

## PLANNING FOR THE FUTURE – PROJECTS, EXPLORATION AND INNOVATION

At AngloGold Ashanti, our project pipeline, exploration programmes and innovation initiatives focus on creating significant value by providing long-term optionality and improving the portfolio quality, two of our strategic focus areas. Innovation in particular aims to improve productivity and efficiencies and to reduce costs.

Our exploration programmes cover greenfields and brownfields exploration. They are based on consistent standards and processes across the AngloGold Ashanti portfolio and are guided by peer review.

Part of our investment strategy is focused on exploration drilling and Ore Reserve development to grow the Mineral Resource and by converting these, we expand the Ore Reserve. The process involves identifying the best group of drill targets and prioritising those that have the highest potential to be advanced first.

We have developed a system – Exploring for value (E4V) – to ensure that our exploration activities are focused on maximising value to the business and that ensures ounces are delivered into the business plan and ultimately brought to account. In order to maximise value, we had to establish a system that goes beyond the SAMREC code and allows us to bring into play at an early stage, very low confidence material in order to ensure that our exploration pipeline can deliver into our life-of-mine plans at the right time and at the right level of confidence. This system allows for the capture of geological understanding from the earliest stage of development. In addition to integrating our E4V process with our life-of-mine planning, we have also integrated with our project stage-gate process and our accounting standards.

In this integration, as an area is explored and drilled a series of stage-gate reviews and appropriate economic studies are used to justify the next level of exploration. The size of the area naturally controls to an extent the scope of the study for example a large greenfields discovery will require a full series of studies moving from early stage scoping to a conceptual study and ultimately all the way to a feasibility study, if it passes the hurdles between studies. Each of these steps, matched with a required level of confidence in the material to be mined, will undergo a defined stage-gate review. In the case of a small underground extension in a brownfields operation the studies would be infinitely less detailed but would still be required. These processes ensure that funds are not expended on areas that do not meet business plan requirement or potentially add value as produced ounces.

Targeted investments during the year led to two positive advances, with Pure Gold Mining achieving first gold production at the Madsen mine redevelopment in Red Lake, Ontario, and Corvus Gold continued advanced exploration at their projects in Nevada and published updated PEA (define) studies for the North Bullfrog and Mother Lode projects. AngloGold Ashanti actively monitors for new early stage opportunities that have the potential to be a fit for our company portfolio should the exploration programmes for the projects prove to be successful.

Our exploration programmes cover greenfields and brownfields work:

- Greenfields exploration aims to discover large, high-value Mineral Resource, which will eventually lead to the development of new gold mines
- Brownfields exploration focuses on delivering value through accretive additions to the Ore Reserve at existing mines as well as new discoveries in defined areas around operations

### Projects

#### Greenfields projects

##### Americas – Colombia

Our three greenfields projects in Colombia are Quebradona, Gramalote and La Colosa, which make a significant combined contribution of 38.5Moz to AngloGold Ashanti's total Mineral Resource. Quebradona and Gramalote together contribute 4.2Moz to the Group gold Ore Reserve while Quebradona has a copper Ore Reserve of 3,105Mlb.

**The Quebradona project** is situated in the Middle Cauca region of Colombia, in the Department of Antioquia, 60km southwest of Medellín within the Municipality of Jericó. The project is 100% owned and managed by AngloGold Ashanti.

The feasibility study currently underway to determine the engineering activities is due to be completed early in 2021. During the second half of 2020, much of the focus was on responding to requests for additional information as part of the application process for the necessary mining and environmental licenses and related permits. Following completion of the feasibility study, the project will be submitted for board approval in the second quarter 2021.



Geita

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The project is expected to treat 6.2Mt annually to produce 3 billion pounds of copper, 1.5Moz of gold and 21Moz of silver over a potential 23-year life. First production is expected to start in the second half of 2025. Quebradona will be a copper mine with gold and silver as by-products. Simultaneously, work continued on incorporating all findings from peer reviews and promoting the ‘#Miningwithpurpose’ campaign, which seeks to highlight the integration of social, environmental and economic imperatives into the project and subsequent mining operations.

