic are precipitated to the various sulfates with the arsenic fixed insolubly as basic ferric arsenate. The slurry is pumped to the water recovery thickener, where it combines with flotation tails, where the solids are dewatered (thickener underflow) and thereafter pumped to the Flotation tailings storage facility. The supernatant thickener overflow solution is channelled to the process water circuit for recycling to the process plant in general. Residence time per neutralization stage (8 off) is 1.5 hours thereby resulting in a circuit residence time of 12 hours.

17.2.4 Carbon in Leach

Washed oxidized slurry from the neutralization section is pumped to the pre-leach tank (CIL Tank 1) of the CIL circuit, where the slurry will be subjected pH adjustment with lime and additional aeration to ensure complete oxidation of cyanide consumers. The slurry will then overflow to CIL Tank 2 where cyanide is added and from there down the circuit to the final CIL tank. Tanks 2 to the final tank all contain activated carbon, retained within the tank by an interstage screen. Slurry residence time in the circuit is set at 36 hours, by which time maximum gold dissolution will have occurred and the carbon will have adsorbed approximately 99% of the soluble gold. The exiting slurry from the final CIL tank will pass over a carbon safety screen to ensure no loss of carbon due to possible interstage screen perforations, before gravitating to the tailings surge tank. From here the slurry is pumped to the detoxification circuit for cyanide destruction before being pumped into the BIOX® tailings storage facility. The carbon within the CIL tanks is pumped counter currently to the slurry flow, together with the relevant slurry, upstream from the last CIL tank to the CIL Tank 2. The carbon Au value increases as it progresses upstream in the circuit while the slurry solids and liquids Au values decrease as the slurry flows downstream in the circuit. Loaded carbon is recovered from CIL Tank 2 by pumping the carbon / slurry to the Loaded Carbon Screen. The slurry passes through the screen and returns to CIL Tank 2. The loaded carbon discharges from the screen into a hopper from where it is transferred the Acid Treatment Vessel at the head of the carbon treatment circuit.

17.2.5 Carbon Treatment

A loaded carbon batch (5 t) is treated at ambient temperature with a 3% hydrochloric acid solution for approximately 1 hour in the acid wash vessel to remove inorganic foulants, predominantly calcium, ahead of the elution process. At the end of the process the spent acid is washed from the column with water and pumped to the BIOX® tailings tank and ultimately sent to the BIOX® tailings storage facility.

The acid washed carbon is transferred by water eduction to the elution column ahead of desorption of the Au. The elution process is the split Anglo American Research Laboratory (AARL) type. This process separates the elution (desorption) cycle from the electrowinning cycle thereby adding flexibility to the process. The loaded carbon is pre-soaked at 110°C with a solution comprising 1% cyanide and 2% caustic soda solution for approximately 1 hour. After this the carbon is eluted with high quality water at 125°C for a period of approximately 4 hours. The gold bearing solution (preg solution) is stored in the Preg Solution Tank in readiness for gold recovery in the electrowinning section. For flexibility, a second preg solution tank is installed to allow fully independent electrowinning to take place. The total elution cycle (including acid treatment) takes approximately 10 hours. The barren carbon is transferred by water eduction from the elution column to the regeneration kiln feed hopper.

The Regeneration Kiln is a horizontal retort type, operating at a temperature of 750°C (hot zone) in a non-oxidizing atmosphere to prevent ignition of the carbon. In this process organic foulants such as oils, greases and flotation reagents are removed thus returning the carbon close to its original virgin activity in readiness for reuse in the CIL circuit. Carbon discharges the kiln into a quench tank (cold water filled) and is then recycled by eductor back to the CIL circuit.

17.2.6 Electrowinning and Smelting

The pregnant solution is pumped to the electrowinning circuit (situated in the Gold Room), comprising two electrowinning cells, each with 16 cathodes and 18 anodes. The cathode is stainless steel mesh wrapped around a stainless-steel frame, connected to the negative terminal, and encapsulated in a non-conducting, perforated cathode box. The anode comprises a stainless-steel perforated plate connected to the positive terminal. DC power to each cell is supplied by a dedicated rectifier (2,000 amps). The preg solution is circulated through the electrowinning circuit over 12 hours. Au in the preg solution deposits onto the stainless-steel mesh in the cathode box with the generation of hydrogen gas (resulting in localized acidic conditions in the cell). The pH in the preg solution must be maintained at approximately 13 to prevent excessive corrosion of the stainless-steel anode due to localized low pH. Oxidation reactions at the anode result in the generation of ammonia and hydrogen amongst others. The gases are vented off in a very diluted form to the atmosphere via an extraction system. Once the residual Au value in the preg solution has reached the low setpoint the process is deemed to be complete and is halted.

The cathode boxes are removed periodically from the electrowinning cell and the gold recovered from the stainless-steel mesh by high pressure water jets. The gold is then filtered and dried in a drying oven. The dried gold is mixed with fluxes (generally borax, silica, and sodium carbonate) and melted in a single pot diesel fired furnace at a temperature of approximately 1,100˚C. (Melting point of gold is 1,064˚C). Once molten the gold is poured into Molds, cooled, cleaned, stamped, and stored in the vault awaiting dispatch to the refinery.

17.2.7 Tailings Handling

Tailings from the CIL circuit are detoxified to reduce the Weak Acid Dissociable Cyanide (WAD) levels to below 50 ppm prior to discharge to the BIOX® tailings TSF. This is accomplished using the INCO SO_2 / Air-process. The process requires a copper catalyst, added as $CuSO_4$ (copper sulfate). The SO_2 source is Sodium Meta Bisulfite (SMBS), while oxygen is generally sourced from compressed air. Minimum O_2 requirement is generally 1 ppm - 2 ppm. Optimum pH is 8 - 10. The process results in the generation of sulfuric acid and thus requires the addition of lime (generally) or caustic soda to maintain pH at the optimum level.

17.3 Plant Water Requirements

Raw water will be supplied to the raw water storage tank, with a live capacity of 2,560 m³, from the pit dewatering pumps and several borehole pumps. The raw water is used for gland service, carbon transfer duties, elution, gravity concentrator circuit water, reagent make-up and fire service duties. The raw water storage tank will have a reserve for firefighting purposes. This reserve will be maintained by suitability positioned fire water and raw water pump suctions.

Process water is stored in the process water dam, an earthen lined structure with a live volume of 10,400 m³. The process water dam collects water from the water recovery thickener, flotation tailings TSF and any plant run-off from pollution control dams. Process water is supplied to all sections of the plant for hosing and screen spraying and specifically to the milling and flotation sections for slurry dilution purposes. The process water balance is negative and relies on a make-up volume (from raw water) of approximately 4,000 m³/day under Phase 2 conditions.

17.4 Reagent Services

The Bilboes plant will use a substantial number of chemical reagents / commodities due to its complexity (Table 17-2). Limestone will be sourced locally; all the other reagents will require importation into Zimbabwe.

Table 17-2: Process Plant Major Reagents / Commodities

Reagent / Commodity	Delivery Form	Area(s) of Use	Make up Facilities
Quick / Burnt lime CaO (85%)	Bulk powder, -1 mm solids	Milling, BIOX® Neutralization, CIL, Cyanide Detoxification	Bulk Slaking (Hydration)plant supplying hydrated lime – Ca (OH)2 - via a ring main system
Limestone (CaCO3) (45%)	Bulk crushed, -40 mm solids	BIOX® Neutralization	Milling plant with dedicated supply to neutralization area
Flocculant (various)	Dry powder, 25 kg bags	Flotation tails thickener, Flotation Conc. thickener, BIOX® CCD thickeners, Water recovery thickener	Dedicated batch make up plants at each relevant site supplying liquid flocculant
Flotation Collector: Sodium Ethyl Xanthate (SEX)	Dry pellets, 850 kg bulk bags	Flotation	Dedicated batch make up plant supplying liquid reagent
Flotation Activator Copper Sulfate (CuSO4)	Dry powder, 25 kg bags	Flotation	Dedicated batch make up plant supplying liquid reagent
Flotation Frother	Dry powder, 200 kg drums	Flotation	Dedicated batch make up plant supplying liquid reagent

Reagent / Commodity	Delivery Form	Area(s) of Use	Make up Facilities
Flotation Depressant 1 Sodium Carbonate (Na_2CO_3)	Dry powder, 25 kg bags	Flotation	Dedicated batch make up plant supplying liquid reagent
Flotation Depressant 2 Starch	Dry powder, 25 kg bags	Flotation	Dedicated batch make up plant supplying liquid reagent
Sulfuric Acid	Bulk tanker liquid 93% H_2SO_4	BIOX®	Ring main system feeding from storage tank to BIOX® circuit.
BIOX® Nutrients	Dry powder, 25 kg bags	BIOX®	Dedicated batch make up plant supplying liquid reagent
Sodium Cyanide NaCN	Briquettes, 1,000 kg bulk bags	CIL, Elution	Solution make-up and storage facility
Caustic Soda NaOH	Pellets, 1,000 kg bulk bags	Carbon Treatment, Cyanide make-up facility	Solution make-up, storage and distribution facility
Hydrochloric Acid HCl	33% Liquid, 200 l plastic drums	Carbon Treatment Acid Wash	Direct pumping from drum into Acid Wash solution make up tank
Sodium Metabisulfite $Na_2S_2O_5$	Powder, 1,000 kg bulk bags	Cyanide Detoxification	Solution make-up, storage and distribution facility
Diesel	Bulk Tanker	Fire water system, Elution and Gold Room	Local diesel storage tank for distribution
Milling grinding media 80 mm dia. forged Cr-Mo steel	200 l steel drums	Milling	Ball loader onto Mill feed conveyor

18 PROJECT INFRASTRUCTURE

The mine layout is shown in Table 18-1 and Figure 18-2.

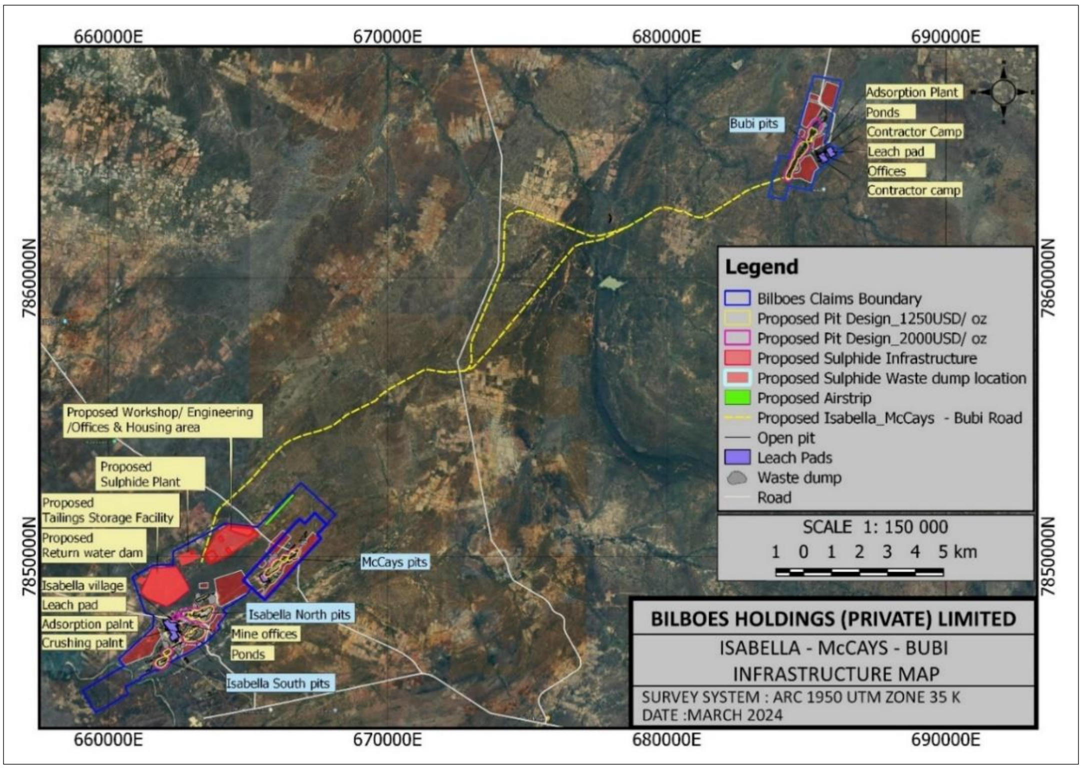
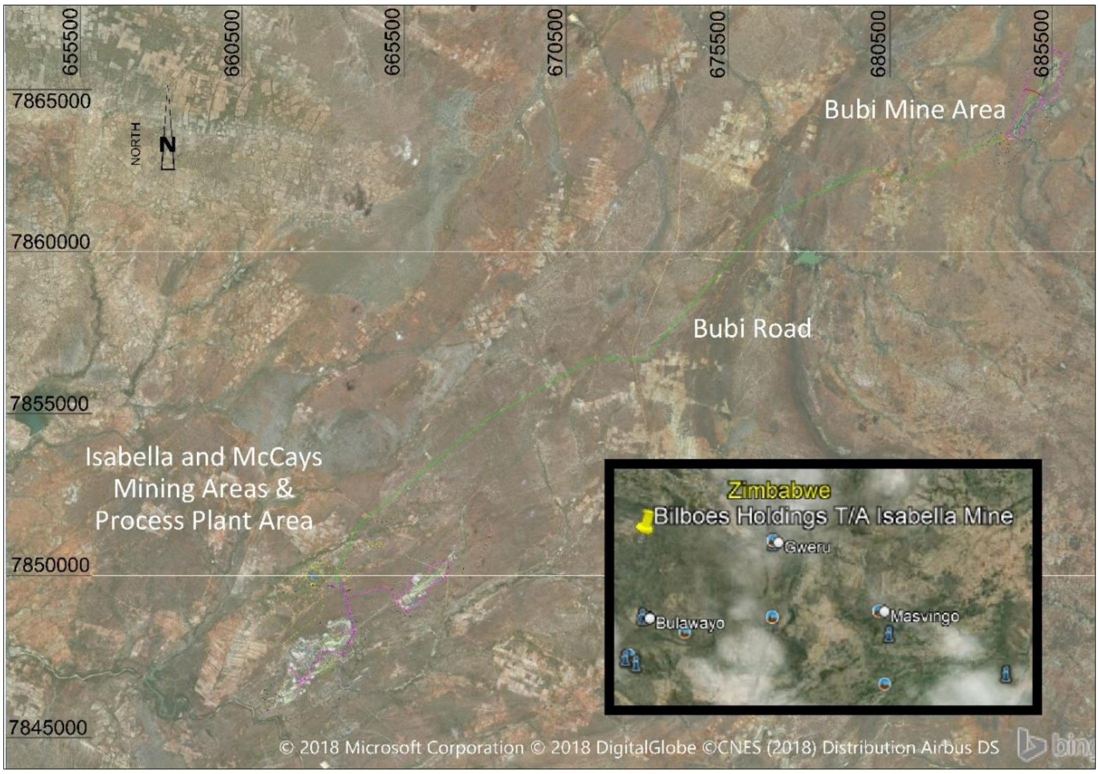


