Perseus Mining Limited
Technical Report
Yaouré Gold Project
Côte d'Ivoire

Qualified Persons:

Jonathon Abbott	MAIG	MPR Geological Consultants Pty Ltd
Joe McDiarmid	MAusIMM (CP)	RPM Global Canada Limited
David Morgan	MAusIMM MIEAust (CP)	Knight Piésold Pty Ltd
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Paul Thompson	FAusIMM	Perseus Mining Limited
Gary Brabham	FAusIMM	Perseus Mining Limited

Effective Date: 3 November 2017

Issue Date: 18 December 2017

CERTIFICATE of QUALIFIED PERSON

I, Jonathon Robert Abbott, MAIG, as an author of this report entitled "Perseus Mining Limited Technical Report Yaouré Gold Project Côte D'Ivoire" (the "Report") prepared for Perseus Mining Limited dated 18th December, 2017, do hereby state:

a) I am a consulting Geologist, with the firm of MPR Geological Consultants Pty Ltd, 19/123A Colin Street, West Perth, WA 6005, Australia.

b) I am a practising Geologist and registered Member of the Australian Institute of Geoscientists.

c) I graduated with a Bachelor of Applied Science in Applied Geology from the University of South Australia in 1990. I am a member of the Australian Institute of Geoscientists. I have worked as a geologist for a total of 27 years since my graduation from university. My experience includes mine geology and resource estimation for a range of commodities and mineralization styles. I have been involved in preparation and reporting of resource estimates in accordance with JORC guidelines for 22 years, and NI43-101 guidelines for approximately 14 years. 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.

d) I am a "Qualified Person" as that term is defined in National Instrument 43-101 (Standards of Disclosure for Mineral Projects) (the "Instrument").

e) I visited the Yaouré Project between the 17th of March and 22nd of March 2017. The purpose of the visit was to review the drilling and sampling practices and project geology.

f) I am responsible for Sections 12 and 14 of the Report.

g) I am independent of Perseus pursuant to Section 1.5 of the Instrument.

h) I do not have nor do I expect to receive a direct or indirect interest in Perseus, and I do not beneficially own, directly or indirectly, any securities of Perseus or any associate or affiliate of such company.

i) I have read the Instrument and Sections 12 and 14 of the Report which have been prepared in compliance with the Instrument.

j) My involvement with the project is limited to work on data reviews and mineral resource estimates since July 2016.

k) As of the effective date of the Report, to the best of my knowledge, information and belief, the sections of the report I am responsible for contain all scientific and technical information that is required to be disclosed to make the report not misleading.

Dated this 18th day of December 2017 at Perth Australia.

Jonathon Abbott, BASc Appl. Geol MAIG

Joe McDiarmid
Principal Mining Engineer
RPM Advisory Services Pty Ltd
Level 2, 131 St Georges Terrace,
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I, Joe McDiarmid, am working as a Principal Mining Engineer for RPM Advisory Services Pty Ltd (RPM), of Level 2, 131 St Georges Terrace, Perth WA 6000. This certificate applies to, the document entitled "Technical Report: Yaouré Gold Project, Côte d'Ivoire" (the "Report") prepared for Perseus Mining Limited dated 3rd November, 2017 (the "Technical Report"), do hereby certify that:

1. I am a Member and Chartered Professional of the Australasian Institute of Mining and Metallurgy ("MAusIMM (CP)") and the Registered Professional Engineer of Queensland (RPEQ).
2. I am a graduate of the Western Australian School of Mines (Australia) and hold a B.Eng. in Mining Engineering,
3. I have been continuously and actively engaged in the assessment, development, and operation of mineral processing projects since 1995.
4. I am a Qualified Person for the purposes of the National Instrument 43-101 of the Canadian Securities Administrators ("NI- 43-101").
5. I have visited the Property from 5th to 8th September 2016.
6. I am responsible for Items 15 and 16 of the Report and contributed to the mining sub sections of Items 1, 25, 26 and 27 of the report.
7. I am independent of Perseus Mining Limited in accordance with the application of Section 1.4 of NI-43-101.
8. I have read NI- 43-101 and Form 43-101F1 and the Technical Report has been prepared in compliance with that instrument and form.
9. To the best of my knowledge, information and belief, as at the effective date the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.

Dated this 15 day of December 2017 at Perth Australia

CHARTERED PROFESSIONAL
AusIMM
THE MINERALS INSTITUTE
MINING
JOE McDIARMID

"Joe McDiarmid" (QP)

Certificate of Qualified Person

I am an author of the report entitled "Technical Report: Yaoure Gold Project, Cote D'Ivoire" (the "Report"), effective date 3rd November 2017, and I hereby state:-

1. My name is David Morgan and I am the Managing Director with the firm Knight Piésold Pty Ltd of Level 1, 184 Adelaide Terrace, East Perth, WA 6004, Australia. My residential address is 182 Burke Drive, Attadale, WA 6155, Australia.
2. I am a member of the Australasian Institute of Mining and Metallurgy (AusIMM #202216), as well as a Chartered Professional Engineer, and a member of the Institution of Engineers Australia (Australia, 974219).
3. I am a graduate of the University of Manchester, (BSc, Civil Engineering, 1980) and the University of Southampton (MSc, Irrigation Engineering, 1981).
4. I have practiced my profession continuously since 1981, and have worked as a civil engineer for a total of 36 years. Starting as a Junior Engineer with Knight Piesold, my work history culminates with my current role as Managing Director for the Knight Piésold Australia office. My relevant experiences include being the Project Director for several large projects in Africa including Akyem Gold Project, Geita Gold Project and the Ahafo Gold Project.
5. I am a "qualified person" as that term is defined in National Instrument 43-101 (Standards of Disclosure for Mineral Projects) (the "Instrument").
6. I have personally visited the Yaoure Gold Project area in May 2017.
7. I have not previously been engaged with respect to the Yaoure Gold Project in my capacity as an Independent Consulting Engineer.
8. The information provided by Knight Piésold for which I am responsible has contributed to section 18. I am responsible for the preparation of, or supervising the preparation of, sections 18.1, 18.2, 18.8, and 18.10 of the Report.
9. I am not aware of any material fact or material change with respect to the subject matter of the Report which is not reflected in the Report, the omission of which would make the Report misleading.
10. I am independent of the Yaoure Gold Project and the Issuer (Perseus Mining Limited) pursuant to section 1.5 of the Instrument.
11. I have read the National Instrument and Form 43-101F1 (the "Form") and the parts of the Report for which I am responsible have been prepared in compliance with the Instrument and the Form.
12. I do not have nor do I expect to receive a direct or indirect interest in the Yaoure Project of Perseus Mining Limited, and I do not beneficially own, directly or indirectly, any securities of Perseus Mining Limited or any associate or affiliate of such company.
13. 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.

Dated at Perth, Western Australia, on 15 December 2017.

Lycopodium

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CERTIFICATE OF QUALIFIED PERSON

I, David Gordon, B App Sc Engineering Metallurgy, FAusIMM, do hereby certify that:

1. I am Group Manager - Process of Lycopodium Minerals Pty Ltd, Level 5, 1 Adelaide Terrace, East Perth, Western Australia, 6004, Australia.

2. This certificate applies to the technical report titled "NI 43-101 Technical Report, Yaouré Gold Project, Côte d'Ivoire" with an Effective Date of 3 November, 2017 (the "Technical Report").

3. I graduated with a degree in Engineering Metallurgy from the Western Australian Institute of Technology in 1983. I am a Fellow of the AusIMM. I have worked as a Process Engineer for a total of 32 years since my graduation from university. My relevant experience includes over 15 years design experience encompassing all aspects of gold processing from testwork to process plant design and over 10 years experience in operating process plants.

4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

5. I did not visit the Yaouré property.

6. I am responsible for the preparation of Sections 13, 17, 18.1 – 18.9, 21.1 and portions of Sections 1, 25, 26 and 27 of the Technical Report.

7. I am independent of the issuer applying all of the tests in section 1.5 of NI 43-101.

8. I have not had prior involvement with the property that is the subject of the Technical Report.

9. I have read NI 43-101 and Form 43-101F1 and the sections of the Technical Report I am responsible for have been prepared in compliance with that instrument and form.

10. 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.

Dated this 18th Day of December, 2017.

David Gordon, B App Sc Engineering Metallurgy, FAusIMM

CERTIFICATE of QUALIFIED PERSON

I, Paul William Thompson, FAusIMM, as an author of the report entitled "Technical Report: Yaouré Gold Project, Côte d'Ivoire" (the "Report") prepared for Perseus Mining Limited and with effective date 3 November, 2017, do hereby state:

a) I am employed as Group General Manager, Technical Services by Perseus Mining Limited of Level 2, 437 Roberts Road, Subiaco, Western Australia.

b) I am a graduate of the University of Liverpool, UK with a Bachelor of Science and the University of Leeds, UK with a Master of Science.

c) I am a Fellow of the Australasian Institute of Mining and Metallurgy, membership number 209231. I have worked as a geotechnical engineer, mine planning engineer, technical services manager, study manager and general manager in the mining industry for a total of 32 years since my graduation. My relevant experience for the purpose of the Technical Report is:

   - Review and report as a consultant for due diligence requirements.

   - Study Manager on a number of feasibility studies in the mining industry in Africa, Australia, Europe and Asia; and

   - Operational and corporate roles to the level of General Manager for a number of mining companies in Africa and Australia.

d) I have read the definition of "qualified person" set out in National Instrument 43-101 (Standards of Disclosure for Mineral Projects) (the "Instrument") and certify that by reason of my education, affiliation with a professional association (as defined in the Instrument) and past relevant work experience, I fulfil the requirements to be a "Qualified Person" for the purposes of the Instrument.

e) I have visited Yaouré site on eleven occasions, the first being in November 2015 and the latest being July 2017. The purposes of the visits were to complete initial due diligence, general management of the site, completion of feasibility study activities and interaction with the community.

f) I am responsible for Sections 1 (joint), 19, 20, 21.2 and 22 of the Report.

g) I am not independent of Perseus pursuant to Section 1.5 of the Instrument.

h) I have read the Instrument and the sections of the Report for which I am responsible and which have been prepared in compliance with the Instrument.

i) My involvement with the Yaouré project is limited to my work as an employee of Perseus Mining Limited.

j) At the effective date of the Report, to the best of my knowledge, information and belief, the sections of the report I am responsible for contain all scientific and technical information that is required to be disclosed to make the report not misleading.

Dated this 18th day of December 2017 at Perth, Western Australia.

Paul William Thompson, B.Sc., M. Sc. FAusIMM

CERTIFICATE of QUALIFIED PERSON

I, Gary Robert Brabham, MAIG, FAusIMM, as an author of the report entitled "Technical Report: Yaouré Gold Project, Côte d'Ivoire" (the "Report") prepared for Perseus Mining Limited and with effective date 3 November, 2017, do hereby state:

a) I am employed as Group Geologist by Perseus Mining Limited of Level 2, 437 Roberts Road, Subiaco, Western Australia.

b) I am a practising Geologist, registered Member of the Australian Institute of Geoscientists (#1385) and a registered Fellow of the Australasian Institute of Mining and Metallurgy (#105665).

c) I graduated with a Bachelor of Applied Science in Applied Geology from the Royal Melbourne Institute of Technology in 1980, a Master of Science (Ore Deposit Geology & Evaluation) from The University of Western Australia in 1998, and a Post-Graduate Certificate in Geostatistics from Edith Cowan University in 2003. I have worked professionally as a geologist for a total of 37 years since my first graduation. My experience includes exploration and mine geology and resource estimation for a range of commodities and mineralisation styles. I have been involved in preparation and reporting of resource estimates in accordance with JORC guidelines for approximately 20 years, and NI43-101 guidelines for approximately 5 years.

d) I have read the definition of "qualified person" set out in National Instrument 43-101 (Standards of Disclosure for Mineral Projects) (the "Instrument") and certify that by reason of my education, affiliation with a professional association (as defined in the Instrument) and past relevant work experience, I fulfil the requirements to be a "Qualified Person" for the purposes of the Instrument.

e) I have visited Yaouré site on seven occasions, the first being in June 2016 and the latest being 13th to 26th July 2017. The purpose of the visits was to direct the drilling and sampling practices and project geological team.

f) I am responsible for Sections 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 23, 24, 25, 26 and 27 of the Report.

g) I am not independent of Perseus pursuant to Section 1.5 of the Instrument.

h) I have read the Instrument and the sections of the Report for which I am responsible and which have been prepared in compliance with the Instrument.

i) My involvement with the Yaouré project is limited to my work as an employee of Perseus Mining Limited, commencing April 2016.

j) At the effective date of the Report, to the best of my knowledge, information and belief, the sections of the report I am responsible for contain all scientific and technical information that is required to be disclosed to make the report not misleading.

Dated this 15th day of December 2017 at Perth, Western Australia.

Gary Brabham, BAppSc, MSc, PG Cert

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1. Summary

1.1 Introduction, Location and Ownership

This report has been prepared for Perseus Mining Limited.

Perseus acquired the Yaouré Gold Project in the first quarter of 2016 via a friendly takeover of Amara Mining plc (Amara). Perseus's interest in the Project is held via a 100 per cent owned Ivorian subsidiary company Perseus Yaouré sarl.

The Yaouré Gold Project is located in a rural area of central Côte d'Ivoire, West Africa, 35 km north-west of the capital Yamoussoukro. The property lies close to the southern shore of man-made Lake Kossou and 25 km east-north-east of the district administrative centre of Bouaflé. The Kossou hydroelectric power station is situated 6 km east of the project.

Perseus Yaouré sarl holds four *permits de recherche* (PRs; exploration permits) in the region covering a 566.44 km^2 area. The Mineral Resources and Mineral Reserves that are the subject of this report are located within PR 397 covering a 49.77 km^2 area. The results of exploration on contiguous PRs 168 and 615 are also discussed in the report for context.

Perseus commenced a Definitive Feasibility Study (DFS) in June 2016, selecting a number of independent consultants for various aspects of the study. The DFS included additional drilling to increase confidence in resource estimates, further investigate geotechnical parameters, gain additional samples for metallurgical test work and to sterilise areas prior to planning placement of infrastructure.

Perseus undertook a drilling campaign between January and June 2017 and an updated resource estimate was completed in October 2017. Also in October 2017, Lycopodium updated the mineral processing and metallurgical testing section for the DFS.

This report presents a summary of work completed pursuant to the DFS and previous work undertaken by Amara that is relevant to the current Mineral Resource and Mineral Reserve estimates. The report has been compiled by Perseus Mining Limited as a consolidation of the work undertaken by the various independent consultants that have contributed to the DFS.

1.2 History

Artisanal gold mining is known to have been conducted at Yaouré since 1913. The Societe des Mines d'Or completed the first exploration program in the Yaouré district on six prospects in 1931. Gold mineralisation was discovered in 1932 at two occurrences known as the 'Filon de Angovia' and the 'Filon de Akakro'. The two occurrences were along the same WNW-ESE oriented quartz vein extending along a 2 km strike between Angovia and Kouakougnanou villages. Historical official annual gold production records indicate significant exploitation activity in the region prior to the outbreak of the Second World War. Annual gold production is reported to have increased from 1.5 kg in 1939 to 107 kg in 1941.

The French Bureau de Recherches Géologiques et Minières (BRGM) completed regional and detailed exploration between 1982 and 1988 conducting regional soil and stream sediment geochemical sampling programs. The BRGM identified a total of eight prospects referred as Angovia 1, Angovia 2, Kouakougnanou, Yaouré, Blangan, Magazine, Zone North and Govisou prospects. Subsequent work through to 1991 consisted of geophysics, trenching, motorised auger drilling and drilling of two diamond core holes and 100 RC holes.

In March 1993, an Exploitation Permit was granted to Compania Minière d'Afrique (CMA), who completed further drilling at Angovia 1, leading to a feasibility study in 1994. CMA established an open pit mining and heap leach processing operation in 1999 and production continued until the mine closed towards the end of 2003. Angovia 1 prospect is now referred to as the CMA deposit.

CMA reportedly extracted 1.9 million tonnes of ore, with a mean plant feed grade of 3.9 g/t gold from three open pits; CMA North, CMA Central, and CMA South. The CMA North pit and Central pit eventually merged into one pit, reaching a maximum depth of 40 m below-surface. Treatment of the oxidized ore in a heap leach facility reportedly achieved a mean recovery of approximately 85%.

The CMA was also granted a 485 km2 exploration permit in July 2002 with the aim of delineating further near-surface oxidized material near to the existing process plant. However, following the closure of the mine in late 2003, the permits were relinquished in 2004, and subsequently transferred to Cliff Gold (West Africa) Côte d'Ivoire sarl, a subsidiary of Cluff Gold plc (Cluff) on 8 October 2004.

The exploration information available to Cluff indicated the Yaouré Zone, immediately west of the CMA pit, to be the most prospective target after the CMA zone, with consistent grades in RC drill holes along a 600 metre strike. Consequently Cluff prioritised exploration of the Yaouré Zone for near surface oxide resources. Over the period 2005-2008 Cluff drilled 481 mainly RC holes into the Yaouré Zone and at the Angovia 2 prospect.

Cluff brought a conventional open pit mine with heap leach processing into production in March 2008 without completing a feasibility study. The company also mined the laterite cap on Blangan Hill during this period. Cluff recovered a total of 54,382 ounces of gold from 2.1 Mt of ore processed at a grade of 1.0 g/t Au up until mining and processing ceased in January 2011.

Cluff Gold plc changed its name to Amara Mining plc in mid-2012. Between 2012 and 2015, Amara undertook several programs of RC and diamond core drilling to delineate sulphide-hosted gold resources in the Yaouré and CMA mineralised zones. In November 2014, Amara prepared an initial pre-feasibility study which included mineral processing and metallurgical testing, mining and recovery methods, project infrastructure and economic analysis. The pre-feasibility study, based on a January 2015 mineral resource estimate, supported an 11 year mine life with ore processed at a rate of 6.5Mtpa. Optimisation studies following the completion of the 2015 drilling campaign and an updated resource model, determined the optimal plant size should be reduced to 4.5Mtpa.

Perseus Mining Limited acquired a 100% interest in the property in April 2016 following the acquisition of all outstanding shares of London-based Amara Mining plc. Perseus holds its interest via 100% owned subsidiary Perseus Yaouré sarl.

1.3 Geological Setting and Mineralisation

The Yaouré gold deposits lie within the eastern half of the informally named Bouflé greenstone belt in central Côte d'Ivoire. The belt is a NNE-trending assemblage of Palaeoproterozoic volcanic, sedimentary and intrusive rocks of the Birimian Supergroup.

Rock types in the Yaouré district are, for the most part, mafic volcanic rocks with minor chert, turbiditic metasedimentary rocks and a fluvio-deltaic formation. The volcano-sedimentary rocks were intruded by tonalite-trondhjemite-granodiorite (TTG) type plutonic rocks and undifferentiated granitoids. Mafic to ultramafic complexes are also found in the Yaouré district.

The entire Birimian rock suite has been metamorphosed to lower greenschist facies.

At Yaouré, structurally controlled gold mineralisation is hosted mainly by Palaeoproterozoic Birimian basaltic rocks. Relatively minor proportions of the Mineral Resource are hosted by a granodiorite intrusion and lesser feldspar, quartz-feldspar and hornblende porphyry dykes.

Gold mineralisation at Yaouré has been subdivided into two main zones: the CMA Zone and the Yaouré Zone. The CMA zone is a relatively continuous 20-45 m thick fault zone featuring quartz-carbonate (dominantly ankerite) veining and disseminated pyrite in albite-carbonate altered wall rocks. It strikes approximately north-south, dips at 30 degrees to the east, extends along 1,200 metres strike and its down-dip continuity has been tested for in excess of 450 m.

The Yaouré Zone comprises a system of structures in a 300 m wide zone, 200 m below the CMA Zone beneath the Yaouré Central Pit. Gold mineralisation is hosted by a series of brittle-ductile structures divided for convenience into 'Y' and 'S' types. The 'Y' fault zones, parallel to CMA, consist of Y1, Y2 and Y3 - shallow easterly dipping reverse faults with associated albite, carbonate and quartz veins in variably altered host rocks with disseminated pyrite. The 'S' type structures comprise sub-vertical faults filled with quartz-tourmaline veins. The 'S' type structures are oriented west-north-west, east-south-east and north-east, south-west.

Numerous, less well developed mineralised structures also occur in the deposit. The majority strike approximately east-west and dip sub-vertically and are best developed in the granodiorite stock where, in places, they combine with less common flat-lying veins to form a stock work. Gold mineralisation also occurs along granodiorite and porphyry contacts and along zones of competency contrast such as the contacts between massive and pillowed basalts.

Gold occurs within quartz, quartz-carbonate and quartz-tourmaline veins and in adjacent altered wall rocks, typically associated with disseminated pyrite. Other than for very fine particles that may be occluded by silicates or pyrite, the gold is "free milling", i.e. cyanide soluble.

Gold mineralisation is accompanied by very minor amounts of arsenopyrite and molybdenite.

1.4 Deposit Types

The Yaouré Deposit is a structurally controlled, greenstone hosted gold deposit similar in nature to many exploited elsewhere in the Birimian terranes of West Africa.

Gold mineralisation is accompanied by traces of molybdenum, tungsten, antimony, bismuth and tellurium indicating that the mineralisation may have affinities with the reduced intrusion-related gold systems (IRGS). The predominance of structural controls and association with carbonatisation, sericitisation and silicification, however, are characteristics that more clearly point to its classification as an orogenic, mesothermal gold deposit

1.5 Exploration

Exploration conducted on PR 397, that covers the Yaouré gold deposits, and contiguous permits 168 and 615 includes:

- Soil geochemical sampling, trenching and drilling by BRGM between 1982 and 1991;
- Resource definition drilling by CMA between 1993 and 1999;
- Stream sediment (BLEG) and soil geochemical sampling and drilling by Cluff between 2005 and mid-2012;
- An airborne geophysical survey (magnetics and radiometrics) in March-April 2012;
- Further soil geochemical sampling, open pit mapping and resource definition drilling by Amara between mid-2012 and end 2015;
- Infill soil geochemical sampling, additional open pit mapping, infill resource definition drilling as well as drilling for geotechnical test work and sterilisation of areas for planned mine infrastructure by Perseus during 2016 and 2017.

A number of zones of known mineralisation such as Angovia 2, Kongonza and Govisou prospect, remain to be evaluated in more detail.

Exploration in the immediate vicinity of the Yaouré gold deposits is hampered by extensive areas of transported cover and a complicated weathering profile resulting from multiple episodes of lateritisation, erosion and profile inversion. Historic exploration drill holes and recent sterilisation drill holes have located many gold-mineralised structures beneath transported cover that require follow-up by further drilling.

1.6 Drilling

When Cliff acquired exploration permit 168 on 8th October 2004, historical exploration data from the BRGM and CMA included 179 diamond drill holes and 134 reverse circulation (RC) holes. Data for two diamond core holes and 100 RC holes drilled by BRGM between 1987 and 1991, excluding geological logging, are retained in the current drill hole database. Data for the drilling by CMA, located mainly within the portion of CMA deposit subsequently mined, are no longer available.

Cluff commenced drilling at Yaouré in 2005 using RC drill rigs to evaluate the soil anomalies identified by the BRGM. The program started initially at Prospects 2, 3 and 4 (Yaouré Zone) and at the Angovia 2 prospect. A total of 774 RC holes (53,078 m) were completed between 2005 and 2007. A total of 62 diamond core holes (6,483 m) were also completed in 2007. As well as delineating resources at Prospect 2 and Prospect 4 (Yaouré Zone), resources were also delineated at Angovia 2.

A review of exploration data completed prior to February 2009 identified the soil anomaly at Blangan as the most important target at that time. RAB drilling was completed which defined a resource leading to the laterite cap being mined. The soil anomaly at Kongonza was tested with RC drilling in 2010 and a (unreported) resource was also delineated there.

Following civil unrest, exploration resumed in June 2011, including RAB drilling at the Zone North soil anomaly. RAB drill testing of soil anomalies continued to October 2012 at the Kongonza NW, Office Zone, and Govisou prospects. RC drilling was completed at the Kongonza, Kongonza NW, Magazine, Govisou and Yaouré in October 2011.

There have been seven phases of drilling targeting Yaouré sulphide resources, starting in August 2011. By June 2013, 47,300 m (153 holes) had been drilled in Phases 1 to 4, testing an area of about 2.1 km in a north-south direction, and about 1.4 km in an east-west direction. This drilling was the basis for a Mineral Resource estimate reported by Amara in January 2014.

Phase 5 comprised an RC drilling programme (16,638 m in 80 holes) focussing on the CMA zone that commenced in April 2014 and finished in October 2014 plus diamond core drilling that commenced in May 2014 and finished in October 2014 (68,936 m in 251 holes).

Drilling completed up to and including Phase 5 informed estimates of Mineral Resources and Mineral Reserves that formed the basis of Amara's 2015 Pre-feasibility Study.

Phase 6 comprised 69 RC holes (6,718 m) drilled between April and June 2015 to test the proposed mine infrastructure area for sterilisation purposes. Phase 6 also included 60 diamond core holes (11,904 m, including deepening of six holes) drilled between April and August 2015.

In conjunction with the preceding drilling, data from Phase 6 drilling informed Amara's updated estimate of Mineral Resources in December 2015.

Phase 7 drilling was undertaken by Perseus to progress the project to completion of a Definitive Feasibility Study. Drilling commenced on 29th December 2016 and was completed on the 28th July 2017. The program totalled 72,628 m in 1,515 holes that included RC and diamond core holes to infill resource definition drilling, trial RC grade control drilling in Yaouré pit, together with sterilisation, pit slope and infrastructure geotechnical drilling and hydrological test bores.

Yaouré Zone mineralisation has been tested by generally 25 by 25 metre spaced drilling to around 80 metres below pre-mining topography. This close spaced drilling includes northerly inclined holes, and more commonly easterly inclined holes. Deeper mineralisation is tested by generally 50 by 50 metre spaced westerly inclined holes. Perseus tested several areas of Yaouré mineralisation with 5 by 5 metre spaced trial RC grade control holes.

CMA mineralisation has been tested by generally 25 metre spaced westerly inclined holes on 50 metre traverses to around 100 to 250 metres depth. Deeper drilling is generally 50 by 50 metre spaced to a maximum depth of around 450 metres.

Material contained in spent leach heaps from previous operations by CMA and Cluff has been sampled by 25 by 25 metre and 50 x 50 metre spaced (respectively) vertical power auger holes. Eleven auger holes have been twinned by diamond core holes.

Most drill hole collar locations have been accurately located by electronic total station theodolite or DGPS. No down-hole surveys are available for BRGM holes or Cluff RC holes. Cluff diamond holes were down-hole surveyed by unspecified methods. Most Amara and Perseus RC and diamond drilling was down-hole surveyed at generally 30 metre intervals using digital instruments. Perseus AC and trial GC holes were not down-hole surveyed. Around 79% of the estimation dataset is from down-hole surveyed holes.

RC drilling utilised face sampling bits with samples collected over generally one metre intervals and riffle split to produce assay sub-samples. Diamond core was generally sampled over one metre intervals and halved for assaying with a diamond saw.

Information available to demonstrate sampling reliability for Amara and Perseus RC and diamond drilling includes sample condition logging, field duplicates and recovered RC sample weights, core recovery measurements and core duplicates. These data demonstrate that the sampling is representative and free of any biases or other factors that may materially impact the reliability of the sampling.

Subset to the optimal pit used for reporting Mineral Resources, the estimation dataset is dominated by fire assayed samples from Amara and Perseus RC and diamond drilling. Cluff RC drilling represents around one third of the Yaouré dataset and around 13% of the combined dataset on an ounce weighted basis.

1.7 Sample Preparation, Analysis and Security

Samples from BRGM and Cluff RC drilling were analysed by BLEG by Abilabs in Abidjan and the Yaouré site laboratory. Most samples from Amara and Perseus resource drilling were fire assayed for gold by commercial laboratories, comprising Actlabs, Bureau Veritas, Intertek and SGS. Samples from drilling from 2014 and later drilling including later Amara drilling and all Perseus drilling were prepared at the Yaouré site laboratory, and analysed by Actlabs.

Amara and Perseus's monitoring of sample preparation and assaying included use of coarse blanks, coarse and pulp duplicates and reference standards, along with several sets of inter-laboratory repeats.

Little information is available to directly demonstrate sampling and assay reliability for Cluff drilling. Confirmation of the reliability of these data is provided by nearest neighbour comparisons with other sampling types which suggest Cluff BLEG assays tend to give slightly lower average gold grades than fire assay datasets. This variability is consistent with the partial extraction nature of BLEG analysis. Although less comprehensively established than for other sampling types, this comparison confirms the reliability of Cluff assaying with sufficient confidence for the current estimates.

The Qualified Person considers that the available information has established that the resource dataset is representative and free of any biases or other factors that may materially impact the reliability of the sampling or significantly affect confidence in estimated resources.

1.8 Data Verification

Verification checks undertaken by the Qualified Person to confirm the validity of the Yaouré drilling database compiled for the current study include the following:

- checking for internal consistency between and within database tables;
- comparison of assay values between nearby holes;
- comparisons between assay results from different sampling phases;
- spot check comparisons between database entries and original field sampling record; and
- comparison of assay entries with laboratory source files.

These checks were undertaken using the working database compiled by MPR and check both the validity of Perseus's master database and potential data-transfer errors in compilation of the working database.

The database checks showed no significant inconsistencies. The available information indicates that the drilling database has been carefully compiled and validated, and in the Qualified Person's opinion forms an appropriately reliable basis for resource estimation.

1.9 Mineral Processing and Metallurgical Testing

Prior to Perseus undertaking the DFS, the metallurgy of the Yaouré Project sulphide mineralisation had been examined in five previous testwork programs commissioned by Amara. That work determined that:

- Whole ore cyanide leaching generally achieved gold extractions exceeding 90% with moderate cyanide consumption. Gold extraction was observed to improve with fineness of grind;
- Gravity concentration was able to recover approximately 30% of the gold into a concentrate. The combined extraction from leaching the concentrate and tailing was no greater than whole ore leaching;
- Flotation achieved good recovery on some samples but the combined flotation and leach extraction was lower than that achieved by whole ore leaching. Flotation response between samples was variable;
- No deleterious elements were noted in assays performed. The organic carbon content was generally below 0.03%. The majority of the gold mineralisation was associated with pyrite and silicates;
- Bond rod mill work indices for the Yaouré zone averaged 18.9 kWh/t which is categorised as 'hard' while the CMA zone averaged 15.3 kWh/t which is 'moderate';
- Bond ball mill work indices averaged 16.7 kWh/t and 12.6 kWh/t for the Yaouré and CMA zones which are 'hard' and 'moderate', respectively;
- Bond abrasion indices averaged 0.27 for the sulphide domains which is considered moderate;
- SMC A x b value for the Yaouré zone averaged 20.6 which is characterised as 'very hard' while the CMA zone averaged 28.6 which is characterised as 'hard';

- Cyanide gold leach extractions were optimum at a P80 grind size of 75 µm with extractions of between 90 and 93% across all domains. Oxygen addition was beneficial kinetically for cyanide leaching but showed similar final extractions to air addition. Cyanide consumption ranged from 0.4 kg/t NaCN to over 2 kg/t NaCN for the oxide samples.

In 2017 Perseus instigated a metallurgical testwork program aimed to achieve the following objectives:

- Select the most suitable processing route;
- Determine the optimum plant operating parameters for the ore types to be processed;
- Evaluate the variability in metallurgical performance for the range of ore types, weathered states and mineralisation styles; and
- Obtain engineering design data required for plant design.