**The Gramalote project**, a joint venture between AngloGold Ashanti (50%) and B2Gold (50%), is located near the towns of Providencia and San Jose del Nus within the municipality of San Roque, in the northwest of the Department of Antioquia. It is approximately 124km northeast of Medellín, the regional capital of the Antioquia Department. B2Gold became the project manager and operator in 2020.

Work on the feasibility study continued as planned in 2020 with drilling resuming in May 2020. An updated Mineral Resource model completed by year end provided the information necessary to advance pit design and mining engineering studies. Feasibility stage metallurgical studies and process plant designs were also completed. Infrastructure design work continues. The results of the feasibility study are expected in 2021, and will be submitted for board approval. In December 2020, the Gramalote project received the “Sello Social de La Minería en Antioquia”, which is presented

through the Ministry of Mines of Antioquia to large scale operations, recognising Gramalote for its commitment to community support.

**The La Colosa project** is located approximately 150km west of Bogota Colombia in Tolima Department and is a very large porphyry-style gold deposit discovered by AngloGold Ashanti Colombia greenfield exploration group in 2006.

The project is 100% owned and managed by AngloGold Ashanti. It was halted and has been voluntarily suspended, since 2017, due to force majeure recognised by the national mining authority, relating to environmental permits required to continue the project’s mining exploration activities.

### Project outlook

The outlook for growth capital expenditure in the Americas region over the next few years until 2024 relate mainly to the Gramalote and Quebradona projects, where Quebradona allows the Group to diversify into copper production at an attractive estimated copper AISC margin of around 60% to 70%.

### Greenfields exploration

During 2020, generative exploration activities were undertaken in Australia, Brazil and the USA. In all, 80,541m of drilling were completed globally with total expenditure of \$31.2m over the year.



## Australia

### Laverton District – AngloGold Ashanti (100%) and Butcher Well and Lake Carey JV (70%)

Aircore (AC), reverse circulation (RC) and diamond drilling (DD) was completed in the Laverton District, with a total of 64,041m drilled in 2020.

At the Bismarck prospect (70% AngloGold Ashanti), six DD holes were completed for 1,128m. The drilling intersected predominantly basaltic-andesite volcanic rocks with gold mineralisation hosted in narrow sulphidic breccias and associated stockwork quartz veins.

At the Turing prospect (100% AngloGold Ashanti), 244 AC holes for 10,949m, 11 RC holes for 1,546m and four DD holes for 1,127m were completed. The AC drilling defined a greater than 2km long, NNW-trending zone of anomalous gold, which remains open along strike. Follow-up RC and DD returned mostly low-tenor gold along intercepts, apart from isolated high-grade results associated with coarse visible gold in narrow quartz veins.

At the Cleveland prospect (100% AngloGold Ashanti), 123 AC holes for 9,728m and 13 DD holes for 2,494m were completed. Several anomalous gold intercepts were received from AC drilling with results open from the southernmost drill line. The DD was designed to extend RC holes and test for down-plunge extensions to a 500m long, NNW-trending zone of gold mineralisation identified in the first half of 2020. Most of the DD holes intersected intervals of pyrite-chalcocopyrite mineralisation within quartz-sericite-pyrophyllite-chloritoid schist.

AC drilling was also completed at the Vampire (1,393m), Pioneer (1,239m), Seguin (558m), Triton (11,844m), Argonaut (1,011m), Juno (17,790m) and Kraken (3,144m) prospects.

### North Queensland (100% AngloGold Ashanti)

Field programmes consisting of mapping and soil sampling continue to be postponed due to travel restrictions related to the COVID-19 pandemic.

## United States

### Silicon (100% AngloGold Ashanti)

At Silicon, the Plan of Operations was approved during Q3 2020, and earthworks started for the construction of pads and roads throughout the central Silicon project area. One RC hole was completed (360m) before drilling was stopped. Drilling was restarted in October, with a total of 9,728m of combined diamond and RC drilling completed during the second half in 2020. Core drilling also began at the Merlin target in the southern Silicon project area during the period.