Figure 18-1: Mine Layout



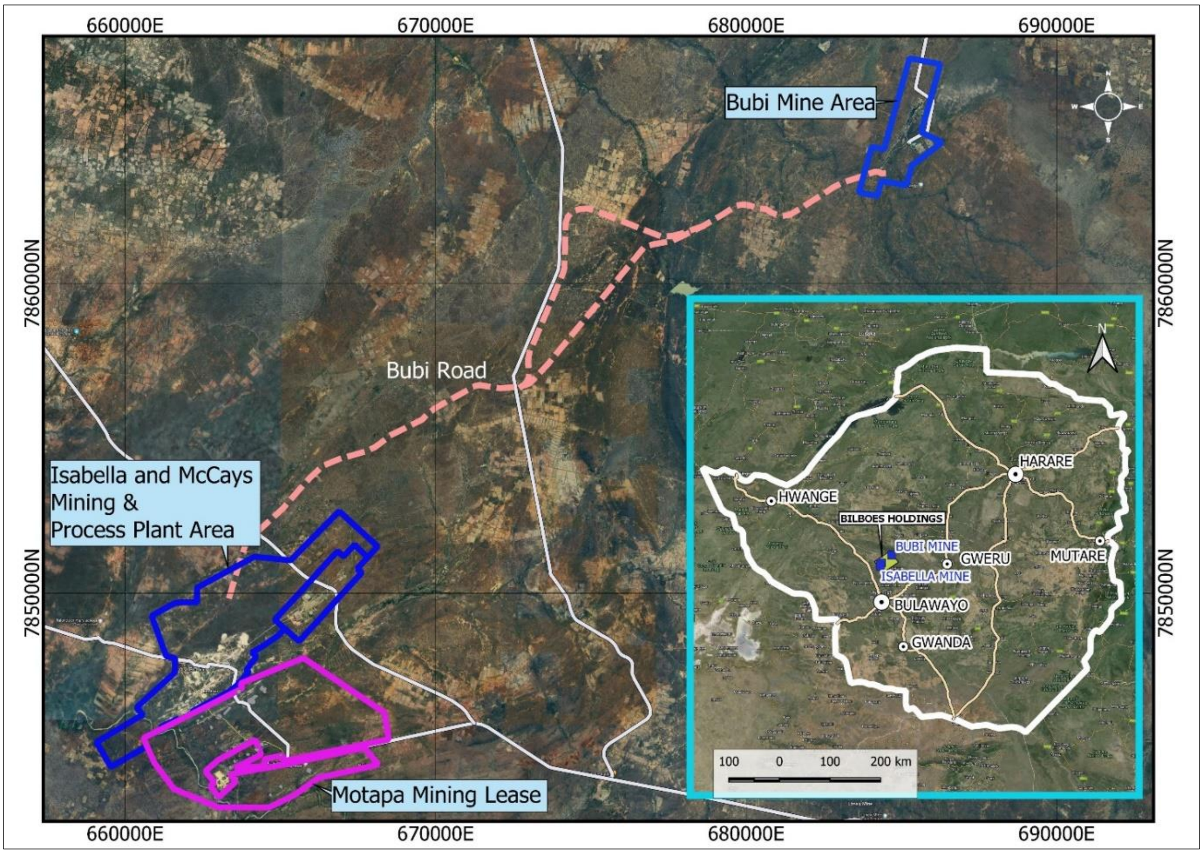


Figure 18-2: Overall Site Plan

18.1 Geotechnical Investigation and Design

The Bilboes Project geotechnical engineering investigation involved the investigation for the Open Pit, TSF, the Process Plant (Plant) and WRD foundation material analysis - Field Investigation and Data Collation

SLR Rock Engineers visited the site at various stages of the geological drilling campaign during 2018 which included, review of geological and geotechnical data, geotechnical logging of core and the collection of intact rock samples for laboratory testing.

Prior to the field investigation, a site reconnaissance study was conducted, during which the site was assessed with the view to planning the investigation methodology. This was followed by a desktop study investigation which involved the compilation and assessment of available information on the site including geology, aerial photography, and previous investigations on the site, where available.

The test pit locations were selected based on early conceptual site layouts of the TSF, RWD and Plant Site to gain maximum coverage of the area.

Selected soil samples were retrieved from the test pits and were submitted to the Contech Geotechnical Testing laboratory in Harare, Zimbabwe. The samples were chosen to determine the design parameters of each material units encountered at the site.

18.1.1 Tailings Storage Facility Site

The following soil and rock properties were derived from the investigation and are recommended for use in design, slope stability analysis and seepage modelling (Table 18-1).

Table 18-1: Proposed Soil and Rock Properties for Foundation Modelling on the TSF Site

Geotechnical Domain	Depth (m) [mean values]	USCS	Dry Density (kg/m^3)	v	Confined Modulus (MPa)	Effective Cohesion (KPa)	Effective Friction Angle (°)	K_{sat} (m/s)
Topsoil	0.0 - 0.6	CL	1,700	0.3	4	0	27	1×10^{-6}
Residual Arkose	0.6 - 1.0	CL/SC/GC	1,700	0.3	8	0	27	1×10^{-6}
Residual Andesite	0.4 - 1.0	CL/SC	1,800	0.3	15	0	30	1×10^{-6}
Residual Meta-Basalt	0.1 - 0.6	CL/SC/GC	1,800	0.3	8	0	30	1×10^{-6}
Rock Type	*Depth (m) [mean values]*	*Rock Classification*	*Dry Density (kg/m^3)*	*v*	*GSI*	*Rock Strength (MPa)*	*Confined Modulus (KPa)*	*K_{sat} (m/s)*
Arkose / Andesite / Meta-Basalt	1.0 - 2.0	Poor Quality Rock Mass	2,600	0.4	25 - 35	1 - 5	50	1×10^{-8}

18.1.2 Process Plant Site

The following soil and rock properties were derived from the investigation and are recommended for use in plant siting and foundation design (Table 18-2).

Table 18-2: Proposed Soil and Rock Properties for Foundation Modelling on Process Plant Site

Geotechnical Domain	Depth (m) [mean values]	USCS	Dry Density (kg/m^3)	V	Confined Modulus (MPa)	Effective Cohesion (KPa)	Effective Friction Angle (°)
Topsoil	0.0 - 0.4	Not considered suitable for founding					
Residual Arkose	0.4 - 1.0	CL	1,700	2		0	27
Residual Arkose - Medium Dense to Dense	1.0 - 1.3	CL/SC/GC	1,800	0.3	8	0	30
Rock Type	Depth (m) [mean values]	Rock Classification	Dry Density (kg/m^3)	V	GSI	Rock Strength (MPa)	Confined Modulus (KPa)
Arkose	1.3	Poor Quality Rock Mass	2,600	0.4	25 - 35	1-5	50

18.1.3 Waste Rock Dump Sites

The Waste Rock Dumps classifies geotechnically as a Class II Low Hazard.

- Waste Rock Dump lift heights should be limited to 10 m with a minimum of a 10 m berm, with an overall height of 40 m.

18.2 Civil Engineering and Earthworks

The general approach adopted was to design/measure and quantify elements, identified as major capital expenses, from the compiled infrastructure layout drawings, and to make the necessary estimation for the following items.

- Haul road (± 26 km) between Isabella and Bubi,
- Internal mining haul roads for Isabella and Bubi, between the proposed open pit mining access and RoM handling facilities,
- Mine access roads to the proposed mining infrastructure including road to the Plant, Administration and Village terraces, Lime stockpile terrace, Substation terrace and existing mine infrastructure,
- Service roads to the PCD, RWD and the relocated Explosive Magazines,
- Re-alignment of a public gravel road around the McCays extension,
- Internal plant roads, bus drop-off and parking,
- Raw water pipeline from the wellfields supply to the Plant Process Water Dam,
- Return water pipelines from the TSF to Plant PCD,
- Bulk earthworks for terraces at Isabella including the Plant, RoM tip ramp and platform, Substation, Village, Administration, Lime stockpile, Contractor's Laydown terrace and the RoM transfer terrace at Bubi,
- Relocation of existing Explosives Magazines at Isabella and Bubi,
- Brake test ramp for the Contractor's Laydown terrace,
- Mine Village and Administration building layout,
- Sewer reticulation and Wastewater Treatment Works for the Plant, Administration and Village,
- Fire and Potable water reticulation for the Plant, Administration and Village,
- Stormwater channels for the Plant, Administration and Village,
- Process Water Dam at the Plant,

- PDC, provided for the Plant and Administration, as well as the Contractors Laydown,
- Process Plant including the RoM tip, Primary Crusher, Secondary Crusher, Screening building, Transfer Towers, Floatation Concentrates Thickener, Cooling Towers, Neutralization Tanks, Reactors, BIOX® Area, Flotation, Reagents Area, Gold Room, Leaching Area, Mill Structure, Tailing's area, Conveyors, Water reticulation, Sewer reticulation, Buildings.

18.3 Mechanical Engineering

The mechanical design criteria cover the process plant and mining related equipment and is based on established technology and practices in the gold mining and processing industry.

Engineering aspects will be developed and optimized for clear definition of scope for the project. Mechanical equipment design shall be based on the application of established technology and practices in the gold mining and processing industry. Equipment will be designed and selected on a "fit for purpose" basis, to carry out required duties over the LoM period.

Mining and process plant equipment and infrastructure will be designed for LoM, of. approximately 15 years.

Mechanized and automated methods shall be implemented where there is a clear contribution to a safer, more productive, and less labor-intensive environment.

Total life cycle costing of equipment and processes over "LoM" shall be considered during design and equipment selection Phase.

Engineering design will endeavor to address outcomes of risk assessments and HAZOP studies. Resulting designs, selected equipment and processes shall be safe for operating and maintenance by personnel and shall be eco-friendly.

Value improving initiatives will be undertaken through application of practical value engineering techniques and the philosophy of standardization and rationalization of equipment (to reduce spares holding requirements). Design to capacity and process simplification will be applied where possible.

18.4 Electrical Power Supply and Reticulation (including Communications)

18.4.1 Interconnection to National Grid

Power will be supplied from the Zimbabwe National Grid by constructing a 70 km 132 kV Lynx line from Shangani Substation. To feed the line, a line bay will be constructed at Shangani. A mine substation will be constructed at Isabella. The estimate received is for a 132-kV substation, equipped with a 50 MVA 132/33 kV step-down transformer.

Detailed design should be considered to reduce the secondary voltage to 11 kV to enable the MV motors to be fed directly without an additional 33/11 kV transformer. The 1.5 MVA required by Bubi can also be supplied at 11 kV.

Power factor correction will be done with 11 kV capacitors.

Interfaces with other designs occur at the following battery limits:

- Zimbabwe Electricity Transmission and Distribution Company (ZETDC),
- 132 kV Substation

  The bulk electricity supply for the project is being planned to cater for a production rate of 508 tph ROM. This corresponds to an electrical load of up to 34 MVA.

18.4.2 Power Requirements

The connected and anticipated running power demand of the mine and plant can be seen in Table 18-3 which compares the installed and anticipated running power and lists the estimated running maximum demand.

Table 18-3: Substation Loading

	Installed Power (kW)	Run Power (kW)	Estimated Maximum Demand (kVA)
Mills and other 11 kV motors	22,360	18,836	19,220
Plant LV Load	18,960	13,858	14,146
Infrastructure	1,700	1,700	2,205
Total	**43,020**	**34,394**	**35,571**

18.4.3 Emergency Power

Four 2.5 MVA emergency power generator sets will be installed and connected to the 11 kV consumer substation. Emergency power is reticulated to downstream substations at 11 kV, where it is distributed to the Motor Control Centre (MCCs).

18.5 General Infrastructure

Table 18-4 lists the building infrastructure that was considered.

Table 18-4: Building Infrastructure

Building	Type	Size (m^2)
Security and Access Control	Prefabricated building	170
Admin Building	A prefabricated building. Office furniture has been included in the square meter rate.	430

Building	Type	Size (m^2)
Plant Laboratory	A prefabricated building. Typical laboratory equipment has been included in the square meter rate.	540
Control Room	Prefabricated building	170
Change house/s	Prefabricated building/s	325
Stores	Two conventionally constructed buildings (brick and mortar)	220 and 100
General Workshop	A conventional constructed building (brick and mortar)	520
Crusher Workshop	Conventional constructed building (brick and mortar)	270
Electrowinning and Gold Room	Conventional constructed building (brick and mortar)	220
Crusher MCC	Prefabricated building	302
CIL MCCs	Prefabricated buildings	253
Floatation MCC	Prefabricated building	65
Substation	Prefabricated building	351
Return Water Dam Pumphouses	Two conventionally constructed buildings (brick and mortar)	38

18.6 Water Management Infrastructure

18.6.1 Water Balance

The stormwater collection dams, and the pollution control dams as proposed herein, were designed in compliance with the IFC Environmental, Health and Safety (EHS) Guidelines for Mining (2007), together with the applicable local Zimbabwean Standards.

The project site falls within the Bembezi river sub-catchment which drains north towards the Zambezi River. The Bembezi river sub-catchment forms part of the Gwayi catchment which largely comprises the Northern Matabeleland area of hydrological zone A.

The stormwater management plan was developed to comply primarily with the IFC EHS Guidelines for Mining (2007); while ensuring adherence to all the applicable local Zimbabwean Standards namely: the Environmental Management Act (Chapter 20:27) implemented by the EMA of Zimbabwe; and the Zimbabwe National Water Act (Chapter 20:24) implemented by the Zimbabwe National Water Authority (ZINWA) through the Zimbabwe National Water Authority Act (Chapter 20:25). In developing the conceptual stormwater management plan, reference was also made to regulation GN 704 of the South African National Water Act, 1998 (Act No. 36 of 1998).

Daily and monthly rainfall were obtained from the ZMSD Nkayi Stations over 38 years of hydrological records (from 1980 to June 2018) and were analyzed to understand the long-term monthly averages, minimum and maximum monthly rainfall. The MAP adopted for this project is 657 mm.

A site wide monthly static water balance model was developed for the Bilboes operation to establish the storage sizes of the pollution control systems; and the average wet, dry season and average monthly water balance.

The water balance simulated water re-use associated with the processing plant, as a pump rate out of the PCD for each of the two mining phases.

The steady state water balance analysis indicates that the Bilboes flotation circuit requires on average approximately 250 m^3/hr (6,015.6 m^3/day) during Phase 1 before decreasing to 201.3 m^3/hr (4,854.0 m^3/day) in Phase 2. For the steady state water balance analysis, there is no make-up water required for the BIOX® circuit in all phases of mining.

To improve the understanding of the movement and the status of the water storage and transport infrastructure elements on the mine and how these changes in response to the varying climatic conditions, a Dynamic Daily Time Step Water Balance analysis was conducted for the project.

The daily time step water balance analysis for the RWD capacity of 380,000 m^3, a return water pumping rate of 490 m^3/hr and a worst-case tailings deposition rate of 240 ktpm yielded only two major spillages in a 70-year period which is considered to be in line with the IFC Environmental, Health and Safety guidelines for stormwater collection dams.

18.6.2 Ground Water

Groundwater numerical modelling was undertaken to simulate the mining operation at Bubi Isabella McCays and the related establishment of the TSF at Isabella McCays. The objective of the modelling is to determine the potential impact on the groundwater flow and groundwater quality during and post mining, for Isabella McCays and Bubi. Isabella McCays and Bubi are located 32 km apart, and therefore a separate groundwater model was developed for each site.

The cone of drawdown predicted for both mines show that after 100 years of simulation, both pits will present a residual drawdown of approximately 10 m. However, the extent of each cone of drawdown is decreasing in time and will remain within the boundaries of the mine sites.

The mass transport simulations indicate that a liner is necessary to contain the migration of the contaminant plume from the contaminant sources.

18.7 Sewage Management

Waterborne sewage networks have been allowed at the Process plant, Admin area, Residential Village and Contractor area at Isabella McCays. All areas mentioned above will gravitate to a central sewage purification plant. The purification plant was designed and costed for 400 people at 150 litres per person per day. The purification plant will be a vendor supply package.

18.8 Project Execution

18.8.1 Execution Strategy

Phase 1 of the project is to be executed initially mostly at Isabella McCays and will involve the engineering, detailed design, procurement, construction, and commissioning of a 240 ktpm gold plant and associated infrastructure.

Phase 2 of the project involves mining at Bubi and a step change in production to 180 ktpm, due to the higher mass pull expected from the different type of ore. Phase 2 will only commence later in November 2028 to suit the life of mine production schedule.