The testwork program included the following stages:

- Selection of samples for comminution, gold and silver extraction and physical characterisation testwork that were representative of the range of Yaouré mineralised ore types, oxidation states, locations and head grades;
- Comminution variability testwork carried out on individual samples representing the range of mineralised material types and spatial distributions within the target and on composites to represent specific mill feed blends expected during the life of the project;
- Ore type master composite optimisation testwork program. Formation of ore type master composites by combining selected drill core intervals representing the main mineralised material types:
  - Mineralogy and gold and silver extraction testwork to be carried out to assess the key elements present in each material type and to identify differences in leaching characteristics;
  - Testwork to be carried out to develop the optimal process conditions for the economic optimum maximum gold recovery and minimum reagent consumption;
  - Determine the engineering parameters necessary for process plant design. Viscosity and thickening testwork to be completed on 100% oxide and 100% fresh composites to determine the range in expected slurry characteristics;
- Variability testwork. The selected optimal processing scheme developed from the master composite programs is used for the variability extraction testwork. Comminution and gold and silver extraction variability testwork to be carried out on individual samples representing the range of mineralised material types, grades and spatial distributions within the target and on composites made up to represent specific periods of the project.

The testwork program was modified due to delays in sample drilling with testwork focussing on the CMA fresh master composite since this was representative of the majority of the ore (67% of tonnes and 79% of contained gold) to be treated. The balance of the ore types were tested in the variability phase following the process route selected for the CMA fresh ore.

The results of the testwork permit estimation of gold recoveries and reagent consumptions for economic modelling of the Project. Plant gold recoveries and reagent consumptions have been estimated based on the results of the CMA variability testwork at a P_{80} grind size of 75 µm.

Table 1-1 Tonnage and Gold Distribution by Ore Type

Ore Type	Tonnage Distribution %	Gold Distribution %
Leach heaps	5.8	3.8
Oxide/transition	19.2	11.8
CMA basalt	67.1	79.2
Yaouré basalt	5.0	3.5
Yaouré granodiorite	3.2	2.0

Table 1-2 Gold Recovery Estimates for Operation at 40% Solids

Ore Type	Gold	
	Extraction % @ 30h	Recovery (%)
Oxide	94.6	93.9
Transition	95.5	95.1
CMA	90.5	89.7
YAO granodiorite	94.8	93.8
YAO basalt S	92.4	91.8
YAO basalt Y	92.7	92.0

Table 1-3 Estimated Plant Reagent Consumptions (@ P80 75 µm)

Ore Type	Consumption	
	NaCN kg/t	Lime kg.t
Oxide	0.44	1.73
Fresh CMA	0.39	0.30

1.10 Mineral Resource Estimates

Estimates of Yaouré Mineral Resources are based on drill data supplied by Perseus in September 2017, which within the resource area includes 2,220 RC and diamond core holes for 258,407 metres of drilling, along with 50 aircore holes and 289 auger holes.

Mineral Resources comprising remnant mineralisation were estimated by Multiple Indicator Kriging (MIK) of two metre down-hole composited assay grades from RC and diamond drill holes, and comparatively minor aircore drilling. The MIK estimates incorporate a variance adjustment to reflect open pit mining selectivity, a method that has been demonstrated to provide reliable estimates of gold resources achieved in open pit mining for a wide range of mineralisation styles. Densities were assigned by mineralisation and weathering domain from the average of immersion measurements of diamond core with Amara results factored to compensate for the apparent slight bias in those data.

For the spent heap leach material, an average gold grade was assigned to each heap component from the de-clustered average cut grades of auger samples. A density of 1.4t/m^3 was assigned to the heaps on the basis of volumetric measurements on samples collected from approximately 1 to 1.5 metres below surface.

Mineral Resources for remnant mineralisation are reported within an optimal pit shell generated using the mining and processing parameters used for developing Mineral Reserves and a gold price of $US1,800 per ounce. They are reported at a cut-off grade of 0.4 g/t reflecting the average cut-off grade for the optimal pit. This same cut-off was used for heap leach estimates. Mineralisation within the resource pit comprises numerous zones within an area around 1.4 kilometres east-west by 2.1 kilometres north-south extending to a maximum depth of around 340 metres below surface.

Table 1-4 shows Mineral Resources estimated for the Yaouré Gold Project. The figures in this table have been rounded to reflect the precision of the estimates.

Table 1-4 Yaouré Gold Project Mineral Resource Estimates. Effective date 3rd of November 2017

Indicated Resources			
Zone	**Mt**	**Au g/t**	**Au Moz**
CMA	24.8	1.81	1.44
Yaouré	16.5	0.81	0.43
Subtotal	41.3	1.41	1.87
Heap leach	1.8	1.02	0.06
Total	**43.1**	**1.39**	**1.93**
Inferred Resources			
Zone	**Mt**	**Au g/t**	**Au Moz**
CMA	16	1.2	0.6
Yaouré	30	0.9	0.9
Subtotal	46	1.0	1.5
Heap leach	-	-	-
Total	**46**	**1.0**	**1.5**

1.11 Mineral Reserve Estimates

The Mineral Resource estimate incorporates a variance adjustment to reflect open pit mining selectivity assuming a selective mining unit (SMU) approximating 4 m E x 6 m north x 2.5 m vertical. The variance adjustment also incorporates a specific adjustment for Information Effect assuming high quality grade control drilling on a 5 m east x 8 m north x 1.25 m vertical spacing. The resultant estimate is regarded as an estimate of "recoverable resources" and the model is regarded as a "ROM" model. The method has been demonstrated to provide reliable estimates of ore tonnages and grades achieved in open pit mining for a wide range of mineralisation styles and the application of additional mining dilution or mining recovery factors is unnecessary and not recommended.

The Mineral Reserves have been estimated using gold cut-off grades determined from cost estimates and metallurgical recoveries that vary by deposit, lithology, oxidation and weathering. RPM completed a processing break-even cut-off calculation for the various mineralisation types and locations and presented these to Perseus for review. Perseus subsequently selected a series of raised cut-off grades that provided a suitable economic margin for the materials processed.

Table 1-5 Yaouré Gold Project Mineral Reserve cut-off Grades

Ore Source	Cut-off grade g/t Au
Weathered ores, all sources	0.40
Transition ores, all sources	0.45
Fresh ore, CMA pit	0.50
Fresh ore, Yaouré pit	0.65
Heap leach dumps	0.45

Table 1-6 Yaouré Gold Project Mineral Reserve Estimate. Effective date 3rd of November 2017

Location	Proved			Probable			Proved + Probable		
	Ore Mt	Grade Au g/t	Gold Moz	Ore Mt	Grade Au g/t	Gold Moz	Ore Mt	Grade Au g/t	Gold Moz
CMA	-	-	-	20.7	1.97	1.31	20.7	1.97	1.31
Yaoure	-	-	-	4.7	1.04	0.15	4.7	1.04	0.15
Sub-Total	-	-	-	25.3	1.80	1.47	25.3	1.80	1.47
Leach Pads	-	-	-	1.4	1.14	0.05	1.4	1.14	0.05
Total	-	-	-	26.8	1.76	1.52	26.8	1.76	1.52

Notes:

1. *The Statement of Mineral Reserves has been compiled under the supervision of Mr. Joe McDiarmid who is a full time Principal Mining Engineer employed by RPM Advisory Services Pty Ltd and is a Member of the Australasian Institute of Mining and Metallurgy (AusIMM). Mr. McDiarmid has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration to qualify as a Qualified Person as defined under CIM.*
2. *Tonnages are dry metric tonnes*
3. *Gold price: 1,200 USD/troy ounce*
4. *Figures reported are rounded to reflect accuracy which may result in small tabulation errors.*

1.12 Mining Methods

The selected mining method is conventional open pit mining utilising hydraulic excavators and standard off-highway rear dump trucks with mining undertaken by a contractor.

In ore, mining bench heights are 5 m with 2.5 m flitches for selective mining to minimise ore loss and waste rock dilution. Waste blocks adjacent to ore will be mined on 5 m benches, while bulk waste more distant from the ore zone will be mined on 10 m benches.

The proposed mining operation will use a selective mining method to minimise ore loss and waste rock dilution. The total movement mining rate averages approximately 26.5 Mt/year for the life of mine to deliver ore feed to support the target processing rate of 3.3 Mt/year. The operation is planned to be operated by a mining contractor to strip free dig material such as topsoil, clays and highly weathered rock near surface, as well as remove backfill in the CMA pit. Fresh rock, which is the dominant rock type, will require significant drilling and blasting, and will form the main material mined by the mining contractor.

To balance waste stripping and ore grades the pits are designed to mine to the ultimate boundary limit using cutbacks. Access to the pits will be by 24 m wide haul roads and ramps incorporating a 10 percent gradient with windrow and drain. Single lane ramps will be used as required especially towards the end of pit life to maximise ore recovery and minimise waste mining. Ore and waste will be hauled to surface with or dumped on stockpiles at the ROM pad and waste dumped to waste disposal dump.

Ore and waste rock will be drilled and blasted prior to excavation. The mine will undertake conventional drilling and blasting activities with pre-splitting in key areas of transition and fresh rock to assure stable wall conditions.

Reverse circulation (RC) drilling will be completed for grade control with samples taken on 2m composites, with the assays used to define the ore boundaries.

Loading operations will be performed by hydraulic excavator mining bulk waste in 10 m benches and waste and ore in 5 m benches. Hydraulic excavators and off-highway rear dump trucks will be appropriately matched by the mining contractor. Smaller excavator equipment will be used for ore mining operations.

The mined material will be hauled to the designated destination being either the ore stockpile, the crusher feed bin (direct dump) or waste dumps. The operation will be supported by front-end loaders for ore stockpile rehandle.

Waste rock will be placed in an ex-pit waste rock dump within the mining lease. Backfilling of the open pits is not anticipated giving the continuing mineral potential of the region.

The potential for acid mine drainage has been examined in detail and, based on testwork, is not expected to present any significant issues. Samples for potentially acid forming rock will be taken and assayed to ensure that waste disposal practices adapt as new information is gained.

1.13 Recovery Methods

The Yaouré treatment plant design incorporates the following unit process operations:

- Primary crushing with a single toggle jaw crusher to produce a coarse crushed product;
- A live stockpile from which ore will be reclaimed to feed the milling circuit;
- A SABC milling circuit comprising a SAG mill in closed circuit with a pebble crusher and a ball mill in closed circuit with hydrocyclones to produce an 80% passing 75 micron grind size;
- Gravity concentration and removal of coarse gold from the milling circuit recirculating load and treatment of gravity concentrate by intensive cyanidation and electrowinning to recover gold to doré;
- A leach and carbon in leach (CIL) circuit of one leach stage followed by six stages of leaching with carbon present for gold adsorption, providing a total of 29 hours leach time at the design leach feed density;
- A split AARL elution circuit treating loaded carbon, electrowinning and gold smelting to produce doré; and
- Tailings pumping to the tailings storage facility (TSF).

Table 1-7 Summary of Key Process Design Criteria

	Units		Source
LOM ore blend		78% primary, 22% saprolite / transition	Perseus
Plant capacity	t/y	3,000,000	Perseus
Gold head grade	g/t Au	1.82	Perseus
Design gold recovery	%	93	Testwork
Crushing plant utilisation	%	80	Lycopodium
Plant utilisation	%	91.3	Lycopodium
SMC Axb	kWh/t	31.5	Testwork/OMC
Bond ball mill work index (BWi)	kWh/t	14.7	Testwork/OMC
Abrasion index (Ai)		0.223	Testwork/OMC
Milling grind size	µm	75	Testwork
Leach circuit residence time	hrs	29	Testwork
Leach slurry density	% w/w	40	Lycopodium
Number of leach tanks		1	Lycopodium
Number of CIL tanks		6	Lycopodium
Elution circuit type		Split AARL	Lycopodium
Elution circuit size	t	10	Lycopodium
Frequency of elution	strips/week	8	Lycopodium
Tailings WAD cyanide concentration	ppm	<150	Perseus

The plant site-wide electrical power requirements for infrastructure, mining and processing were calculated on the basis of preliminary equipment sizing.

Table 1-8 Installed Load and Maximum Demand

Area	Installed Load		Maximum Demand		Average Demand	
	(MW)	(MVA)	(MW)	(MVA)	(MW)	(GWh/y)
Process plant	22.29	24.80	16.18	16.93	12.49	114.8
Site infrastructure	3.54	4.08	1.59	1.82	1.28	11.2
Site total	25.83	28.88	17.77	18.47	13.77	126

The power supply will be sourced from the electricity grid. The grid supply from Côte d'Ivoire, is by world standards, economically priced and more financially favourable than other options including self-generation, as the tariff is based on a mix of hydro and thermal generation.

Power for the site will be provided via a proposed new 6 km 225 kV overhead power line from the nearby CI Energies Kossou substation attached to the Kossou hydroelectric power station.

Dual 11 kV feeders from the 225/11 kV substation will supply a plant main 11 kV switchboard which will reticulate power to all locations on the site. Emergency power loads from the process plant and plant site infrastructure will be supported by two 2,000 kVA standby rated 11 kV high speed diesel generators located in the process plant precinct.

The overall site water balance indicates that a significant source of clean water is required for the raw water plant and for the process water dam make-up.

A critical supply rate of 139 L/s (3.6 Mm^3/year) is required to prevent process water shortfalls under design dry conditions. When pit dewatering is included in the water balance, this is reduced to 91 L/s (2.4 Mm^3/year). This is governed by the high oxide blends during Year 1 of operation, and river abstraction requirements reduce after this initial period of high oxide blends. For average conditions, this reduces to 123 L/s (3.2 Mm^3/year), and 76 L/s (2.0 Mm^3/year) when pit dewatering is included in the water balance.

Subject to final approval by government authorities, raw water will be predominantly sourced from the Bandama River.

1.14 Project Infrastructure

The main access route to site will utilise the multi-lane, modern motorway connecting Abidjan to Yamoussoukro and thence highway A6, with the turn-off to Kossou at Toumbokro village, 28 km north-west of Yamoussoukro. The 16 km provisional road from Toumbokro to Kossou is narrow, in poor condition and the sides are heavily vegetated. This road may be upgraded by the Government prior to Project implementation. The last 7 km road from site to Angovia is an unpaved public road periodically maintained by the road authority. It is in poor condition and will require an upgrading.

The process plant will be located northeast of the CMA open pit, just outside of the 500 m blast zone. The ROM pad preceding the plant will be located and configured to take advantage of the natural terrain.

Site buildings will be 'fit for purpose' industrial type structures. Offices and amenity buildings will predominantly be prefabricated structures. A security facility, plant office, staff mess, ablutions, plant workshop, water treatment plant, sewage treatment plant, switchyard, reagent storage area and gold room will be located inside the process plant high security area.

A gatehouse with boom gate control, the main administration building, a first aid clinic, staff mess, main warehouse, warehouse yard, LV workshop and car parks will be located in fenced areas adjacent to the process plant.

A separately fenced Mine Services Area (MSA) will be located approximately 400 m west of the process plant area and north of the existing heap leach pads. The mine services facilities will be provided entirely by the mining contractor with Perseus supplying the necessary utilities.

The main fuel contractor will supply bulk diesel which will be stored in their storage tanks located in the MSA.

A separately fenced new camp will be built approximately 1 km east of the process plant. The camp will be built to accommodate 144 senior staff and specialist workers.

Potable water for the site will be sourced from existing bores via a modular water treatment plant. The water treatment facility will include sand filtration, micro filtration, ultraviolet sterilisation and chlorination. Additional ultra-violet sterilisation units will be installed on outgoing potable water distribution headers.

Filtered water will be pumped from the raw water tank to the filtered water treatment plant and storage tank located in the plant area. Filtered water will then be reticulated to gland seals and the gold room, elution and emulsion facility areas.

Effluent from all water fixtures in the process plant, MSA and accommodation camp will drain to their respective sewerage headers. The sewerage system for each area will drain to a sewer pump station from where it will discharge via a pressure main to a package sewage treatment plant system.

One of the local mobile phone providers will be contracted to install facilities on site and provide a link into the local, national and international telecommunication networks.

Internal communications and IT services will be via a site wide fibre optic network.

A radio network will be established with dedicated operational, security and emergency channels.

A local ground station will be installed to provide global satellite voice and data connection.

The bulk explosives depot and high explosives / detonator magazines will be securely located approximately 1.0 km southeast of the ROM pad on a small elevated and protected plateau.

The tailings storage facility (TSF) will consist of a valley storage facility formed by two multi-zoned earthfill embankments, comprising a total footprint area (including the basin area) of approximately 87 ha for the Stage 1 TSF increasing to 162 ha for the final TSF. The TSF is designed to store a total of 30 Mt of tailings (at an annual throughput of 3.3 Mtpa). The TSF will be constructed in annual stages, to defer construction costs and allow the flexibility to adjust the design to ongoing mine planning and operational performance. A downstream structural fill buttress will be constructed during the initial years of operation to further improve embankment stability and thus provide additional protection to the downstream settlement of Kouakougnanou.

A downstream seepage collection system will be installed within and downstream of the TSF embankment, to allow monitoring and collection of seepage from the TSF in the collection sump located downstream of the final TSF downstream toe.

Supernatant water will be removed from the TSF via submersible pumps located within decant towers, constructed at start-up and raised during operation. The supernatant pond will be maintained within the northern valley of the TSF basin. Solution recovered from the decant system will be pumped back to the plant for re-use in the process circuit.

At the end of the TSF operation the downstream faces of the embankments will have a slope of 3H:1V, with 5 m wide benches located at 10 m height intervals, for an overall slope profile of 3.5H:1V. The downstream profile will be inherently stable under both normal and seismic loading conditions and will allow for revegetation.

1.15 Market Studies and Contracts

Gold is a commodity freely traded on the world market for which there is a steady demand from numerous buyers. It is also possible to sell gold for delivery at a fixed price at a future date (forward sale).

The gold prices of US$1,200 and US$1,250 per ounce, respectively, used for delineation of Mineral Reserves and financial evaluation, were nominated by Perseus.

The gold price of US$1,800 per ounce applied to estimate Mineral Resources was nominated by Perseus.

At the effective date of this report the spot gold price was US$1267 per ounce.

1.16 Environmental Studies, Permitting and Social or Community Impact

Amara commissioned baseline studies to support an Environmental and Social Impact Assessment (ESIA) that was lodged with government authorities in July 2015. The ESIA includes an Environmental Management Plan which, in turn, includes a Water Management Plan, Waste Management Plan and preliminary Mine Closure and Rehabilitation Plan. The ESIA assessment requires updating to reflect changes to the proposed mining and processing operations that have arisen out of the DFS.

Perseus has applied for a water abstraction permit to take water from the Bandama River and a series of groundwater bores. Government specialists are currently reviewing the data and consultant's findings prior to issuing the permit. No issue are expected.

Other permits that will be required for the Yaoure Project include:

- Permits for road construction, diversions and major upgrades;
- Building Permits for the construction of buildings and other structures;
- Radiation Permit for the radiation density gauges in the Process Plant;
- Permits for the transport and storage of explosives; and
- Permits for the transport and storage of hazardous chemicals, specifically cyanide.

These Permits will be applied for prior to the commencement of the relevant activity.

The Mining Code requires that a reclamation bond equal to an agreed percentage of the estimated total cost of the rehabilitation and closure work for the site be paid into an environmental rehabilitation escrow account upon first commercial production. The amount can be reviewed every three years to capture any changes to the mine plan or completed rehabilitation. The actual percentage to be paid will be determined during the Mining Convention negotiations and will be captured in the Convention.

There are currently no significant negative environmental or social impacts identified for the development of the Yaoure Project, and the potential minor negative impacts identified will be managed as a priority. There are a number of positive impacts expected, mainly related to community development and opportunities for local people.

1.17 Capital and Operating Costs

The capital cost estimate for the Yaouré Gold Project has been compiled by Lycopodium Minerals Pty Ltd with input from Knight Piésold on water infrastructure and the tailings storage facility and Perseus Mining Limited on project specific portions of Mining and Owner's costs.

The estimate is based on the Project being implemented using an EPCM approach for the Process Plant, whereby the EPCM Engineer will provide design, procurement and construction management services on behalf of the Owner, based on a project schedule. The Owner will self-perform the majority of works outside the Process Plant.

The estimate is expressed in US dollars based on prices and market conditions current at third quarter 2017 (3Q17).

Table 1-9 Capital Estimate Summary (US$, 3Q17, ±15%)

Area	US$'000
Construction distributables	26,191
Treatment plant costs	65,670
Reagents and plant services	9,947
Infrastructure	49,163
Mining	17,880
Management costs	17,665
Owner's project costs	45,881
Owner's operation costs (working capital)	Excl.
Subtotal	**232,397**
Contingency	23,865
Taxes & duties (import duty & land tax only)	2,463
Escalation	Excl.
Estimated total	**258,725**

Provisional Cost Items

Detoxification plant	4,000
Project total	**262,725**

Operating cost estimates are based on prices obtained in the third quarter of 2017 (3Q17) and are considered to have an accuracy of ±15%.

The life of mine (LOM) operating cost is estimated at $999.8 million, which equates to $731/oz gold recovered and $37.36/t ore milled.

Table 1-10 LOM Operating Cost Summary (US$, 3Q17, ±15%)

Cost Centre	LOM	
	$M	$/t
Mining	527.095	19.70
Processing	320.326	11.97
General and Administration	91.928	3.44
Bullion Transport and Refining	3.063	0.11
Royalties	57.426	2.15
Total	**999.838**	**37.36**

Estimated operating costs include:

- costs associated with the contract mining of ore and waste and its delivery to the process plant ROM bin and the placement of waste on the waste rock dump;
- labour costs for supervision, management and reporting of on-site organisational, commercial, technical, environmental, security, training and occupational activities;
- labour costs for operating and maintaining the mobile equipment, light vehicles, process plant and supporting infrastructure as well as for monitoring of the environment;
- all power, fuels, reagents, consumables and maintenance materials utilised in operating the mobile equipment, light vehicles, process plant and supporting infrastructure as well as for monitoring of the environment;

- operating costs of an on-site assay laboratory;
- costs associated with general and administration (G&A) activities; and
- import duties on consumable unit costs.

1.18 Economic Analysis

The Yaouré Gold Project has been evaluated using the discounted cashflow method, by taking into account yearly milled tonnages, grades and associated recoveries for the ore, gold price, operating costs, bullion transport, refining charges, royalties and capital (both initial and sustaining). Construction at the Yaouré Project is completed within two years with operations commencing thereafter.

The project has been evaluated as stand-alone and 100% equity financed with no debt financing considered.

Applying a long-term gold price of US$1,250/oz on a flat line basis from the commencement of production, estimated pre-tax cashflows generated are US$408.4 million and the payback of the Yaouré Project is 2.67 years. The mine life for the Yaouré Project is estimated at 8.4 years.

The Yaouré Gold Project internal rate of return (IRR) is 26.9% and the net present value (NPV) is US$170.3 million (based upon real, post-tax cash flows, calculated using a 10% discount rate). Life of mine average cash costs of production are US$690/oz while all-in sustaining costs (AISC) are US$759/oz for the Yaouré Project.

2. Introduction

This report is prepared for Perseus Mining Limited (Perseus; the Issuer).

Perseus acquired the Yaouré Gold Project (the Project or the Property), located in central Côte d'Ivoire in West Africa, in the first quarter of 2016 via a friendly takeover of Amara Mining plc (Amara). Perseus's interest in the Project is held via a 100 per cent owned Ivorian subsidiary company Perseus Yaouré sarl.

Amara completed a prefeasibility study (PFS) in May 2015 for an open pit mining and 6.5 Mtpa processing operation at Yaouré.

After additional drilling in 2015, Amara updated the PFS in February 2016 for a 4.5 Mtpa processing option.

Perseus undertook a due diligence review of Yaouré prior to the acquisition in early 2016. The proposed plant throughput rate was reduced to 3 Mtpa in order to optimise capital expenditure. The review concluded that the project appeared to be both technically feasible and economically viable.

Perseus commenced a Definitive Feasibility Study (DFS) on the Project in June 2016, selecting a number of independent consultants for various aspects of the study. The DFS included additional drilling to increase confidence in resource estimates, further investigate geotechnical parameters, gain additional samples for metallurgical test work and to sterilise areas prior to planning placement of infrastructure.

Perseus undertook a drilling campaign between January and June 2017 and an updated resource estimate was completed in October 2017. Also in October 2017, Lycopodium updated the mineral processing and metallurgical testing section for the DFS.

This report presents a summary of work completed pursuant to the DFS and previous work undertaken by Amara's studies that is relevant to the current Mineral Resource and Mineral Reserve estimates. The report has been compiled by Perseus Mining Limited as a consolidation of the work undertaken by the various independent consultants that have contributed to the DFS.

2.1 QP Responsibilities and Site Visits

A summary of the Qualified Persons responsible for the information contained in this report is provided in Table 2-1. The Qualified Persons that are not employees or directors of Perseus Mining Limited or its subsidiaries are each independent of the Issuer for the purposes of National Instrument 43-101 "Standards of Disclosure for Mineral Projects".

The following Qualified Persons conducted site visits of the Property:

- Jonathon Abbott, B. App. Sc, MAIG, visited the Property from 17th to 22nd March 2017.
- Paul Anderson B. Eng. visited the Property on behalf of David Gordon, B. App. Sc, FAusIMM, 15th to 19th September 2016.
- Joe Mc Diarmid, B. Eng., MAusIMM (CP), visited the Property from 5th to 8th September 2016.
- David Morgan, B. Sc, M. Sc, MAusIMM and MIEAust CP Eng, visited the Property from 20th to 22nd May 2017.
- Paul Thompson, B. SC, MSc, FAusIMM, has visited the Property on eleven occasions, the first being in November 2015 and the latest being 19th to 21st July 2017.
- Gary Brabham, B. App. Sc, MSc, MAIG, FAusIMM, has visited the Property on seven occasions, the first being in June 2016 and the latest being 13th to 26th July 2017.

Table 2-1 Summary of Qualified Persons

Report Section	Qualified Person	Company
1. Summary	All QP's	
2. Introduction	Gary Brabham	Perseus Mining
3. Reliance on Other Experts	Gary Brabham	Perseus Mining
4. Property Description and Location	Gary Brabham	Perseus Mining
5. Accessibility, Climate, Local Resources, Infrastructure and Physiography	Gary Brabham	Perseus Mining
6. History	Gary Brabham	Perseus Mining
7. Geological Setting and Mineralisation	Gary Brabham	Perseus Mining
8. Deposit Types	Gary Brabham	Perseus Mining
9. Exploration	Gary Brabham	Perseus Mining
10. Drilling	Gary Brabham	Perseus Mining
11. Sample Preparation, Analyses and Security	Gary Brabham	Perseus Mining
12. Data Verification	Jonathon Abbott	MPR Geological Consultants
13. Mineral Processing and Metallurgical Testing	David Gordon	Lycopodium Minerals
14. Mineral Resources Estimate	Jonathon Abbott	MPR Geological Consultants
15. Mineral Reserves Estimate	Joe Mc Diarmid	RPM Global
16. Mining Methods	Joe Mc Diarmid	RPM Global
17. Recovery Methods	David Gordon	Lycopodium Minerals
18. Project Infrastructure		
18.1 Introduction	David Gordon	Lycopodium Minerals
18.2 Roads	David Gordon	Lycopodium Minerals
18.3 Buildings	David Gordon	Lycopodium Minerals
18.4 Mine Services Area	David Gordon	Lycopodium Minerals
18.5 Workforce Accommodation	David Gordon	Lycopodium Minerals
18.6 Power Supply and Reticulation	David Gordon	Lycopodium Minerals
18.7 Emergency Power	David Gordon	Lycopodium Minerals
18.8 Water Supply	David Gordon	Lycopodium Minerals
18.9 Miscellaneous Infrastructure	David Gordon	Lycopodium Minerals
18.10 Tailings Storage	David Morgan	Knight Piésold
19. Market Studies and Contracts	Paul Thompson	Perseus Mining
20. Environmental	Paul Thompson	Perseus Mining
21. Capital and Operating Costs		
21.1 Capital Cost Estimate	David Gordon	Lycopodium
21.2 Operating Costs Estimates	Paul Thompson	Perseus Mining
22. Economic Analysis	Paul Thompson	Perseus Mining
23. Adjacent Properties	Gary Brabham	Perseus Mining
24. Other Relevant Data and Information	Gary Brabham	Perseus Mining
25. Interpretation and Conclusions	Gary Brabham	Perseus Mining
26. Recommendations	Gary Brabham	Perseus Mining
27. References	Gary Brabham	Perseus Mining

2.2 Currency and Units of Measure

All units of measurement in this study are in metric unless otherwise stated.

Monetary units are in US dollars, unless otherwise stated.

2.3 Data Sources

Sources of data used in this technical report are listed in Section 27.

3. Reliance on Other Experts

3.1 Other Experts

The Qualified Persons contributing to this report have relied in good faith on information provided by other experts in relation to the aspects listed in Table 3-1.

The Qualified Persons have not personally verified the fitness, currency or conditions of mineral titles that comprise the Yaouré property nor do they offer any opinion as to political risk.

Table 3-1 Other Experts

Report Section	Information	Source
4	Mineral tenure, surface rights, legal access, obligations	Martijn Bosboom, Perseus Mining Limited
4	Royalties, payments, encumbrances	Martijn Bosboom, Perseus Mining Limited
4	Environmental liabilities	Colin Carson, Chantelle De La Haye, Perseus Mining Limited
4	Permits that must be acquired to conduct work proposed for the property	Colin Carson, Chantelle De La Haye, Perseus Mining Limited
5	Sufficiency of surface rights	Martijn Bosboom, Perseus Mining Limited
20	Environmental studies	Chantelle De La Haye, Perseus Mining Limited
20	Permitting requirements	Chantelle De La Haye, Perseus Mining Limited
20	Community Impact	Chantelle De La Haye, Perseus Mining Limited
20	Mine closure requirements and costs	Chantelle De La Haye, Perseus Mining Limited

3.2 Acknowledgements

Christopher Picken, previously Exploration Project Manager for Perseus at Yaouré, provided first drafts of sections 4, 5, 6, 7, 8, 9, 10, 23, 24 and 25 of the Technical Report.

Amadou Cissé, Senior Exploration Geologist for Perseus at Yaouré, contributed to the compilation of section 11 of the Technical Report.

4. Property Description and Location

4.1 Location

The Yaouré Gold Project is located in a rural area of central Côte d'Ivoire, West Africa, 35 km north-west of the capital Yamoussoukro. The property lies close to the southern shore of man-made Lake Kossou and 25 km east-north-east of the district administrative centre of Bouaflé. The Kossou hydroelectric power station is situated 6 km east of the project. The villages of Angovia and Allahou-Bazi are situated within one kilometre of the main gold deposits (Figure 4-1).

Figure 4-1 Yaouré Gold Project Location

Source: www.geology.com/world-ivory-coast-map.gif

4.2 Property Description

Perseus Yaouré sarl, a wholly owned subsidiary of Perseus Mining Limited, holds four *permits de recherche* (PRs; exploration licences or permits) in the region covering a 566.44 km^2 area. The permits granted are PRs 168, 397, 577 and 615. The details of the original permit grant dates, renewal information, expiry dates and surface areas are detailed in Table 4-1.

The Mineral Resources and Mineral Reserves that are the subject of this report are located within PR 397 covering a 49.77 km² area. The results of exploration on contiguous PRs 168 and 615 are also discussed in the report for context.

There have been no Mineral Resources delineated on PRs 168, 577 and 615 and activities remain at the exploration stage on these permits.