The final \$2.4m payment of the Silicon Option Earn-in Agreement was paid to acquire 100% ownership of the Silicon project.

### Rhyolite – AngloGold Ashanti (100% AngloGold Ashanti)

In the first half of the year, RC drilling for 2,423m was completed with no significant results received. Additional prospecting work was carried out at Rhyolite in second half of the year.

### Transvaal – AngloGold Ashanti (100% AngloGold Ashanti)

At Transvaal, drill target delineation was completed during the period based on detailed geological mapping and surface rock chip geochemical sampling from first half of 2020. IP lines were completed in the target area to refine drill targets developed in the first half of 2020. A Notice of Intent permit was submitted and received for drill pad and access construction for the first targets.

## Other

In **Brazil**, additional exploration licenses were granted at the WBC project.

In **Argentina** and **West Africa**, exploration focused on target generation activities.

## Brownfields exploration

During 2020, brownfields exploration activities were undertaken across the globe. Brownfields exploration completed 1,409km of



Australia – Tropicana

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drilling with a total expenditure of \$63.1m (capital) and \$67.7m (expensed) for the year.

### Africa

**Tanzania:** Capitalised (underground) and expensed (surface/underground) drilling programmes completed a total of 117,938m during the year at a cost of \$27.2m.

Mineral Resource development drilling continued at the Nyamulilima deposit. Results confirmed the continuity of the ore zones within the eastern and western mineralised domains and increased the Mineral Resource confidence within the optimised pit shells and allowed for the declaration of a maiden Ore Reserve. Results from the Mineral Resource development drilling at Nyankanga Block 3, Star & Comet Cut 3 and at Cut 2 confirmed the Mineral Resource model interpretations.

Sterilisation drilling for the waste dump was carried out and show no significant intersections.

Mineral Resource definition drilling was carried out at Nyankanga Block 1, returning results that confirmed the down-dip continuity of mineralisation at Block 1.

Reconnaissance drilling programmes into the footwall of the Nyankanga underground project returned low grade, erratic mineralisation hosted within these deep-seated structures. Reconnaissance drilling carried out at Star & Comet Cut 2 returned results that confirmed the presence of the footwall structure.

**Guinea:** Capitalised and expensed drilling programmes completed a total of 85,119m during the year at a total cost of \$10.9m.

At Block 1 infill drilling occurred at the Kami Saddle, Sintroko West, Sanu Tinti, Sokunu, Bidini, Bidini-Tubani-Kalamagna pushback, Sofore-Tubani, Bidini North, Kami and Seguelen PB2.

Reconnaissance drilling occurred at Kami North, Kami West and South, Solakoro North, Seguelen, the Carbonate Hills, Komatiguiya South East, Seguelen PB2, Sorofe-Tubani, Kossise and Balato NW.

In Block 2, Saraya infill drilling occurred and sterilisation drilling was carried out at Foulata. At Saraya West E.L. and Foulata reconnaissance drilling was completed.

Assays results were received for Sokunu northwest infill drilling, Sintroko West reconnaissance drilling, Sintroko West infill drilling and Komatiguiya southeast reconnaissance drilling.

Mapping focused on improving the understanding of the geology of the Bidini, Sanu Tinti, Kalamagna, Kami and Tubani pits. Field works were also conducted at Doko, Didid, Kossisem Kozan and Sokunu and there were encouraging observations.

Geometallurgical proxy data collection and interpretation were performed, and samples have been analysed respectively for pXRF, Terraspec and Equotip. At Saraya, metallurgical DD deeper hole drilling was completed, aimed at understanding Western intrusion.

**Ghana:** At Iduapriem, drilling totalled 47,164m at a cost of \$6.4m. During the year, exploration drilling principally focused on Block 1 East and West, Efuanta, Badukrom and the Block 5 Extension projects.