18.8.2 Engineering and Design

It has been advocated that a short Front End Engineering Design (FEED) Phase be implemented to bridge any gaps arising from the Prefeasibility Study (PFS) and Detailed Engineering period. The FEED Phase will allow detailed design scoping to be done and focus on the key requirements for procurement planning and management.

18.8.3 Construction Philosophy

The EPCM Contractor will mobilize a Project Construction Management Team who, under the overall direction of the EPCM Project Manager, through the EPCM Construction Manager will manage and co-ordinate the activities of the appointed construction contractors.

These appointed construction contractors will perform the construction operations for the duration of the construction Phase.

18.8.4 Schedule

The schedule is used for long term planning, including cash flow. The schedule will be revised to be aligned with the latest information available before the project can be progressed from the planning Phase to the execution Phase.

18.9 Tailings Storage Facility

SLR Consulting (Africa) (Pty) Ltd (SLR) were appointed to design and cost a new TSF and the associated sundry infrastructure which include RWD, silt traps, pollution control system, access roads and perimeter fencing.

18.9.1 Design Standards

It is understood that there are no specific Zimbabwean regulations or standards that are applicable to TSF designs. The Bilboes TSF design complies with various international regulations, standards, and guidelines as well as the necessary supplementary Zimbabwean regulations e.g., the environmental protection associated with the disposal of mining waste, the Zimbabwe Statutory Instrument 6 of 2007 applied and The Zimbabwe Standard Specification for Hazardous Waste Management (ZWS 806:2012).

According to Bilboes Gold, the Zimbabwe EMA views the incorporation of a 1.5 mm thick HDPE geomembrane in the lining system as minimum best practice. Caledonia Mining is not a member of the ICMM, or an official signatory of the Global Industry Standard on Tailings Management (GISTM) but has taken the decision to align its tailings design and management with the principles of the GISTM. As such, the GISTM principles, as well as other tailings dam standards such as SANS 10286 and ANCOLD (2012) will be taken into consideration in the project development process.

18.9.2 Design Criteria

It is understood that the flotation and BIOX® CIL tailings streams are chemically and physically diverse, and as a result, it was considered appropriate to design a facility with two separate compartments.

The general area for a TSF site was preselected by Bilboes Gold. SLR conducted a trade-off study that compared various TSF construction, development, and deposition techniques over several TSF layout options on the pre-selected site area. The trade-off costing exercise demonstrated that the lowest start-up and sustaining capital costs were associated with a hybrid development system that incorporated full containment of tailings during the initial high Rate of Rise (RoR) deposition phases, followed by upstream development in the latter phases of development when the RoR reduces to the permissible 2 m/year.

Conventional tailings slurry disposal by way of spigotting with a maximum allowable RoR of 2 m/year above the containment wall crest was adopted for the project.

EPCM supplied the tailings production profile indicating three distinct phases of production as presented in Table 18-5.

Table 18-5: Production Profile

Phase	Year	Deposition Rate (tpm)		Cumulative Tonnage (t)	
		Flotation Tailings	BIOX® Tailings	Flotation Tailings	BIOX® Tailings
Phase 1	1.75 to 7.25	240,000	12,000	14,977,000	803,000

Phase	Year	Deposition Rate (tpm)		Cumulative Tonnage (t)	
		Flotation Tailings	BIOX® Tailings	Flotation Tailings	BIOX® Tailings
Phase 2	7.25 to 13	180,000	18,000	11,178,000	1,242,000
			TOTAL	28,549,000	2,171,000

Based on the production profile and plant process data supplied by DRA, the TSF was sized to accommodate a deposition rate of 28.5 Mt for the flotation tailings compartment, and 2.2 Mt for the BIOX® compartment.

TSF sizing was further based on an overall downstream (outer) embankment slope of 1V:4H which is considered an environmentally stable slope to encourage indigenous vegetation growth.

The properties derived from the geotechnical site investigation and were used for stability analysis and TSF foundation design:

Selected embankment fill material friction angle (Φ’)	: 25°.
Selected embankment fill material cohesion (C’)	: 20 KPa
Selected embankment fill material unit weight	: 1,600 kg/m³
Waste Rock friction angle (Φ’)	: 35°.
Waste Rock cohesion (C’)	: 5 KPa
Waste Rock unit weight	: 2,100 kg/m³
Foundation material (residual arkose / andesite) friction angle (Φ’)	: 30°
Foundation material (residual arkose / andesite) cohesion (C’)	: 12.5 KPa
Foundation material (residual arkose / andesite) unit weight	: 1,700 kg/m³
Bedrock friction angle (Φ)	: 50°
Bedrock cohesion (C’)	: 50 KPa
Bedrock unit weight	: 2,600 kg/m³

18.9.3 Tailings Physical Characterization

A full suite of geotechnical laboratory tests including foundation indicator tests, consolidated undrained triaxial tests, slurry settling tests, volumetric shrinkage tests, dispersiveness tests, evaporation/air-drying tests were conducted on representative Isabella McCays composite and the Bubi flotation tailings samples provided by Bilboes from the on-site pilot plant. The Isabella

McCays composite sample was blended at the Isabella-North: Isabella-South: McCays ratio of 50%: 30%: 20% in line with the mining plan.

The following tailings physical properties were derived from the geotechnical site investigation and were used in the design of the Bilboes TSF:

In-situ dry density of deposited tailings for capacity calculations	: 1,35 t/m³
Flotation tailings solids concentration in slurry (by mass)	: 40%
BIOX® tailings solids concentration in slurry (by mass)	: 20%
Flotation tailings specific gravity	: 2,70
BIOX® tailings specific gravity	: 2,75
Flotation tailings slurry density	: 1,337 t/m³
BIOX® tailings slurry density	: 1,144 t/m³
Flotation and BIOX® tailings effective friction angle (Φ')	: 31°
Flotation and BIOX® tailings cohesion (C' (KPa)	: 0
Flotation and BIOX® tailings unit weight (kg/m³)	: 1,500

Against expectation, the Isabella McCays BIOX® tailings foundation indicator tests results showed a very fine uniformly graded material (99% passing 0.075 mm sieve).

Based on preliminary discussions with Bilboes regarding the tailings Particle Size Distribution (PSD), the design envisaged a hybrid system of TSF construction incorporating full wall containment using waste rock material during the initial stages of deposition (up to Year 7), together with upstream wall raises using dried consolidated tailings from Year 7 onwards. However, safe upstream construction will not be achievable using such fine tailings, and as such BIOX® tailings may require full containment. The Isabella McCays BIOX® tailings PSD will therefore need further testing and confirmation during the detailed design phase.

18.9.4 Liner Selection

Based on the XRF results for the Isabella McCays BIOX® material, the Zimbabwe Standard Specification for Hazardous Waste Management (ZWS 806:2012) prescribes the following liner system as the minimum liner required for the Bilboes BIOX® tailings:

- 2 mm HDPE,
- 150 mm cement base.

The design presented in this report is based on the following selected liner systems (Table 18-6).

Table 18-6: Liner System

<table>
<tr><th rowspan="2">Layer Description</th><th colspan="2">Flotation Tailings</th><th colspan="2">BIOX Tailings</th></tr>
<tr><th>TSF</th><th>RWD</th><th>TSF</th><th>RWD</th></tr>
<tr><td>HDPE geomembrane thickness</td><td>1.5 mm</td><td>2 mm</td><td>2 mm</td><td>2 mm</td></tr>
<tr><td>Base layers</td><td>300 mm selected clayey material (compacted in 2x150 mm thick layers)</td><td>300 mm compacted clay liner compacted in 2x150 mm thick layers)</td><td>600 mm compacted clay liner compacted in 4x150 mm thick layers)</td><td>600 mm compacted clay liner compacted in 4x150 mm thick layers)</td></tr>
<tr><td>In-situ base preparation</td><td>Rip and re-compact 150 mm in-situ layer</td><td>Rip and re-compact 150 mm in-situ layer</td><td>Rip and re-compact 150 mm in-situ layer</td><td>Rip and re-compact 150 mm in-situ layer</td></tr>
<tr><td colspan="2">For the flotation compartment, the above only applies up to 200 m into the basin. The central portion of the flotation compartment will be lined with CCL as described below:</td><td colspan="3" rowspan="4">N/A</td></tr>
<tr><td colspan="2">Flotation Compartment Central Portion of Basin Liner</td></tr>
<tr><td>1</td><td>600 mm CCL</td></tr>
<tr><td>2</td><td>150 mm Base preparation</td></tr>
</table>

18.9.5 Seepage / Leakage Quality

The geochemical assessment report also provides expected seepage and liner leakage water qualities following source term modelling.

The geochemical assessment indicated that the BIOX® tailings are likely to be Potentially Acid Generating (PAG) whilst the flotation tailings are non-PAG.

18.9.6 Contaminant Plume Modelling

Using the results of the geochemical assessment and source term modelling of tailings, SLR further conducted contaminant plume modelling to determine plume extents because of seepage or leakage from the TSF and associated RWDs. The composite liner option is expected to confine plume migration to the TSF site with the plume not expected to exceed 260 m from the source over a 100-year period.

18.9.7 TSF Infrastructure

The TSF complex development incorporates an outer containment wall, constructed in stages using approved available mine waste and developed in a downstream manner and sized to fully contain all deposited tailings up to the point when the tailings deposition rate reduces from

240 ktpm to 180 ktpm. The remainder of the facility up to the LoM will then be raised progressively with upstream wall raises using compacted tailings.

18.9.8 TSF Hazard Classification

The Bilboes TSF hazard classification was conducted in accordance with both SANS 10286:1998 and ANCOLD (2012). Based on the assessment the Bilboes TSF can be classified as follows:

- A "High" hazard facility per the SANS 10286:1998 safety classification criteria,
- A "High B" consequence category per ANCOLD (2012).

18.9.9 TSF Operation and Monitoring

During the life of the TSF, various elements should be monitored to ensure the integrity of the TSF complex. Monitoring elements will typically include:

- TSF engineering parameters,
- Groundwater monitoring programme,
- Dust monitoring programme.

18.9.10 TSF Closure Concept

The closure concept is envisaged to include a covering of the mine waste with a low hydraulic conductivity layer such as a clay or geosynthetic membrane. There will be on-going rehabilitation of the TSF complex through on-going vegetating of the embankment slopes.

18.9.11 TSF Optimization

An optimization of the previous TSF was undertaken by SLR Consulting. All previously determined design criteria, including site location, plant processes, tailings production, deposition methodology, tailing material characteristics as well as earthworks and embankment construction methodology were assumed.

- The assumption is that the currently selected site is fixed. Due to the topographical constraints of the current site, a large volume sacrificial wall needs to be constructed for the TSF Phase 1 deposition, which could be reduced if an alternative site is found.
- The PEA LoM production profiles were provided by DRA (240 ktpm):
  - The total tonnes expected are 23.1 Mt:
  - Flotation TSF compartment: 22.9 Mt.
  - BIOX TSF compartment: 1.7 Mt

- The total LoM is 10 years.

➢ The maximum allowable RoR, for this PEA, was assumed to be 2.5 m/year, to lower the starter wall embankment heights, thereby reducing the overall construction and material costs of the Flotation and BIOX TSF starter wall embankments.

➢ The annual RoR is the highest during the first few years after deposition commences and decreases after year four.

➢ The Bilboes TSF can accommodate a maximum tailing cumulative volume of 21.7 Mt for the Flotation TSF compartment and 1.6 Mt for the BIOX TSF compartment (Flotation and BIOX compartment) within the RoR limit below 2.5 m/year (at 1.35 t/m³).

➢ The starter wall heights, for the Flotation and BIOX TSF compartments for the proposed deposition are recommended as follows:

- Flotation TSF compartment Phase 1 and Phase 2: 1,153.5 mamsl.
- Flotation TSF compartment Phase 3: 1,158.0 mamsl.
- BIOX TSF compartment Phase 1: 1,158 mamsl.

➢ The phasing of the TSF is to be (Figure 18-3):

- The BIOX TSF constructed without being divided and therefore as a complete compartment, up to the Phase 3 wall elevation, while the Flotation compartment is to be divided into two compartments.
- A dividing / sacrificial wall be constructed to separate the Flotation TSF compartment into two compartments. This wall is to be constructed from approved available mine waste (the same as for the original starter wall embankments).
- In addition to the dividing/ sacrificial wall a cut-off trench and protection berm are to be constructed upstream of the sacrificial wall, in the Phase 2 Flotation compartment.

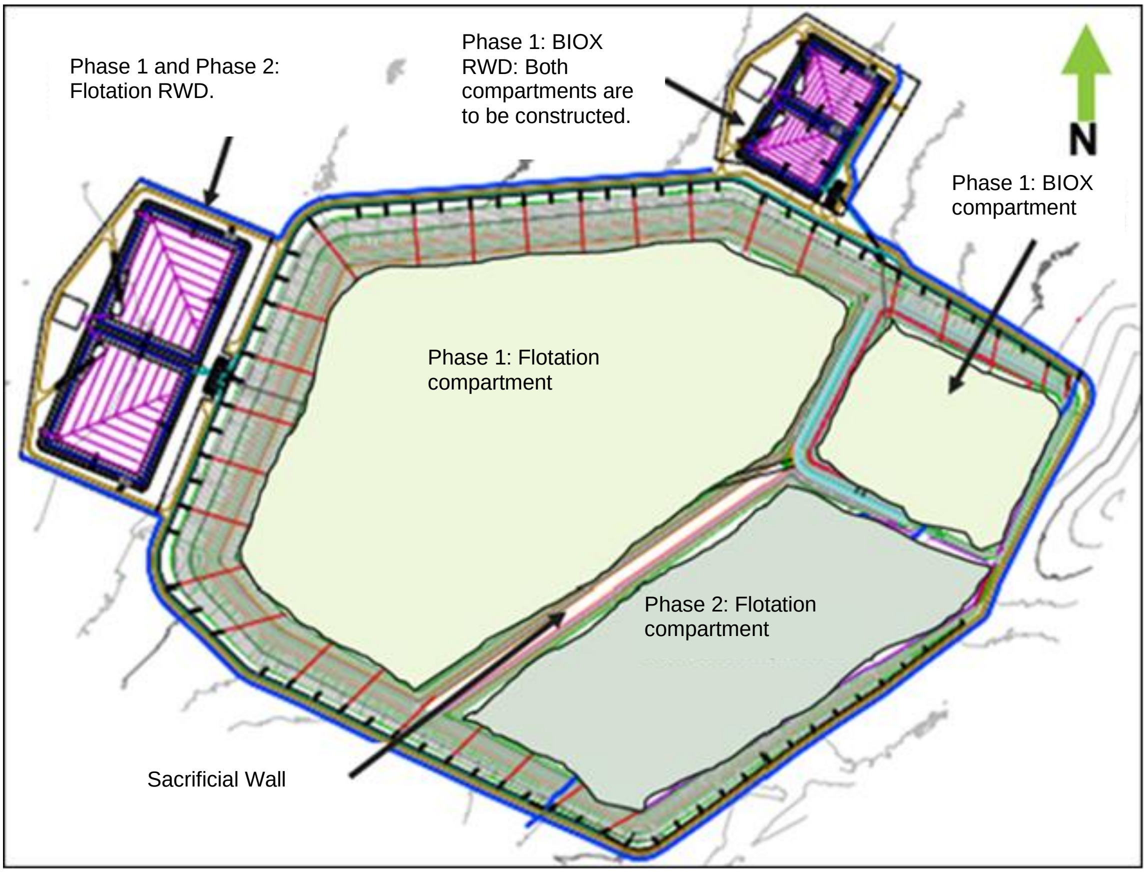


Figure 18-3: Phasing of Flotation TSF Compartment – 240 ktpm

- The following phasing of the Flotation TSF compartment is suggested:
  - Phase 1 – deposition volume of three years in the Phase 1 compartment up to the Phase 1 starter wall elevation.
  - Phase 2 – deposition volume up to the elevation of the sacrificial wall height with deposition taking place in the Phase 2 compartment. The Phase 2 wall elevation will apply to the Phase 1 and Phase 2 TSF compartments.
  - Phase 3 – deposition volume up to the elevation of the Phase 3 wall elevation with the Flotation TSF compartment being operated as one deposition compartment, i.e. the Phase 1 compartment and Phase 2 compartment are merged and operated as a single TSF.
  - Phase 4 – the tailings elevation is above the Phase 3 wall height and the TSF is "self-building" with tailings, up to the final design elevation.
- For the Flotation Phase 1 compartment, it is recommended that the temporary penstocks as well as the final permanent penstock intake be constructed for operational use during Phase 1 deposition. Two additional temporary penstocks will be required within the Flotation Phase 2 compartment to allow decant water to drain sufficiently from the

compartment. The final permanent penstock will be utilized during the end of deposition on the Phase 1 compartment, as well as after the Phase 1 and 2 compartments are merged into one (Phase 3 operation).