Table 4-1 Mineral Tenure Information

Permit Holder:	Perseus Yaouré sarl	Perseus Yaouré sarl	Perseus Yaouré sarl	Perseus Yaouré sarl
Permit Number	168	397	577	615
Permit Type	Exploration Permit	Exploration Permit	Exploration Permit	Exploration Permit
Original Grant Date	31 July 2002	11 December 2013	6 May 2015	30 September 2015
Latest Renewal Date	1 December 2016	1 December 2016	n/a	n/a
Surface Area	3.6 km^2	49.77 km^2	206 km^2	307 km^2
Expiry Date	30 November 2018	30 November 2018	5 May 2019	29 September 2019

4.3 Ownership and Title

4.3.1 Exploration Permit 168

PR 168 was granted to Compagnie Minière d'Afrique (CMA) by decree number 2002-376 of 31 July 2002. The permit was transferred to Perseus Yaouré sarl (formerly Amara Mining Côte d'Ivoire sarl, and before that Cluff Gold (WA) Côte d'Ivoire sarl (Cluff)) in 2004, as evidenced by order no. 48/MEMME/DM of 8 October 2004. Following a series of extensions, a final extension of the PR to 30 November 2018 was granted by order no. 0162/MIM/DGMG of 1 December 2016.

A map showing the location of the 3.67 km² PR 168 is displayed in Figure 4-2 and its coordinates are listed in Table 4-2.

Table 4-2 Coordinates of Exploration Permit 168

Point	Latitudes (North)	Longitudes (West)
A	07° 03' 00"	05° 29' 55"
B	07° 03' 00"	05° 29' 21"
C	07° 01' 06"	05° 29' 21"
D	07° 01' 06"	05° 29' 55"

4.3.2 Exploration Permit 397

PR 397 was granted to Perseus Yaouré sarl (formerly Amara Mining Côte d'Ivoire sarl, and before that Cluff Gold (WA) Côte d'Ivoire sarl) by decree no. 2013-840 of 11 December 2013. An extension of the permit to 30 November 2018 was granted by order no. 0165/MIM/DGMG of 1 December 2016.

A map showing the location of the 49.77 km² PR 397 is displayed in Figure 4-2 and its coordinates are listed in Table 4-3.

Table 4-3 Coordinates of Exploration Permit 397

Point	Latitudes (North)	Longitudes (West)
A	07° 03' 00"	05° 33' 46"
B	07° 03' 00"	05° 29' 55"
C	06° 59' 54"	05° 29' 55"
D	06° 59' 54"	05° 30' 08"
E	06° 59' 10"	05° 30' 08"
F	06° 59' 10"	05° 33' 46"

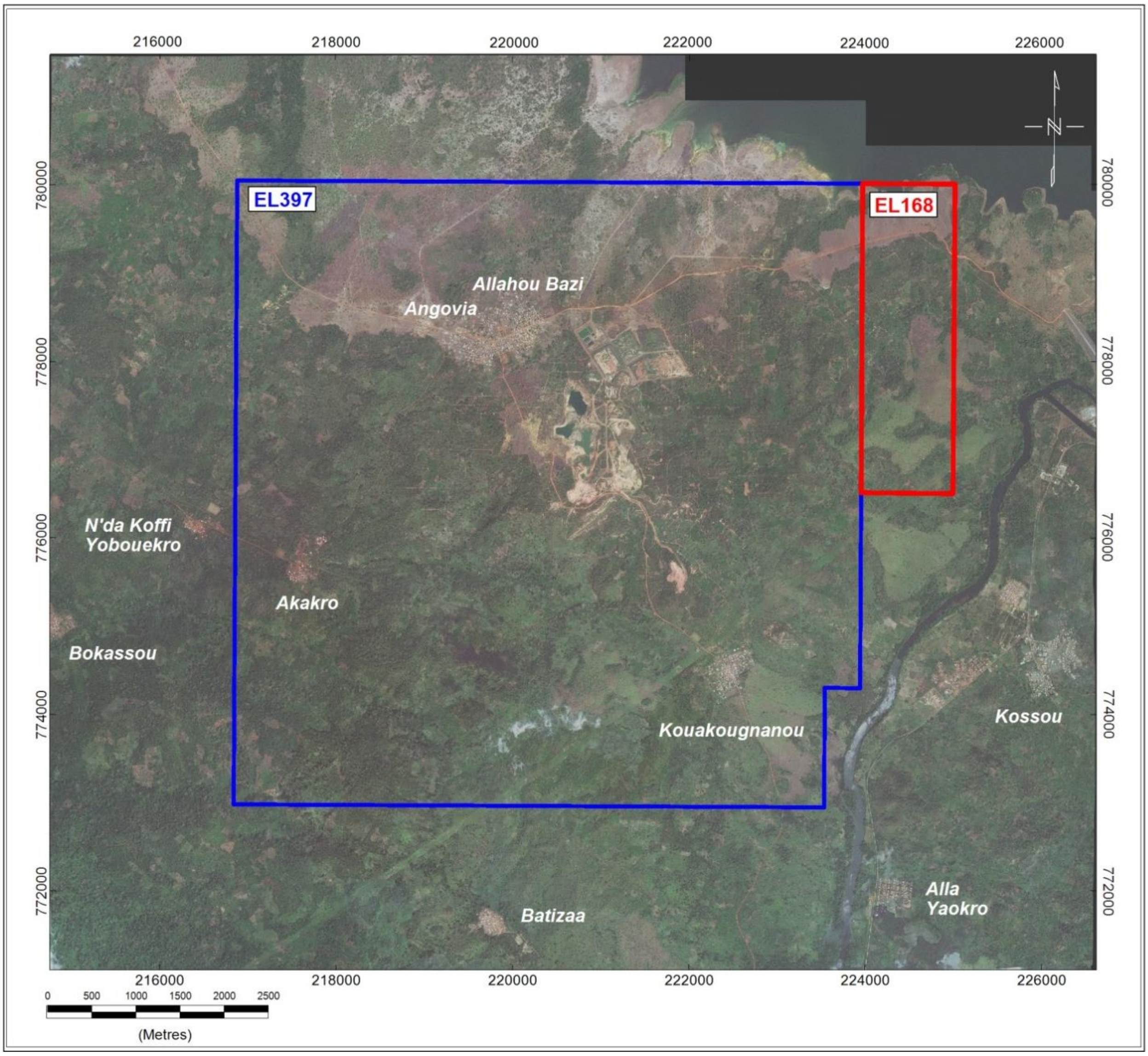


Figure 4-2 Yaouré Gold Project Land Tenure: Exploration Permits 397 & 168

4.3.3 Exploration Permit 577

PR 577 was granted to Perseus Yaouré sarl (formerly Amara Mining Côte d'Ivoire sarl) by decree no. 2015-318 on 6 May 2015. Geographic coordinates for PR 577 covering a 206 km2 area are shown in Figure 4-3 and listed in Table 4-4.

Table 4-4 Coordinates of Exploration Permit 577

Point	Latitudes (North)	Longitudes (West)
A	07° 06' 43"	05° 25' 30"
B	07° 02' 56"	05° 25' 30"
C	07° 02' 56"	05° 22' 49"
D	06° 59' 05"	05° 22' 49"
E	06° 59' 05"	05° 16' 17"
F	07° 06' 43"	05° 16' 17"

4.3.4 Exploration Permit 615

PR 615 was granted to Perseus Yaouré sarl (formerly Amara Mining Côte d'Ivoire sarl) by decree no. 2015-665 on 30 September 2015. It covers an area relinquished from permit 168. The location of the coordinates for PR 615 covering a 307 km^2 area are shown in Figure 4-3 and listed in Table 4-5.

Table 4-5 Coordinates of Exploration Permit 615

Point	Latitudes (North)	Longitudes (West)
A	7°07'01"	5°40'00"
B	7°07'01"	5°34'23"
C	7°07'50"	5°34'23"
D	7°07'50"	5°32'08"
E	7°03'00"	5°32'08"
F	7°03'00"	5°33'46"
G	6°59'10"	5°33'46"
H	6°59'10"	5°32'08"
I	6°55'00"	5°32'08"
J	6°55'00"	5°40'00"

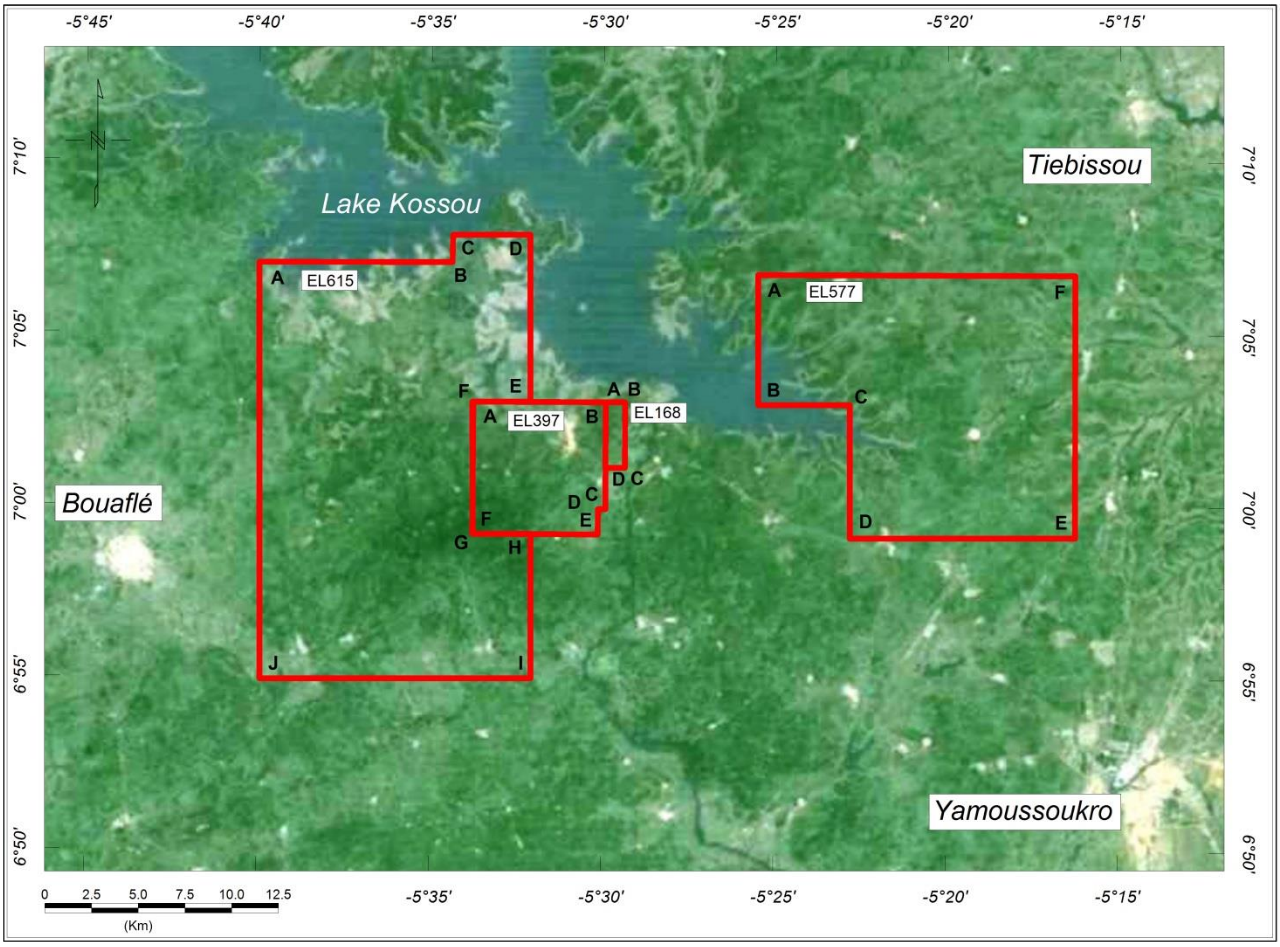


Figure 4-3 Yaouré Gold Project Land Tenure: Exploration Permits

4.4 Legal Obligations

The Ministry of Mines sets minimum expenditure requirements which must be met in order for Perseus Yaouré sarl to retain each exploration permit. The expenditure requirements for PR 397, the permit covering the Mineral Resources and Mineral Reserves described in this report, are detailed in Table 4-6.

The granting of a PR permits drilling to be undertaken without requiring additional permission. There is a requirement to compensate local landowners for any damage to agricultural crops required to access drilling sites. The compensation payable to landowners is according to the guidelines set by the Ministry of Agriculture.

Table 4-6 Minimum Expenditure Requirements in Currency of Côte d'Ivoire (CFA)*

Year	Permit 397
1	CFA 3,250,996,000
2	CFA 1,409,104,000
3	n/a
4	n/a

** At December 2017 1 USD ~ 554 CFA*

In general, an exploration permit does not have any legal environmental performance requirements. A government audit by the National Environmental Agency was completed on permit 397 to assess the environmental effects from previous mining by CMA and Cluff (2D Consulting, 2014).

4.5 Exploitation Permit Application

An application for a *permit de exploitation* (PE; exploitation permit or mining lease) in respect of the Yaouré mining project was lodged by Amara on 3 August 2015. That application has been superseded by the renewal of PR 397 for two years to 30 November 2018.

Perseus proposes to lodge an updated application for an exploitation permit in early 2018 to cover the areas of PR 397 and 168. That application will be supported by submission of the Definitive Feasibility Study report to the Ministry of Mines.

At the time of grant, the Government of Côte d'Ivoire takes a 10 per cent non-contributing interest in a newly created holding entity. Additionally, the Government of Côte d'Ivoire is entitled to revenue-based royalties as set out in Table 4-7 and a further 0.5 per cent of revenue is required to be paid into a community development fund.

The Mineral Resource area is not affected by sites of historical or environmental significance. A number of culturally significant sites in the surrounding area (cemeteries, sacred groves) and the proximity of Angovia/Allahou Bazi village must be considered in future mine development but are not expected to be significant impediments.

An Environmental and Social Impact Assessment, forming part of Amara's PE application process, was submitted on 28 July 2015. That assessment requires updating to incorporate the mine development envisaged in the DFS.

Table 4-7 Scale of royalties

Spot price per ounce - London PM Fix	Royalty Rate
Less than or equal to US$1000	3%
Higher than US$1000 and less than or equal to US$1300	3.5%
Higher than US$1300 and less than or equal to US$1600	4%
Higher than US$1600 and less than or equal to US$2000	5%
Higher than US$2000	6%

5. Accessibility, Climate, Local Resources, Infrastructure & Physiography

5.1 Accessibility

The Yaouré project is accessed using the national paved road network. The 230 km stretch between Abidjan and Yamoussoukro comprises a four lane motorway. From Yamoussoukro, the site is accessed using a 25 km section of the main road to Bouaflé up to the village of Toumbokro. The road network is in poor condition for 15 km from the turn-off at Toumbokro to the end of the paved section at Kossou Dam. The last 6 km to Yaouré site is on a laterite gravel road (Figure 5-1).

The Yaouré site may also be accessed from Abidjan by air. The airport, situated 12 km north-west of Yamoussoukro, is 39 km by road from the mine site (Figure 5-1).

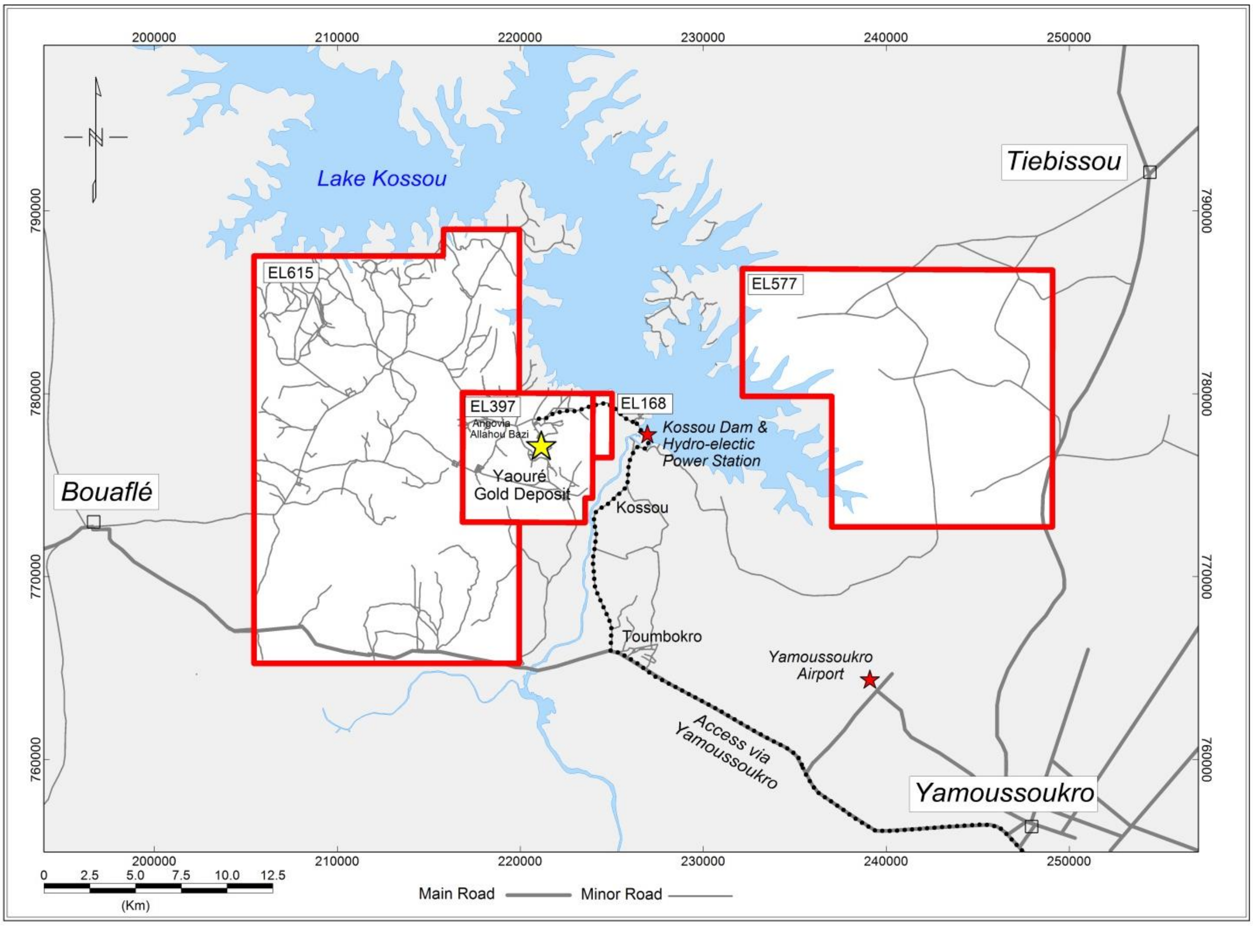


Figure 5-1 Location of the Yaouré Gold Project

5.2 Physiography

The terrain of the Yaouré exploration licence area is dominated by the Mount Yaouré hills (Figure 5-2) in the centre of the southern portion of exploration licence 615. The terrain elsewhere is mostly flat to undulating plains, which in turn give way to the north to the man-made Kossou Lake (Figure 5-3). In addition to the primary river, the Bandama, which flows southwards from the Kossou hydro-electric power station, there is a radial pattern of rivers and streams which drain the Mount Yaouré hills.

Ecologically, the area is classified as a forest-savannah mosaic, consisting of variably degraded forest interlaced with savannah and grassland habitats, with areas cleared for settlement and agriculture. Figure 5-4 shows a view from a point approximately 400 metres east of the Yaouré gold deposit, looking west, showing typical vegetation and terrain surrounding the deposit area. Angovia village can be seen in the distance.

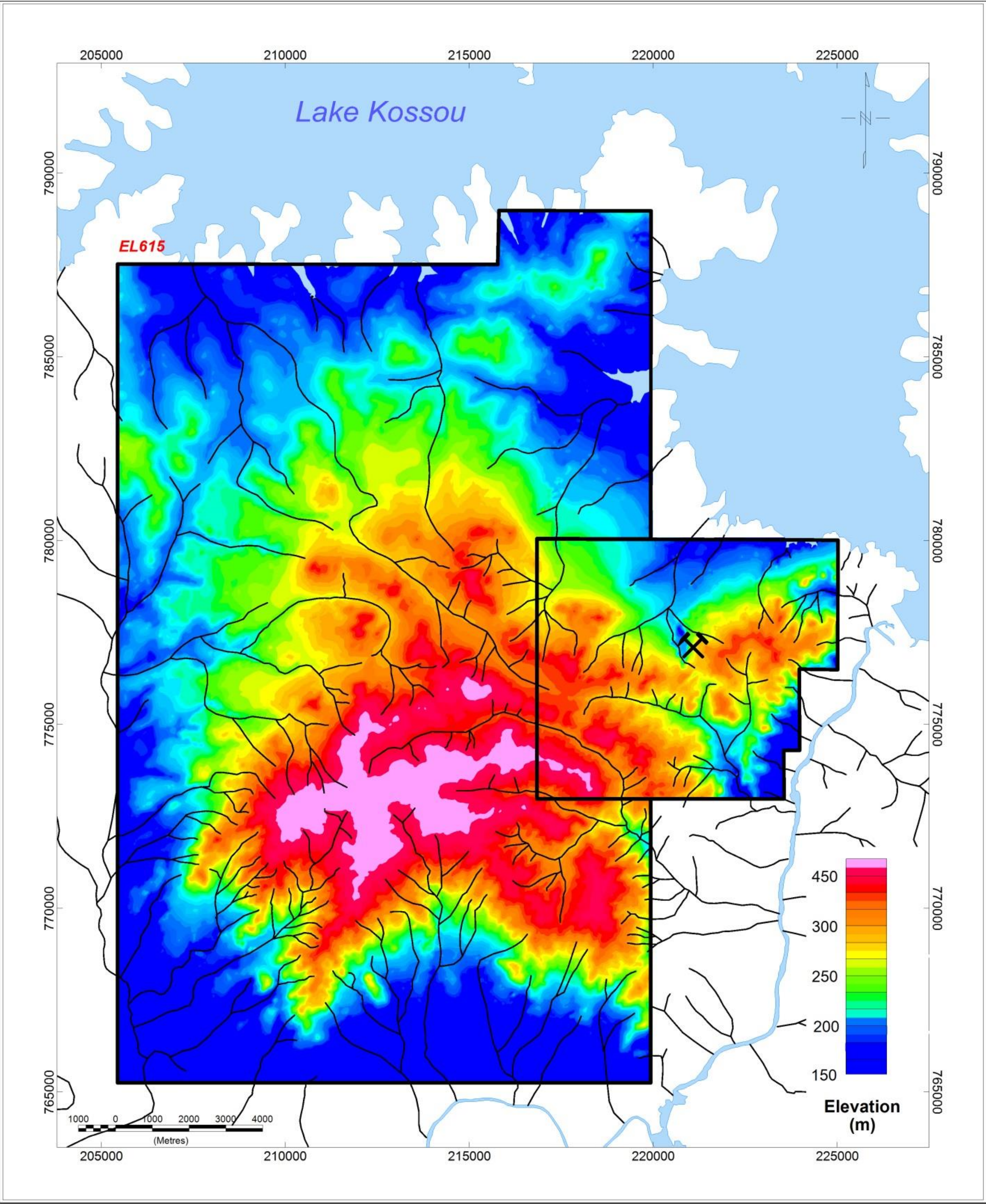


Figure 5-2 Yaouré Exploration Licence: Topography and Drainage

Figure 5-3 Yaouré Gold Project-Typical Savannah Vegetation & Lake Kossou

Figure 5-4 Yaouré Gold Project-Typical Forest & Savannah Vegetation surrounding Yaouré

5.3 Climate

The Project falls into ecological Zone 2 of Côte d'Ivoire, which is an equatorial transition zone. Three seasons can be distinguished, namely: warm and dry (November to March), hot and dry (March to May), and hot and wet (June to October). The average annual rainfall is 1,273 mm. Prevailing winds are the south-west monsoon and the north-east Harmattan. Average daytime maximum temperatures range between 22˚C and 32˚C throughout the year.

5.4 Infrastructure

5.4.1 Electric Power and Communications

Electrical power to the site is supplied by the local grid, via a 33 KVA feeder line from Kossou. Power outages from the local grid are infrequent with the loss of power usually lasting for several hours during periods of heavy rainfall in the wet season.

A fully operational 150 MW hydroelectric power station, powered by the Kossou dam is situated 6 km from site (Figure 5-5). The hydroelectric power station is not in full time operation, only being used when the grid demand requires it. The high voltage lines situated to the south-east of the project send power from the hydroelectric power station to Bouaflé.

The entire area is serviced by reliable mobile phone networks.

Figure 5-5 CIE Hydroelectric Power Station, Kossou

5.4.2 Current Site Infrastructure

Current site infrastructure at Yaouré comprises the former Cluff mine office complex, including a sample preparation laboratory, logistics store, medical clinic, core shed, workshop, accommodation, diesel storage facilities and a helipad.

Senior personnel are presently accommodated in Kossou village, on the eastern side of Kossou dam. Junior personnel are accommodated on site. Local labour is sourced from the Angovia and Allahou-Bazi villages, situated within one kilometre of the existing office complex, and from other nearby villages.

Internet communication on-site is provided by means of satellite.

A 455 KVA standby generator has been installed on site and is used occasionally when the local grid power fails.

5.4.3 Local Economy

The main economic activities in the area are pastoral and cultivated agriculture, forestry, artisanal mining, and fishing. Artisanal mining has taken place in the Angovia area for more than 100 years (Chauveau 1978; Gaston 1913).

The primary working activity is reported in the 2015 Environmental and Social Impact Assessment (ESIA) as: agriculture 51%, artisanal and small mining (ASM) 18% and trade 12%. Secondary working activity is reported as: ASM 27%, agriculture 17% and trade 12%.

The average monthly income per household is reported in the 2015 ESIA to be CFA 120,000 (about US$240) and the average monthly expenditure per household is CFA 85,000 (about US$170).

It is anticipated that the proposed mining operation will readily source unskilled and semi-skilled labour from villages in the immediate vicinity. Qualified tradesmen are available in Bouaflé and Yamoussoukro. Professional personnel are likely to derive from Abidjan.

6. History

6.1 Pre-BRGM Exploration

Artisanal gold mining is known to have been conducted at Yaouré since 1913 (Gaston, 1913). The Societe des Mines d'Or completed the first exploration program in the Yaouré district on six prospects in 1931. Gold mineralisation was discovered in 1932 by J Dupuy at two occurrences known as the 'Filon de Angovia' and the 'Filon de Akakro'. The two occurrences were along the same WNW-ESE oriented quartz vein extending along a 2 km strike between Angovia and Kouakougnanou villages. Historical official annual gold production records indicate significant exploitation activity in the region prior to the outbreak of the Second World War. Annual gold production is reported to have increased from 1.5 kg in 1939 to 107 kg in 1941. In 1947, E Molly completed regional geological reconnaissance and described ten occurrences of gold mineralisation in rocks from Angovia, Benou and the M'Bouessou prospects. At Benou, gold mineralisation was discovered in quartzites and conglomerates outcropping in the Bandama River. The Society for Mineral Development in Cote d'Ivoire (Sodemi) completed work in 1968, re-sampling the quartz veins at Dupuy's discovery site and completed trenching and shallow drilling at the Benou prospect (Sonnendrucker, 1968).

6.2 BRGM Exploration

The French Bureau de Recherches Géologiques et Minières (BRGM) completed regional and detailed exploration between 1982 and 1988 conducting regional soil and stream sediment geochemical sampling programs across exploration permit (PRA No.36).

The BRGM completed the first phase of soil sampling on 100 m spaced grid lines at 50 m intervals over a 1500 m by 600 m area centred on the Filon de Angovia in 1983. The results of the survey did not identify the expected east-west anomaly along the strike of the vein but instead very strong gold anomalism to the north of the vein, oriented NE-SW with gold concentrations ranging between 300ppb and 900 ppb. Subsequent soil geochemical sampling programs identified a 2000 m long, 300 m wide anomaly. A second prominent NW-SE trending soil anomaly was delineated near the village of Kouakougnanou. Subsequent work through to 1991 consisted of geophysics, trenching, motorised auger drilling and diamond drilling to evaluate these two main anomalies.

The BRGM identified a total of eight prospects from their geochemical exploration program. These were referred as Angovia 1, Angovia 2, Kouakougnanou, Yaouré, Blangan, Magazine, Zone North and Govisou prospects. A regional soil anomaly was also delineated in the Alekran area near the village of Kouassi Pelita in the south western corner of PR 615. The gold-in-soil anomaly over the Yaouré Gold Deposit and in areas in close proximity is shown in Figure 6-1.

Between 1987 and 1991 BRGM drilled two diamond core holes and 100 RC holes in the various prospects.

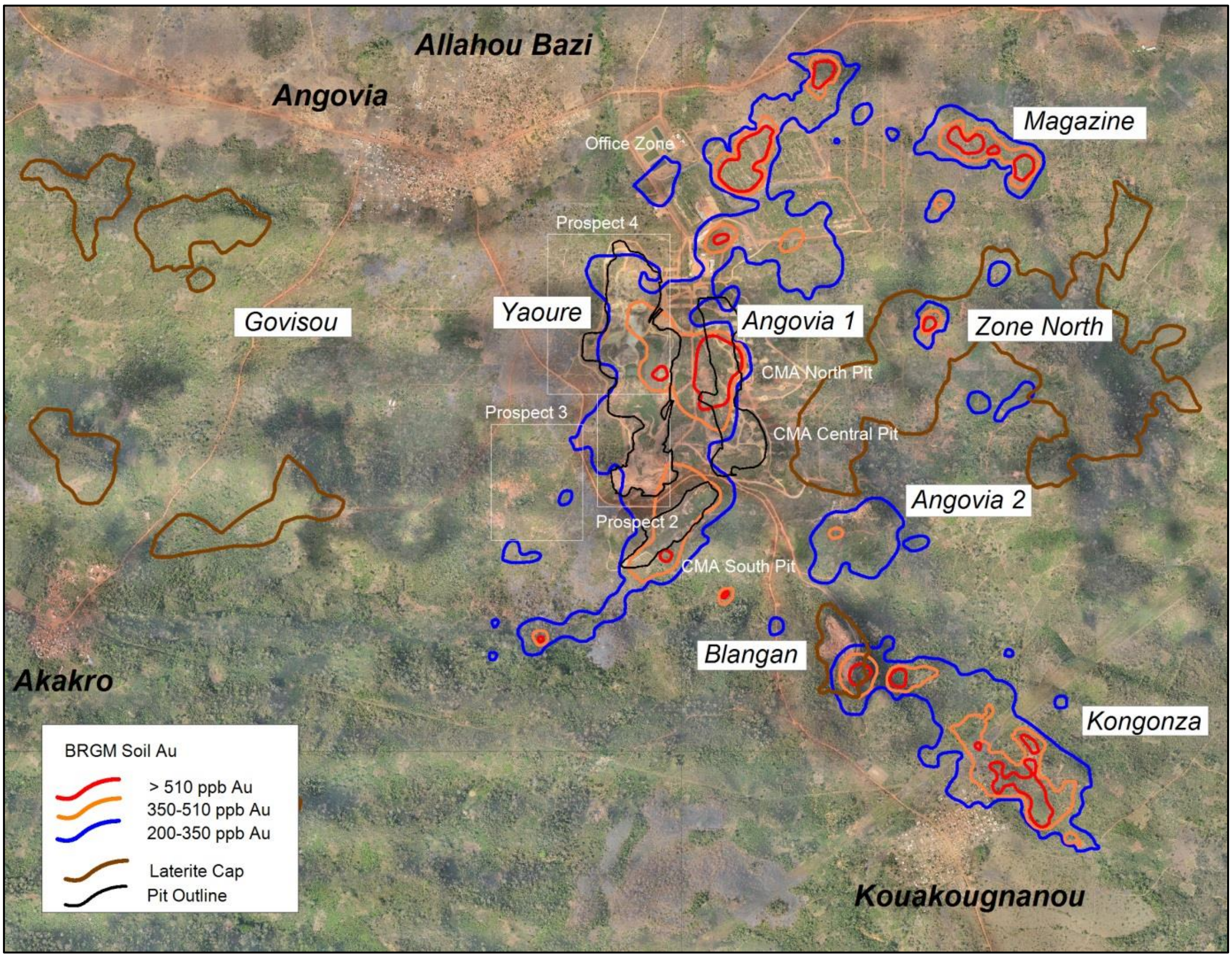


Figure 6-1 Soil Anomalies and Prospects surrounding the Yaouré Gold Project

6.3 Compania Minière d'Afrique

On 25 March 1993, an Exploitation Permit was granted to Compania Minière d'Afrique (CMA) (Permit Number 30 by Order Number 048/MME/DM), who completed further drilling at Angovia 1, leading to a feasibility study in 1994. CMA's drill core and the feasibility study report are not available for review. CMA established an open pit mining and heap leach processing operation in 1999 and production continued until the mine closed towards the end of 2003. Angovia 1 prospect is now referred to as the CMA deposit.