The Block 1 exploration project involved mapping and Mineral Resource conversion drilling at Block 1 Central, Block 1 East and Block 1 West. Significant intersections were reported for Block 1 East.

At Efuanta, drilling was wrapped up with significant intersections reported. While at Badukrom, drilling commenced in Q4 and reported significant intersections.

One hole was drilled at Block 3 West to ascertain the weathering profile down dip of the pit as part of the return water dam feasibility studies.

Block 5 extension drilling via RC and DD returned significant intersections.

Sampling of the Mile 8 auger drilling project was completed, and results have been received and narrowed down the anomalous targets. Outcrop mapping was carried out at Block 1 East and an 8m thick conglomerate outcrop was observed at ML6J.

At Obuasi, drilling continued with a total of 55,094m drilled in the underground exploration programmes at a cost of \$6.5m.

Exploration and infill drilling activities continued on 41 level in Block 10, and in stockpiles 12, 13 and 14 along the ODD 32 level in Block 8.

Grade control drilling continued in Block 8, 27 and 29 Level, Sansu 18 Level and 26 Level and 28 KRS in Block 10.

Results from 41 Level north and south drilling confirmed the Mineral Resource models.

Results from the reconnaissance drilling from stockpiles 12, 13 and 14 along the ODD showed continuity in grade and structure within the Obuasi fissure.

Grade control drilling results at 27 L 312, at 28 L KRS 295 and at 26 L in Sansu 3 shows continuity of the Obuasi fissure but variability in width.

**Democratic Republic of the Congo:** Capitalised and expensed drilling programmes at Kibali completed a total of 17,845m during the year at a cost of \$3.6m. The focus of exploration was on Mineral Resource replacement/addition and underground projects.

Drilling at KCD is in progress, with additional deep holes planned as the initial deep hole results were not encouraging, possibly clipping the edge of the payshoots.

Results returned from the Ikamva East and Kombokolo confirm the models. Two identified targets are to be tested with proposed drilling in 2021 Q1 at Ikamva area.

At Madungu, the target shows some upside with possible plunge extent to the mineralisation and further holes are planned. At Oere,

overall results from both drilling and trenching programmes support the current model.

While for the Kibali region, the KZ geological map was updated and four main sets of structures were highlighted and identified that infill soil sampling is required. At KZ South, field activities were completed and identified 6 sub-targets interpreted to potentially host higher grade mineralisation.

**Republic of Mali:** No exploration.

## Americas

In **Argentina**, a total of 25,075m of drilling was completed at a cost of \$4.4m.

A total of 0.93km of channels were carried out on the Carmela, Dora, Teresa and Gabriela veins in the southern and central parts of the tenements

Drilling was carried out to test down-dip extension of vein mineralisation at the Northern zone (Cuncuna, Vanguardia 1, Vanguardia 2, Vanguardia 3 veins), Central zone (Atila, Gesica, Loma del Muerto veins) and Southern zone (Carmela, El Lazo, Teresa veins).

Drilling was also carried out to test the extension of mineralisation in less well-defined veins outside the main district at Dora, El Trío, Oveja and Trinidad.

In **Brazil**, at Cuiabá and Lamego a total 89,251m was drilled at a cost of \$9.6m.

At Cuiabá, Mineral Resource Conversion drilling on Levels 20 and 21 was completed at the beginning of Q4. The L20 FGS/SER (main orebodies) drilling campaign continues, and excellent results reported. A directional drilling programme started in March and focused on Fonte Grande South.

The intensive drilling/ mapping campaign within the quartz-vein satellite orebodies was completed and the model has been updated. Several significant intercepts were also reported.

Drilling at secondary orebodies: Viana, Serrotinho and Galinheiro extensions (levels 04 and 05) returned good results confirming the orebodies potential to create mining flexibility at shallower levels.