- Initially, the underdrainage system only needs to be constructed and operational for the Flotation Phase 1 compartment as well as for the entire BIOX TSF. Therefore, there will be an initial cost saving on the underdrainage system required for the Flotation TSF. However, any tie-in systems or part thereof, that fall within the Phase 2 basin area will need to be constructed during Phase 1, for ease and continuity of construction.
- The solution trench, around the perimeter of the facilities is to be concrete lined, as it was agreed that the “worst case” option in terms of tailings type and classification would be adopted as part of this assessment.
- The siting of the Flotation and BIOX RWDs and silt traps are to remain as per the 2019 FS.
- As the catchment area of Phase 1 is less than the overall TSF, only one of the Flotation RWDs needs to be constructed as part of Phase 1, while the second will need to be constructed during Phase 2. The BIOX RWDs should be constructed during Phase 1.
- The outer containment walls for the Flotation and BIOX TSF compartments are to be constructed in stages using approved available mine waste, developed in a downstream manner to fully contain all deposited tailings up to the point when the tailings RoR is below 2.5 m/year. The waste rock material is assumed to have a friction angle of 1v:3h, slightly steeper than the conventional industry guideline of 1v:4h, due to the material properties of the waste rock.
- From previous geotechnical investigations, the soils in the area are about 0.4 m thick and generally sandy clays grading to clayey sands. Field and laboratory permeability testing indicate permeability ranging from 10 - 5 m/s to 10 - 7 m/s and on average 10 - 6 m/s. Maximum outflow rates in the clay layers should be 10 - 9 m/s for Class B facilities and 10 - 8 m/s for Class C facilities. Thus, it is recommended that an investigation is undertaken to identify clay sources on or near the site for barrier construction. Alternatively, GCL may be imported and used for the construction of the barrier system but will need to be costed.
- The tailings sample is not considered representative of the tailings material as it was treated prior to the geochemical analysis. The high leachable and total arsenic concentrations need to be verified by a repeat test. The treated tailings also need to be verified that they will indeed classify as a Type 2 waste.

- An options study should be undertaken on the Class C barrier system to identify other alternatives to the typical Class C Landfill Barrier System. This may include extraction boreholes around the site, or a thick clay layer being placed as a barrier system.
- Therefore, it is recommended that the liner system previously recommended be implemented as part of this PEA.
- The rates used for the CAPEX and OPEX were based on the best estimate rates available to SLR checked against recent rates obtained by DRA and shared with SLR. However, SLR strongly recommends that the BoQ be issued to market as part of the next Phase of design and the rates validated and benchmarked to ensure that the rates are in line with current costs.
- At this level of design (Optimized PEA) there are uncertainties that will only become clear as the next project Phase commences, and design parameters are fixed and/or investigated further at more detailed design stages.
- For the current design an excessive amount of clay material is required for the Flotation and BIOX TSF compartments as well as for the RWDs (Flotation and BIOX). Based on current information, the specified clay material is not readily available on site or in the nearby vicinity and therefore will need to be sourced, leading to additional costs. Therefore, should the required volume and type of clay material not be available, alternatives such as GCL may need to be imported at an additional cost.
- Construction difficulties will arise due to the Phase 1 Flotation TSF being operational while the Phase 2 Flotation TSF is being constructed, (as with Phase 2 Flotation TSF being constructed while the Phase 3 Flotation is under construction). This will be due to the operational facility being in direct proximity to a construction site. Further engineering design and consideration needs to be implemented and incorporated in the next Phases of design.
- Operational challenges will develop, including depositional constraints as well as correct pool management. This holds true for all Phases of the TSF development. Additional penstocks have been included for the Phase 2 Flotation compartment to aid with pool management.
- The joining of already placed liner (Phase 1) to the new liner (Phase 2) will be challenging and will need a good lining contractor to undertake the lining operation.
- Exposed liner will become damaged by UV, rocks, and accidental and/or deliberate negligence. Additional liner protection material as well as extra sandbags have been allowed for, but detailed design and construction CQA will be required.

19 MARKET STUDIES AND CONTRACTS

19.1 Historical Supply and Demand

Gold is a precious metal refined and sold as bullion on the international market. Aside from the gold holdings of central banks, current uses include jewellery, private investment, dentistry, medicine, and technology (Figure 19-1).

Gold is mined in many countries around the globe; China, Australia and Russia are major gold producers providing 31.5% of world gold supply with recycled gold being a significant part of global supply (Figure 19-2). Globally jewellery is the main application sphere of this precious metal accounting for over 48% of total demand.

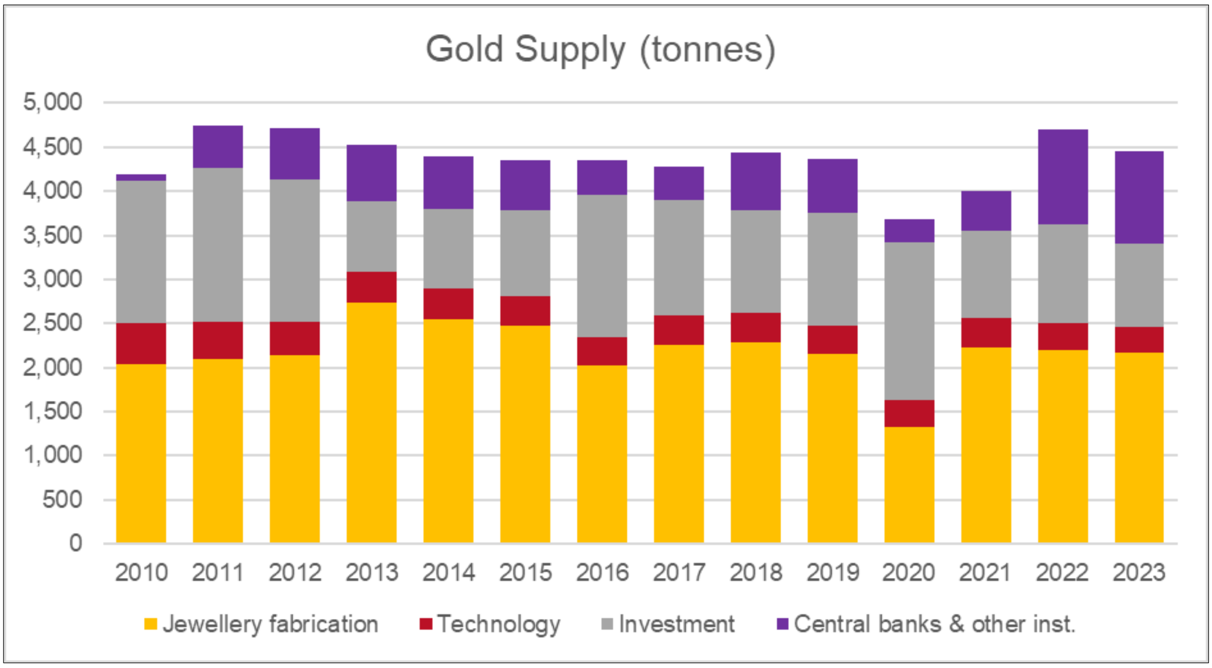


Figure 19-1: Historical Gold Supply (2010 -2023)[§]

[§] Source: World Gold Council

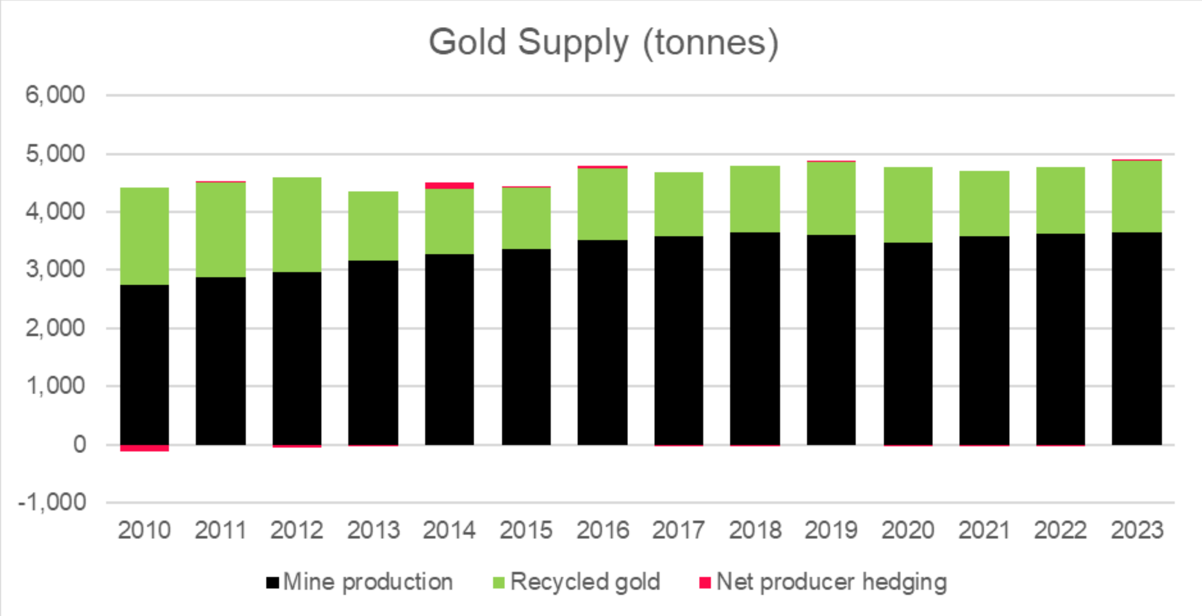


Figure 19-2: Historical Gold Demand (2010 - 2023)[**]

About half of gold jewellery consumption is in India and China and these markets' trends greatly influence the overall gold industry. Investment in gold is another important application sphere and its share is about 29%. Demand from national central banks has also been growing especially from banks of developing countries in Latin America, the Middle East and Asia.

The supply and demand of gold does not follow typical supply and demand logic as gold is indestructible and can easily be recycled and is stored in vaults of banks. Gold is therefore relatively liquid and subject to the vagaries of global economics. These characteristics of the gold market make it challenging to forecast the gold price.

[**] Source: World Gold Council

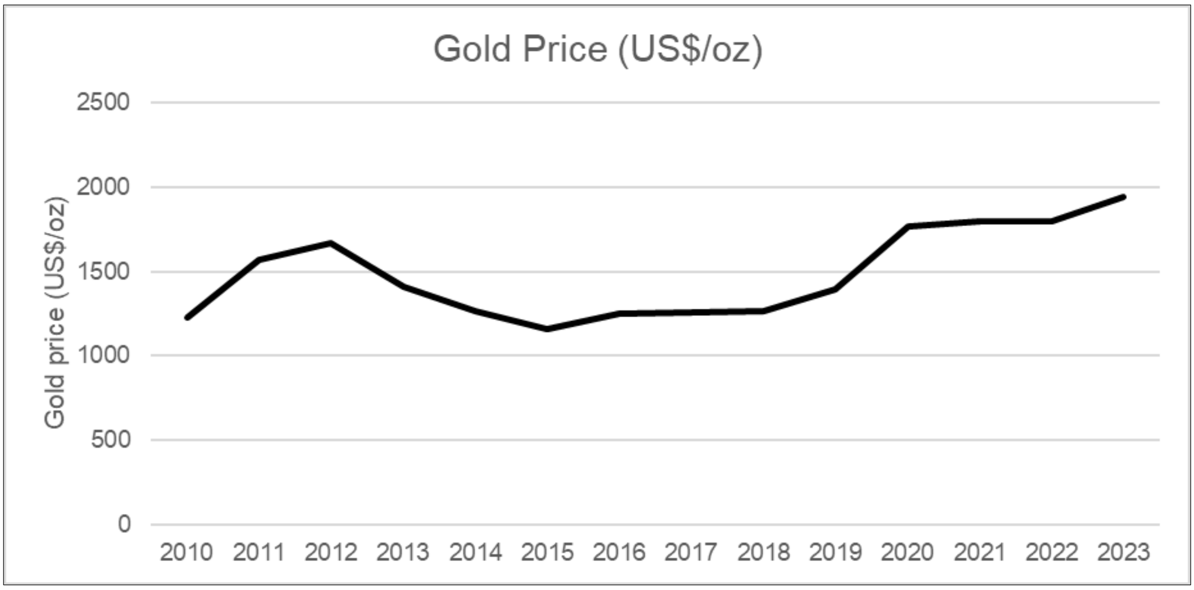


Figure 19-3: Gold Price (2010 - 2023)††

Over the past century, gold has consistently shown as both a beacon of potential stability and a mirror reflecting global economic fluctuations. Gold's value over time is marked by significant fluctuations influenced by economic policies, global crises, and shifts in demand.

With a backdrop of financial and geopolitical uncertainties, the outlook for gold prices suggests a continued appeal of the precious metal as a so-called safe-haven asset. In recent years, gold has demonstrated resilience in the face of global economic challenges, including inflationary pressures and currency fluctuations. Several macroeconomic factors could shape the gold projections in the future:

- Inflation: While many assume a direct correlation between inflation and gold, the relationship is complex and not as straightforward. Inflation can impact the metal, but other factors often mitigate its effects,
- Currency Fluctuations: Gold and the US dollar share an inverse relationship. As the dollar weakens, gold often rises, becoming more attractive to investors holding other currencies,
- Geopolitical Tensions: Conflicts and political instability historically drive investors towards gold as a so-called safe haven, potentially boosting its price during periods of heightened uncertainty.
- Interest Rates: Gold's appeal can diminish with the expectation of rising interest rates, as higher yields on bonds and savings accounts compete with the non-yielding metal.

†† Source: World Gold Council

19.2 Gold Sales in Zimbabwe

The Gold Trade Act empowers the Minister responsible for Finance to issue a Gold Dealers License which entitles entities to export and sell gold from Zimbabwe to customers of its choice. Prior to 1 June 2021, only FGR had the Gold Dealership License and therefore all gold bullion was sold to FGR. With effect from 1 August 2021, all gold producers can directly sell any incremental production to customers of their choice using FGR's license to export. Caledonia's Blanket Mine is currently selling 75% of its gold to a customer of its choice outside Zimbabwe by exporting the gold using FGR's license. Sales proceeds from the exported gold are received directly into Blanket's bank account in Zimbabwe. As all Bilboes production is considered incremental, Bilboes will be able to choose to sell its gold directly to customers of its choice or to continue selling to FGR.

Bilboes is confident that it will be able to export and sell its gold production on similar terms as those currently in place between FGR and Blanket.

The Blanket toll arrangement which will be similar to Bilboes is outlined below:

19.2.1

Lodgements to FGR can be made on any day of the week.