CMA reportedly extracted 1.9 million tonnes (Mt) of ore, with a mean plant feed grade of 3.9 g/t gold from three open pits; CMA North, CMA Central, and CMA South (SRK 2008). The CMA North pit and Central pit eventually merged into one pit, reaching a maximum depth of 40 m below-surface. Treatment of the oxidized ore in a heap leach facility reportedly achieved a mean recovery of approximately 85%.

The CMA was also granted a 485 km^2 exploration permit in July 2002 with the aim of delineating further near-surface oxidized material near to the existing process plant. However, following the closure of the mine in late 2003, the permits were relinquished in 2004, and subsequently transferred to Cluff Gold (West Africa) Côte d'Ivoire SARL on 8 October 2004.

6.4 Cluff Gold (West Africa) Côte d'Ivoire SARL

Cluff Gold acquired prospecting permit EXPL168 on 8th October 2004 following the end of the first civil war in Côte d'Ivoire. When Cluff commenced exploration in 2005 the historical exploration data from the BRGM and CMA comprised information from 79 test pits, 179 diamond drill holes, 134 reverse circulation (RC) holes and 205 trenches. These data derived principally from the CMA and CMA South deposits previously mined, but also from the Yaouré Zone and the Angovia 2, Blangan and Kongonza prospects (Figure 6-1). This information clearly demonstrated the Yaouré Zone to be the most prospective target after the CMA zone, with consistent grades in RC drill holes along a 600 metre strike. Consequently Cluff prioritised exploration of the Yaouré Zone for near surface oxide resources. Over the period 2005-2008 Cluff Gold drilled 481 mainly RC holes into the Yaouré Zone and at the Angovia 2 prospect.

Cluff Gold brought a conventional open pit mine with heap leach processing into production in March 2008 without completing a feasibility study (Figure 6-2 & Figure 6-3). The company also mined the laterite cap on Blangan Hill during this period (Figure 6-4). Cluff Gold recovered a total of 54,382 ounces of gold from 2.1 Mt of ore processed at a grade of 1.0 g/t Au up until mining and processing ceased in January 2011 (Table 6-1). The total figure includes the mining of 581,075 tonnes of laterite on Blangan Hill which produced 17,870 ounces of gold at an average grade of 1.23 g/t.

The mine waste from Cluff Gold's mining activities was backfilled into the pre-existing CMA pit and there are now parts of the waste dump that are topographically higher than the pre-mining surface.

Figure 6-2 View of Yaouré Pit looking North

Figure 6-3 View of Yaouré Pit looking South

Figure 6-4 View of Laterite Cap Mined on Blangan Hill

Table 6-1 Yaouré (formerly Angovia) Gold Mine Production 2008 to 2011

Category	Units	TOTAL	2012	2011	2010	2009	2008
Ore Mined	(t)	2,393,192	n/a	176,418	903,301	880,538	432,935
Waste Mined	(t)	12,627,959	n/a	878,233	3,343,923	5,233,896	3,171,907
Ore Processed	(t)	2,095,293	n/a	172,460	811,921	738,832	372,080
Head Grade	(g/t)	1.00	n/a	0.86	0.90	1.20	0.90
Gold Produced	(oz)	54,382	1,381*	6,470	20,222	21,632	4,677
* No mining. Processed from heap leach pads							

Between 2009 and January 2011, soil sampling was carried out along the Kongonza trend, between Kongonza and Blangan, and at the Zone North, Govisou and Magazine prospects. Cliff Gold evaluated the prominent soil anomalies with shallow rotary air blast (RAB) drilling initially due to limited budgets at that time. Cluff Gold reported in-house (non-JORC compliant) ore resource estimates at Angovia 2 (2.8Mt @ 0.98 g/t, 85,000 oz Au) Kongonza (1.68 Mt @ 1.39 g/t, 75,100 oz Au) and at Zone North (30,000 oz Au @ 0.70 g/t). These estimates are historical, included for information only and should not be regarded as current Mineral Resource estimates.

The start of the second civil war in March 2011 saw the closure of Cluff's mining operations and the suspension of exploration activities due to security concerns. The exploration program resumed in August 2011, and a diamond drill programme to assess the potential in the sulphide zone directly below the mined oxide zones commenced.

The first hole of the sulphide drill program was planned to twin Cluff RC hole (ARC0024) which had intersected 28 metres grading 3.54 g/t. Due to the wet condition of the RC samples this result was regarded as unreliable and requiring confirmation with core drilling. Due to flooding of the pit, the drilling of this hole was delayed whilst dewatering operations proceeded, and the rig diverted to drill a series of short holes into the steep structures that had been identified during the mining phase.

Once pit dewatering was completed, hole YDD0021 was drilled to twin ARC0024. It confirmed the RC intercept with a remarkably similar aggregate intersection of 28 metres grading 3.27 g/t. YDD0021 was effectively the discovery hole that led to the complete reorientation of exploration at Yaouré towards delineating sulphide resources.

Cluff Gold plc changed its name to Amara Mining plc in 2012 and completed a pre-feasibility drill programme between 2011 and 2015. In November 2014, Amara prepared an initial pre-feasibility study which included mineral processing and metallurgical testing, mining and recovery methods, project infrastructure and economic analysis (Tetra Tech, 2015). The pre-feasibility study, based on a mineral resource estimate dated 5th January 2015, supported an 11 year mine life with ore processed at a rate of 6.5Mtpa. Optimisation studies following the completion of the 2015 drilling campaign and an updated resource model, determined the optimal plant size should be reduced to 4.5Mtpa (Tamlyn, 2016). Economic evaluation for the 15 year operating life, mining and processing 62.2Mt at 1.62 g/t gold and operating at 4.5Mt per annum, gave post-tax financial parameters of 38% IRR, 2.1 year undiscounted payback on US$334 million initial capital, and an NPV of US$55 million using a discount rate of 8% and a gold price of US$1,200 per ounce.

Perseus Mining Limited acquired a 100% interest in the property in April 2016 following the acquisition of all outstanding shares of London-based Amara Mining plc. Perseus holds its interest via 100% owned subsidiary Perseus Yaouré sarl.

6.5 Historical Mineral Resource Estimates

The estimates described below are historical, included for information only and should not be regarded as current Mineral Resource estimates. **A Qualified Person has not done sufficient work to classify the historical estimates as current Mineral Resources or Mineral Reserves and the Issuer is not treating the historical estimates as current Mineral Resources or Mineral Reserves.**

The first mineral resource estimates at Yaouré were prepared for Cluff Gold by consultants SRK in 2005 and 2006, and by Dr Simon Ingram of Auverdi in 2007. The resource estimate by Auverdi combined Prospect 2 and Prospect 4 (Yaouré Zone) with SRK's 2006 estimate which combined the sulphide-hosted mineralisation below the base of the previously mined CMA oxide pits, with near-surface oxidised mineralisation defined within the entire exploration permit including the Angovia 2 prospect. The Auverdi estimate in 2007, documented in SRK (2008), is presented in Table 6-2.

Table 6-2 2007 Auverdi Mineral Resource Estimate in SRK (2008)

Oxidation Level	Category	Tonnes (Mt)	Grade (g/t Au)	Gold (oz)
Oxidised	Measured	2.10	1.4	97,000
	Indicated	2.01	1.4	91,000
	Inferred	0.56	1.6	28,000
Sulphide	Measured	2.97	1.5	147,000
	Indicated	2.21	1.7	117,000
	Inferred	0.30	1.6	16,000

Amara Mining's first resource estimate for Yaouré was announced in March 2013, informed by assays up to drill hole YDD0112. The resource estimate by Arnold (2013) using 0.5, 0.8 and 1.0 g/t Au cut-offs reported an indicated and inferred gold resource of 2 million ounces using 0.80 g/t cut off (Table 6-3).

Table 6-3 Yaouré Indicated & Inferred Resources 25th March 2013

Resource Category	Unit	Cut-Off Grade (g/t)		
		0.5	0.8	1.0
Indicated	Tonnes (Mt)	13.5	8.02	5.65
	Grade (g/t)	1.04	1.31	1.49
	Content (Koz)	450	340	270
Inferred	Tonnes (Mt)	59.3	34.6	24.7
	Grade (g/t)	1.15	1.52	1.78
	Content (Koz)	2,200	1,700	1,400

Amara's second resource model in December 2013 was based on the complex litho-logging code system designed by Bond (2013) who generated 145 different logging codes incorporating alteration styles into rock code nomenclature. This modelling was largely due to the limited structural understanding of Yaouré at this stage in the project. The Yaouré total indicated and inferred mineral resources detailed in Table 6-4 reported significantly increased resources as the drilling progressed (Rossi & Brown, 2014). These results continued to confirm the potential for a large-scale sulphide deposit underlying the previously mined oxide resources.

Table 6-4 Yaouré Indicated & Inferred Resources 1st December 2013

Resource Category	Unit	Cut-Off Grade (g/t)		
		0.5	0.8	1.0
Indicated	Tonnes (Mt)	20.2	13.3	10.0
	Grade (g/t)	1.20	1.48	1.68
	Content (Koz)	778	637	541
Inferred	Tonnes (Mt)	133	85.7	65.5
	Grade (g/t)	1.29	1.65	1.89
	Content (Koz)	5,518	4,554	3,974

The resource model prepared in December 2015 was changed from using a litho-code based estimation into one using structural domains (Rossi and Brown, 2015). Gold grades were estimated using a combination of ordinary kriging (OK), inverse distance cubed (ID3) and multiple indicator kriging (MIK), both for grades and to probabilistically estimate the proportion of rock type for those domains that could not be interpreted and wireframed.

Table 6-5 Yaouré Measured, Indicated & Inferred Resources 20th December 2015

Resource Category	Unit	Cut-Off Grade (g/t)		
		0.5	0.8	1.0
Measured	Tonnes (Mt)	18.6	14.3	11.9
	Grade (g/t)	1.86	2.23	2.49
	Content (Koz)	1,114	1,024	957
Indicated	Tonnes (Mt)	85.5	60.5	47.4
	Grade (g/t)	1.47	1.81	2.07
	Content (Koz)	4,042	3,527	3,151
Measured & Indicated	Tonnes (Mt)	104.1	74.8	59.4
	Grade (g/t)	1.54	1.89	2.15
	Content (Koz)	5,155	4,552	4,108
Inferred	Tonnes (Mt)	47.7	34.0	27.1
	Grade (g/t)	1.41	1.71	1.92
	Content (Koz)	2,156	1,874	1,674
Total	Tonnes (Mt)	151.8	108.8	86.5
	Grade (g/t)	1.50	1.84	2.08
	Content (Koz)	7.312	6,425	5,782

The wireframes used in the model were CMA, CMA South, Y1, Y2, Y3, S1 and S2. The Yaouré total measured and indicated mineral resources in December 2015 were 6.42 Moz with 0.80 g/t cut off (Table 6-5). These resources were tabulated within the global envelope, and a pit shell defined using a US$1,500 Au price, with inter-ramp slopes of 44º in oxides and 53º in fresh rock, as well as other costs published in the 2015 pre-feasibility study.

7. Geological Setting and Mineralisation

7.1 Regional Geology

The geology of Côte d'Ivoire mainly consists of Archaean and Palaeoproterozoic terranes (Figure 7-1).The coastal part of the country is largely covered by a Mesozoic-Cenozoic sedimentary basin.

Archaean rocks that form the pre-Birimian basement occur in the western part of the country. The Archaean terranes are generally composed of hypersthene-bearing rocks (termed charnockitic suite or granulitic suite). Ferruginous quartzite, basic and ultrabasic rocks (pyroxenite and amphibole pyroxenite), gneiss, migmatite, and granite also occur. The metamorphism varies between granulite and amphibolite facies.

Palaeoproterozoic rocks of the Birimian Supergroup cover more than two-thirds of the country (Lompo 2010; Vidal et al. 2009). They consist predominantly of granitoid zones with volcano-sedimentary greenstone belts. The predominant strike is north-northeast to south-southwest, with typically sub-vertical dips. The dominant regional metamorphism is greenschist facies.

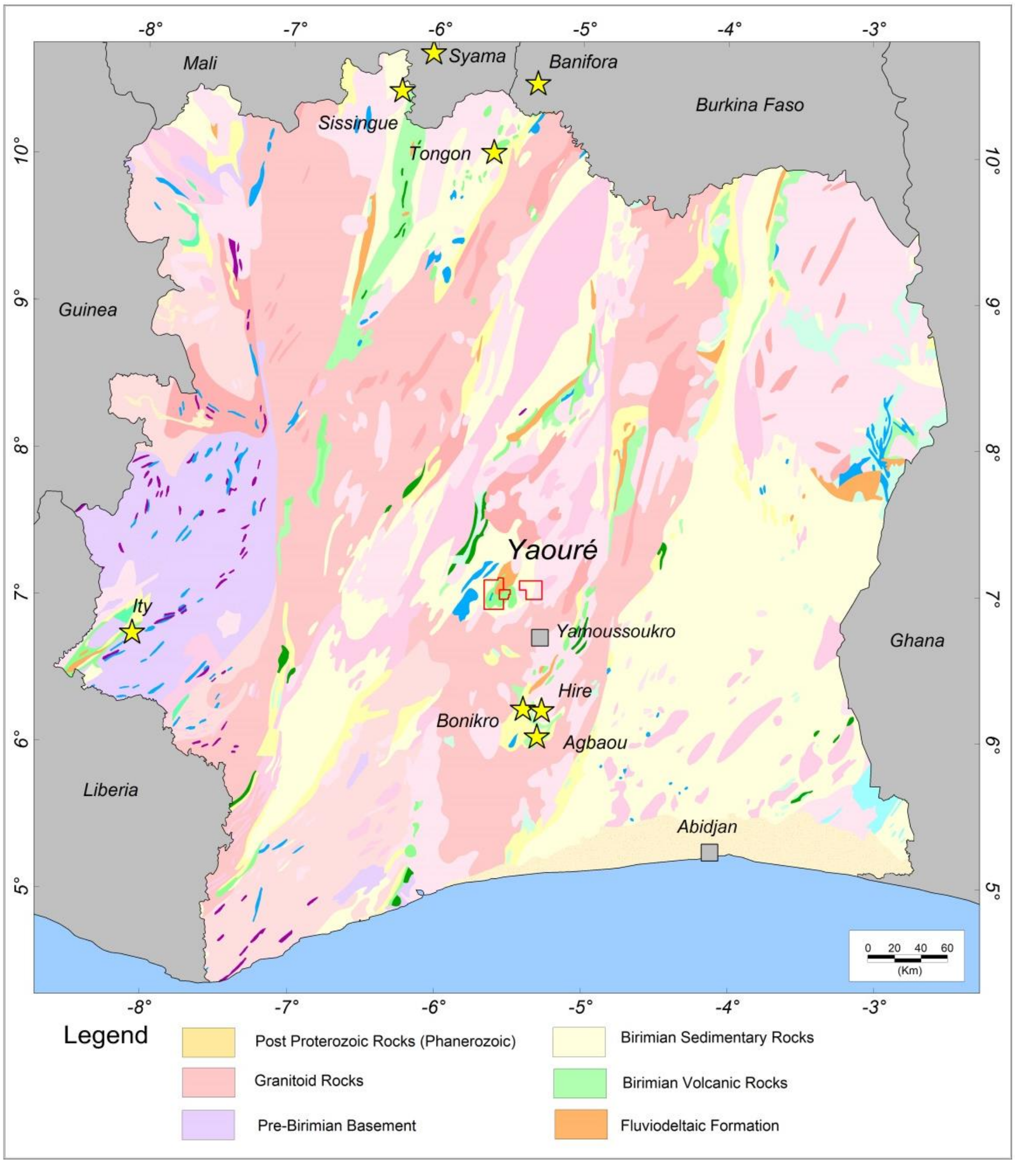


Figure 7-1 Geological Map of Côte d'Ivoire and surrounding countries

Modified from BRGM: West African Gold Deposits in the Lower Proterozoic Lithostructural Setting.

7.2 Local Geology

The Yaouré project area lies within the eastern half of the informally named Bouflé greenstone belt in central Côte d'Ivoire. The belt is a NNE-trending assemblage of Palaeoproterozoic volcanic, sedimentary and intrusive rocks of the Birimian Supergroup.

Rock types in the Yaouré district are, for the most part, mafic volcanic rocks with minor chert, turbiditic metasedimentary rocks and a fluvio-deltaic formation (Figure 7-2). The flysch-like turbiditic metasediments consist of sandstone to argillite with graphitic and conglomeratic horizons. The fluvio-deltaic formation consists of sandstone, conglomerate, and argillite. The volcano-sedimentary rocks were intruded by tonalite-trondhjemite-granodiorite (TTG) type plutonic rocks and undifferentiated granitoids. Mafic to ultramafic complexes are also found in the Yaouré district.

The entire Birimian rock suite has been metamorphosed to lower greenschist facies. Original ferromagnesian minerals are variably replaced by chlorite and leucoxene and rare actinolite and biotite. Plagioclase is typically saussuritised and variably replaced by albite, sericite and minor calcite.

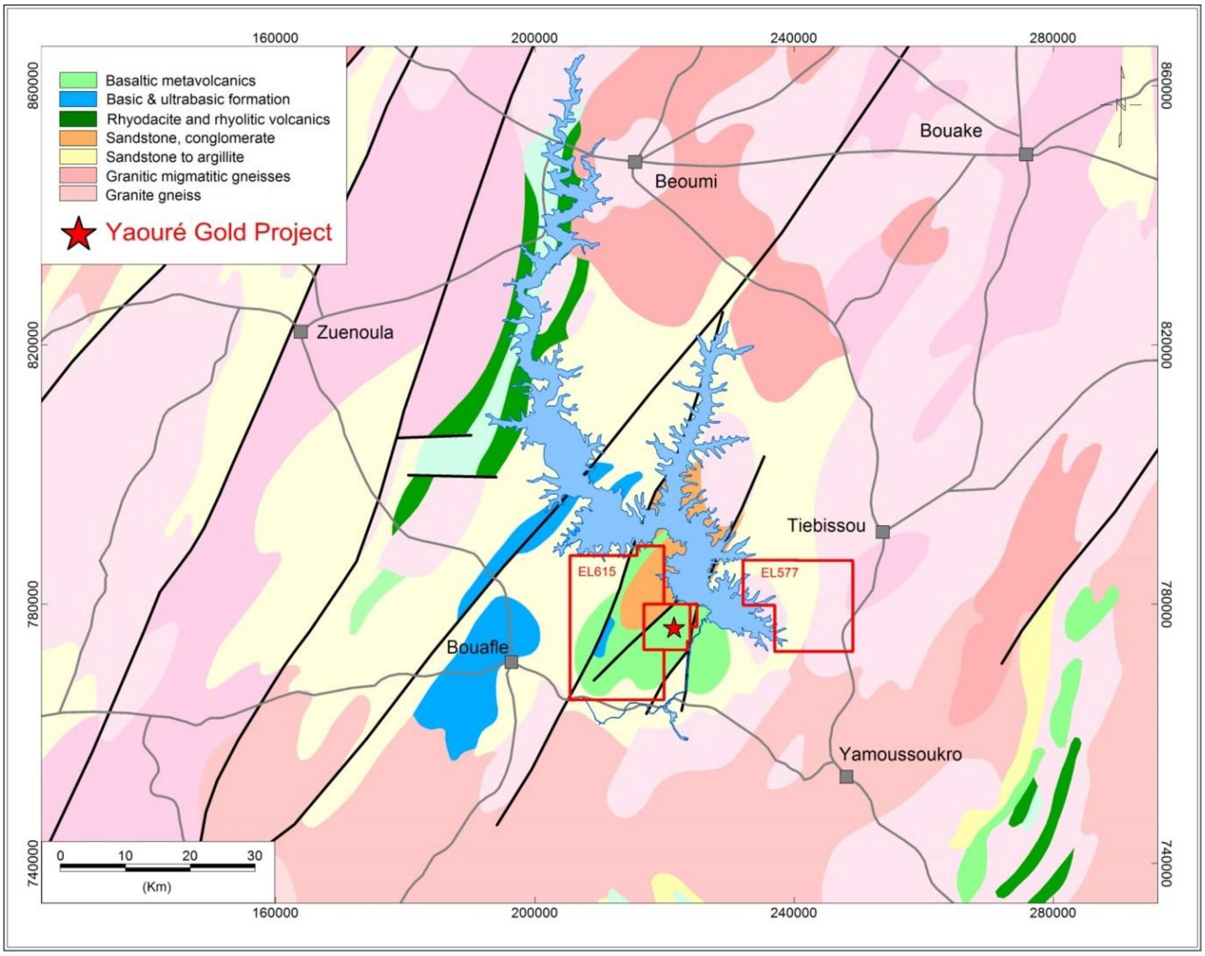


Figure 7-2 Regional Geological Setting

7.3 Project Geology

7.3.1 Introduction

The Yaouré gold deposit is hosted by Palaeoproterozoic Birimian basaltic rocks with intrusions of granodiorite and lesser feldspar, quartz-feldspar and hornblende porphyry dykes. A geological map of the Yaouré district is shown in Figure 7-3. The basaltic volcanics are thought to be the equivalent of the middle portion of the Sefwi Group of western Ghana that have been dated at 2,174 to 2,154 Ma (Perrouty et al. 2012).

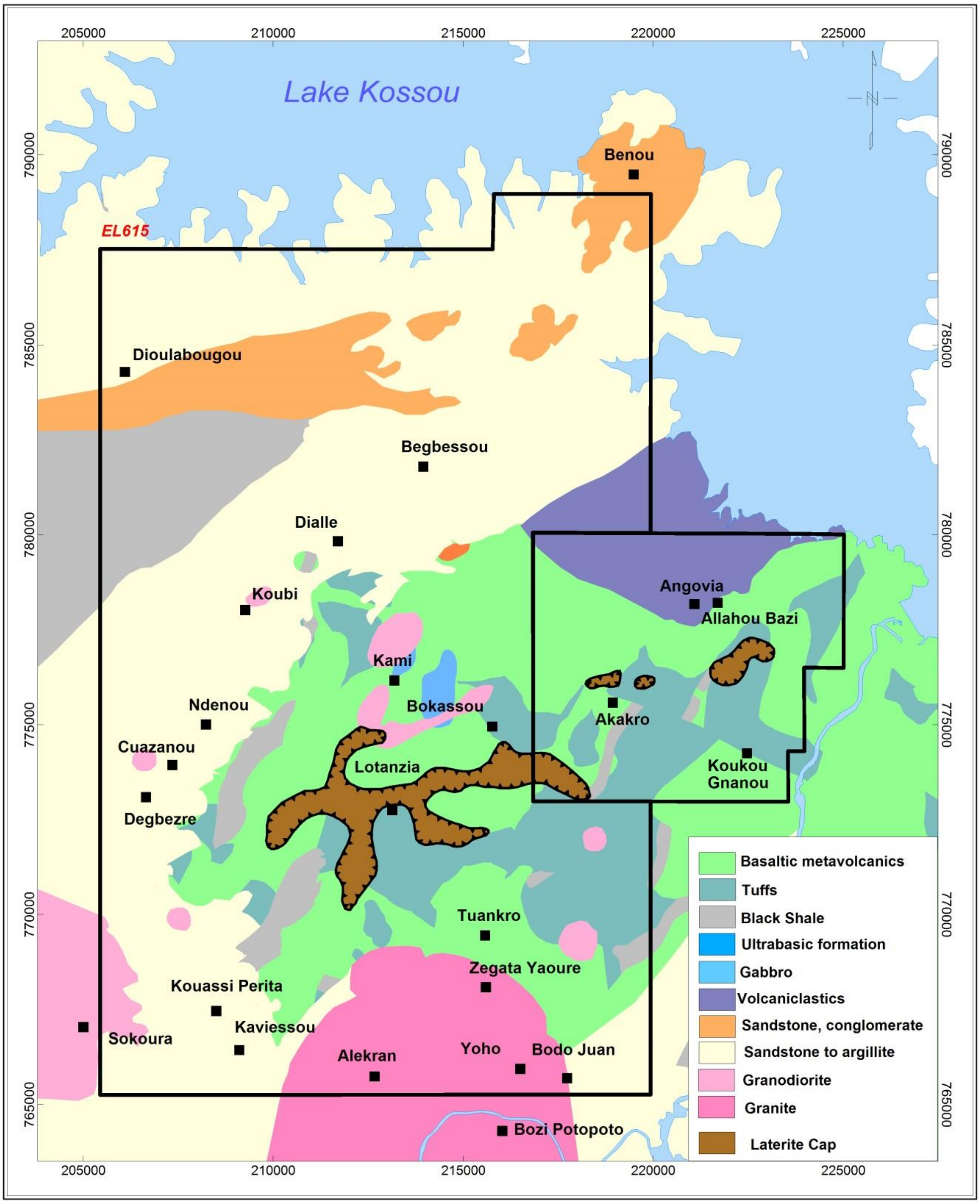


Figure 7-3 Geology of EL 615, EL397 & EL168

7.3.2 Geomorphology

Despite local relief of up to 100 metres, bedrock exposures are rare. Remnant laterite caps mostly comprise re-laterized transported material overlying either in situ or transported saprolite. Much of the area immediately surrounding the Yaouré deposits is covered by up to 20 metres of transported material, rendering surface geochemical sampling of limited use as an exploration tool.

7.3.3 Stratigraphy

The Yaouré deposit is located immediately south of a major break in the structural-stratigraphic architecture of the Birimian host rocks (Figure 7-4). Variably altered, pillowed and massive basalt, quartz and quartz- feldspar porphyry intrusions, and a granodiorite plug host the Yaouré deposit. Logging of pillowed intervals within the basalt sequence indicates the primary volcanic stratigraphy dips approximately 30^{o} to the east.

The area immediately north of the deposit comprises a distinctly different volcano-sedimentary sequence that is thought to have been deposited in a fault-bound basin. Based on drill core exposures it has been divided into an upper and lower unit. The basal unit consists of basaltic volcanoclastic rocks interbedded with layers of pebble conglomerate with fine ash and crystal-rich tuffs. The characteristics of this unit suggest it was deposited as a series of mass and pyroclastic flows with minor episodes of high energy fluvial sedimentation. The upper unit comprises a homogenous sequence of sandstone of dacitic composition, with no bedding or deposition features. The unusual lack of depositional or sedimentary reworking textures throughout this unit suggests a unique, extremely voluminous and proximal volcanic source (Mériaud, 2017). Drill core exposures indicate that the basin-bounding faults have been reactivated as reverse faults during basin inversion and it is possible that such reactivation was contemporaneous with gold mineralisation.

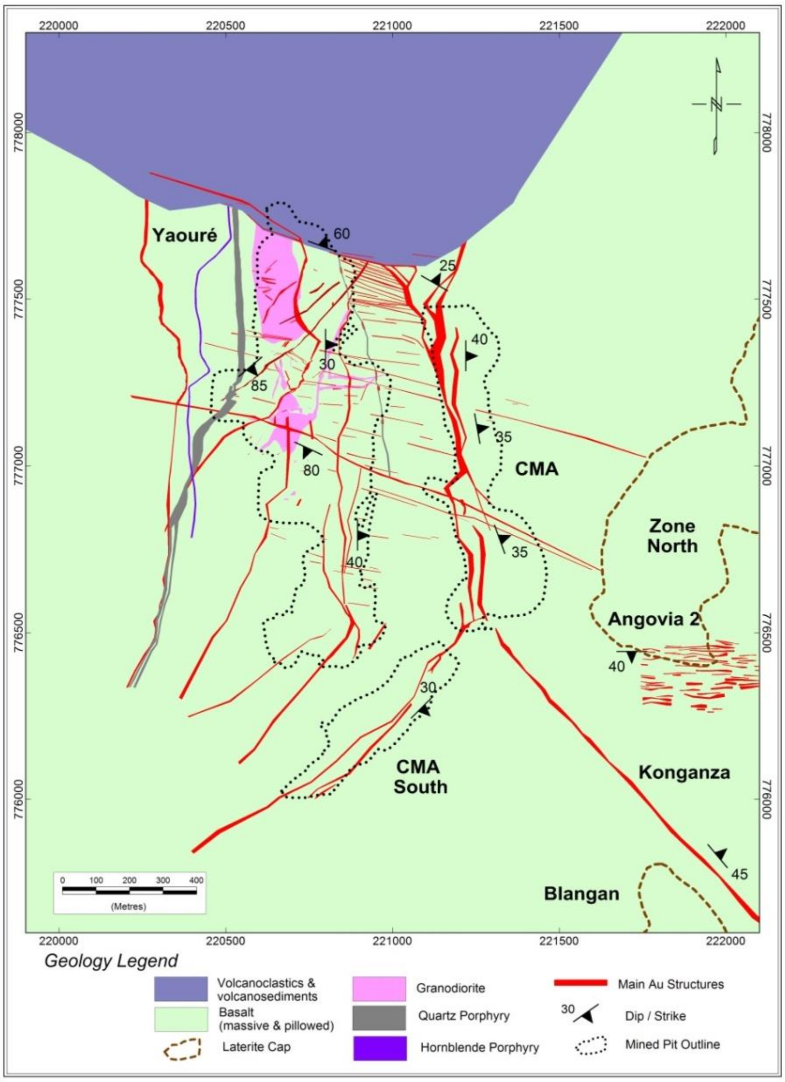


Figure 7-4 Yaouré Gold Deposit – Interpreted Bedrock Geology

Basalts

The predominant rock type at Yaouré is basalt occurring in three main varieties: pillow basalt (Figure 7-5), a fine to medium-grained massive basalt, and a coarser-grained porphyritic variety typical of submarine basalts. Penetrative deformation fabrics are rare; most of the basalts retain their volcanic groundmass texture and pillow margins are well preserved. Fine-grained basalts possibly represent sub-volcanic dykes and sills.

Figure 7-5 Pillow basalt

Volcano-Sedimentary Sequence

The volcano-sedimentary sequence has been divided into an upper and lower unit. The lower unit consists of basaltic volcanoclastic rocks interbedded with layers of pebble conglomerate with fine ash and crystal-rich tuffs. The upper unit comprises a homogenous sequence of dacitic sandstone, with no bedding or deposition features. The broad rock types intersected in this sequence are displayed in Figure 7-6.

Dacitic Sandstone

Crystal Tuff

Lithic Tuff

Lithic Tuff

Ash Tuff

Pebble Conglomerate

Basaltic Volcanoclastic

Figure 7-6 Volcanoclastic rocks

7.3.4 Intrusive Rocks

Intrusive rocks at Yaouré can be distinguished into two main types: a relatively large, north-south striking, granodiorite plug outcropping along a 750 metre section in northern parts of Yaouré Pit and a range of quartz and feldspar porphyries intruding the basalt sequence. The porphyries generally have an intermediate composition, ranging from andesite, dacite, diorite and tonalite. Quartz-feldspar, feldspar, and hornblende porphyries have been identified within the drilled sequence with the majority occurring below the CMA Zone. Many can be correlated along strike and down dip on drill sections with variable steep and gentle dips to the east. A steep sub-vertical east-west striking granodiorite dyke has also been mapped in outcrop in Yaouré Pit and traced in drill holes.