In the regional programmes, at Descoberto a second drill rig commenced drilling and good results continue to be reported. At Tinguá, various exploration activities progressed well including mapping, soil sampling, which resulted in positive outcomes. The historical surface galleries surrounding or associated with Cuiabá mine were scanned. At Matarelli, a geochemical soil survey was conducted, and the first results showed local gold anomalies.

At the Lamego Sul Target the soil sample campaign was completed and the soil survey to cover most of the region started.

At Lamego, underground and surface drilling continued.

Results from exploratory drilling campaign from Queimada orebodies level 5 confirmed potential in lower levels of the mine and show strike extension potential.

Surface drilling returned positive gold results for AVOX (oxide programme). The Arco da Velha sulphide drilling campaign is currently on hold due to landlord issues.

At Córrego Do Sítio (CdS), capitalised and expensed drilling programmes completed a total of 154,709m at a cost of \$10.1m during the year.

At CdS I, underground drilling focused on Cachorro Bravo, Laranjeiras and Carvoaria with positive results from all targets. Surface drilling was carried out at Rosalino, Campinas and Mutuca and returned positive results.



Cuiabá

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Sunrise Dam

CdS II drilling was carried out at São Bento, Sangue de Boi and Pinta Bem Sul with positive results. Results are still pending for Pinta Bem Sul.

CdS III drilling continued at Jambreiro target and Anomalia as well as sterilisation drilling for the CdS III mining project. Most results are pending.

At Serra Grande, capitalised and expensed drilling programmes completed a total of 117,057m at a cost of \$7.8m.

Drilling focused on completing the drilling programme at Ingá, Forquilha, Mangaba-Corpo IV, Angicão (D Tereza), Mangaba, Palmeiras South Mine, Superior Zone (Mine III), VQZ (deep mine) and Pequizão.

The Mineral Resource evaluation process has been finished with Mineral Resource additions of 482,000oz and Ore Reserve additions of 343,000oz.

In **Colombia**, at La Colosa, no exploration occurred.

At the Quebradona project, drilling to cover the vent shafts and the planned ore passes was completed, and all results have been reported.

Grade control schedule activities were reviewed for the Quebradona Advanced Geology project. Operational Readiness final adjustments and feasibility study chapters are expected to include the summary of these activities up the end of January 2021.

The 2020 geotechnical drilling programme for infrastructure sites has been concluded. The geotechnical soils testing programme and rock test work is currently in progress.

## Australia

Exploration field reconnaissance, grab sampling and mapping was performed.

At Sunrise Dam capitalised and expensed drilling programmes completed a total of 214,294m at a cost of \$30.6m during the year.

Eleven underground rigs were used during the period, for infill, and reconnaissance drilling at Frankie, Frankie Extensions, Carey Shear, Porphyry Steeps, Cosmo East, MWS Steeps,

Hammerhead South, Vogue South, Vogue East, Vogue Deeps, Elle, Western Ramps and Flamingo. Exploration/reconnaissance drilling was conducted at Stella and Western Ramps. Regional surface exploration targeted Orchard, Pink Lady, Sunrise North and Golden Delicious

Significant intercepts were reported for Vogue, Frankie, Carey, Hammerhead South, Elle, Cosmo East, Western ramps and Porphyry Steeps.

At Tropicana, drilling completed 127,468m at a cost of \$10.2m.

Mine Mineral Resource development drilling comprised of in-pit Mineral Resource Confidence drilling at BS03; Mineral Resource confidence drilling at Crouching Tiger as part of the TSF options study; Indicated drilling at Madras and Measured underground diamond drilling at Tropicana underground.

Regional exploration AC drilling was carried out at Paradise, Madras, New Zebra, Husky, Sanpan, Phoenix North, Bushwacker and Snowball. RC and diamond drilling were completed at Madras/Masala, Springbok, Highball, Hat Trick, Phoenix, Voodoo Child, Wild Thing, Angel Eyes and Sazerac. The best assay results were returned from Tropicana underground and the Sazerac regional target.