Melting and assaying charges of US$ 21/kg gross bullion weight applies.

The applicable Government royalty of 5% is deducted from proceeds due to the customer. FGR collects half of the 5% royalty which is payable to the Government of Zimbabwe in physical gold.

25% of the Blanket gold ounces is sold to FGR and settled in ZIG. Pricing is based on the previous day's LBMA PM fix of the day of packing for export.

The ZiG portion is settled within 7 days.

75% per cent of the gold ounces are refined at FGR and exported by Caledonia using Fidelity's gold dealing licence to a refiner outside Zimbabwe which undertakes further refining.

The refiner outside Zimbabwe pays 90% of the value on the day of lodgement and 10% after further refining. Pricing is based on the LBMA AM fix price on date of lodgement.

FGR charges a 1.24% toll refining fee of the gross value of the export proceeds.

19.3 FGR Gold Price Predictions

A summary of the predicted gold prices for 2024 are presented in Table 19-1

Table 19-1: Predicted Gold Price‡‡

Analyst/Firm	2024 Gold Price Prediction
Bank of America	US$ 2,400/oz by end of 2024
UBS Bank	US$ 2,200/oz by end of 2024
Goldman Sachs	US$ 2,133/oz by end of 2024
World Bank	US$ 1,900/oz by end of 2024
Citibank	US$ 2,400/oz by end of 2024
ING	US$ 2,100/oz by end of 2024
Wells Fargo	US$ 2,100 – 2,200/oz by end of 2024
Ronald Stoeferle, Incrementum AG	US$ 2,500/oz by end of 2024
Zach Scheidt, Rich Retirement Letter	US$ 3,000/oz by end of 2024

‡‡ 2024 Gold Price Prediction, Trends, & 5-Year Forecast (goldsilver.com)

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1 Environmental Issues

The natural environment within the project site has been significantly transformed by existing mining operations. The surrounding environment is more natural with disturbances from communities and subsistence farming activities. Other mining operations do occur in the region, however over time several mines in the area have been closed. The EIA (SLR, 2019) identified a number of potential environmental impacts as shown in Table 20-1.

Table 20-1: Potential Environmental Impacts

Potential Environmental Impacts	Mitigation	Significance After Mitigation
Potential loss of soil and related grazing land capability within the proposed project footprint	Soil can be conserved and reused during rehabilitation	Low
Potential contamination of soils, surface water and/or groundwater features	Design of potentially contaminating facilities and managing the storage and handling of polluting substances and related clean-up of spills reduces the Intensity of these potential impacts	Medium to High
Alternation of drainage patterns and related downstream functionality of aquatic habitat due to encroachment of the Bubi open pit into the non-perennial Bubi River	The Bubi River can be diverted to ensure that that the Hydraulic connectivity of the river is retained, and pollution, sedimentation and erosion impacts are generally avoided.	Medium
Potential contamination of surface and groundwater resources from various operational activities and contamination from the new TSF and WRDs	Implementation of industry-aligned surface water management measures and a composite lining for the floatation compartment and full HDPE liner for the BIOX® compartment of TSF	Surface water = Medium Groundwater = High
Lowering of groundwater levels potentially affecting third party water supply should third party boreholes be located within the dewatering cone of depression	Any third-party water sources that have a proven decrease in yield or dry up because of the proposed operations would be compensated with an alternative water supply of equivalent quality and quantity	Medium
Potential reduction in ambient air quality due to particulate emissions	Implementation of an air quality and dust management plan during the implementation and operation of the proposed project lowers the intensity, and probability of such impacts occurring	Medium (operational Phase) to Very Low (construction and decommissioning Phases)
Elevation in ambient noise levels creating a potential disturbance to nearby receptors.	Incorporating mitigation into the site design, as well as adopting sound management practices (e.g., maintaining machinery and equipment in good working order).	Medium (operational Phase) to Low (construction and decommissioning Phases)
Visual disturbance to nearby local communities	Undertaking rehabilitation throughout the course of the proposed operations,	Low
Physical destruction and general disturbance of terrestrial and/or aquatic biodiversity	By ensuring that the project footprint for planned clearing and infrastructure establishment is clearly demarcated and all areas of increased ecological sensitivity, outside of the mining footprint are designated	Medium

Potential Environmental Impacts	Mitigation	Significance After Mitigation
	as No-Go areas would limit the associated significance of these impacts	

The EIA (SLR, 2019) concluded that the proposed project presents several potential positive and negative impacts associated with the unmitigated scenario. With mitigation (in the residual impact scenario) some of the identified potential impacts can be prevented and the remainder can be managed and mitigated to remain within acceptable environmental limits so long as the mitigation set out in the ESMP is implemented and Bilboes develops, implements, and annually reviews the ESSMS. Positive impacts can be enhanced by developing and implementing a Community Development Plan as set out in the ESMP.

Bilboes is committed to implementing the mitigation measures within the ESMP together with the ESSMS which will be implemented as part of Bilboes on-going efforts of continuous environmental improvement. The management system will contain plans and procedures to help manage environmental aspects and impacts and help ensure legal compliance.

20.2 Waste, Tailings, Monitoring and Water Management

20.2.1 Tailings Management and Disposal

Gold recovery at Bilboes would entail a two-stage process that would result in the generation of two different tailings streams - Flotation and BIOX® tailings. The TSF would be developed with two separate compartments to accommodate each tailings stream.

The proposed liner system for each comportment would incorporate (from top down):

- Floatation Compartment – A 1.5 mm HDPE geomembrane, a base layer of 300 mm selected clayey material (compacted in 2 x 150 mm thick layers),
- BIOX® Compartment – A 2 mm HDPE geomembrane, a base layer of 600 mm selected compacted clay liner (compacted in 4 x 150 mm thick layers),
- Both compartments would have a ripped and re-compacted 150 mm in-situ base layer,
- The TSF would incorporate a filter drainage system comprising an 8.5 m wide, 500 mm deep toe drain located immediately adjacent to the upstream toe of the starter wall for the Floatation compartment and a 7.5 m wide, 500 mm deep toe drain located immediately adjacent to the upstream toe of the starter wall for the BIOX® compartment,

Both compartments would have a reticulation of above-liner finger drains consisting of a configuration of 160 mm and 110 mm diameter slotted seepage collector pipes in the basin discharging to the solution trench independently of the toe drains to allow monitoring. The proposed decant systems consist of temporary intake structures (designated FT) and permanent intakes (designated FP). The intake structures have both top and side inlets.

There would be on-going rehabilitation of tailings through the application of the rising green wall. The TSF design slopes adopted (1V:4H) are considered environmentally stable to allow for indigenous vegetation growth with minimal ongoing maintenance. To assist with the vegetation establishment, the vegetation will be manually planted and irrigated during the initial stages. A cover involving topsoil and subsoil (in combination with the rocky waste rock material placed during construction protruding) will be progressively placed onto the side slopes of the TSF as the same is developed. These protrusions are advantageous as they mimic natural slopes and dissipate the kinetic energy of rain drops as they strike the surface.

The tops surface will be covered with topsoil mixed into tailings. The top surface will then be paddocked into smaller catchments to reduce water flow lengths.

The Bilboes TSF is classified as a Medium Hazard to High Hazard facility due to the number of residents in zone of influence estimated to be between 8 and 16 (determined in accordance with terms of the South African Code of Practice for Mine Residue Deposits (SABS 0286:1998) and the requirements of Mineral Regulation 527 of 23 April 2004). The classification considered the two compartments as one facility.

20.2.2 Waste Rock Management and Disposal

The planned WRD construction method would entail the following:

- A nominal wall of waste material would initially be constructed to confine the extent of the dumping area within the planned WRD footprint.
- Waste material will be delivered to WRD by truck and tipped from the leading edge of the WRD towards the inside of the WRD footprint. The waste will then be spread and shaped as necessary by earthmoving equipment.
- The WRD would then be developed in successive lifts of up to 10 m in height, with each lift being completed before commencement of the subsequent lift.

The WRD will be constructed at an angle of repose slopes of approximately 35°.

In principle, the WRD lift heights shall be limited to 10 m with a minimum of a 10 m berm, with an overall height of 40 m. Seepage from the toe of the WRD, as well as runoff from the slopes, would be controlled by the construction of an outer containment wall. The containment wall will be the boundary between the clean and potentially contaminated water systems for the purposes of stormwater management.

Some compaction of the waste is expected to take place during placement as trucks pass repeatedly over previously placed material on their way to and from the advancing faces of the WRDs. While compaction of wastes is desirable to maximize density and storage capacity, it is not a requirement for structural stability. Compaction will assist in reducing differential settlements with time, which will assist in ensuring the longer-term integrity of surface water management measures.

20.2.3 Non-Mineralized Waste Management

Non-mineralized waste (including general industrial waste, medical clinic waste, hazardous industrial and domestic waste) would be temporarily handled and stored on site before being removed for recycling by suppliers, reuse by scrap dealers or final disposal at the existing waste disposal area located at Isabella. Bilboes has a designated burning site for all waste materials associated with cyanide packaging and hazardous waste on the heap leach pad where all leachate goes into the heap leach cyanide circuit as recommended by the cyanide suppliers. An internal waste management procedure will be developed for waste generated by the project.

With respect to sewage, it is proposed that the existing sewage treatment facility located at Isabella would handle the sewage generated. It is proposed that a sewage treatment plant would be established at Bubi.

20.2.4 Site Environmental Monitoring

The proposed monitoring programme is detailed in the ESMP for the proposed project. The aspects for which monitoring is proposed includes:

- Annual monitoring (physical observation) for erosion, as well as slope / TSF failure,
- Monthly surface and groundwater monitoring (of parameters including water quality, volumes, levels, spillages, and management infrastructure),
- Monthly updating of the site-wide water balance (including biennial updates of the water balance model),
- Air and noise monitoring to establish baseline constituent concentrations / ambient noise levels, as well as regular monitoring during construction and operations, as applicable.

Requirements for post-closure monitoring to determine whether the mitigation and rehabilitation measures are effective would be incorporated into a final Closure Plan to be compiled for the operations prior to the commencement of decommissioning.

20.3 Water Management

There is evidence that the Bembezi, Mdutshane and Bubi Rivers have been impacted upon by various anthropogenic activities in the broader area. Furthermore, the planned widening of the open pits at Bubi would encroach directly on the Bubi River and the tributary located within Bubi claims area. This would have a material impact on this feature and may have an impact on downstream water users. It is thus recommended that the Bubi River be diverted around the proposed expansion of the southern open pit to ensure that the hydraulic connectivity of the river is retained, and that pollution, sedimentation and erosion impacts are avoided.

The following measures could be implemented to allow improved water management and limit the risk of flooding the southern open pit during a high flow event in the Bubi River.

The measures to be implemented by Bilboes to address potential adverse water quality effects and to ensure that the planned infrastructure is constructed, operated, and maintained to comply with the provisions of the IFC guidelines, include:

- Separating clean water systems from dirty water systems, Minimizing the size of dirty areas and divert clean run-off and rainfall water around dirty areas and back into its normal flow in the environment,
- Locating all activities and infrastructure outside of the specified zones and/or flood lines of watercourses, as far as possible. Where this is not possible, the affected area should be remediated/rehabilitated to restore the original ecological function post-closure,
- Maintaining specified zones around surface water features in instances where flood lines are unknown or un-surveyed,
- Incorporating suitable erosion protection measures at all discharge points, should any discharge be required. Furthermore, all discharges from the mine into the environment will comply with the IFC Effluent discharge standards.

20.4 Project Permitting

An approved EIA is required in terms of the Environmental Management Act (Chapter 20:27) No. 13 of 2002 and the Mines and Minerals Act (Chapter 21:05) of 1996. The ESIA was undertaken for the project to satisfy the requirement and an ESIA Report was completed for submission to EMA within the first quarter of 2020. Thereafter, SLR held a public feedback meeting to disclose the findings of the ESIA Report to the identified stakeholders. A record of this disclosure process was compiled and submitted to EMA. An EIA certificate was issued to Bilboes for the project in February 2021 and was and was valid for two years to February 2023. The EIA certificate is renewable on an annual basis subject to conditions which include project update reports, compliance to Environmental Management Plans (EMP) outlined in the ESIA Report and notification to EMA for any changes in the project likely to alter the project as stipulated in the ESIA Report. The current EIA certificate is valid until March 2025 and the renewal process will continue annually for the duration of the operations.

Other project related licenses/permits currently in use include explosives (purchase and storage), firearms, medicines control, public health (medical examination), water abstract and hazardous substances (importation, transportation, storage and use), solid waste disposal which are renewed quarterly or annually when become due. The conditions of renewal are limited to payment of applicable fees to the relevant statutory bodies. A total of US$ 70,000 is required to cover all the license fees and permits on an annual basis.

20.5 Social and Community Related Requirements and Plans

An ESMP has been developed which contains the environmental, social and safety management and monitoring commitments that Bilboes will implement to manage the negative impacts and enhance the positive impacts identified in the EIA.

To mitigate against the loss of, or reduced access to, land for livelihood activities, a LRP will be compiled and implemented prior to the commencement of construction.

As part of the existing operations Bilboes have undertaken several CSR programmes. These include the supply of various community boreholes at communities and local schools, building and repairs of school blocks, the repair of various local roads, excavation and scooping of dams and provision of various other services including access to health facilities at the mines and transport in cases of emergency.

To address potential issues related to employment, Bilboes will develop a fair and transparent labor, working conditions and recruitment policy. The policy will comply with local law, IFC Performance Standard 2: Labor and Working Conditions, and International Labor Organization (ILO) conventions.

To optimize local small business development, a local procurement policy will be developed and implemented and communicated to all local stakeholders.

The Stakeholder Engagement Plan developed for the project will be maintained and updated to provide a formal procedure for communications with the regulatory authorities and communities.

20.6 Social/Community Issues

Based on the EIA undertaken for the proposed project, social or community impacts that were identified and assessed include the following:

- Positive economic impact because of the direct construction and operational project expenditure, direct and indirect business opportunities. Significance after mitigation - Very High Positive,
- Potential reduction of access to land for livelihood activities (e.g., cattle ranching and subsistence agriculture) undertaken within the mine claims area. A key recommendation to ensure that these land users are appropriately identified, engaged, and compensated. Significance after mitigation - Medium,
- Inward migration due to the expectation of employment. Bilboes should aim to source most employees from the surrounding local communities, as far as possible. Significance after mitigation - High to Medium,
- Various health and safety risks for third parties are associated with the proposed project. While the likelihood of incidents is deemed to be low (with mitigation) any injuries or fatalities of third parties would be of high intensity. Significance after mitigation - Medium,
- No cultural-heritage resources were found to be located within the proposed project footprint. Significance after mitigation - Very Low.

20.7 Mine Closure

A conceptual closure plan and LoM closure liability estimate, based on the environmental, social, and economic risks identified in the EIA, is included in the EIA. Furthermore, the closure issues and concerns raised by stakeholders were also incorporated, where applicable.

Generally accepted "good international practice" mine closure methods were used as the basis for the conceptual closure plan, as well as, for determining the unit rates for the various closure components used in the LoM liability calculation. The mine closure methods also conform to the statutory requirements of Zimbabwe EMA who are the regulatory body.

Mine closure planning is a dynamic process that is integrated with LoM planning to ensure a seamless transition from the operational to the decommissioning Phases in the mine life cycle. The environmental objective for closure is to minimize the impacts associated with the decommissioning and closure of the mine and to achieve post closure land use as outlined.