Although the porphyries are not interpreted to be the primary control on gold mineralisation at Yaouré, they do appear to play an important role in locally controlling mineralised structures. Gold grades are commonly elevated along porphyry dyke and sill contacts.

Granodiorite

Granodiorite is generally medium grained with 4-7% hornblende-biotite (Figure 7-7). It is occasionally porphyritic in texture and contains mafic xenoliths.

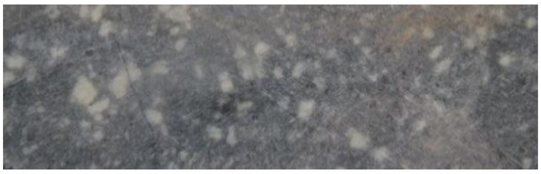
Figure 7-7 Granodiorite Intrusive

Several other granodiorite intrusions are known to occur in the vicinity of Yaouré. Drilling has intersected granodiorite/tonalite at Govisou, approximately one kilometer west of Yaouré pit, and granodiorite is exposed in road cuttings at Blangan, south of CMA.

Porphyries

There are three main types of porphyry (Figure 7-8): medium grey, fine-grained porphyry with feldspar and mafic amphibole phenocrysts, pale grey quartz-feldspar porphyry and medium-grey hornblende porphyry with up to 10% amphibole phenocrysts. In most drill hole exposures the porphyries range from several centimetres to several metres in thickness.

Several porphyry dykes can be traced along strike and down-dip: a quartz-feldspar porphyry on the western side of Yaouré, a steeply dipping dacitic porphyry in central parts between the CMA and Yaouré Zones and a north-east trending porphyry dyke on the eastern margin of the granodiorite plug. A number of smaller, irregular dykes occur throughout the sequence.



Feldspar Porphyry

Quartz Porphyry

Hornblende Porphyry

Figure 7-8 Porphyry Intrusives

7.4 Structure

Outside of the main mineralised structures, penetrative deformation fabrics are rarely observed at Yaouré. Features such as basalt pillow margins are well preserved; a spaced fracture cleavage is observed only in places.

Gold mineralisation at Yaouré has been subdivided into two main zones: the CMA Zone and the Yaouré Zone. The CMA zone is a relatively continuous 20-45 m thick fault zone featuring quartz-carbonate (dominantly ankerite) veining and disseminated pyrite in albite-carbonate altered wall rocks. It strikes approximately north-south, dips at 30 degrees to the east, extends along 1,200 metres strike and its down-dip continuity has been tested for in excess of 450 m. The structure splits and bifurcates into more than one zone, often forming two or more distinct strands. The superimposition of brittle and ductile fabrics and cross-cutting vein relationships indicate multiple reactivations over an extended time period.

At the northern limit of drill coverage, CMA splits into two main strands, the upper continuing to the north and dipping east and the lower merging with the faulted contact with volcanoclastic rocks striking west-north-west and dipping to the north at 60 degrees.

The Yaouré Zone comprises a system of structures in a 300 m wide zone, 200 m below the CMA Zone beneath the Yaouré Central Pit. Gold mineralisation is hosted by a series of brittle-ductile structures divided for convenience into 'Y' and 'S' types (Figure 7-9). The 'Y' fault zones, parallel to

CMA, consist of Y1, Y2 and Y3 - shallow easterly dipping reverse faults with associated albite, carbonate and quartz veins in variably altered host rocks with disseminated pyrite. The first structure with similar characteristics to the CMA, Y1, occurs 200 metres below the CMA, Y2 occurs 440m below CMA and Y3 occurs 550m below CMA. Y1 and Y2 are less well developed than CMA and contain less cataclasite material. Y3 contains both brittle and ductile fabrics similar to CMA and is considered the base of the Yaouré reverse fault system.

The 'S' type structures comprise steep, sub-vertical faults filled with quartz tourmaline veins. The 'S' type structures were identified as S1 and S2 according to orientation. The S1 and S1 parallel structures are oriented west-north-west, east-south-east, and the S2 structure is orientated north-east, south-west. A nomenclature system has been developed whereby prominent veins parallel to S1 are allotted odd numbers and those parallel to S2 even numbers. Thus S9 is sub-parallel to S1; S4 is sub-parallel to S2 (Figure 7-9).

Numerous, less well developed mineralised structures also occur in the deposit. The majority strike approximately east-west and dip sub-vertically and are best developed in the granodiorite stock where, in places, they combine with less common flat-lying veins to form a stock work. Gold mineralisation also occurs along granodiorite and porphyry contacts and along zones of competency contrast such as the contacts between massive and pillowed basalts.

It is thought that the 'S' and 'Y' type structures developed in the same stress field – with the maximum principal stress direction oriented approximately east-west. Subtle differences in the alteration and vein mineral assemblages associated with each of the two types of structures may, however, indicate that their formation was not entirely coeval.

The CMA structure is not exposed at surface, the CMA pit having been backfilled with waste mined out of the Yaouré pit. A number of the other principal mineralised structures are exposed in Yaouré pit (Figure 7-10 through Figure 7-16).

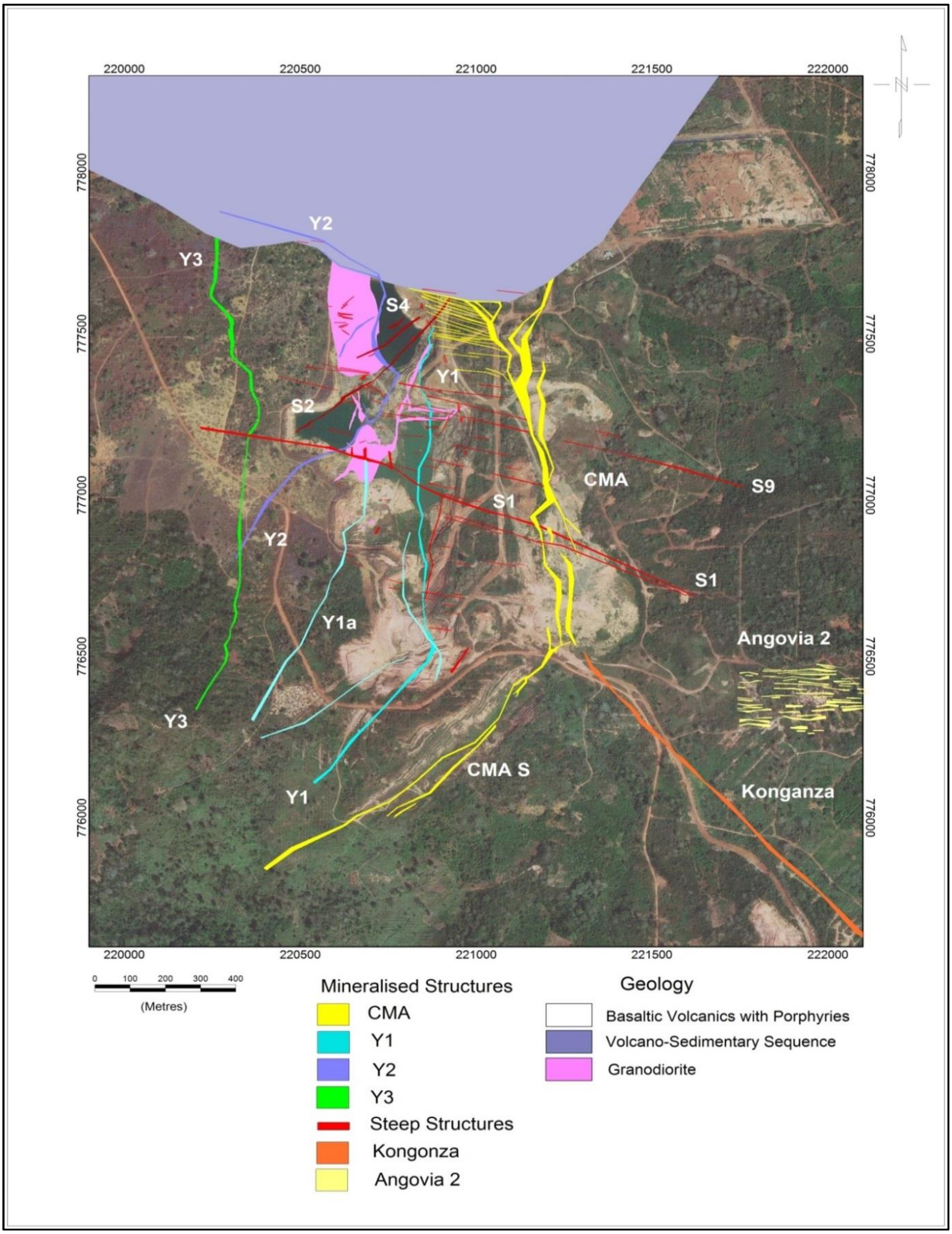


Figure 7-9 Principal Mineralised Structures in Yaouré Gold Deposit

Figure 7-10 Y1 Quartz Vein

Figure 7-11 Y2 Quartz Vein

Figure 7-12 S1 Quartz Vein

Figure 7-13 S2 Structure in granodiorite

Figure 7-14 S2 Structure contact between basalt and quartz porphyry

Figure 7-15 Multiple S1 parallel veinlets in basalt

Figure 7-16 Multiple S1 parallel veinlets in granodiorite

7.5 Alteration and Mineralisation

7.5.1 Pre-mineralisation Alteration

The earliest phase of alteration at Yaouré, predating gold mineralisation, resulted in widespread metasomatic precipitation of calcium rich phases such as clinozoisite, epidote, clinoamphibole and andradite garnet (Townend 2016; Figure 7-17). Early boron metasomatism, possibly related to the intrusion of granodiorite, resulted in the development fine grained prismatic tourmaline, and the release of magnesium and iron lead to the formation of chlorite.

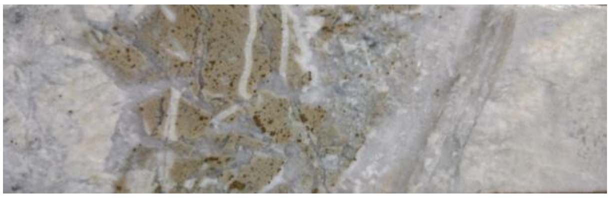
Calc-silicate altered basalt YDD0305 107m 0.90 g/t chlorite clinozoisite

Calc Silicate altered basalt YDD0305 0.51 g/t garnet, epidote magnetite

Figure 7-17 Calc-Silicate alteration styles

7.5.2 CMA-type Alteration

The most common style of alteration with gold mineralisation at Yaouré is quartz veining and intense silicification with albite, ankerite, sericite, biotite and chlorite and pyrite mineralisation, best developed in the CMA structure. This "CMA-type" alteration is clearly distinguished by its pervasive, moderate to strong, pink-pale brown albite and carbonate alteration (Figure 7-18, Figure 7-19). Visible gold is relatively common in the CMA zone within both quartz veins and intensely altered and sheared host rocks. Zones of strong chlorite magnetite pyrite alteration are common in the footwall rocks immediately adjacent to the main 'Y'-type shear zones.



YDD0414 5.75 g/t quartz carbonate albite ankerite pyrite altered basalt

YDD0309 122m at 11.70 g/t Albite ankerite tourmaline altered basalt

Figure 7-18 CMA style alteration

Figure 7-19 CMA IntersectionYDD0068 12.74m at 2.32 g/t & 22.5m at 4.90 g/t

The other 'Y' type structures display alteration and pyrite mineralisation similar to the CMA Zone but less strongly developed (Figure 7-20 through Figure 7-22).

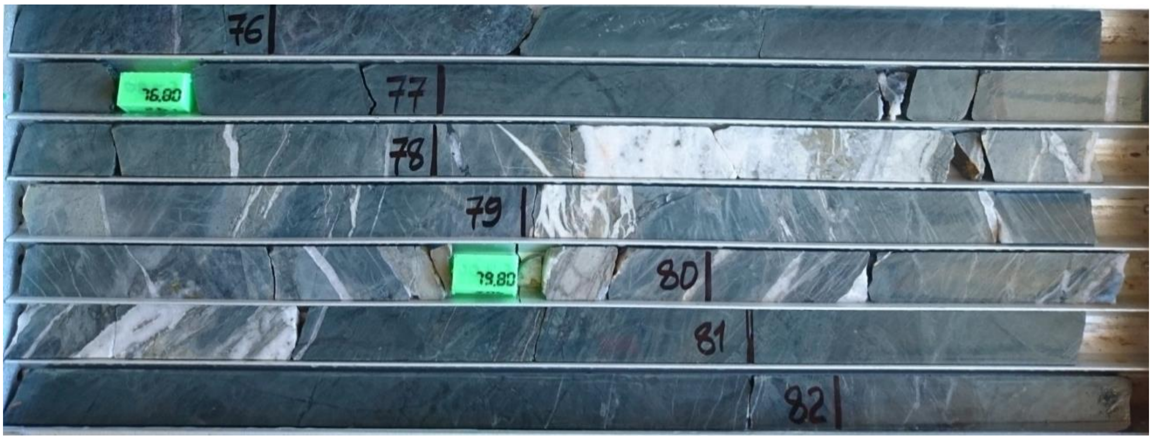


Figure 7-20 Y1 Structure YDD0414 3m at 5.42 g/t

Figure 7-21 Y2 Structure YDD0184 6m at 5.53 g/t

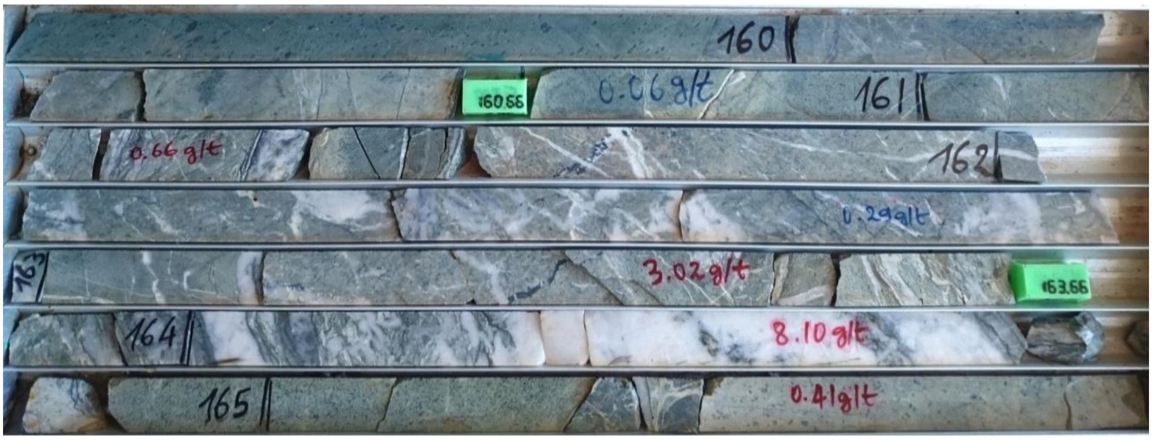


Figure 7-22 Y3 Structure YDD0335 18m at 2.85 g/t

7.5.3 "S" type Alteration and Mineralisation

The 'S' type structures are marked by steep, sub-vertical faults filled with quartz tourmaline veins. Wall rock alteration adjacent to the veins commonly consists of quartz carbonate veinlets with variably developed shear textures with pyrite, biotite, and carbonate selvedges (Figure 7-23, Figure 7-24). 'S' type mineralisation lacks the characteristic orange brown and pink coloured albite and ankerite alteration associated with the 'Y' type structures.

'S' type structures commonly also contain traces of molybdenite (Figure 7-25). Visible gold also occurs in 'S' type mineralisaiton (Figure 7-26).

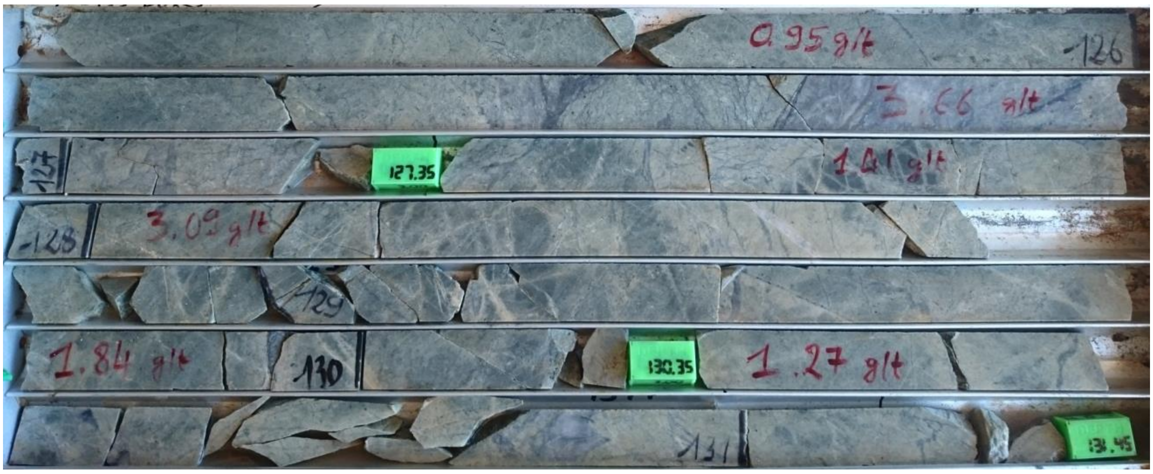


Figure 7-23 S1 Structure YDD0183 18m at 2.85 g/t

Figure 7-24 S2 Structure YDD0444 14m at 3.03 g/t

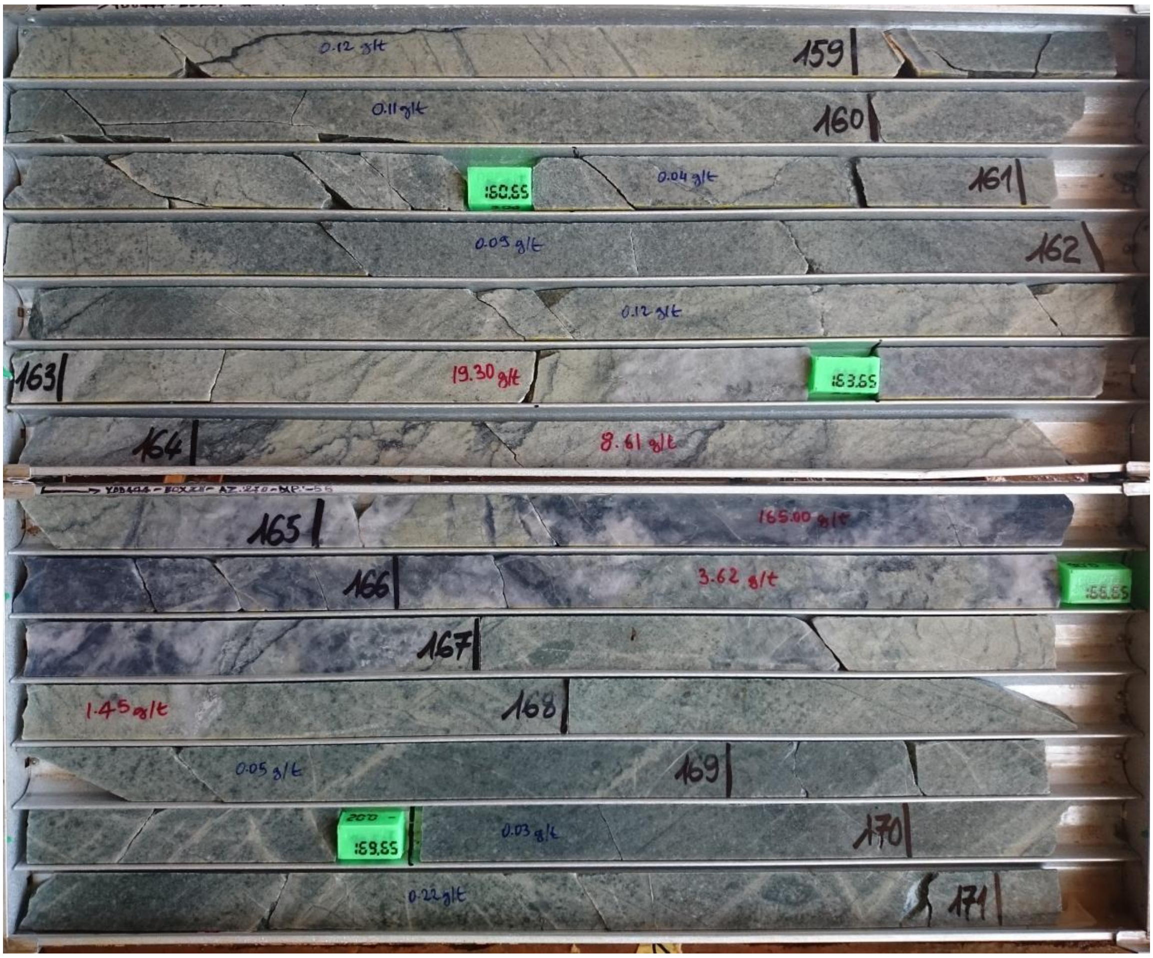


Figure 7-25 YDD0444 Quartz molybdenite vein aligned in a structure parallel to S1

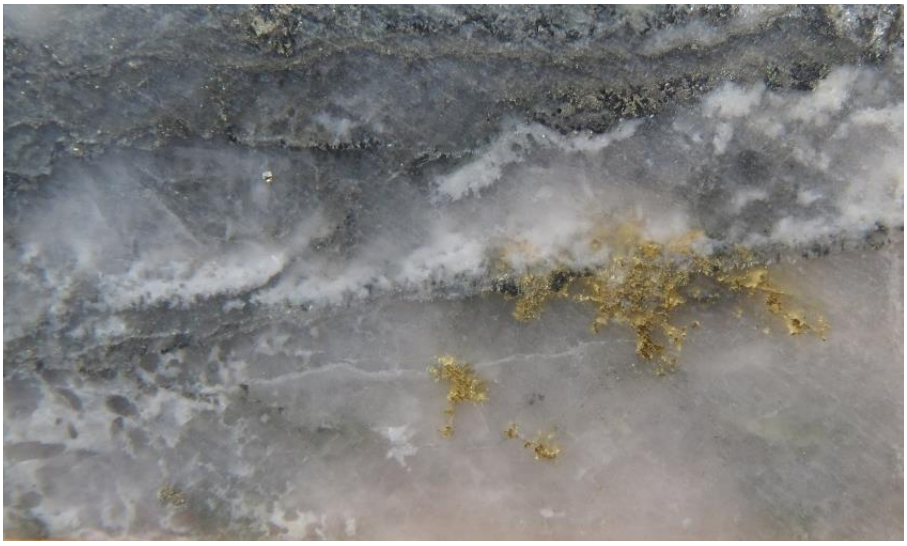


Figure 7-26 YDD0479 94m 113.00 g/t Coarse Visible Au in S1 structure

7.5.4 Granodiorite-hosted Mineralisation

Granodiorite hosted mineralisation is dominated by pervasive, moderate to strong silica-sericite-carbonate alteration with sheeted quartz carbonate veinlets (Figure 7-27). The orientation of veins in the granodiorite is similar to those in basalt, implying the veins formed as part of the same event. Similar to basalt-hosted mineralisation, the veins associated with 'S' type structures appear to more commonly contain tourmaline and traces of molybdenite.

YDD0193 210m 5.14 g/t grey quartz chlorite tourmaline veined granodiorite

YDD0444 59m 19.00 g/t tourmaline muscovite chlorite pyrite grey quartz altered granodiorite

YDD0455 quartz molybdenite vein in altered granodiorite

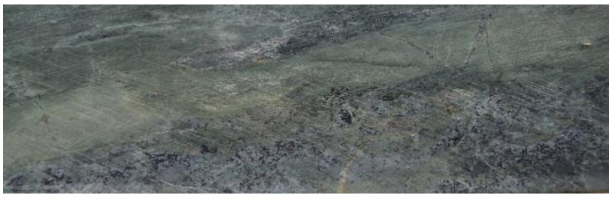
Figure 7-27 Alteration styles in granodiorite

7.5.5 Other Mineralisation

Kerr (2014) described an additional type of mineralisation: "dark peripheral ore". It comprises mineralisation without any obvious controlling fault or shear with biotite, pyrite, quartz and tourmaline micro-veinlets commonly with biotite-chlorite-calcite selvedges (Figure 7-28). Pyrrhotite often dominates over pyrite. The features also commonly occur in un-mineralised rocks, indicating their presence is not necessarily indicative of gold mineralisation.

YDD0182 69m 2.00 g/t quartz carbonate veined chlorite altered basalt

YDD0204 100m 0.80 g/t quartz carbonate veined pyrite altered basalt



YDD0182 77m 0.29 g/t chlorite tourmaline carbonate altered basalt

Figure 7-28 Dark peripheral ore

7.6 Geological Interpretation

Previous drill hole logging at Yaouré utilised a number of different logging code systems, some which were complicated by attempting to incorporate weathering, alteration, rock type and veining into a single code. In 2016 the system was changed in order that weathering, oxidation, rock type, alteration style, vein type and sulphide mineralisation are all logged as separate features. The majority of drill holes already drilled within the Yaouré Zone were re-logged and all holes drilled in the 2017 Phase 7 drill program have been logged using the revised system. The change in the system together with the information from geological and structural mapping of exposures in Yaouré pit helped develop a better understanding of the complex controls to gold mineralisation, particularly in northern parts of Yaouré where an array of mineralised vein systems cut the granodiorite body (Figure 7-29). The understanding of the deposit has improved to the point that alternative interpretations are not considered viable.

Figure 7-30 through Figure 7-36 show interpreted geology and principal mineralised structures on 200 metre spaced cross sections looking north. Typical long sections with azimuth 015 degrees are shown in Figure 7-37 and Figure 7-38.

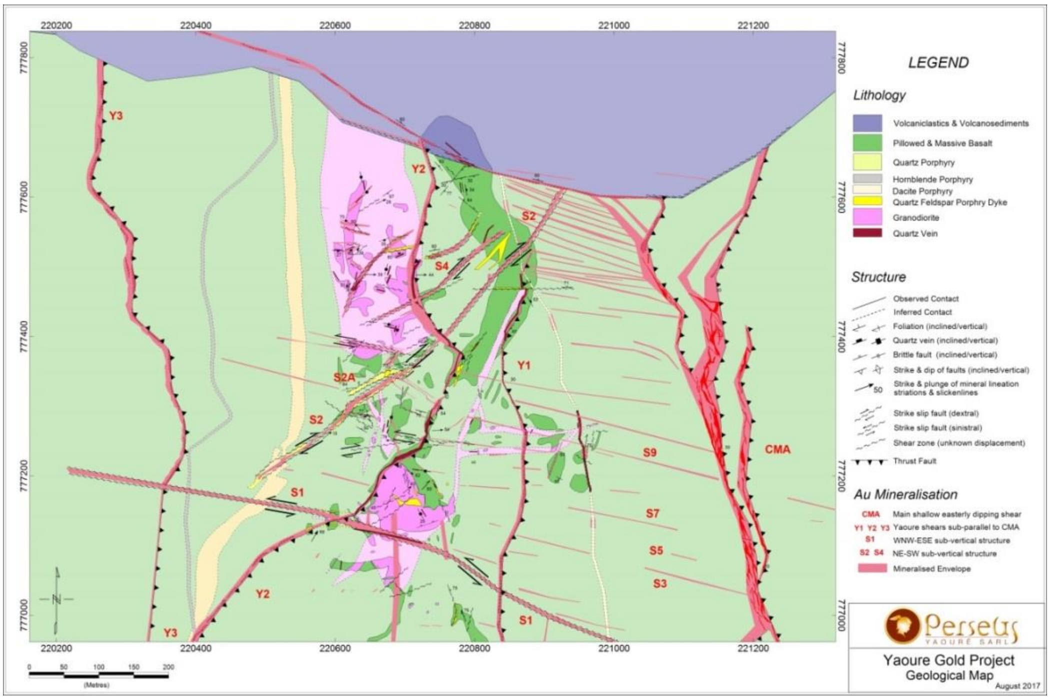


Figure 7-29 Structural geology of the northern section of the Yaouré Gold Deposit