### Exploration outlook

- Our planned investment in brownfields exploration drilling ramps up to a level of approximately \$150m to \$160m for Ore Reserve and Mineral Resource addition in 2021
- We expect another year of good performance across the portfolio
- We have expanded our greenfields exploration budget in 2021 to allow for expanded drilling in Western Australia and Nevada targets
- We were able to take advantage of field restrictions that were in place during most of 2020 to generate a group of new terranes and districts through data reviews and desktop assessments for field validation in 2021.

## Innovation

AngloGold Ashanti has a multi-pronged approach to innovation, spanning what is currently underway to a ten-year horizon and beyond. Our innovation timeline is as follows:

<b>Currently underway</b>	<ul style="list-style-type: none"> <li>• Mine automation</li> <li>• Electric/battery power</li> <li>• Data collection – analyse data gathered at the mining operations to improve insight into control of critical processes</li> </ul>
<b>Short term – in collaboration with:</b>	<ul style="list-style-type: none"> <li>• Innovative companies</li> <li>• Special organisations</li> <li>• Universities</li> </ul>
<b>Medium term:</b>	<ul style="list-style-type: none"> <li>• Collaborative research</li> </ul>
<b>Investing in innovation</b>	<ul style="list-style-type: none"> <li>• Funding</li> </ul>

### Innovation currently underway

Automated mining processes offer an immediate and significant opportunity to improve the quality of the underground environment, the precision of activities such as drilling, and the time spent on such activities. Automated equipment has been developed in conjunction with original equipment manufacturers (OEMs) and mining contractors, on a site-by-site basis. Leading examples of automation within the Group include drill automation at Tropicana, underground materials handling at Kibali, and remote underground loading at several of our operations. Obuasi and Quebradona have incorporated automation into their project scopes, while at Quebradona electric vehicles, remote loading/drilling and cave monitoring are planned from the outset.

The rollout of a A\$6m autonomous drill fleet at Tropicana is believed to be an industry first for hard-rock mining. This drill fleet is based on a hammer function versus the more traditional rotary concept for blast-hole drilling.

At Tropicana, five autonomous CAT MD6250 drill rigs and seven manned rigs are included in the mine's drilling fleet, and are supported by Flanders, a technology innovator and world leader in autonomous drilling, and by Tropicana Mining Alliance partner Macmahon Holdings. While still in its initial stages, the autonomous fleet has already recorded an 8% increase in instantaneous penetration rates compared to the manned rigs, along with much improved execution times.

### Short-term innovation

In the short term, encouraging innovation work is being driven by the strong connections we maintain with innovation companies. Such work includes identifying and managing trials at our operations. It is expected that these programmes will also involve key universities. Key to the successful completion of these projects, is to identify and support site champions. This research includes live monitoring of tailings dams using lidar (remote laser sensing), using fully integrated blast movement in grade control, spectral scanning of underground faces and muck piles to predict grades, new assay techniques such as photon assay for gold, artificial

intelligence to predict geological outcomes, and the use integrated diamond and reverse circulation underground drilling rigs.

### Medium-term innovation

We have targeted a five-ten-year time horizon for more centralised research efforts to be put into effect. These efforts are based on collaborative research, with AngloGold Ashanti's funding being met dollar-for-dollar by co-sponsors and, in many cases, by government funding. In terms of this innovation development model, we are actively involved in directing the research programmes toward those initiatives that best address identified areas requiring innovation. This effort is managed by a team of dedicated programme champions from within AngloGold Ashanti.

Currently, the organisations with which we are collaborating include Mining3, Amira, CRC Ore, LOP, Cave Mining2040 and COSMO.

### Investing in innovation

In the longer term, a move to invest in venture capital funds aimed at mining innovation is being considered. Two funds are being assessed. Investing in such funding in the very early stages of development will enable us to participate in and benefit from early-stage beta testing. This will also give us an advance preview of new technologies and the potential ability to reshape the industry, and eventually to enjoy the returns from the successful commercialisation of projects and from the growth of the start-up companies funded.



Australia Tropicana