The conceptual closure plan objectives include the following:

- Environmental damage is minimized to the extent that it is acceptable to all parties involved.
- The land is rehabilitated to achieve a condition approximating its natural state (as far as practicable), or so that the envisaged post closure land use/land capability is achieved.
- Some of the smaller open pits shall be completely backfilled with material from the overburden/WRDs. Inert building rubble from the decommissioning activities can also be buried in the pit voids. The remaining open pits would not be backfilled and remain open. The pit sidewalls and end-walls will only be ‘made safe.
- All surface infrastructure, excluding the TSF and any other surface infrastructure that will support the envisaged post-closure end use, will be removed from site after rehabilitation.
- Contamination beyond the mine site by wind, surface run-off or groundwater movement will be prevented through appropriate erosion resistant covers, containment facilities (i.e., stormwater ponds) and drainage controls.
- Mine closure is achieved efficiently, cost effectively and in compliance with the law.
- The social and economic impacts resulting from mine closure are managed in such a way that negative socio-economic impacts are minimized.
- Based on the above, the closure outcomes for the mine site are assumed to be as follows:
- To achieve chemical, physical, and biological stability for an indefinite, extended time period over all disturbed landscapes and residual mining infrastructure
- To protect surrounding surface water, groundwater, soils, and other natural resources from loss of utility value or environmental functioning
- To limit the rate of emissions to the atmosphere of particulate matter and salts to the extent that degradation of the surrounding properties’ land value and land capability does not occur.
- To create a final land use that has economic, environmental, and social benefits for future generations that outweigh the long-term aftercare costs associated with the facility.
- These broad closure objectives and outcomes will be continually refined as operations continue.

20.8 Estimated Environmental Costs for Closure

The quantities used in the closure liability calculations were derived from the layout plans and general arrangements for the project; the project infrastructure details within the feasibility study report; and the proposed mining and deposition schedule. The closure liability calculation has been determined for the LoM (end of year 10) and is calculated to be US$ 32 m (excl. VAT) (2023). The closure liability calculations will be regularly reviewed and updated during the project up and until the commencement of closure activities (i.e., final closure plan). On-going environmental rehabilitation is based on a unit rate of US$ 0.25 / t plant feed.

21 CAPITAL AND OPERATING COSTS

21.1 Capital Cost

21.1.1 Basis of Estimate - Mechanical

The method used to determine the Capital Cost Estimate (CCE) for the PEA Production Trade Off Study consisted of the following steps:

- Step 1: The estimate was based on the original development of the 2019 Bilboes Project FS, which was revalidated in 2021 and 2023 and updated by submissions from other consultants (i.e. BIOX plant costed by Metso, and Tailings Storage Facility costed by SLR Consultants).
- Wherever information was not revalidated, DRA database information was utilized, escalated to the new project base date, or factorised.
- The following costing areas were identified as optimisation areas:
    - Open pit mining,
    - Updated TSF costs by SLR,
    - Buildings (updated with client estimate received),
    - Chinese sourced material for steelwork and platework,
    - Major mechanical equipment sourced from China (crushers, mills, flotation cells, thickeners for example).
- Step 2: Factors were carefully developed from the established Phase 1 and 2 “known costs” based on Work Breakdown Structure (WBS) and discipline level breakdown. Factors were either developed from the mechanical supply costs, direct field costs, or relevant discipline supply costs.
- Step 3: For equipment, revalidated mechanical supply costs were utilized.
- The factors developed in Step 2 were then applied to all disciplines and factored either from the newly established mechanical supply costs, direct field costs or discipline supply costs.
- Wherever detailed costs were calculated for the applicable discipline (i.e. mining costs), detailed costs superseded the factoring method and phase.

21.1.2 Basis of Estimate – Civils and Earthworks

21.1.2.1 Quantities

- All quantities and costs were revalidated for 2023,
- A revised Geotechnical Report was not completed at this stage of the project,
- The bulk of earthworks quantities were modelled in three dimensions,
- Allowances were made for engineered mattresses for lightly loaded buildings.
- Piling was allowed for dynamically and heavily loaded structures.
- Concrete quantities were generated by using the DRA database for similar structures,
- Reinforcement allowed at 80 kg to 120 kg depending on the structure type.

21.1.2.2 Costs

- Rates in US$ were allowed for and based on rates for works recently executed in Zimbabwe.
- Preliminary and General (P&G's) costs for earthworks were allowed for a percentage (%) of measured work and were based on latest P&G percentages for works recently executed in Zimbabwe.

21.1.3 Basis of Estimates – Mechanical Equipment

- The original 2019 CCE mechanical equipment structure in the CCE was used as the basis for revalidation and is in accordance with the Mechanical Equipment List (MEL),
- The 2019 selected vendor quotations were used and sent back to the vendors for revalidation,
- Some 97% of the mechanical costs were revalidated by vendors,
- If no response was received from a vendor or the vendor did not quote for a specific item, the Estimating department reverted to using a database price, escalation from 2021 to current base date or factoring,
- The CCE used around 1% of costs from the DRA database costs, escalation amounted to 2% and 0% factorisation,
- For 2023, Metso validated costs for the BIOX area,
- Mechanical installation rates were revalidated by a SMP contractor,

- Most of the information in the CCE remained unchanged, with exception to the follow mechanical equipment pricing, which was updated with equipment sourced from China:
    - Crushers,
    - Mills,
    - Flotation cells,
    - Thickeners

21.1.4 Basis of Estimates – Steelwork, Platework and Piping

- The original 2019 Bill of Quantity (BOQ's) were sent to the selected SMP contractors for revalidation and rates included in the CCE,
- The BIOX plant supply was provided by the vendor, Metso.
- P&G's were quoted by a SMP contractor and allowed for as a percentage of measured work on the supply and installation costs,
- A SMP contractor quoted for transportation of supplied material,
- Piping was factored from mechanical supply costs.

21.1.5 Basis of Estimates – Electrical Control and Instrumentation

- The MEL was used as bases of design,
- Estimated lengths were used to determine cable and cable support quantities,
- Lighting and small power quantities were estimated using the process plant footprint,
- Lightning protection and earthing requirements were estimated according to plant buildings,
- Instrumentation quantities based on process requirements,
- The control system based on process requirements and instrumentation quantities.
- Bulk power cost received from ZETDC,
- Major electrical equipment costs were based on quotations received for current execution projects,
- Control and instrumentation equipment costs were based on recent quotations,
- Installation costs were based on budget tender rates received for other Zimbabwean projects,

- P&G's were calculated as a percentage of supply and installation costs on recently completed in-country projects.

21.1.6 Capital Costs Summary

The mining cost for mining are combination of site establishment and pre-development during the production ramp up which consists of the first 9 months of production.

Table 21-1: Summary by Discipline

Description	(US$ m)
Open Pit Mining	25.54
Tailings Storage Facility	75.25
Earthworks	36.81
Civils and Infrastructure	14.48
Buildings	5.85
Steelwork	16.34
Conveyor Steelwork	4.37
Platework	12.49
Conveyor Platework	0.38
Mechanicals	76.11
Conveyor Mechanicals	1.90
Vendor Commissioning	4.00
Piping and Valves	19.19
EC&I	35.36
Consumables	2.25
Spares	7.05
Construction Services	0.54
Project Services	22.36
Owners Cost	8.88
Estimate Allowance	33.82
Total	**402.97**

21.2 Operating Cost

The operating cost estimate has been completed from a zero base and presented in US$. Costs associated with labor, materials and consumables have been included in this estimate.

21.2.1 Mining Contractor Costing

The average mining cost based two mining contractor submissions received is US$ 2.65/t including the plant feed transport cost from all mining areas process plant. The cost breakdown is shown in Table 21-2. A diesel price of US$1.52 was used in all cost modelling.

Table 21-2: Life of Mine Mining Contractor Cost Summary

Total LOM Cost Summary	Base Case Cost 240 – 180 ktpm (US$ m)	Base Case Cost 240 – 180 ktpm (US$/t)
Time Related P&G	65.8	0.29
Load-Haul-Dump Cost	421.9	1.88
Total Drilling Cost	72.9	0.32
Total Blasting Cost	28.2	0.13
Plant feed Re-handle at ROM Tip	4.9	0.02
Services and Rehabilitation Cost (Allowance)	2.4	0.01
Total Bilboes Mining Cost	596.1	2.65

21.2.2 Process Plant Operating Cost

The concept level operating cost estimate was completed from a zero base. All labor, energy costs, materials and consumables have been included in this estimate. The bulk of the inputs were generated by DRA based on outcomes from mass balance, equipment sizing and budget quotations for the supply of reagents from typical suppliers within the region. Labor rates were supplied by the Bilboes owners' team with the compliment developed to support the plant operation. Engineering maintenance costs are based on a % applied to direct costs and can be treated as an annual allowance.

The Operating Expenditure (OPEX) cost for the process plant for each Phase and scenario is provided in the tables below as well as the reagent cost and consumption for Isabella McCay's and Bubi ore.

21.2.2.1 Reagent Consumption and Supply Rates

Table 21-3 presented below provides a summary of the expected reagent and consumable consumptions for Isabella McCay's and Bubi ore, based on results obtained from test work, vendor specifications, benchmark data and mass balances.

Table 21-3: Reagent Cost and Consumption for Isabella McCay's and Bubi

Description	Consumption Rate, kg/t ore	Supply Cost, US$/t RoM	Supplier Name
Isabella McKay's			
Collector (SEX)	0.150	3,125	BetaChem (SA)
Modifier ($CuSO_4$)	0.100	3,170	BetaChem (SA)
Frother (DOW)	0.045	3,063	BetaChem (SA)
Depressant (Na_2SO_3)	0.350	500	BetaChem (SA)
Depressant (Starch)	0.110	1,825	BetaChem (SA)
Sulfuric acid (H_2SO_4)	1.050	575	Curechem (Local)
Limestone	2.183	65	PPC Zim

Description	Consumption Rate, kg/t ore	Supply Cost, US$/t RoM	Supplier Name
Lime	3.074	330	PPC Zim
Nutrient	0.430	423	-
Anti-scalant	0.002	3,810	-
Corrosion inhibitor	0.002	3,542	-
Biocide	0.002	4,500	-
Defoamer - BIOX	0.001	5,940	-
Defoamer - CIL	0.005	5,940	-
Flocculant	0.017	4,000	-
Cyanide	1.000	3,030	Curechem (Local)
Carbon	0.001	3,540	Acol chemicals (Local)
Hydrochloric acid	0.025	770	Curechem (Local)
Caustic soda (NaOH)	0.065	1,050	Curechem (Local)
SMBS	0.250	860	Acol chemicals (Local)
Copper sulfate ($CuSO_4$)	0.005	3,167	Acol chemicals (Local)
Bubi			
Collector (SEX)	0.150	3,125	BetaChem (SA)
Modifier ($CuSO_4$)	0.100	3,170	BetaChem (SA)
Frother (DOW)	0.045	3.063	BetaChem (SA)
Depressant (Na_2SO_3)	0.350	500	BetaChem (SA)
Depressant (Starch)	0.110	1,825	BetaChem (SA)
Limestone	45.708	65	PPC Zim
Lime	7.831	330	PPC Zim
Nutrient	0.860	423	-
Anti-scalant	0.003	3,810	-
Corrosion inhibitor	0.003	3,542	-
Biocide	0.003	5,727	-
Defoamer - BIOX	0.001	5,940	-
Defoamer - CIL	0.020	5,940	-
Flocculant	0.030	4,000	-
Cyanide	2.000	3,030	Curechem (Local)
Carbon	0.012	3,540	Acol chemicals (Local)
Hydrochloric acid	0.050	770	Curechem (Local)
Caustic soda (NaOH)	0.130	1,050	Curechem (Local)
SMBS	0.500	860	Acol chemicals (Local)
Copper sulfate ($CuSO_4$)	0.1	3,167	Acol chemicals (Local)

21.2.2.2 Power

The estimated average running load has been calculated using expected power draw from the equipment. Plant power has been based on grid supply at a unit rate of 0.10 US$/kWh. A summary is shown in Table 21-4.

Table 21-4: Process Plant OPEX – Power

Description	Unit	Value	Source
Power Supply Cost	US$/kWh	0.10	Bilboes Owners Team
Power Draw: Isabella McCay's	kWh/t RoM	66	Calculated
Power Draw: Bubi	kWh/t RoM	114	Calculated

21.2.2.3 Maintenance

An annual maintenance allowance has been included and is based on a percentage of mechanical equipment, platework, steelwork, ECI, piping and valve capital costs. An allowance equivalent to 5% has been included in the cost estimate.

21.2.2.4 Labor

Labor rates have been supplied by the Bilboes owners' team. The compliment has been reviewed between DRA, Bilboes and Metso Outotec covering the main process plant and BIOX for each scenario.

21.2.2.5 Laboratory

Costs associated with the laboratory covering labor, consumables, and sample analysis have been considered. An estimated cost of 0.177 US$/t RoM was used for the various scenarios.

21.2.2.6 Tailings Storage Facility Deposition and Operation

SLR have conducted a concept level revalidation costing exercise for the tailing storage facility covering both the flotation and BIOX tailings storage. A unit operational cost of US$ 0.30/t flotation tails and US$ 0.49/t BIOX tails has been estimated and used in the cost estimate.

21.2.2.7 Operating Cost Estimate Summary

Table 21-5 provides an approximate breakdown of operating costs per major section of the proposed Bilboes plant for each scenario and Phase of the project.

Table 21-5: Process Plant OPEX

Description	Unit	Phase 1: 240 ktpm IM	Phase 2: 180 ktpm Bubi
Variable	**US$ m/a**	**37.93**	**53.33**
Reagents and Consumables	US$ m/a	20.58	34.51

Description	Unit	Phase 1: 240 ktpm IM	Phase 2: 180 ktpm Bubi
Power	US$ m/a	9.64	10.09
Maintenance	US$ m/a	7.70	8.73
Fixed	**US$ m/a**	**12.31**	**17.17**
Power	US$ m/a	9.23	14.45
Labor	US$ m/a	1.75	1.75
Tailings deposition	US$ m/a	0.82	0.58
Laboratory	US$ m/a	0.51	0.38
Overview		-	-
RoM	t/a	2.88	2.16
Total variable	US$ m/a	37.93	53.33
Total fixed	US$ m/a	12.31	17.17
Total	US$ m/a	50.24	70.49
Unit cost	US$/t ore	17.44	32.64

21.2.3 General and Administration Costs

The G&A cost includes administrative personnel, general office supplies, safety and training, travel (both on site and off site), independent contractors, insurance, permits, fuel levies, security, camp power, camp costs, ICT, relocation, and recruitment.

The costs mentioned above are not directly chargeable to the mining and process areas and hence are grouped together in general and administrative costs. Total G&A costs amount per scenario Phase is shown in Table 21-6.

Table 21-6: General and Administrative Cost

Plant Throughput (ktpm)	G&A Cost (US$ m/a)
IM 240 ktpm	4.91
Bubi 180 ktpm	4.91

22 ECONOMIC ANALYSIS

22.1 Introduction

The potential economic viability and performance of the PEA has been determined through developing a financial model founded on the results derived from the study and information provided by the Bilboes owner's team only using indicated and measured resources. The results tabled in this section have been based on forward looking statements, including (but not limited to) the feed profiles, grade profiles, gold recoveries, capital and operating cost requirements and gold pricing profiles. As such, the results presented in this section should be treated with caution and are meant for decision-making purposes only.

22.2 Method

The economic analysis for this option has been carried out using Discounted Cash Flow (DCF) methodologies. The analysis has been based on earnings after taxation modelled in constant terms and does not consider the effects of inflation, interest, escalation, and other financial charges. The economic model has been populated on a 100% equity basis and does not consider alternative financing scenarios. Financing related costs such as interest expense, withholding taxes on dividends and interest income, are excluded from the economic model. Additional exclusions pertaining to capital and operating costs can be sourced from the relevant report chapter detailing these sections.