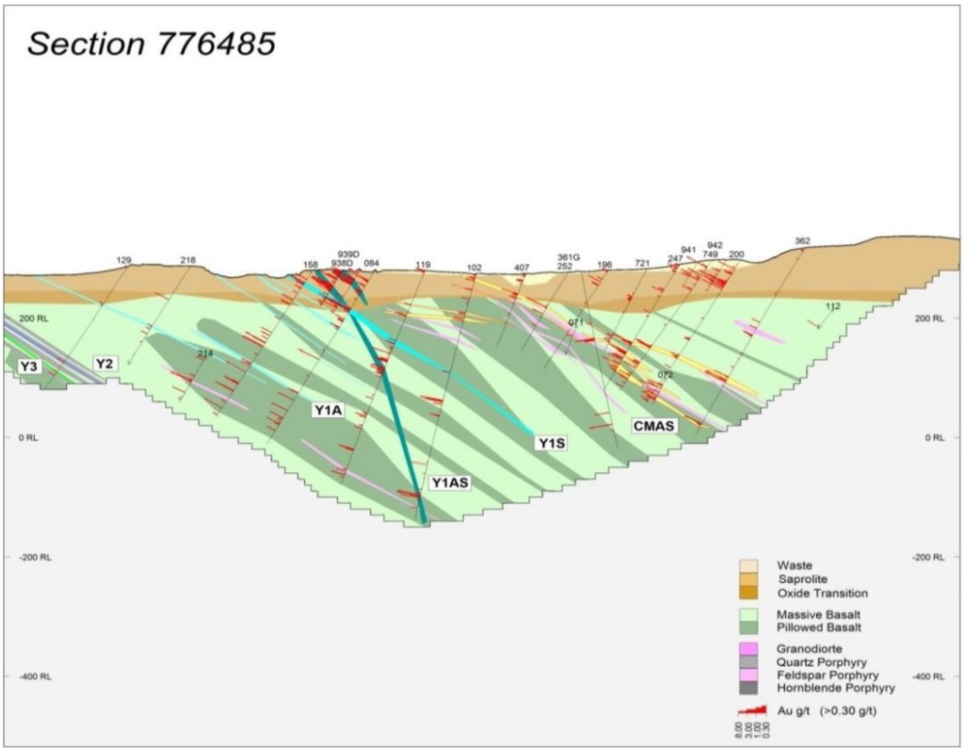


Figure 7-30 Geological Section 776485

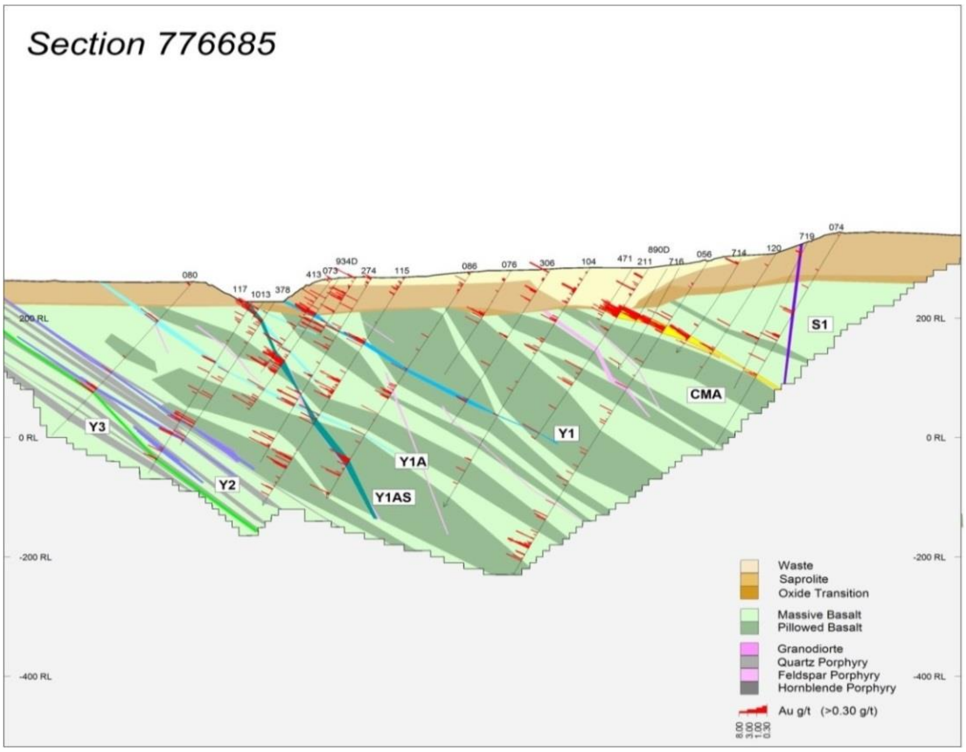


Figure 7-31 Geological Section 776685

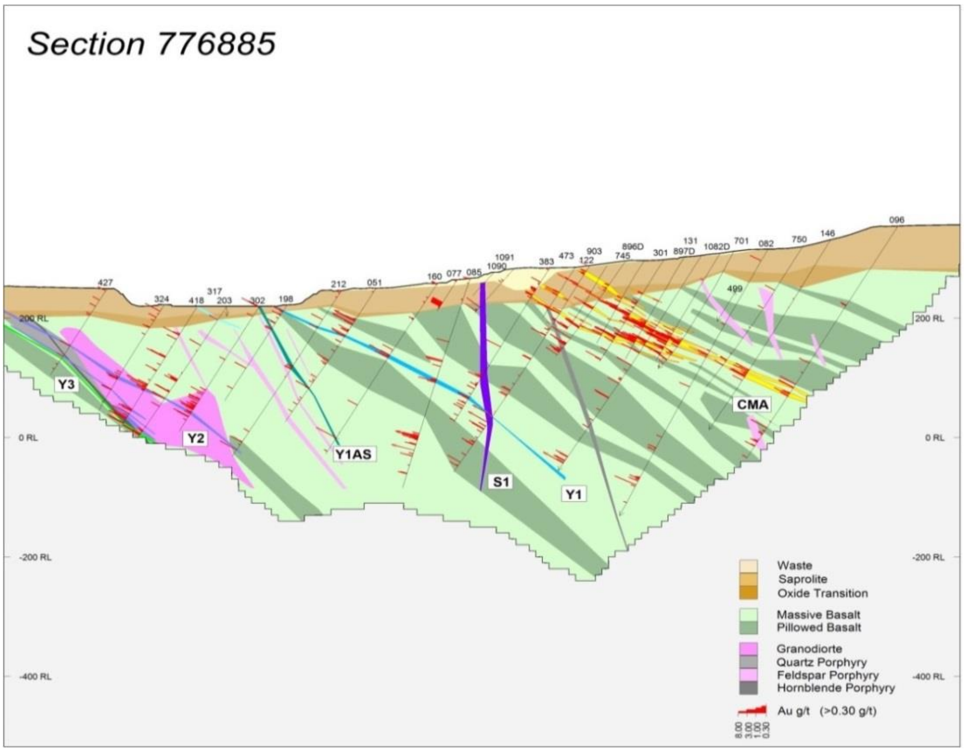


Figure 7-32 Geological Section 776885

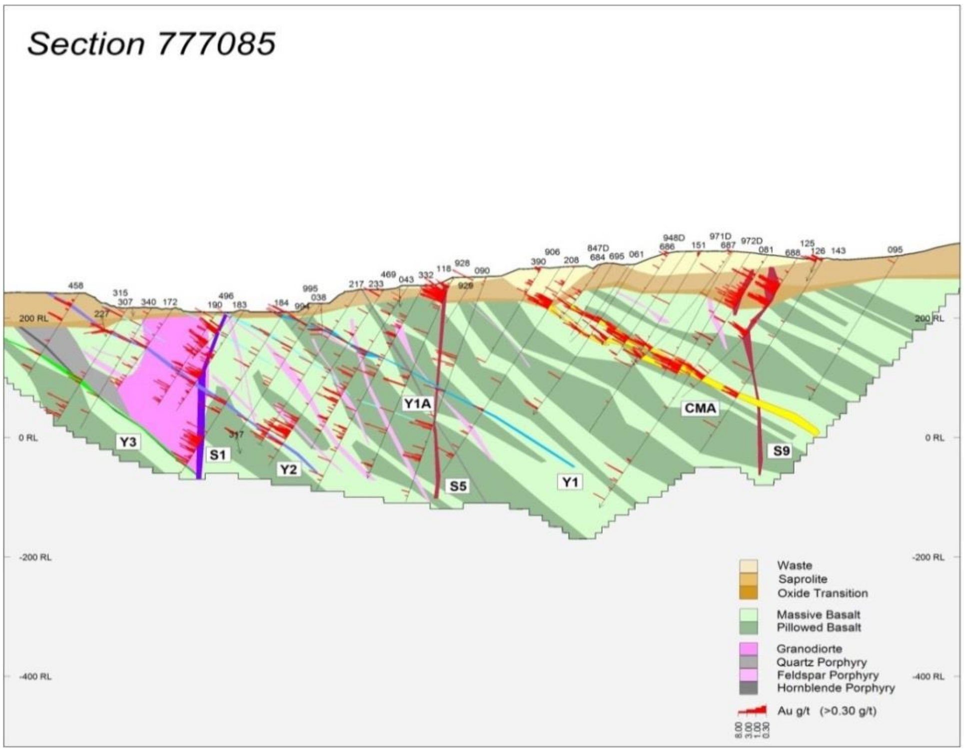


Figure 7-33 Geological Section 777085

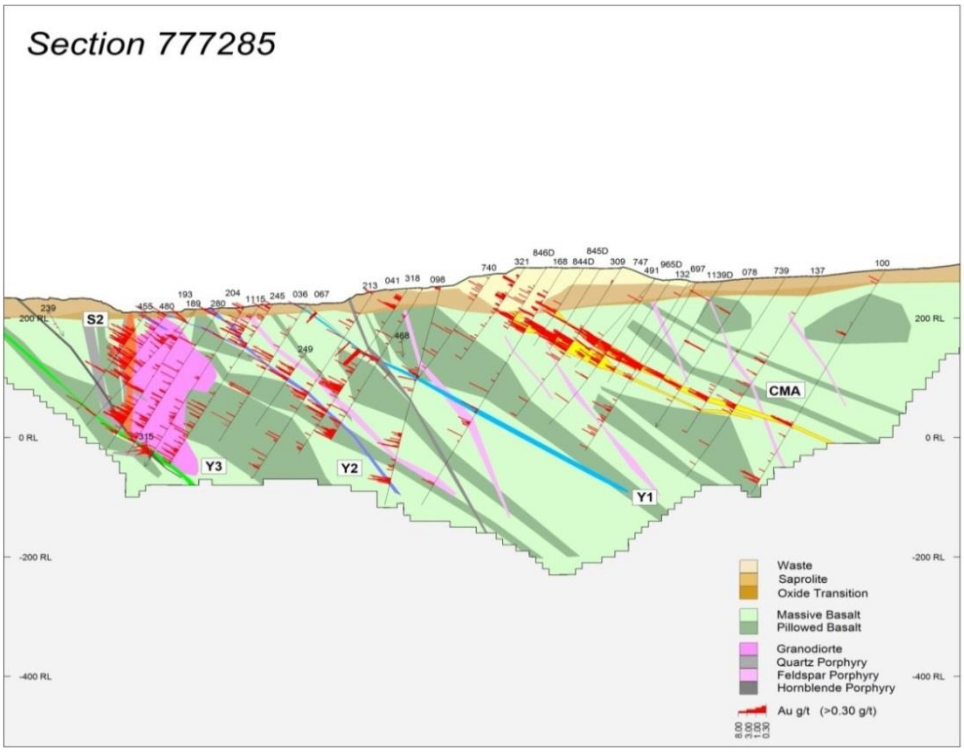


Figure 7-34 Geological Section 777285

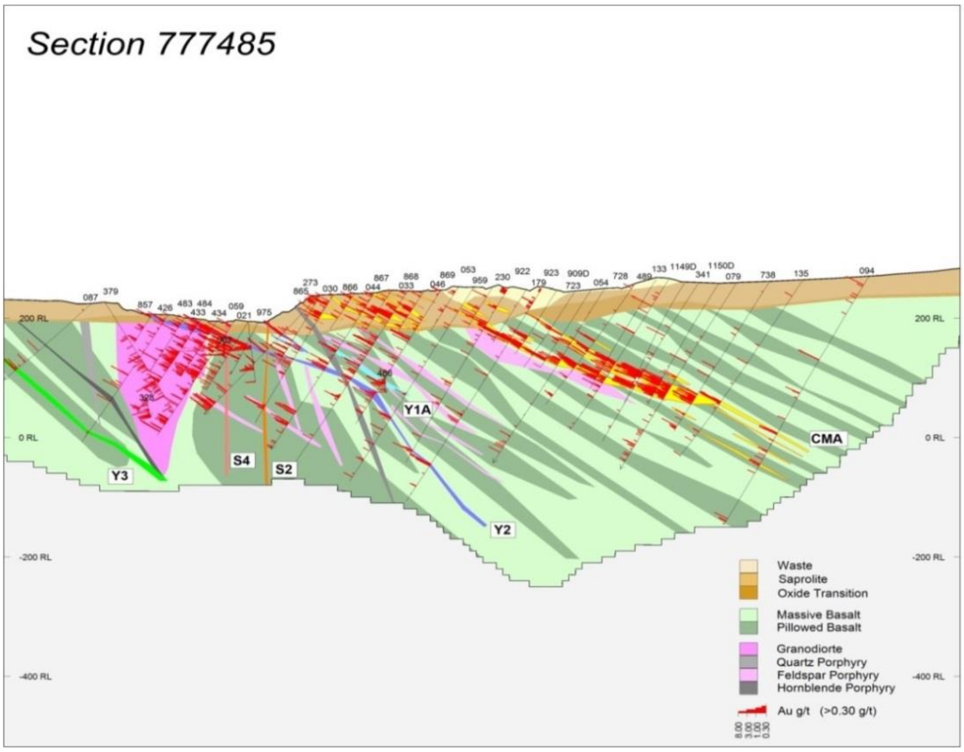


Figure 7-35 Geological Section 777485

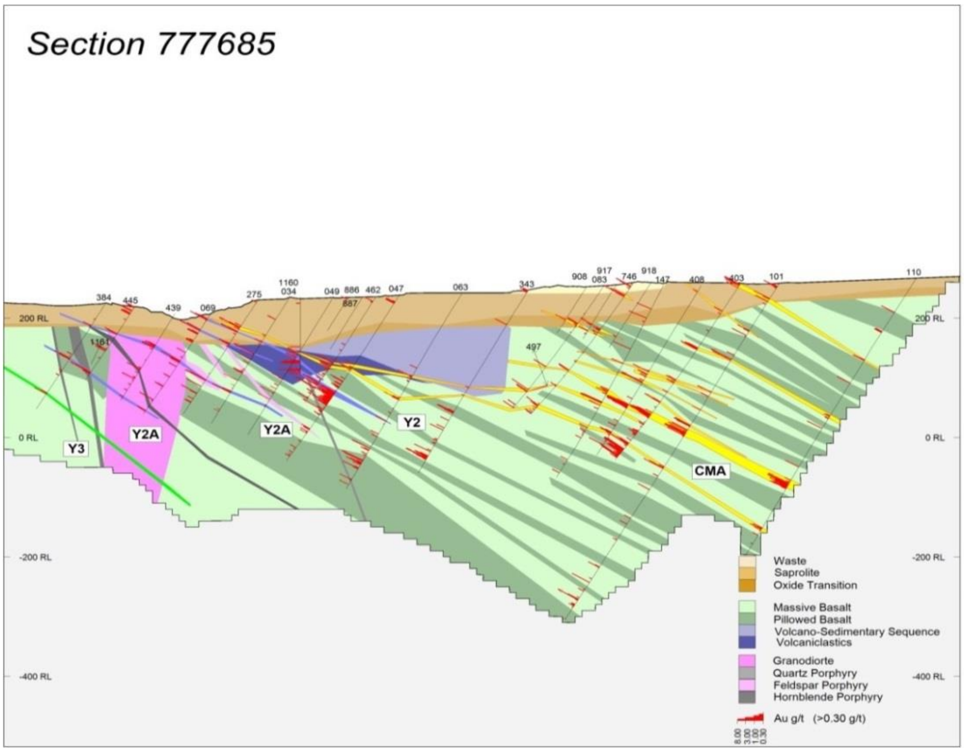


Figure 7-36 Geological Section 777685

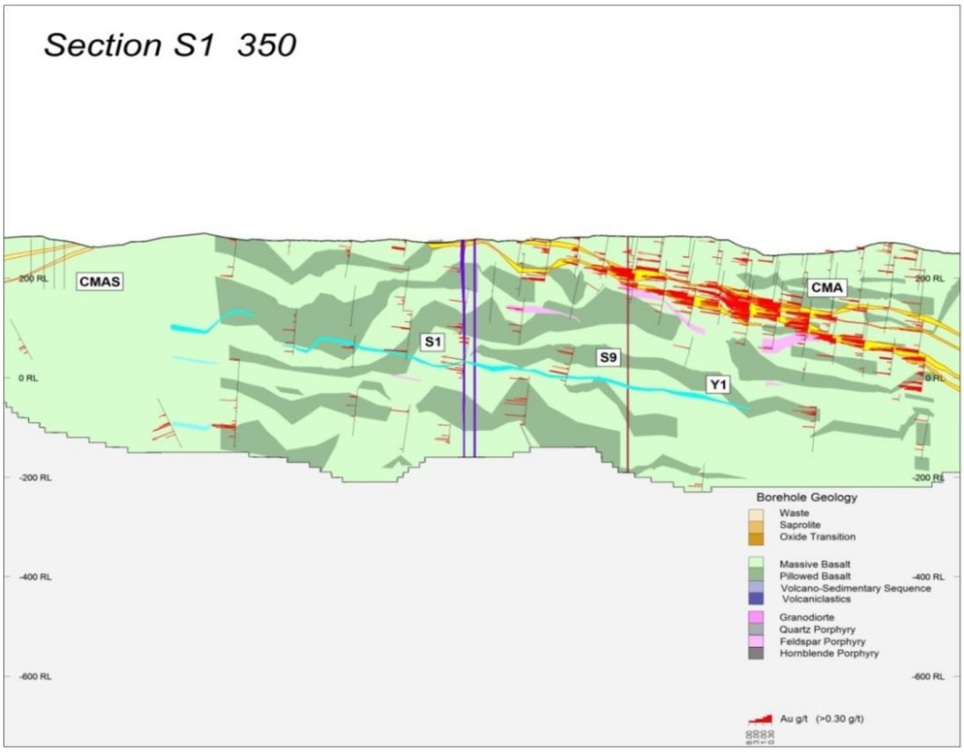


Figure 7-37 Long Section S1 350

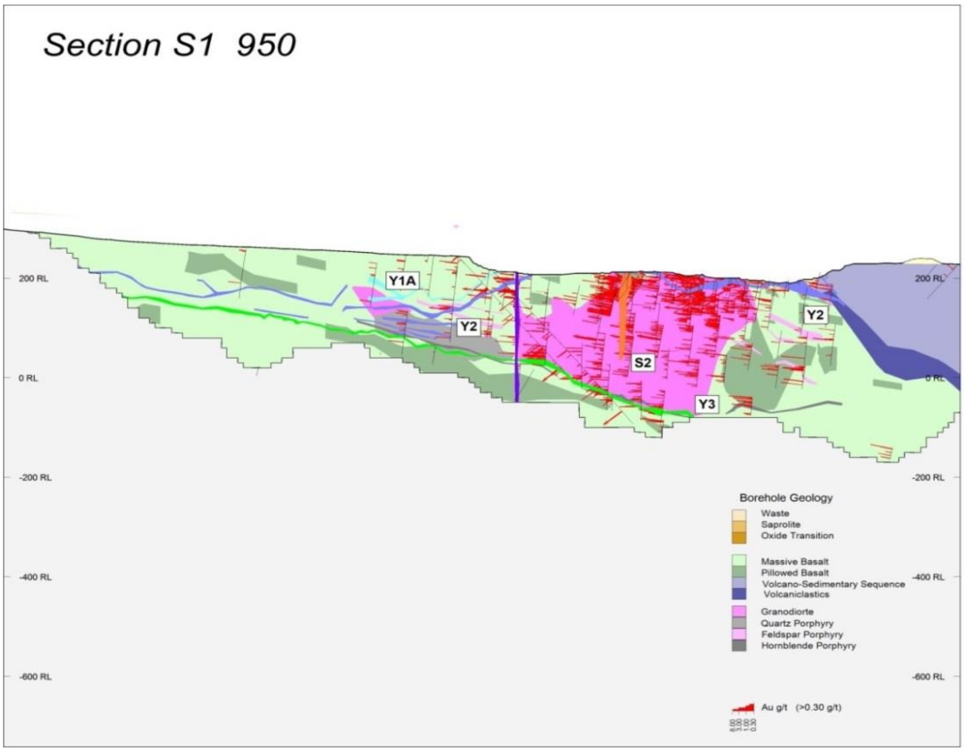


Figure 7-38 Long Section S1 950

8. Deposit Types

The Yaouré Deposit is a structurally controlled, greenstone hosted gold deposit similar in nature to many exploited elsewhere in the Birimian terranes of West Africa.

Gold mineralisation is accompanied by traces of molybdenum, tungsten, antimony, bismuth and tellurium indicating that the mineralisation may have affinities with the reduced intrusion-related gold systems (IRGS). The predominance of structural controls and association with carbonatisation, sericitisation and silicification, however, are characteristics that more clearly point to its classification as an orogenic, mesothermal gold deposit.

Other deposit types known in the Yaouré district include:

- lateritic oxide deposits as ferricrete remnants on the tops of hills, consisting of transported and re-cemented iron-rich pisoliths and quartz fragments; the only known examples are Blangan and Zone North;
- small elluvial and alluvial deposits which have been mined by artisanal miners.

9. Exploration

9.1 Coordinates, Survey Controls and Topographic Surveys

Locations of Yaouré exploration data and drill holes are based on the UTM coordinate system, Zone 30 North in World Geodetic System (WGS) 84 datum on the Earth Gravitational Model (EGM) 96 Geoid. Eight ground survey control points were established throughout the project area in 2007 by the Centre de Cartographie et Télédétection, a division of the Bureau National d'Etudes de Techniques et de Development.

Stream sediment and soil samples are located using hand-held global positioning system (GPS) units. Drill hole collars were surveyed by qualified surveyors using total station equipment and, after 2014, differential GPS.

Historic mine survey data are available for the Yaouré and CMA pits. The Yaouré pit survey is dated March 2011 and is a reliable representation of the pit void at the cessation of mining. The CMA survey data are available only as an uncontrolled triangulation of point data and, as supplied, does not form a reliable representation of the pit void prior to it being backfilled. Points were recovered from the triangulation and "re-strung" to recover crest, toe and ramp strings prior to reforming a triangulated surface. The resulting surface agrees closely with drill intercepts of the bottom of backfill material in most areas. Perseus considers that it forms a reasonably reliable representation of the CMA pit void at the cessation of mining.

In January 2017 Perseus contracted African Consulting Surveyors (ACS) to undertake an airborne LiDAR survey over an 11 x 8 kilometre area centred on the resource area. Data were rectified using the established control points referred to above. ACS provided the full point cloud, "model key points" (filtered ground points) and a series of orthorectified aerial photographs forming a mosaic over the entire survey area.

9.2 Exploration Activity

9.2.1 Overview

Exploration undertaken prior to the acquisition of Yaouré by Cluff in 2004 is discussed in Section 6, above.

Cluff undertook soil geochemical sampling at the Kongonza, Kongonza NW, Zone North, Govisou and Magazine targets between April 2009 and January 2011 in the search for new oxide ore resources for the mining operations which were in progress between 2008 and 2011. Exploration resumed in June 2011 following temporary closure of operations due to the civil war, initially focussed on the search for additional Blangan type lateritic deposits using soil geochemistry and focussing on the Zone North target.

An airborne geophysical survey (magnetics and radiometrics) was completed over exploration permits 168, 397 and 615 in March and April 2012 followed by a remote sensing interpretation using Landsat imagery in June 2012. The geophysical data and satellite interpretation defined a number of regional exploration targets that were tested by soil sampling programs between November 2012 and August 2013, and November 2014 to January 2015. The remote sensing study also delineated the main resistant lateritic caps and exploration for laterite hosted gold mineralisation extended across the exploration permit 615.

Soil sampling also focused on the targets identified by the airborne geophysical survey. During the period September 2013 to March 2014, further soil sampling was carried out within 4 km of the Yaouré gold deposit with the dual objectives of sterilising ground for future mine planning purposes as well as defining additional mineralisation. During 2015 and 2016, soil sampling programmes continued with coverage across the majority of permit 615. The results of exploration activities are detailed below.

9.2.2 Geological Mapping

A regional mapping programme has not been completed since the work by the BRGM in the 1980's. Geological outcrop is generally sparse due the depth of weathering, inversion of weathering profiles and extensive areas of transported colluvium and alluvium. Surface outcrops that have been observed during regional soil sampling are recorded in a database.

The best rock exposures in the vicinity of the Yaouré gold deposits are those created by mining activities in the Yaouré pit. The first geological map was prepared during mining activities by Cluff Gold in 2009, followed by structural mapping by Kerr (2012). The compilation of data from mapping by Cluff Gold at 215m bench level (Figure 9-1) showed the distribution of basalt and granodiorite together with the distribution of brittle quartz veins and demonstrated the ore processed by Cluff Gold was largely derived from the array of quartz veins within granodiorite and basalt and along intrusive contacts. The structural mapping by Kerr (2012) identified the orientations of the main shear zones and faults (Figure 9-1).

The first detailed geological mapping program commenced in 2015 during detailed channel sampling in the Yaouré Pit that was conducted in conjunction with Phases 5 and 6 of the resource drilling program. The 2015 pit mapping provided the first detailed geological map showing the distribution of the main rock types, and structure and orientation of the main gold bearing structures (Figure 9-2).

Further detailed structural mapping was completed by Tourigny (2016) with special focus on the kinetic displacement on the principal shears and faults. The latest geological interpretation based on surface mapping, channel sampling and incorporating information from the resource drilling is displayed in Figure 9-3

Figure 9-1 Geological Mapping (Cluff Gold 2009) and structural mapping (Kerr 2012)

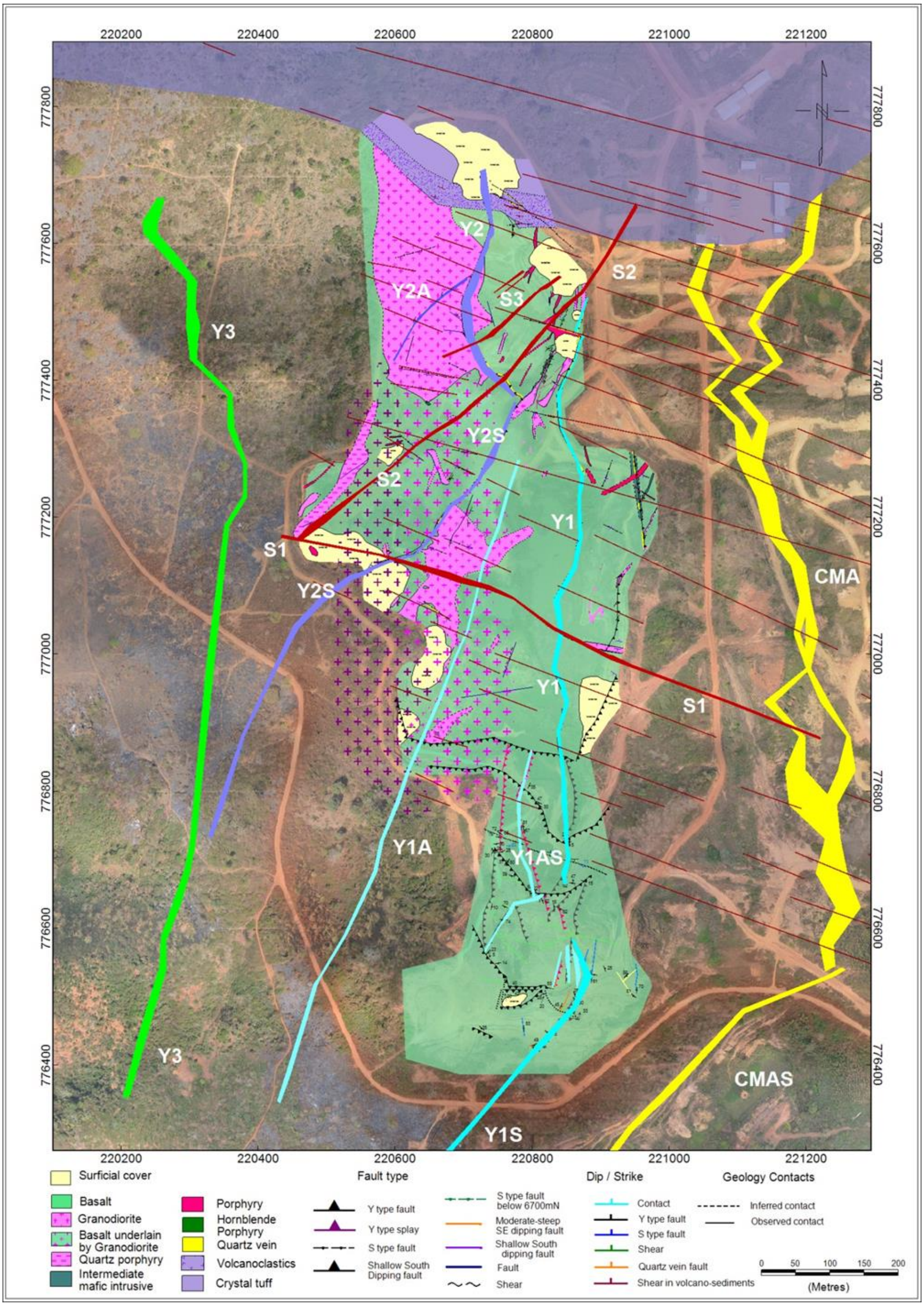


Figure 9-2 Geological Mapping Yaouré Central Pit, SRK, 2015

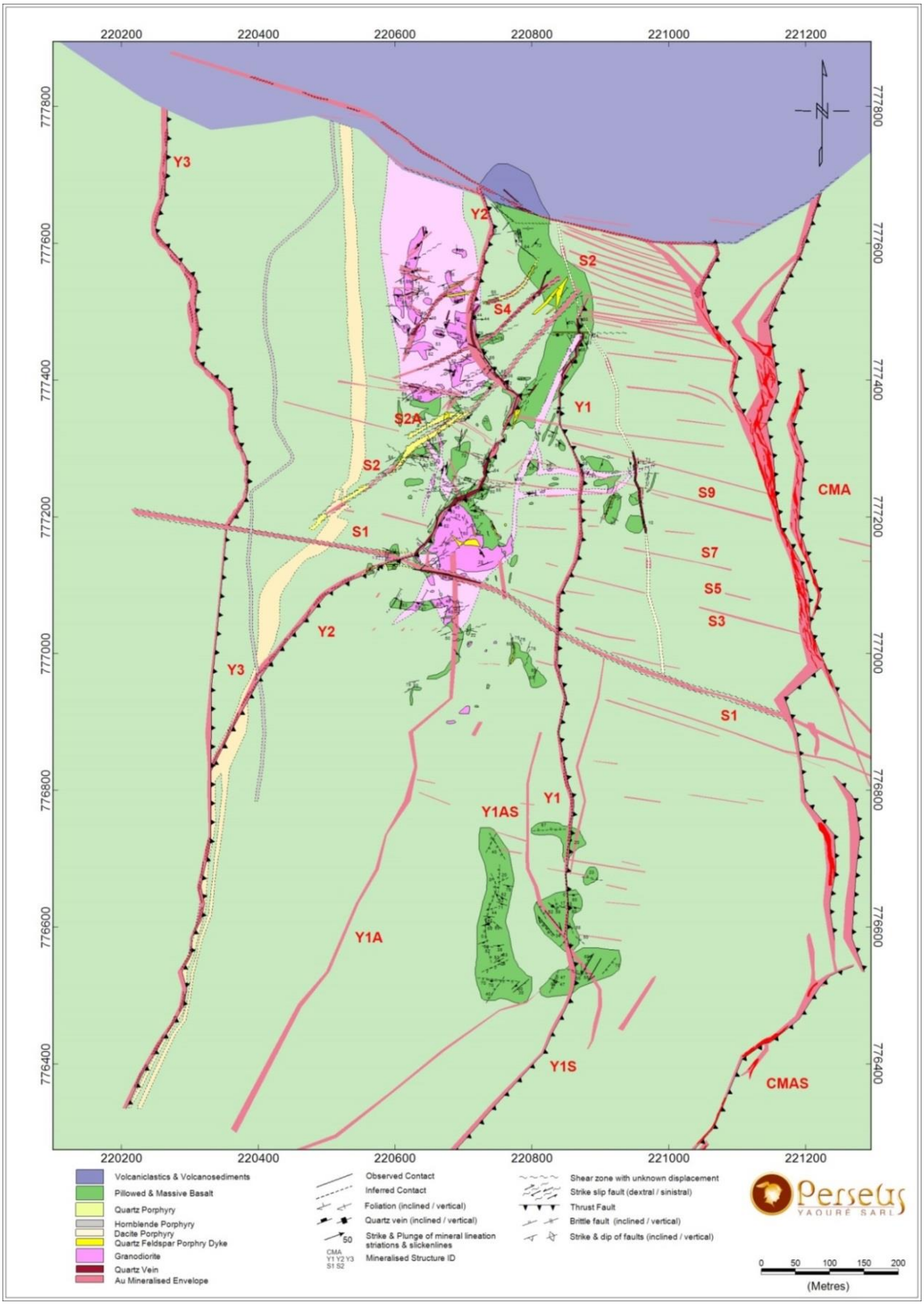


Figure 9-3 Geological Mapping Yaouré Central Pit 2017

9.2.3 Stream Sediment Sampling

A stream sediment sampling program was completed over permits 168, 397 and 615 in December 2012 (Figure 9-4). A total of 105 samples were analysed by the bulk leach extractable gold (BLEG) method with solvent extraction with a lower detection limit of 1 ppb Au at Bureau Veritas laboratories in Abidjan. The results of the survey show significant gold concentrations downstream of the Yaouré gold deposit, in northern areas along the shoreline of Lake Kossou, and in the south-west of the exploration permit 615. The BLEG method was shown to be a useful tool for the rapid preliminary evaluation of a large exploration licence. The program generally confirmed the results obtained previously by the BRGM.

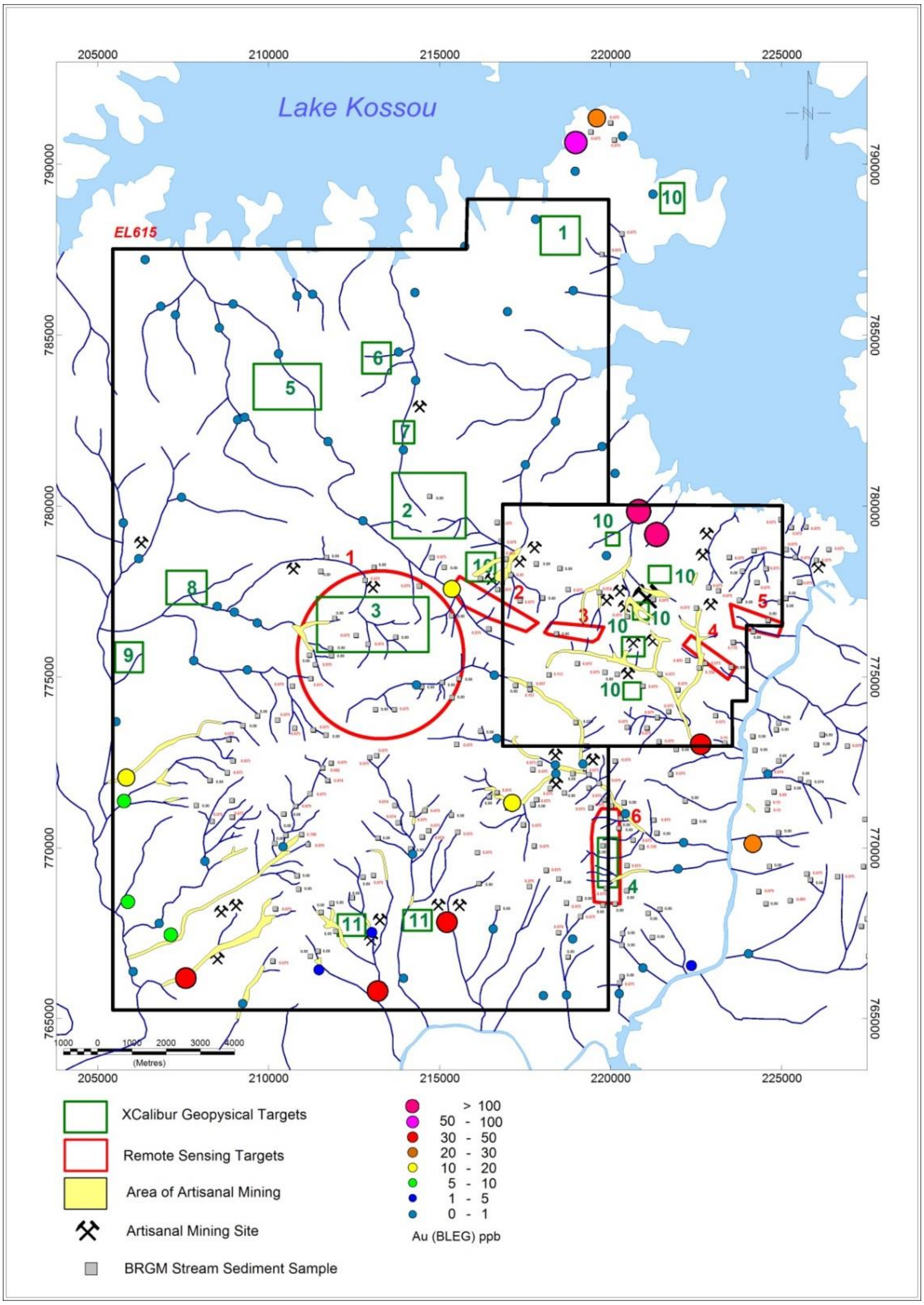


Figure 9-4 Stream sediment sampling program 2012

9.2.4 Soil Geochemistry

Soil sampling has proven to be an effective exploration method in areas of residual saprolite and soil exposures. The initial soil sampling by the BRGM in the 1980s detected the Yaouré Central, CMA, Blangan, Kongonza and Zone North mineralisation. The results of subsequent soil sampling since 2009 are shown in Figure 9-5 and Figure 9-6.

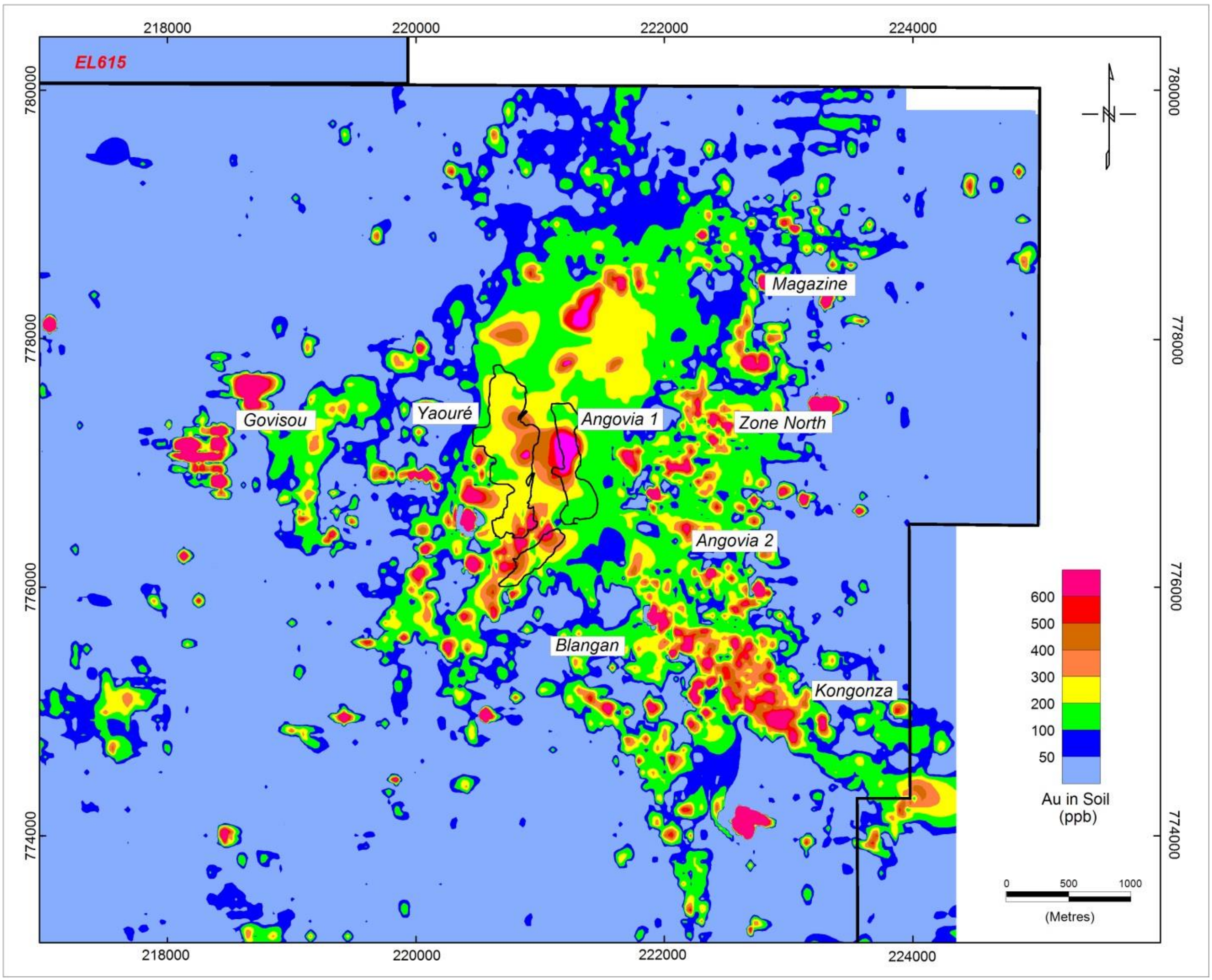


Figure 9-5 BRGM and Perseus soil geochemistry surrounding Yaouré Gold Deposit

Soil samples were taken along grid lines established using hand-held GPS units. At each sample point the top humus layer was removed along with the top 30 cm of the soil regolith. Samples were taken at a depth of about 30 cm below the base of the humic layer. Large rock fragments were removed and 1 to 2 kg of sample collected. Sample details such as soil type, colour, moisture, rock fragments, and vegetation were recorded. Other information concerning the area around the sample position, such as vegetation, farming, or nearby artisanal mining, was also recorded.

The Phase 1 regional sampling was completed at a grid line spacing of 400 m and a sample collection interval of 50 m. Soil grids at 200 m by 100 m spacing were also completed in the early phases to follow-up the soil geochemical anomalies delineated by the BRGM. Soil sampling programs also focussed on the numerous laterite caps in the Yaouré district which had been identified in the remote sensing study. If gold anomalism above 200 ppb was detected, follow-up soil sampling was carried out on closer spaced grids.

The main soil anomalies identified within permit 615, outside of the main Yaouré gold deposit, are Benou, N'Denou, Yobouekro North, Akakro, Akakro South, Degbezre and Alekran (Figure 9-6)

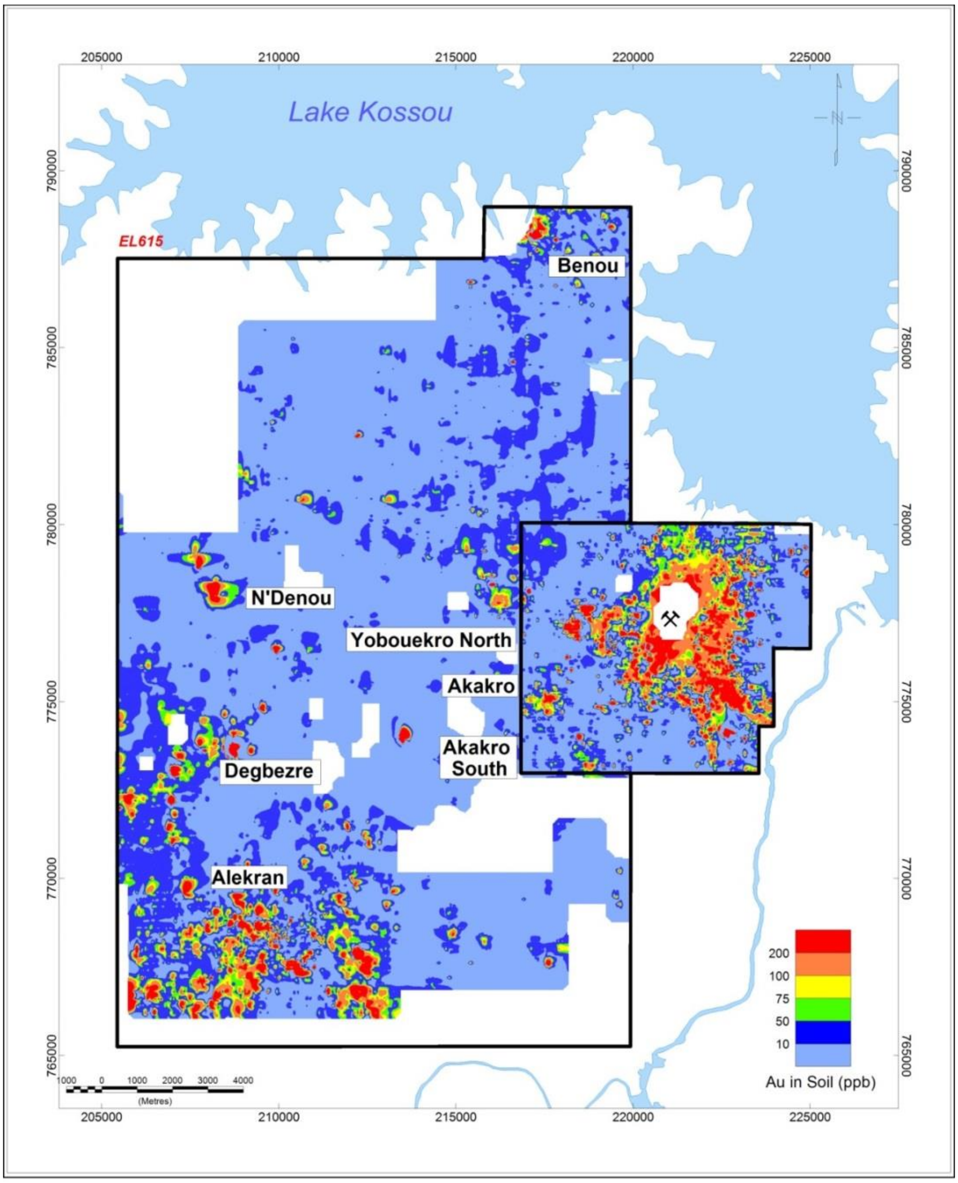


Figure 9-6 Regional soil sampling programs and main anomalies

9.2.5 Geophysics

A high-resolution airborne magnetic and radiometric survey was flown by XCalibur Airborne Geophysics for Cluff Gold in April 2012 over the combined areas of exploration permits 168, 397 and 615 (Figure 9-7). The main survey comprised 5,057 line-km over a 23 km by 22 km area. The survey was flown at a nominal ground clearance of 50 m and line spacing of 100 m. Infill lines were flown to achieve 50 m line spacing over the north-eastern part of the survey area. The data were interpreted by XCalibur (Le Roux, 2012; Steenkamp, 2012), the main products being a geological interpretation of the entire survey area, including targets recommended for follow-up, and a detailed interpretation for the vicinity of the Yaouré gold deposit. The geophysical data were also re-interpreted by PGN Geoscience (Allieres, 2013).

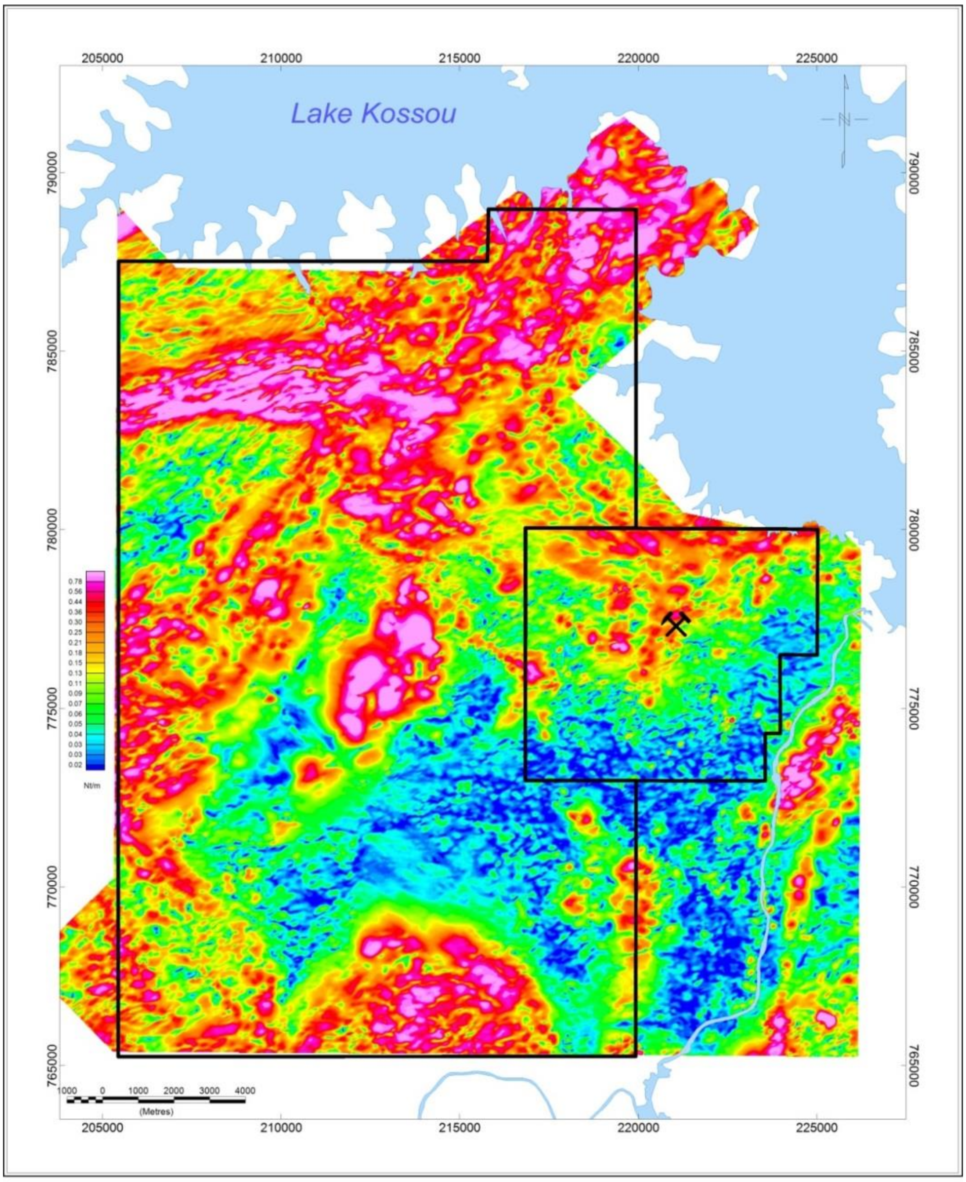


Figure 9-7 Airborne magnetic survey analytical signal of total magnetic intensity

9.2.6 Remote Sensing & Satellite Imagery

The structure and the general geology of the exploration licence were interpreted using Landsat imagery and airborne aeromagnetic and radiometric data at a scale of 1:40,000 (Baker, 2012). A mosaic of high-resolution Ikonos and Quickbird satellite imagery was used to refine the interpretation locally and to map lateritic ferricrete occurrences in detail.

The study provided an interpretative geology map of the exploration licence and highlighted six primary targets for ground-checking (Figure 9-8). The remote sensing study also delineated the distribution of ferricrete remnants which was used to refocus the search for lateritic oxide gold deposits similar to the mineralisation mined by Cluff at Blangan.

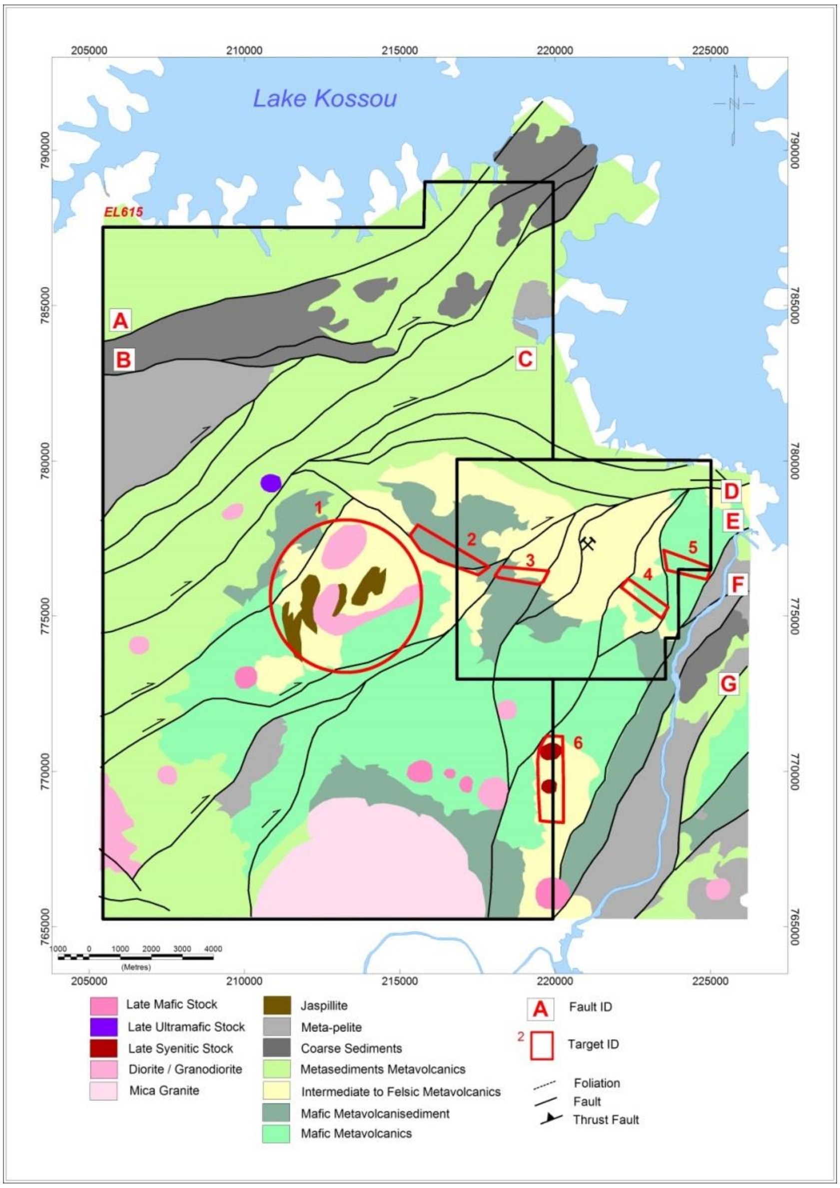


Figure 9-8 Remote sensing interpretation & simplified geology of EL 615, EL397 & EL168

9.2.7 Outcrop Sampling

There has been a limited program of rock chip sampling completed during the various phases of geological mapping. Rock samples have been assayed to assist in understanding the structural controls, particularly in artisanal mine workings at the Govisou and Magazine prospects.

9.2.8 Trenching & Pitting

Trenching and pitting has not formed a large part of the exploration methodology. In 2009-2010, four old BRGM trenches were re-opened at Blangan and Kongonza, and 22 test pits were excavated at Prospect 2 (Yaouré Zone). Following the re-start of exploration in June 2011, limited trenching was completed immediately south of Angovia 2, at Govisou and at Benou in the extreme north and Alekran in the south-western corner of permit 615.

In 2015 a programme of shallow trenching and high quality channel sampling (167 trenches and channels totalling 4,659 m) was carried out in the Yaouré Pit (Figure 9-9). The locations of the channel samples were surveyed using differential GPS and the samples were prepared and assayed using the same protocols as were used for RC and diamond core drill samples. The assay results were used to inform a previous Mineral Resource estimate undertaken by Amara (Rossi & Brown 2015); they have not been used to inform the estimate of Mineral Resources reported herein.

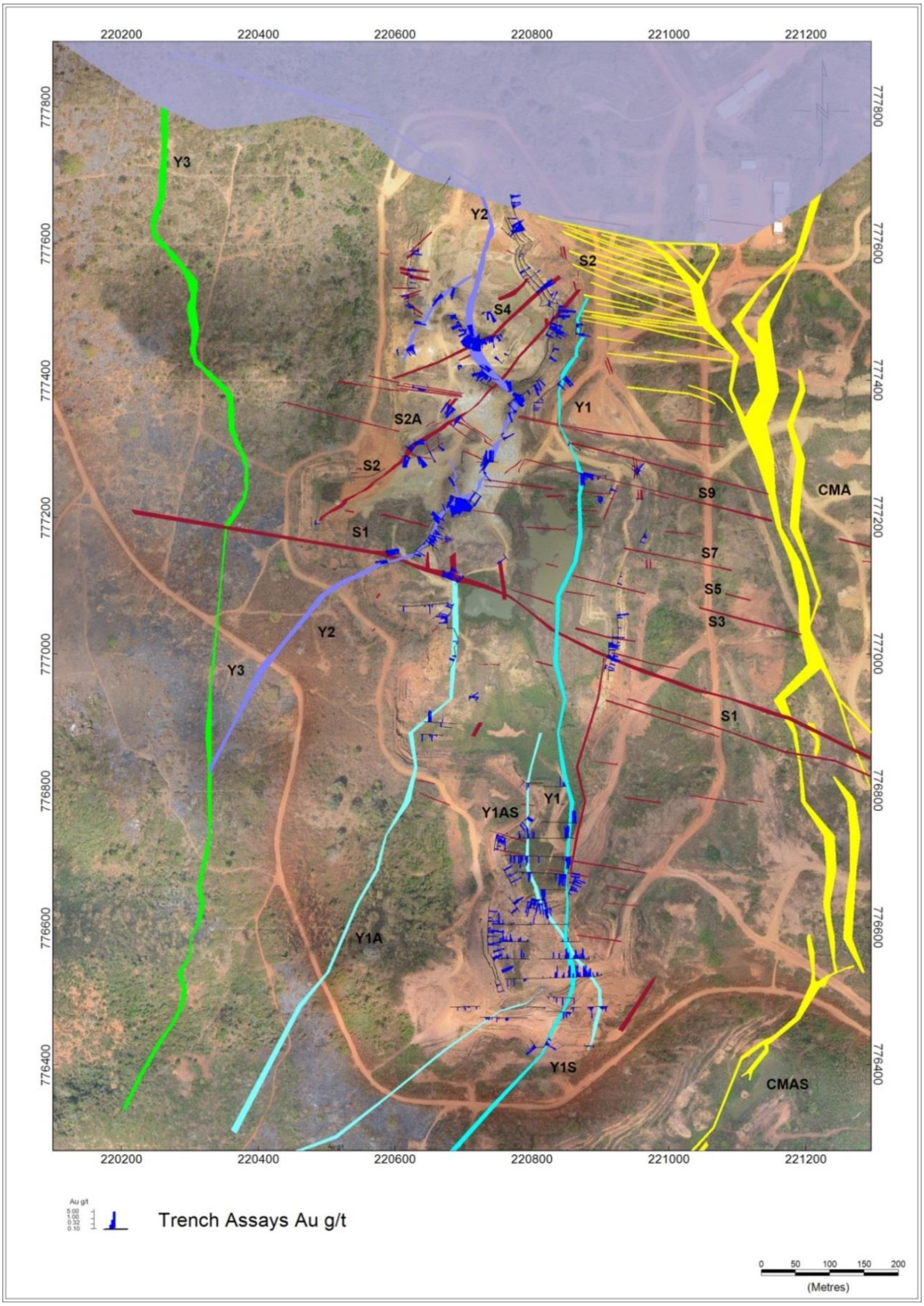


Figure 9-9 Yaouré Pit Channel Sampling Assay Results

9.2.9 Petrology, Mineralogy & Other Research Studies

Petrological analyses were completed on 27 thin sections in July 2012 by Microsearch CC to aid with core logging. The range of sample types covered all main rock types and sulphide mineralisation types. Petrological and geochemical studies of the Yaouré deposit were also completed by N'Guessan (2014) as part of a company sponsored M.Sc. project titled "Hydrothermal alteration related to Yaouré Gold Deposit".

A further 49 samples (YTS001-YTS049) were submitted to Townend Laboratory in 2016 for petrographic and mineralogical description covering the main rock types and styles of alteration. The lithologies were classified as altered, albitised, spillitic basalts with intrusive porphyries of andesitic, dioritic and tonalitic composition. Some of the basalts retained a porphyritic texture that is found in submarine basalts. The intrusive rocks are generally intermediate in composition. The alteration of the rocks is in the lower greenschist facies. Most of the basalts show no significant deformation with the retention of their volcanic groundmass texture. Some mafic rocks were considered possibly to be later mafic intrusions (Townend 2016).

Twenty-six core samples, representing both mineralised and barren zones were analysed for 48 elements by Activation Laboratories Ltd (Actlabs) in Canada in 2013. Gold correlated well with silver, bismuth, and sulphur, and to a lesser extent with molybdenum, lead and tungsten. Various elements were also normalised with respect to the Upper Continental Crust (UCC) composition. Both barren and particularly mineralised samples show enrichment of arsenic, silver, antimony, bismuth, and gold compared to the UCC, indicating that the effects of the hydrothermal alteration were quite pervasive.

In a more comprehensive study 473 samples of only mineralised basalt assaying 0.3 g/t Au or greater, were analysed at ALS Limited (ALS) Vancouver in 2014. The CMA and Yaouré Zones, are clearly enriched in sulphur, rhenium, bismuth, selenium, tungsten, molybdenum, antimony, and silver and to lesser extents in copper, arsenic, cobalt, scandium, and nickel. All the elements mentioned above are also enriched in lower-grade basalt (gold less than 0.3 g/t) but with lower enrichment factors (Figure 9-10).

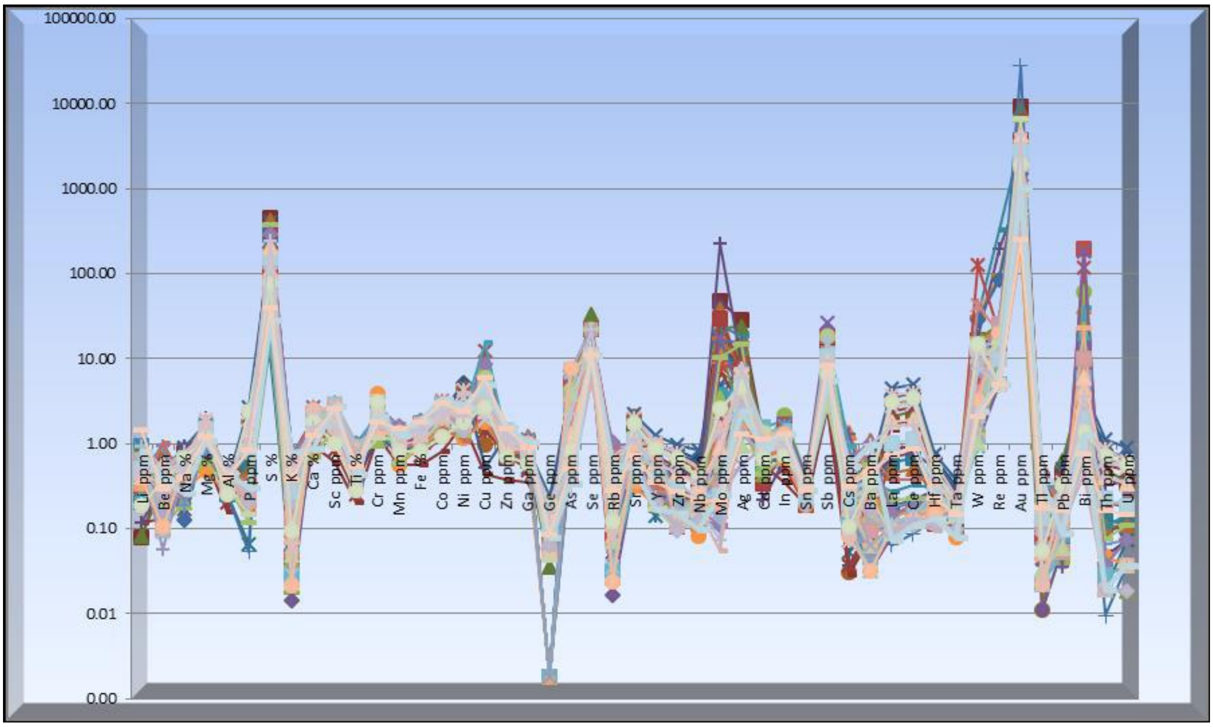


Figure 9-10 UCC Normalised Plots for CMA Mineralised Basalts with Gold ≥0.3 g/t

10. Drilling

10.1 Summary

When Cliff acquired exploration permit 168 on 8th October 2004, historical exploration data from the BRGM and CMA included 179 diamond drill holes and 134 reverse circulation (RC) holes. Data for two diamond core holes and 100 RC holes drilled by BRGM between 1987 and 1991, excluding geological logging, are retained in the current drill hole database. Data for the drilling by CMA, located mainly within the portion of CMA deposit subsequently mined, are no longer available.

Cluff commenced drilling at Yaouré in 2005 using RC drill rigs to evaluate the soil anomalies identified by the BRGM (Figure 10-1). The program started initially at Prospects 2, 3 and 4 (Yaouré Zone) and at the Angovia 2 prospect. A total of 774 RC holes (53,078 m) were completed between 2005 and 2007. A total of 62 diamond core holes (6,483 m) were also completed in 2007. As well as delineating resources at Prospect 2 and Prospect 4 (Yaouré Zone), resources were also delineated at Angovia 2 (SRK, 2008).

A review of exploration data completed prior to February 2009 identified the soil anomaly at Blangan as the most important target at that time. RAB drilling was completed which defined a resource leading to the laterite cap being mined. The soil anomaly at Kongonza was tested with RC drilling in 2010 and a (unreported) resource was also delineated there.

Following civil unrest, exploration resumed in June 2011, including RAB drilling at the Zone North soil anomaly. RAB drill testing of soil anomalies continued to October 2012 at the Kongonza NW, Office Zone, and Govisou prospects. RC drilling was completed at the Kongonza, Kongonza NW, Magazine, Govisou and Yaouré in October 2011 (Figure 10-1).

There have been seven phases of drilling targeting Yaouré sulphide resources, starting in August 2011 (Figure 10-2). By June 2013, 47,300 m (153 holes) had been drilled in Phases 1 to 4, testing an area of about 2.1 km in a north-south direction, and about 1.4 km in an east-west direction. This drilling was the basis for the Mineral Resource estimate reported in January 2014 (Rossi & Brown, 2014). Six diamond core holes (1,101 m) were also drilled at Kongonza in October 2011 whilst waiting for water to be pumped out of Yaouré Pit.