The interpretation of the taxation and the associated legislation relevant to Zimbabwe has been based on information available in the public domain as well as guidance received from the Bilboes team. DRA does not provide expert advice on taxation matters. VAT refunds and exemptions have not been considered in the economic model. Any other tax or levy, not explicitly defined, has not been considered in the model. The tax model used should be regarded as conceptual but is deemed to be suitable for this level of study. It is recommended, during the next project phase, to seek validation through a third-party consulting firm who specialize in taxation and legislative conformance in Zimbabwe.

Cash flows considered in the cash flow model include annual revenue, operating costs, initial capital expenditure, Stay in Business (SIB) capital allowance, capital contingency, environmental rehabilitation capital allowance, royalties (to government and Baker Steel) and income tax presented on a year-by-year basis. The project start date has been based on year 2026. All currency figures are reported in US$ with all cashflows presented in financial years starting in January and ending in December.

22.3 Sources of Information

The basis of the financial evaluation has been founded on information sources from DRA and the Bilboes owners' team. An overview of key sources of information is presented in Table 22-1.

Table 22-1: Sources of Information

Description	Source of Information / Responsible / Notes
General	
Discount rate	Bilboes Owners Team
Royalty tax rate	Bilboes Owners Team
Aids levy	Bilboes Owners Team
Macro Variables	
Exchange rates	Bilboes Owners Team
Product pricing	Bilboes Owners Team
Production Schedules	
RoM tonnes and ounces	DRA
Initial Capital Expenditure (CAPEX)	
Mining	DRA
Process plant	DRA (with input from others)
TSF	SLR
Stay in Business (SIB) Capital	
Mining	DRA
Process plant	DRA
Operational Expenditure (OPEX)	
Mining	DRA
Process plant	DRA (with input from others)
TSF	SLR
G&A	Bilboes Owners Team
Revenue	
Product recoveries	Bilboes Owners Team (previous testwork)
Product pricing	Bilboes Owners Team

22.4 Exchange Rates

A following static exchange rates have been applied and shown in Table 22-2.

Table 22-2: Exchange Rates

Exchange	Rate
US$: ZAR	18.74
US$: AUD	1.50
US$: GBP	0.79
US$: EUR	0.92

22.5 Production Profile

The production profile is reported as plant feed fed to the plant from four mineralization properties which are McCays, Isabella North, Isabella South and Bubi for all three scenarios that were considered before selecting the one published in this report. A total of ~23 Mt of mineralized material is delivered to the processing facility, with ~200 Mt of waste removed over the same period. The average grade over life of mine is estimated at ~2.38 g/t Au.

22.6 Capital Expenditure and Phasing

The total initial capital estimate for the project includes capital required to expand the mining operation and a contingency allowance. Initial capital has been phased based on a high-level project execution schedule for each scenario. Further detail covering the execution schedule and basis of costs can be found in the relevant section of this report.

A summary of initial capital costs is shown in Table 22-3. This is inclusive of mining, processing, tailings, and a contingency allowance.

Table 22-3: Initial Capital Cost – Constant Terms (2023)

Scenario	Unit	Total	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036
Base Case	US$ m	403	-	120	189	24	-	11	15	43	1	-	-	-

22.7 Stay in Business Capital

SIB capital expenditure has been considered, covering both mining and process plant allowances. Mining costs have been allowed for over LoM on a period basis for fleet replacement. Process plant SIB has been based on an annual allowance of 1% of process plant OPEX. Total SIB costs are summarized in Table 22-3.

Table 22-4: SIB Capital Cost (LoM) – Constant Terms (2023)

Scenario	Unit	Total (LoM)
Base Case	US$ m	8.52

22.8 Operating Expenditure

The operating costs over the LoM include the mining operation, processing plant (incl. tailings disposal) and G&A costs.

Table 22-5 shows the estimated operating cost by category over the LoM. These costs have been developed from first principles and do not include a contingency.

Table 22-5: Operational Cost Estimate (LoM) – Constant Terms (2023)

Description	Unit	Value
Mining		
Cost	US$ m	596.13
Unit cost	US$/t RoM	25.54
Process Plant		
Cost	US$ m	564.31
Unit cost	US$/t RoM	24.18
G&A		
Cost	US$ m	47.17
Unit cost	US$/t RoM	2.02
Total		
Cost	US$ m	1,207.61
Unit cost	US$/t RoM	51.74

22.9 Gold Recovery

Process specific parameters have been applied for each mineralization property, informed from historical test work outcomes, third party consultation and discussions with the Bilboes owners' team.

Metal recoveries have been applied as static variables over the prescribed LoM for each scenario. A summary of these inputs is shown in Table 22-6.

Table 22-6: Gold Recovery per Mineralization Property

Property	Unit	Recovery	Reference
McCays	%	83.62	Testwork / Third party / Client
Isabella north	%	83.62	Testwork / Third party / Client
Isabella south	%	83.62	Testwork / Third party / Client
Bubi	%	88.88	Testwork / Third party / Client

22.10 Gold Pricing

A static metal price, based on a three-year trailing average price up to April 2024, has been applied as prescribed by the Bilboes owners' team. A price of US$ 1,884/oz has been applied in the financial model for all scenarios considered.

22.11 Salvage Value

No allowance for asset disposal at the end of life of mine has been included in the financial model.

22.12 Working Capital

No allowance for working capital has been included in the financial model.

22.13 Sunk and On-going Capital

No on-going, historical, or sunk costs have been considered in the financial model.

22.14 Reclamation and Closure

An allowance for on-going environmental rehabilitation is included in the financial model together with a final closure cost of US$ 32 m expended during the last year of operation for each scenario. On-going environmental rehabilitation is based on a unit rate of US$ 0.25/t RoM.

22.15 Royalty Tax

Royalty tax has been based on Zimbabwean legislation (Mines and Minerals/Finance Act) and supported by the Bilboes owners' team. Royalties' payable are a function of gross revenue and a royalty percentage. The royalty percentage is fixed at 5% for gold and enforced regardless of operating margin achieved. The formula used to calculate royalty's payable has been defined below:

$$Royalty\ (USD) = Gross\ Sales\ (USD) \times Royalty\ \%$$

Where royalty % is defined as:

$$Royalty\ \% = 5\%\ for\ gold\ sales$$

22.16 Corporate Income Tax

Corporate income tax has been based on Zimbabwean legislation (Income Tax Act) and as advised by the Bilboes owners' team. Income tax payable is a function of pre-tax profit and a taxation rate. Pre-tax profit is inclusive of all revenue, capital and development costs, operating costs, depreciation, amortization, and royalties. Capital expenditure (and development costs) incurred prior to production are claimed in full during the first production year. Subsequent capital expenditure is expended in full during the year of occurrence. Losses are carried over indefinitely until a profit is realized following which tax is levied based on annual pre-tax profits. A fixed effective taxation rate of 25.75% has been applied and is inclusive of an AIDs levy.

22.17 Discount Rate

The project is based on an execution start date of 2026. A 10% discount rate has been applied in the financial model. A day zero discounting has been applied i.e. the full financial year of 2025 has not been discounted in the model.

22.18 Economic Outcomes

The financial model has been prepared on a 100% equity project basis and does not consider alternative financing scenarios (Table 22-8). A discount rate of 10% has been applied in the analysis. The outcomes are presented on a pre-tax and post-tax basis. A static metal price of US$ 1,884/oz has been applied. All-in sustaining costs have been reported as per the WGC guideline dated November 2018 and is exclusive of project capital, depreciation, and amortization costs. Capital payback is exclusive of the construction period and referenced to the start of first production. Key financial outcomes are shown in Table 22-7.

Table 22-7: Summary of Economic Outcomes

Description	Units	Value
Production Statistics (LoM)		
Life of Mine	years	10
Total RoM Tonnes	tonnes	23,340,310
Cost Estimate Summary (LoM)		
Capital Cost (incl. contingency)	US$ m	402.97
SIB Capital Cost	US$ m	8.52
Operating Cost	US$ m	1,207.61
Unit Cost	US$/t RoM	51.74
Revenue (LoM)		
Au Recovered	Ozt	1,518,111
Ave. Price	US$/Ozt	1,884
Financial Outcomes (Pre-tax, Constant Model Terms)		
NPV @ 10%	US$ m	431.68
IRR	%	39.39
Peak Cash Funding	US$ m	309.18
AISC	US$/Ozt	967.90
Payback (UNDISCOUNTED) - From Production Start	years	1.9
Financial Outcomes (Post-tax, Constant Model Terms)		
NPV @ 10%	US$ m	308.73
IRR	%	33.99
Peak Cash Funding	US$ m	309.18
AISC	US$/Ozt	967.90

Description	Units	Value
Payback (UNDISCOUNTED) - From Production Start	years	1.9

Table 22-8: Cashflow Model

		FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037
Revenue														
Total metal produced	koz	-	-	-	145.18	196.10	166.02	170.20	178.44	174.87	146.01	144.31	135.70	67.80
Net Revenue	US$ m	-	-	-	266.64	360.17	304.91	312.59	327.72	321.18	268.16	265.05	249.22	124.53
Operating and Other Costs														
Mining costs	US$ m	-	-	-	(58.53)	(85.31)	(91.60)	(92.27)	(47.97)	(53.74)	(56.22)	(49.95)	(46.96)	(13.58)
Process plant costs	US$ m	-	-	-	(42.86)	(50.51)	(50.24)	(50.24)	(49.75)	(70.79)	(70.49)	(70.49)	(70.49)	(38.78)
G&A costs	US$ m	-	-	-	(2.95)	(4.91)	(4.91)	(4.91)	(4.91)	(4.91)	(4.91)	(4.91)	(4.91)	(4.91)
Environmental Rehabilitation	US$ m	-	-	-	(0.58)	(0.72)	(0.72)	(0.72)	(0.71)	(0.55)	(0.54)	(0.54)	(0.54)	(31.90)
Total		-	-	-	(104.92)	(141.46)	(147.47)	(148.14)	(103.34)	(129.99)	(132.17)	(125.90)	(122.91)	(89.17)
SIB Capital														
Mining	US$ m	-	-	-	-	-	-	-	(2.88)	-	-	-	-	-
Process plant	US$ m	-	-	-	(0.43)	(0.50)	(0.50)	(0.50)	(0.50)	(0.71)	(0.70)	(0.70)	(0.70)	(0.39)
Total	US$ m	-	-	-	(0.43)	(0.50)	(0.50)	(0.50)	(3.37)	(0.71)	(0.70)	(0.70)	(0.70)	(0.39)
Capital Expenditure														
Mining	US$ m	-	-	(10.91)	(14.63)	-	-	-	-	-	-	-	-	-
Process and Infrastructure	US$	-	(103.60)	(141.00)	(4.00)	-	(10.91)	(13.89)	(37.24)	(1.18)	-	-	-	-
Indirect	USD	-	(11.53)	(15.17)	(2.87)	-	-	(0.74)	(1.48)	-	-	-	-	-
Contingency	USD	-	(4.83)	(22.14)	(2.52)	-	-	(0.52)	(3.81)	-	-	-	-	-
Total Capital	USD	-	(119.96)	(189.22)	(24.02)	-	(10.91)	(15.15)	(42.53)	(1.18)	-	-	-	-
Royalties	US$ m	-	-	-	(13.67)	(18.47)	(15.64)	(16.03)	(16.81)	(16.47)	(13.75)	(13.59)	(12.78)	(6.39)
Pre-Tax Cash Flow	US$ m	-	(119.96)	(189.22)	123.60	199.73	130.39	132.77	161.68	172.83	121.53	124.85	112.83	28.58
Tax	US$ m	-	-	-	-	(3.64)	(33.58)	(34.19)	(41.63)	(44.50)	(31.30)	(32.15)	(29.05)	(7.36)
Post-Tax Cash Flow	US$ m	-	(119.96)	(189.22)	123.60	196.09	96.82	98.59	120.05	128.33	90.24	92.70	83.78	21.22

22.19 Sensitivity Analysis

A sensitivity analysis has been conducted assessing the impact of variations in initial capital cost, operating cost, and metal selling price. Each variable is assessed in isolation to determine the impact on Net Present Value (NPV) and Internal Rate of Return (IRR).

The impact of initial capital costs has a limited elasticity in impacting overall project value due to the capital phasing profile and relatively low expenditure in comparison to revenue and operating costs over the prescribed LoM. A summary of these relative variations is shown in Figure 22-1.

Figure 22-1: Sensitivity Analysis

A data table analysis has been conducted to specifically illustrate the influence of changes in gold pricing and discount rates on the project's economic outcomes and is presented in Table 22-9. The yellow highlight in the table below indicates the current base case scenario. The NPV and payback period (undiscounted, from production start) are presented on a post-tax basis.

Table 22-9: Data Table Analysis

NPV (Post-tax), USD M

Gold Price, USD/Ozt	Discount Rate, % 15	12.5	10	7.5	5
1,500	31	59	94	137	191
1,700	116	157	206	267	342
1,884	194	246	309	385	480
2,000	243	302	373	460	567
2,200	327	398	484	588	717
2,400	411	494	594	717	867
2,600	495	590	705	845	1016

Gold Price, USD/Ozt	Payback Period (Post-tax), years
1,500	3.6
1,700	2.5
1,884	1.9
2,000	1.8
2,200	1.6
2,400	1.5
2,600	1.3

23 ADJACENT PROPERTIES

Several small mines and two larger ones have operated in the past in the area around the Isabella property and within the Isabella and Gwizaan EPOs (Figure 23-1) but all of these had been dormant for at least 15 years prior to the renewal of exploration activity in the area in the early 1980s. The productions listed in Table 23-1 are for the period to 1980. The Calcite Mine is located in the area now covered by the Isabella operation and its production is included in the History section. The Motapa, Fossicker and Jupiter Mines are situated immediately to the south of the Mine and trend in the same general strike of Isabella, McCays and Bubi.

The Isabella EPO 1726 surrounds Isabella McCays while the Gwizaan EPO 1646 surrounds Bubi as well as a cluster of other Bilboes exploration claims namely When, Sandy and Ferroro. The two EPOs which are contiguous were approved for exploration through a government gazette of 13 July 2018 and had a combined ground holding of 67,419 ha. The EPOs have a three-year tenure which expired on 12 July 2021. Approvals for extension of the tenure of the EPOs are still pending. Several high quality geological and aeromagnetic targets are located within the major northeast-southwest trending deformation zones that transect the EPOs such as along the Peter-Pan, Courtleigh and Gabriella-Mulungwane shear zones. These targets in addition to the existing exploration claims offer potential for organic growth of Bilboes' Gold Mineral Resources.

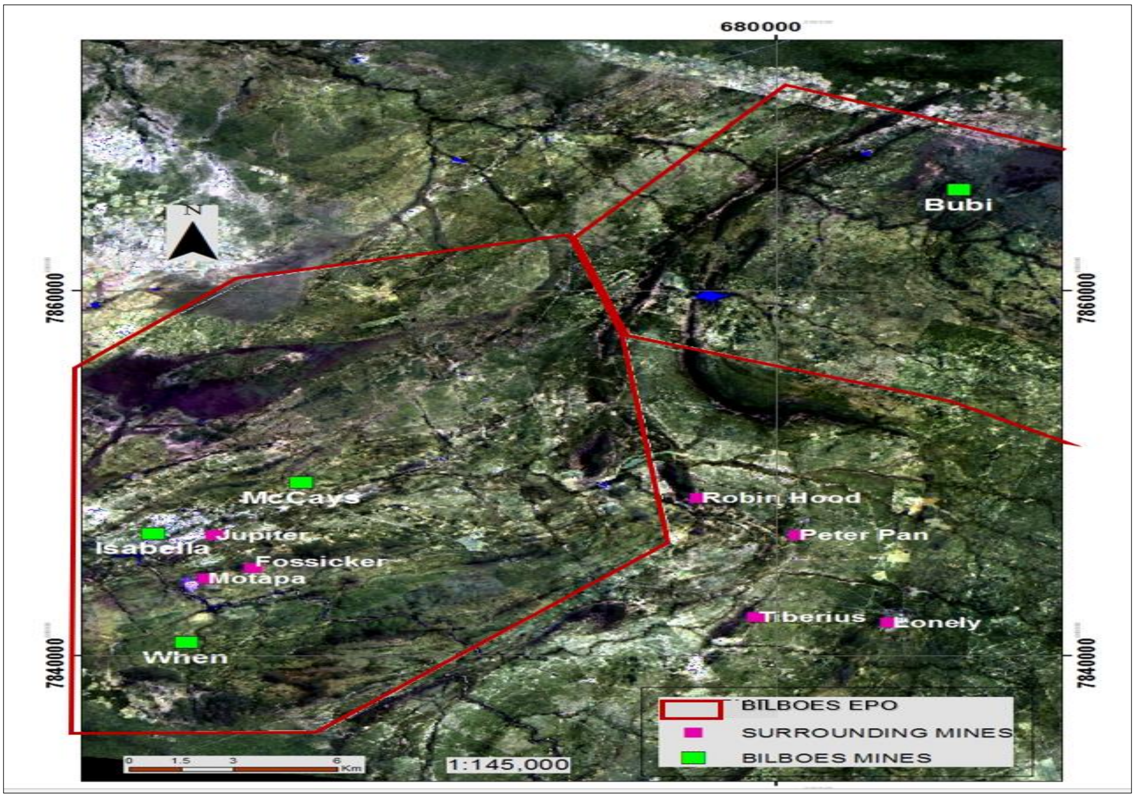


Figure 23-1: Adjacent Properties around Isabella McCays and Bubi

Table 23-1: Historic Gold Production from Mines around Isabella McCays and Bubi to 1980

Mine	Au kg	Grade g/t	Coordinates		Locality from Isabella
			Easting	Northing	
Motapa	9,467	4.3	663,613	7,844,250	2 km south
Fossicker	472	3.7	664,953	7,844,803	3 km south-east
Jupiter	201	3.9	663,870	7,846,633	1 km east
Lonely	34,786	17.5	683,276	7,841,837	20 km east
Peter Pan	968	2.9	680,606	7,846,618	18 km east
Robin Hood	248	2.1	677,790	7,848,663	15 km east
Tiberius	263	2.2	679,408	7,842,128	17 km east

Source Bartholomew (1990), Coordinate system: UTM, Arc1950, Zone 35S, Spheroid-Clarke 1880.

Gold mining near Bulawayo, Zimbabwe, involves several projects currently being developed by various companies.

One significant project is the Bulawayo Gold Project, led by Galileo resources. This project encompasses two exploration licenses covering 1,300 km^2 near Bulawayo. Recent soil surveys have revealed substantial gold targets, extending known gold-bearing structures in the region. The project aims to identify and drill-test these anomalies, which have shown promising gold-in-soil sample results.

Additionally, Galileo resources is also involved in the Queen's Mine area near Bulawayo. They have identified multiple gold targets based on recent soil analytical results. These targets represent extensions of existing gold-bearing structures, which host both commercial and artisanal mining operations.

Another notable venture is the Golden Valley Project, acquired by Pambili in November 2023. Located in Matabeleland Province, this project has a history of high-grade underground mining. Pambili plans to leverage modern exploration techniques to unlock the full potential of the site, which has been underexplored in recent years.

The relevant QP has been unable to verify the information in this section. The information in this section is not necessarily indicative of the mineralization on the Bilboes properties.

24 OTHER RELEVANT DATA AND INFORMATION

None.

25 INTERPRETATION AND CONCLUSIONS

25.1 Mineral Resource Estimate

- The data collected during the exploration, drilling and sampling programmes, including surveying, drill hole logging, sampling, geochemical analysis, and data quality assurance, was collected in a professional manner and in accordance with appropriate industry standards by suitably qualified and experienced personnel.
- The geological modelling and Mineral Resource estimate were undertaken utilizing recognized deposit and industry strategies/methodologies for the Bilboes deposit.
- The Mineral Resource is constrained in an optimized pit shell. This together with the assumptions relating to mining, processing, infrastructure, and market factors supports the "reasonable prospects for eventual economic extraction".
- Based on an assessment including: - data quality and integrity, data spacing, confidence in the grade interpolation, confidence in the geological interpretation and confidence in the estimate the relevant QP believes the Mineral Resource estimate is robust.

25.2 Mining Engineering

- Both the modelling and the grade interpolation have been conducted in an unbiased manner and that the resulting grade and tonnage estimates should be reliable within the context of the classification applied.
- The open pit modelling is based on suitably supported assumptions and parameters and completed utilizing appropriate industry standards suitable for the Bilboes Project.
- The economic modelling is supported by technical studies in mining, processing, infrastructure, environmental, social, and marketing. Based on the inputs from these disciplines, the financial model demonstrates an economically viable mine. The economic analysis is based on a US$ 1,884/oz.
- The sensitivity analyses demonstrates that the profitability of the project is most sensitive to revenue related factors such as gold price and recovery.

25.3 Economic Outcomes

The financial model has been prepared on a 100% equity project basis and does not consider alternative financing scenarios. A discount rate of 10% has been applied in the analysis. The outcomes are presented in Table 25-1 on a post-tax basis. A static metal price of US$1,884/oz has been applied.

Table 25-1: Project Economics Summary

Description	Units	Value
Financial Outcomes (Post-tax, Constant Model Terms)		
NPV @ 10%	US$ m	308.73
IRR	%	33.99
Peak Cash Funding	US$ m	309.18
AISC[§§]	US$/oz	967.90
Payback (UNDISCOUNTED) - From Production Start	years	1.9

25.4 Risk Assessment

Various risks have been identified with consideration of the appropriate mitigating factors. These are presented in Table 25-2.

[§§]As per updated guidance note published by WGC, 2018. Excludes project capital, depreciation, and amortization costs.

Table 25-2: Summary of Identified Risks and The Mitigation Strategies

Risk Category	Risk	Description / Cause	Mitigation / Control
Permitting	Significant effect of ability to produce	The lapsing of permits or license	Proactive management of permits, licenses, compliance etc.
Geology and Mineral Resources	Significant Variance in Mineral Resource Tonnage	1. Inaccurate mineral resource models due to poor geological understanding of the deposit. 2. Inaccurate mineral resource models due to geological complexity of the deposit. 3. The tonnage is expected to change on a local scale but is unlikely to vary significantly on a global scale.	1. Contingency measures applied during mineral resource modelling to ensure mineral resource models remain conservative. 2. Continued drilling conducted on the deposit to improve geological understanding of the deposit. 3. A infill drilling programme will be conducted pre-mining and throughout the life of the mine.
Geology and Mineral Resources	Significant Variance in Mineral Resource Grade	The estimation of the grade is based on a limited number of intersection points. Although care has been taken to provide a robust estimate, the grade is expected to change on a local scale but is unlikely to vary significantly on a global scale.	1. A grade control programme including drilling will be conducted pre-mining and throughout the life of the mine. 2. Provision has been made for infill drilling and on-going exploration drilling during LoM.
Geology and Mineral Resources	Inaccurate oxide, transitional and sulphide plant feed tonnes and grades	Poor interpretation of the oxide, transitional and sulphide zones resulting in non-optimal planning.	Continued monitoring of the Oxide-Sulphide interface during the mining operation.
Mining	Poor run of mine plant feed grade	Poor grade control of the RoM plant feed resulting in excessive dilution of the grades.	1. Grade control drilling will be conducted pre-mining and the cost for this has been allowed for in the PEA. 2. Grade controllers will be employed to monitor the mining team during operations.
Mining	Significant reduction in plant feed produced	Lack of production due to aspects of geology, personnel, and resources	3. Continuous skills training 4. Monitoring of critical resources of production e.g. fleet 5. Proactive production management
Processing	Lower than planned gold recovery from the plant	Inaccurate gold recovery from the plant	1. Gold recovery assumptions were informed by the on-site flotation and BIOX® pilot plant test work. 2. Bilboes procured a flotation and a BIOX pilot plant for on-site test works during the operational phase to optimize the flotation and BIOX® gold recovery. 3. Sulphide / Sulphur concentrate feed grade which ensures high bacterial activity and process stability is higher than the minimum of 4-6% required.

Risk Category	Risk	Description / Cause	Mitigation / Control
Processing	Operational inefficiencies in the BIOX® plant	1. As it will be the first BIOX plant in Zimbabwe there may not be local operators / metallurgists with appropriate expertise. 2. Shortage of BIOX critical skills in Zimbabwe.	1. Provision made for experienced personnel in the budget. 2. Bilboes will enter into a BIOX® Technology License Agreement with Outotec for technical support in the running of the BIOX plant. 3. Outotec will train and develop local personnel in the running of the BIOX® plant. 4. Bilboes will second personnel to similar operations for exposure before commencement of its own operation.
Finance	Inflation and monetary policy	The project is in Zimbabwe, which is facing severe economic challenges, which seriously undermines confidence for investment in major projects.	1. The project earns its 75% of its revenues in US$ and has minimal exposure to Zimbabwe inflation. ➢ Bilboes can retain and maintain access to its revenue in US$.

26 RECOMMENDATIONS

- Based on the study work completed it shows a positive economic outcome. It is recommended that the Bilboes Project enters a feasibility study phase.

27 REFERENCES

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- SLR Consulting (Pty) ltd (August 2019) Hydrogeological Study for Bubi-Isabella-McCays Mines. Project No.: 710.04026.00019. Prepared for: DRA Projects (Pty) Ltd
- SLR Consulting (Pty) ltd (August 2019) Geotechnical Study for Bubi-Isabella-McCays Mines. Project No.: 710.04026.00019. Prepared for: DRA Projects (Pty) Ltd
- World Gold Council (2018) Guidance Note on Expenditure Definitions
- World Gold Council (2024) Statistics for Gold Demand and Supply

Appendix A: Desmond Subramani,

Principal Consultant at Caracle Creek International Consulting MINRES (Pty) Ltd (CCIC MinRes).

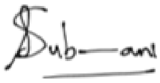
(HB.Sc., Pri.Sci.Nat.)

Site Visits, Data validation, Mineral Resource Estimate, Reporting

I, Sivanesan (Desmond) Subramani, BSc. Hons (Geology), Pri.Sci. Nat (400184/06) do hereby certify that:

1. I am Principal Geologist for Mineral Resources at Caracle Creek International Consulting MinRes (Pty) Ltd, 90 Beryl Avenue, Bramley North, Sandton, 2090, Gauteng, South Africa.
2. This certificate applies to the technical report titled "Bilboes Gold Project Preliminary Economic Assessment," with an effective date of 30 May 2024.
3. I am a graduate of University of KwaZulu Natal with a BSc Honors in Geology and Economic Geology.
4. I have practiced my profession continuously since 1995. I have over 25 years' experience in the exploration and mining industry. I have been involved in Mineral Resource estimation and compilation of technical reports since 2005.
5. I am a registered professional member of the South African Council for Natural Scientific Professions (Reg. No. 400184/06). I am a member of the Geological Society of South Africa and a member of the Geostatistical Association of Southern Africa.
6. I have read the definition of "Qualified Person" set out in National instrument 43-101 (NI 43- 101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be, a "Qualified Person" for the purposes of NI 43-101.
7. I am coordinating author of the Technical Report, and co-author responsible specifically for sections 7, 8, 9, 10, 11, 12, and 14, unless subsections are specifically identified by another Qualified Person.
8. I visited the property between 20 and 22 March 2018, and on 26 September 2018.
9. I am independent of Bilboes Holding (Private) Limited and its affiliates applying all the tests in section 1.5 of NI 43- 101.
10. I have not had prior involvement with the property that is the subject of the Technical Report.

11. I have read NI 43-101 and Form 43-101F1; the sections of the Technical Report I am responsible for have been prepared in compliance with that instrument and form.
12. As of the Effective Date, to the best of my knowledge, information and belief, the sections of the Technical Report I am responsible for contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.



Desmond Subramani

Appendix B: David Thompson,

Principal Mining Engineer, DRA Global

(B-Tech, Pr. Cert Eng, SACMA)

Mining Methods, Mining Capital and Operating Costs and Reporting.

CERTIFICATE OF QUALIFIED PERSON

I, David Alan Thompson, B-Tech, Pr. Cert Eng, SACMA do hereby certify that:

1. I am Principal Mining Engineer for DRA Projects Pty Ltd of Building 33 Woodlands Office Park / 20 Woodlands Drive Woodlands, Sandton, 2080 / South Africa.
2. This certificate applies to the technical report titled "Bilboes Gold Project Preliminary Economic Assessment," (the “Report"), prepared for Caledonia Mining Corporation Plc.
3. The Effective Date of the Report is 30 May 2024.
4. I am a graduate of University of Johannesburg with a Bacclaureus Technology Degree in Mining Engineering. I have worked as a mining engineer for a total of 40 years and 14 years since my B-Tech graduation.
5. I am a member of the Engineering Council of South Africa (No. 201190010), and a current member of the South African Colliery Managers Association (5066).
6. I have read the definition of "Qualified Person" set out in National instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be, a "Qualified Person" for the purposes of NI 43-101.
7 I am co-author of this Report and co-author responsible specifically for sections 1.13, 1.14, 1.23, 1.24, 15, 16, 21, and 25, unless subsections are specifically identified by another Qualified Person.
8. I have visited the property on 21 and 22 February 2018 and have reviewed all technical documentation available for the project to date.
9. I am independent of Bilboes Holding (Private) Limited and its affiliates and applying all the tests in section 1.5 of NI 43-101.
10. I have prior involvement with various study phases for the property that is the subject of the Technical Report.
11. I have read NI 43-101 and Form 43-101F1; the sections of the Technical Report I am responsible for have been prepared in compliance with that instrument and form.

12. As of the aforementioned Effective Date, to the best of my knowledge, information and belief, the sections of the Technical Report I am responsible for contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dave Thompson

David Thompson

Appendix C: Aveshan Naidoo,

Specialist Engineer at DRA Global.

(BSc Chemical, MBA, PrEng)

Metallurgy, valuation, reporting

As the Qualified Person and Compiler of the report entitled "Bilboes Gold Project Preliminary Economic Assessment," with an effective date of 30 May 2024 (the "Report"), I hereby state:

1. My name is Aveshan Naidoo, and I am the Specialist Engineer – Hydromet & Economics for DRA Projects, Building 33, Woodlands Office Park Sandton 2080.
2. I am a practising consulting engineer and registered with the Engineering Council of South Africa [Registration No. 20130523].
3. I have a Bachelor of Science in Chemical Engineering from the University of KwaZulu-Natal, South Africa and a Master of Business Administration from the University of Witwatersrand. I have 16 years of mining industry experience (especially gold, uranium, PGM's and manganese-related projects). I have practised my profession continuously since 2008.
4. I am a 'Qualified Person' as defined in and for the purposes of the National Instrument 43-101 (Standards of Disclosure for Mineral Projects) (the Instrument).
5. I have not visited the Bilboes Project for personal inspection.
6. I am a co-author of the Report, and co-author responsible specifically for sections 1, 17, 21, 22, 25, and 26 of this Report, unless subsections are specifically identified by another Qualified Person.
7. I am not aware of any material fact or material change with respect to the subject matter of the Report that is not reflected in the Report, the omission of which would make the Report misleading.
8. I declare that this Report appropriately reflects the Qualified Person's/author's view.
9. I do not have, nor do I expect to receive a direct or indirect interest in the Mineral properties of Bilboes Holding (Private) Limited and its affiliates and I do not beneficially own, directly or indirectly, any securities of Bilboes Holding (Private) Limited or any associate or affiliate of such company.
10. I have read the Instrument and Form 43-101F1 (the "Form) and the Report has been prepared in compliance with the Instrument and the Form.

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

Aveshan Naidoo