Phase 5 comprised the RC drilling programme (16,638 m in 80 holes) focussing on the CMA zone that commenced on 11 April 2014 and finished on 19 October 2014 plus diamond core drilling with nine Boart Longyear rigs that commenced on 2 May 2014 and finished on 20 October 2014 (68,936 m in 251 holes).

Drilling completed up to and including Phase 5 informed estimates of Mineral Resources and Mineral Reserves that formed the basis of Amara's Pre-feasibility Study (Tetra Tech, 2015).

Phase 6 comprised 69 RC holes (6,718 m) drilled between 23 April 2015 and 27 June 2015 to test the proposed mine infrastructure area for sterilisation purposes. Phase 6 also included 60 diamond core holes (11,904 m, including deepening of six holes) drilled between 21 April 2015 and 26 August 2015.

In conjunction with preceding drilling, data from Phase 6 drilling informed Amara's updated estimate of Mineral Resources in December 2015 (Rossi & Brown, 2015).

Phase 7 drilling was undertaken by Perseus to progress the project to completion of a Definitive Feasibility Study. Drilling commenced on 29th December 2016 and was completed on the 28th July 2017. The program totalled 72,628 m in 1,515 holes that included RC and diamond core holes to infill resource definition drilling, trial RC grade control drilling in Yaouré pit, together with sterilisation, pit slope and infrastructure geotechnical drilling and hydrological test bores.

The various types of drilling completed at the project between 2009 and 2017 using RAB, aircore (AC), RC and diamond drilling (DD) are summarised in Table 10-1.

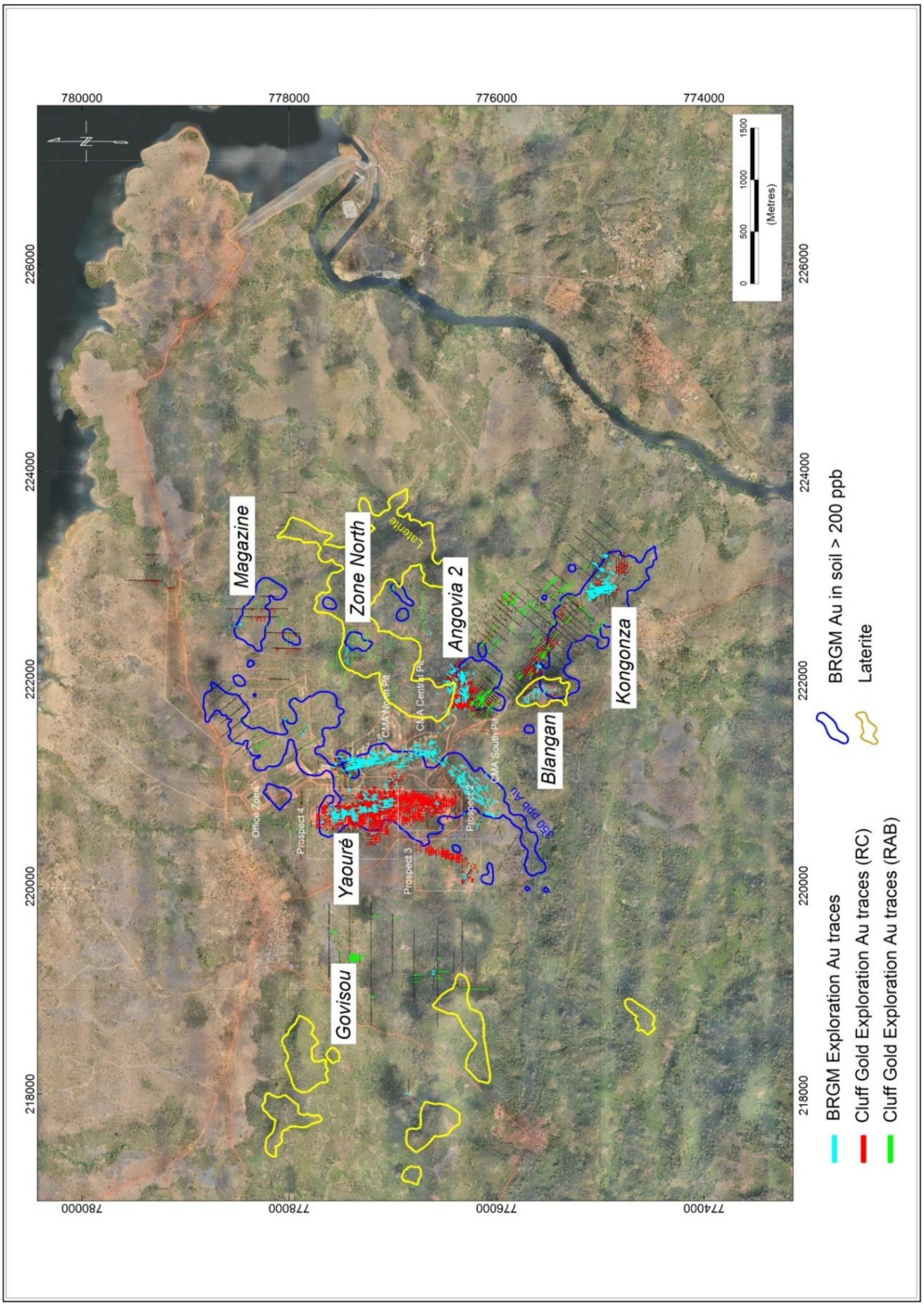


Figure 10-1 RC and RAB drill holes 2005-2011

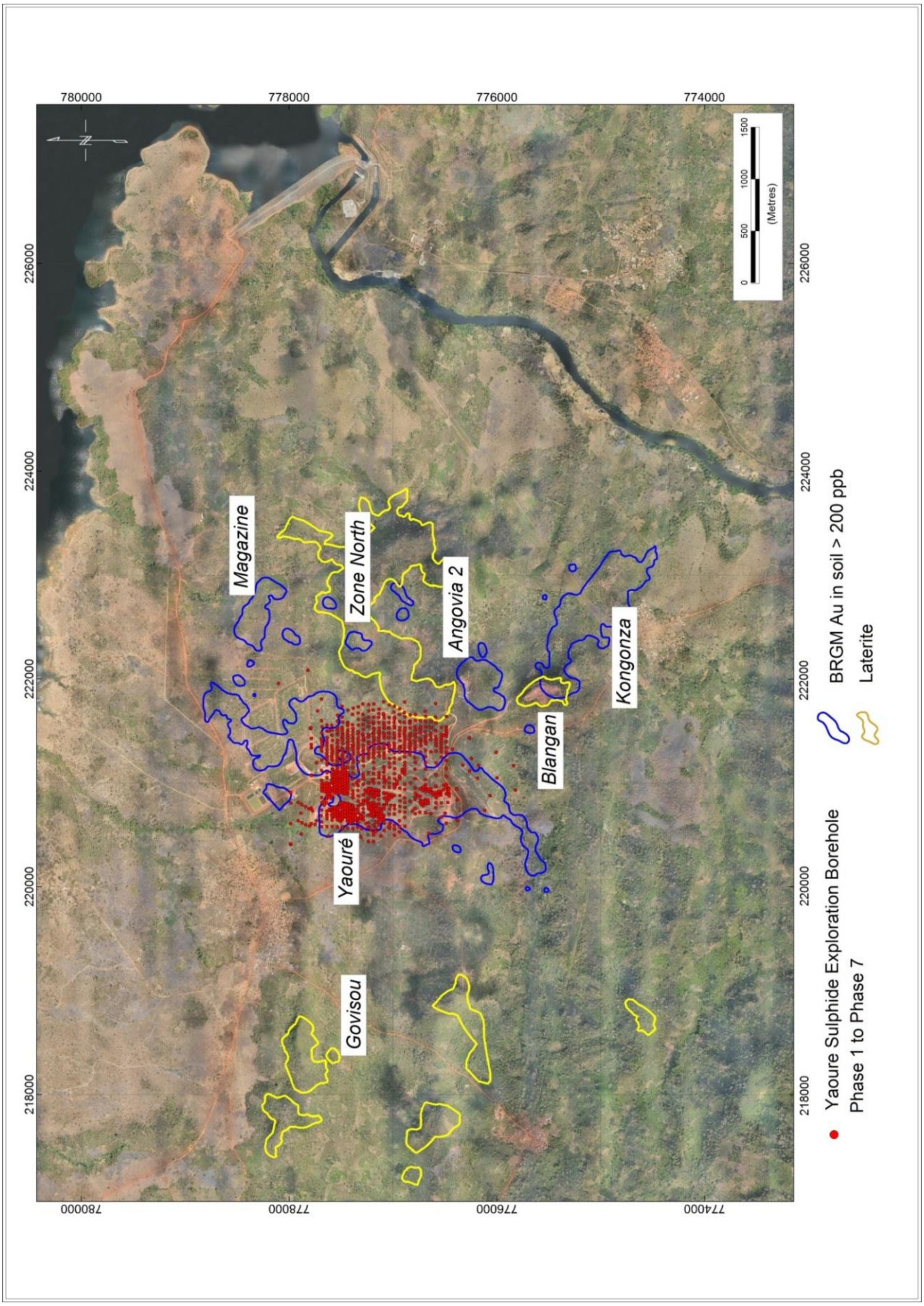


Figure 10-2 Yaouré sulphide drilling program drill holes 2011-2017

Table 10-1 Summary of drilling

Year	Drill Type	Sulphide Drill Phase	Prospect	Company	Metres	No. of Holes
1987-	DD		Various	BRGM	155	2
1991	RC		Various	BRGM	6,296	100
1993-	DD		Angovia 1 (CMA)	CMA	unknown	177
1994	RC		Angovia 1 (CMA)	CMA	unknown	34
2005	RC		Prospect 2	Cluff Gold	1,913	30
	RC		Kongonza	Cluff Gold	562	8
2006	RC		Angovia 2	Cluff Gold	5,360	71
	RC		Prospect 2	Cluff Gold	3,049	35
	RC		Prospect 4	Cluff Gold	10,174	156
2007	RC		Angovia 2	Cluff Gold	1,586	20
	RC		Prospect 4	Cluff Gold	8,151	107
	DD		Prospect 4	Cluff Gold	400	4
	RC		Prospect 2	Cluff Gold	22,283	347
	DD		Prospect 2	Cluff Gold	6,083	58
2009	RAB		Blangan	Cluff Gold	716	70
			Kongonza	Cluff Gold	984	118
			Prospect 2	Cluff Gold	388	39
			Prospect 4	Cluff Gold	276	16
2010	RC		Blangan	Cluff Gold	240	24
			Kongonza	Cluff Gold	5,351	82
			Prospect 4	Cluff Gold	3,406	78
2011	RAB		Angovia 2 Sth	Cluff Gold	581	30
			Kongonza NW	Cluff Gold	5,339	248
			Kongonza K2	Cluff Gold	1,751	74
			Zone Nth	Cluff Gold	5,608	270
			Magazine	Cluff Gold	1,844	96
	RC		Kongonza	Cluff Gold	1,669	21
	DD	1	Prospect 4	Cluff Gold	1,967	23
			Kongonza	Cluff Gold	1,101	6
2012	RAB		Angovia 2 Sth	Amara	2,690	130
			Govisou	Amara	8,285	362
			Kongonza NW	Amara	4,323	266
			K2	Amara	2,250	167
			Office Zone	Amara	3,871	239
			Low Grade Stockpiles	Amara	372	51
	RC		Angovia 2 Sth	Amara	7,846	83
			Govisou	Amara	400	4
			Kongonza	Amara	2,668	32
			Kongonza NW	Amara	11,594	154
			Kongonza K2	Amara	3,573	60
			Magazine	Amara	5,315	97
		2	Yaouré Central North Extension	Amara	1,402	13

	DD	2, 3	Yaouré Central and CMA	Amara	29,898	83
2013	DD	4	Yaouré Central and CMA Nth Central	Amara	15,435	47
2014	RC	5	CMA Nth Central	Amara	16,638	80
	DD	5	Yaouré Central and CMA Nth Central	Amara	68,936	251
2015	RC		Condemnation – proposed infrastructure	Amara	6,718	69
	DD	6	Yaouré Central	Amara	11,904	60
2017	DD	7	Abandoned	Perseus	108	4
	DD		Govisou	Perseus	301	2
	RC		Grade Control Yaouré	Perseus	12,709	417
	Auger		Heap Leach Pads	Perseus	410	37
	DD		Heap Leach Pads	Perseus	165	11
	DD		Plant Geotech	Perseus	277	8
	DD/RC	7	Resource CMA	Perseus	24,133	182
	DD/RC	7	Resource Yaouré	Perseus	12,845	181
	RC/AC		Sterilisation Plant	Perseus	3,977	159
	RC/AC		Sterilisation TSF	Perseus	4,775	265
	AC		Sterilisation WRD-A	Perseus	5,323	128
	AC		Sterilisation WRD-B	Perseus	5,478	97
	RC		Sterilisation CMA South	Perseus	870	10
	DD		TSF Geotech	Perseus	135	4
	RC		Hydrological	Perseus	1,122	10

10.2 Collar Coordinates

Drill hole collar locations have been accurately surveyed by qualified surveyors using total station and, after 2014, a differential GPS.

Drill hole locations are recorded on the UTM coordinate system, Zone 30 North in World Geodetic System (WGS) 84 datum on the Earth Gravitational Model (EGM) 96 Geoid. Eight ground survey control points were established throughout the project area in 2007 by the Centre de Cartographie et Télédétection, a division of the Bureau National d'Etudes de Techniques et de Development.

10.3 Downhole Surveys

No down-hole surveys are available for BRGM holes or Cluff RC holes. Cluff diamond core holes were down-hole surveyed by unspecified methods. Most Amara and Perseus RC and diamond core holes were down-hole surveyed at generally 30 metre intervals using digital instruments. Perseus aircore and trial grade control holes were not down-hole surveyed.

Downhole surveys have been completed by the various drilling contractors using either Proshot (GES) or Reflex EZ-Com II (E-Global) survey instruments. Measurements were taken at 30 m intervals. From early October 2012, an additional reading at 6 m was introduced..

An additional survey tool (EZ A2) was used from April 2013 to June 2013, during Phase 4, to check and confirm the readings provided by the Reflex tool. No significant differences were reported using the different survey tools.

For the 2014 RC drilling a Reflex EX Trac tool and a Reflex gyroscopic survey tool were used.

Downhole surveys were checked at the drill site by a company geologist. Criteria for repeating downhole surveys were:

- consecutive azimuth readings with a difference greater than 10°
- consecutive inclination readings with a difference greater than 6°

Readings that failed to meet these criteria were repeated immediately. If repeat readings were still not satisfactory, a note was made in the database and spurious readings de-prioritised.

10.4 Rotary Air Blast Drilling

RAB drilling was carried out by Foraco, an Ivorian contractor, using a Montabert Hydroforse rig with 85 mm blade bits. The rig used a separate Atlas Copco compressor with a maximum capacity of 350 psi. Holes were normally inclined at 60° although for surface laterite prospects, such as Blangan, holes were drilled vertically. The RAB holes were typically drilled to blade refusal between 10-20 m depth.

10.5 Yaouré Sulphide Project Drill Programs

10.5.1 Phase 1 Diamond Core Drilling

The first phase of Yaouré sulphide project diamond drilling was completed within the existing Yaouré Pit between August and December 2011. A total of 23 holes totalling 1,967 m were completed in this phase (Figure 10-3). Ten holes were orientated at an azimuth of 270° and inclined at 60° to the west. Eight holes were drilled to the north at an inclination of -60° and five holes were drilled to the south at an inclination of -60°. The objectives of the first phase were:

- to confirm the mineralisation and results of the historical RC drilling from 2005 to 2007;
- to obtain structural information;
- to test the cross-cutting steep veins, by aligning the holes to the north and south.

The results confirmed the widths and grades of the main mineralised zone reported from historical RC results. Drilling with a north and south azimuth confirmed the presence of steep cross-cutting veins with visible gold (YDD0003).

10.5.2 Phase 2 RC Drilling

RC drilling in 2011 and 2012 was carried out by GES, a Côte d'Ivoire-based company, using Schramm 450 and Hanjin Power 7000SD-RC rigs, under the supervision of a company geologist or geo-technician. Both rigs used Sullair compressors, with a maximum capacity of 500 psi. Only 140 mm RC hammers were used, together with the appropriate shrouds depending on drilling conditions. Drilling under wet conditions was continued infrequently with the assistance of a booster compressor. If sample recovery became poor under wet conditions, the hole was abandoned.

10.5.3 Phase 2 Diamond Core Drilling

The second phase of diamond drilling, conducted in Q1-Q2 2012, totalled 6,442 m in 24 holes (Figure 10-3). This phase tested the continuity of the north-south trending, east dipping structures at Yaouré Central over a 900 m strike length and up to 340 m across strike. Holes were all drilled to the west (270°) with a nominal spacing of 100 m and stepping back between approximately 100 m and 340 m. The drilling confirmed the dip of the Yaouré Central mineralization to the east.

10.5.4 Phase 3 Diamond Core Drilling

Phase 3 outline drilling began in early May 2012, but positive initial results led to the expansion of the programme in August 2012. The objective of the expanded Phase 3 programme was to outline the extent of the open pit minable sulphide mineralisation around Yaouré Central, at nominal 200 m grid spacing, extending over an area of 2.1 km in a north-south direction and by up to 1.1 km in an east-west direction (Figure 10-3). This enlarged target area included the backfilled CMA North and Central pits to the east and the CMA South pit in the south.

At the end of Phase 3, on 8 November 2012, a total of 59 holes (including 6 structural holes collared in the Yaouré Central pit and 4 abandoned holes) had been drilled; with a total advance of 23,546 m. Results of the first eight holes were reported by Amara on 14 August 2012. The results for a further 30 holes, plus 4 deepened holes, were reported on 3 December 2012. The results of the remaining 16 holes, including a further 7 deepened holes were reported on 4 February 2013.

Of the 55 completed Phase 3 holes:

- 16 deep holes tested both the mineralisation below the CMA North and Central pits, and the continuity from the west of the underlying Yaouré Central pit mineralisation at depth.
- 8 holes tested the mineralisation below the CMA North and Central pits.
- 6 holes tested the CMA South pit and possible Yaouré Central mineralisation under the CMA South pit with 325^{o} azimuth.
- 17 holes tested only the Yaouré Central pit mineralisation at depth and up to 200 m to the north of the Yaouré Central pit.
- 2 holes tested the south-east trending arm extending from the southern end of the CMA Central pit, trending 220^{o} towards the Angovia 2 mineralisation (YDD0072 220^{o} & YDD0112 220^{o}).
- 6 holes were short structural holes, collared within the Yaouré Central pit.

The CMA North-Central area was mainly drilled at 200 m spacing during Phase 3. The drill pattern comprised three rows. Holes in the first row target the estimated position of the base of the backfilled CMA pits, the second row stepped back 200 m, and the third row stepped back a further 200 m, with a maximum vertical intersection depth of approximately 300 m (a down-dip length of about 500 m from the presumed base of CMA North pit).

10.5.5 Phase 4 Diamond Core Drilling

Phase 4 infill drilling, conducted from 14 January to 4 June 2013, totalled 15,435 m in 47 holes (Figure 10-3). All were drilled with 270^{o} azimuth with the exception of YDD0123 (337^{o}) and YDD0124 (157^{o}). Of the 47 holes:

- 27 holes infilled the CMA North and Central deposit to 100 m.
- 10 holes infilled the Yaouré Central South drilling.
- 4 holes tested the extension of Yaouré Central to the north-west.
- 2 holes tested the underlying Prospect 3 mineralisation to the south-west.
- 2 holes tested the possible extension of mineralisation to the north-east (towards the Magazine area).
- 2 holes tested a cross-cutting quartz vein in the CMA North area.

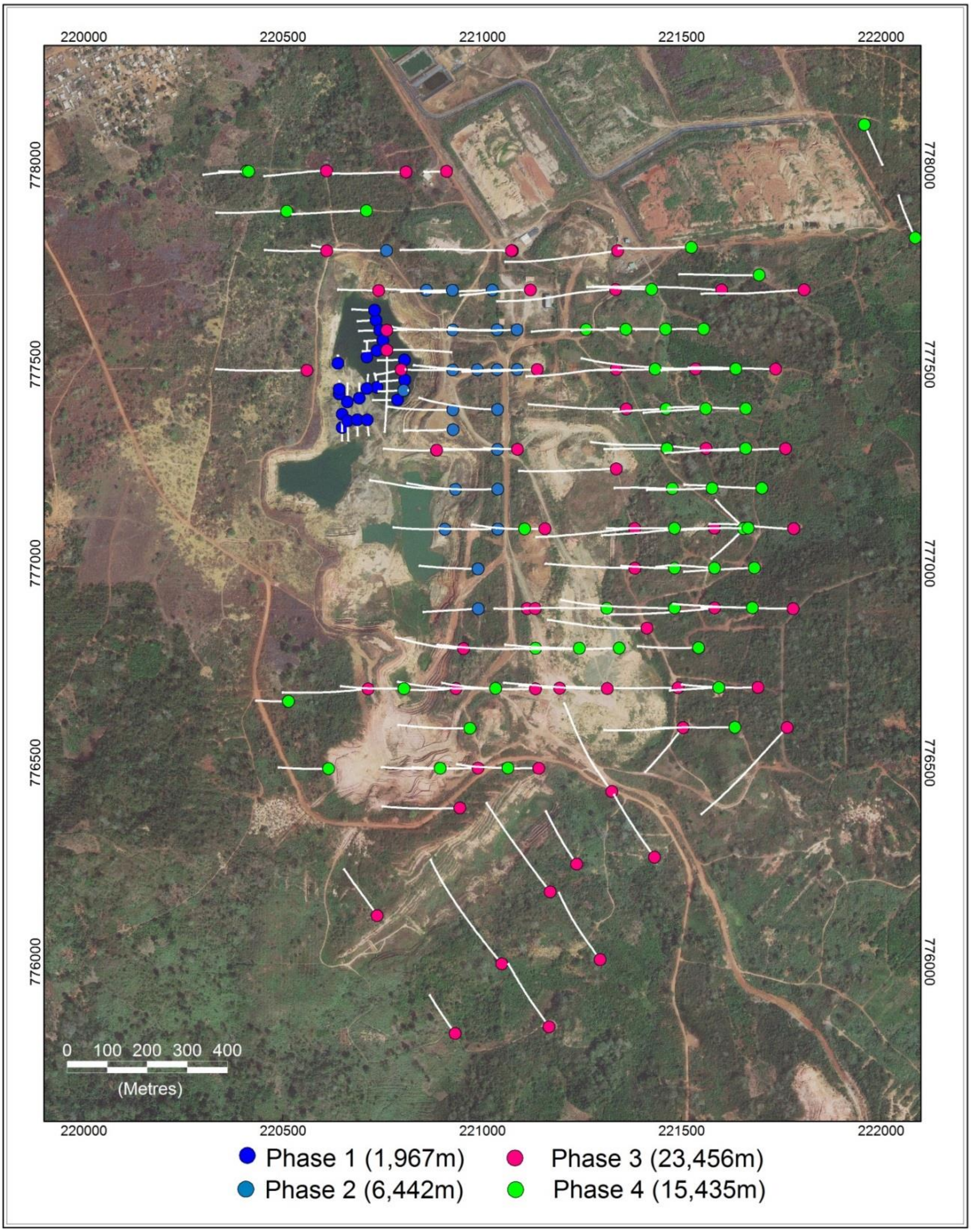


Figure 10-3 Yaouré sulphide drilling Phases 1-4: drill hole locations

10.5.6 Phase 5 RC Drilling

RC drilling in 2014 was carried out by two drilling contractors: Major Drilling from April to August 2014, and Boart Longyear from August to October 2014. A total of 80 RC holes were completed, all testing the CMA Zone, for a total 2014 advance of 16,638 m. The locations of all the RC holes drilled in 2014 are shown in Figure 10-4.

Major Drilling completed 50 RC holes (10,543 m) from April to early August 2014, using a Max Cat 315 track-mounted rig with a Sullair compressor. When necessary to obtain dry samples, a Hurricane Booster was used to increase the pressure of the output air. Both companies used 5½ to 4⅞ inch bits on 4½ inch reciprocating hammers.

Boart Longyear completed 30 RC holes (6,095 m) from August to October, using a KWL1600 truck-mounted rig and a Max Cat 315 track-mounted rig, both with Sullair compressors. When necessary to obtain dry samples, an auxiliary Sullair compressor and an 800 psi Hurricane Booster were used, thus allowing an increase in volume and pressure of the output air to 1,200 cfm at 800 psi. In addition, between 20 October and 20 November 2014, Boart Longyear completed eight environmental baseline water monitoring bores outside of the resource area, and seven pumping test holes around the current pit area.

In addition to resource delineation drilling, the 2015 RC drilling programme included 69 holes (6,718 m) to test the proposed mine infrastructure area for condemnation purposes (Figure 10-4). Eleven of those holes (1,084 m) have been used in the Mineral Resource estimate that is the subject of this report.

10.5.7 Phase 5 Diamond Core Drilling

Phase 5 infill drilling, completed from 2 May to 20 October 2014, totalled 68,936 m in 251 holes (Figure 10-4). The holes were drilled mainly with 270^{o} azimuth. Holes YDD0227, YDD0315, YDD0317 & YDD0328 were drilled to the north. Hole YDD0239 was drilled with 135^{o} azimuth to intersect the S2 structure in western parts of the central Yaouré Pit. Of the 251 holes:

- 83 holes infilled the CMA North and Central zones.
- 139 holes infilled the Yaouré Central mineralisation.
- 29 holes tested both the CMA and Yaouré Central mineralisation.
- 8 of the holes were geotechnical (2,957 m) drilled at an inclination of -80°.

The deepest hole in Phase 5 was 415 m; average depth was 274 m.

10.5.8 Phase 6 Diamond Core Drilling

The northern and western portions of the water-filled Yaouré Central pit were pumped out. Phase 6 infill drilling, completed from 21 April to 26 August 2015, totalled 11,904 m in 60 holes (Figure 10-4). Of the 60 holes:

- 38 holes infilled the Yaouré Central Granodiorite.
- 14 holes infilled Yaouré Central South.
- 4 holes infilled CMA South.
- 4 holes tested steep structures (drilled to north).

In addition, six holes from the 2014 campaign were deepened.

10.5.9 Phase 7 RC and Diamond Core Drilling

Phase 7 drilling included resource definition drilling for the Definitive Feasibility Study completed between 13 January and 27 May 2017 totalling 36,979 m in 363 holes (Figure 10-4). Of the 363 holes:

- 182 holes evaluated the CMA Zone, infilling the existing 50 m by 50 m grid to a 25 m by 50 m grid, limited 25 m by 25 m grid north of UTM N777435 where the CMA branches out along the volcanoclastic contact. The programme comprised 18 diamond core holes, 92 RC holes and 72 RC pre-collars with diamond tails. The total includes 9 pit wall geotechnical holes (2,204m) which intersected the CMA zone.
- 181 holes evaluating the Yaouré Zone with 25 m by 25 m grid infill over selected central, southern and northern parts. The programme comprised 15 diamond core holes, 155 RC holes and 11 RC pre-collars with diamond tails.

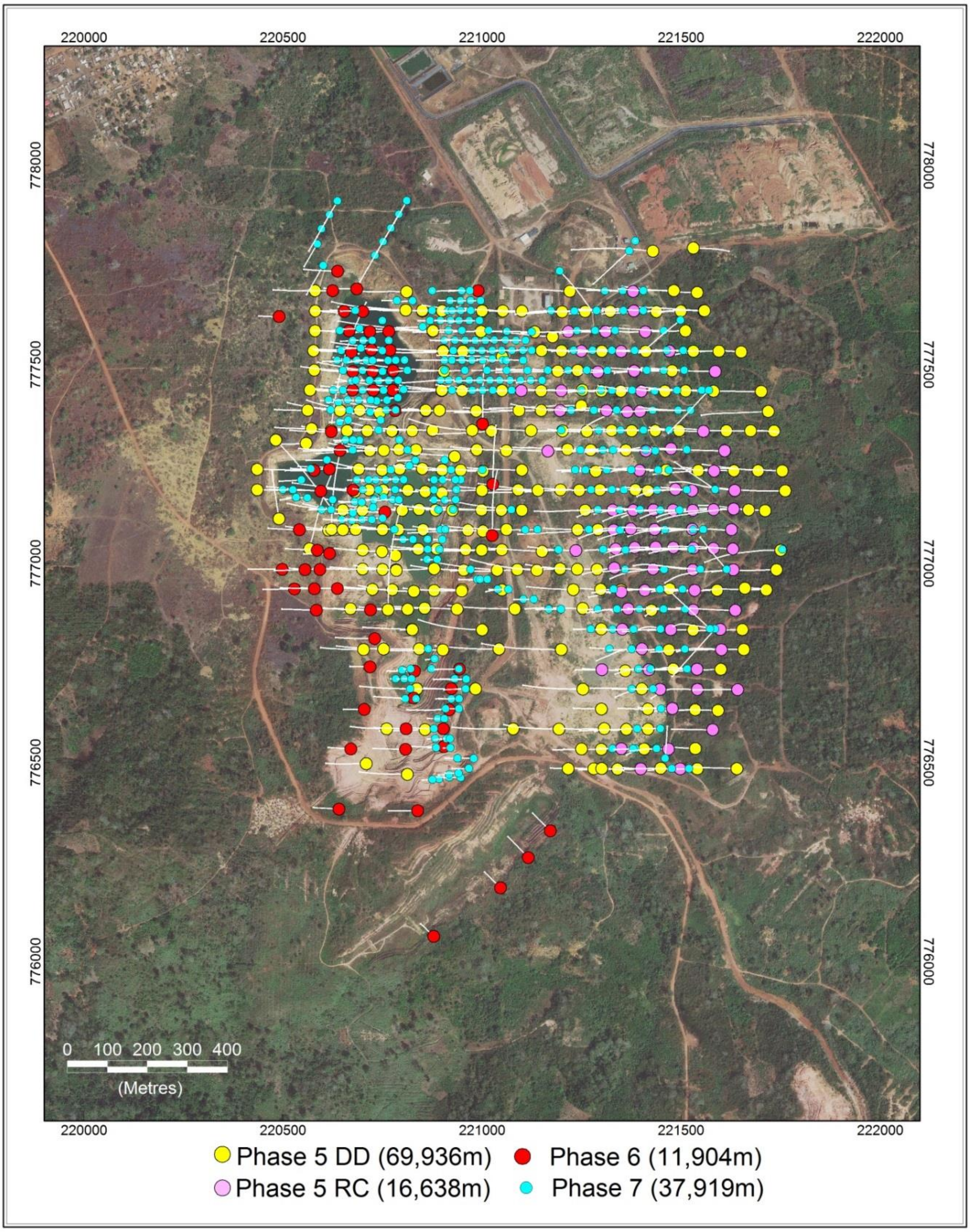


Figure 10-4 Yaouré sulphide drilling Phases 5-7: drill hole location

10.6 Trial Grade Control Drilling

A total of 417 RC holes totalling 12,709 m were drilled between 29 December 2016 and 10 June 2017 on a 5 m by 5 m grid in the Yaouré Pit down to the 185 mRL. Average hole depth is 30.5 m. The holes along the Y2 structure were drilled vertically and those along the S2 structure drilled with -60° inclination and 270° azimuth (Figure 10-5).

RC grade control sample data were generally excluded from the data that inform the Mineral Resource and Mineral Reserve estimates. Data were included from a selection of holes in the south-west of the trial area, an area not tested by resource drilling. For that area, grade control holes were selected on a nominal 10 by 25 metre pattern to give a dataset of comparable spacing to general resource drilling (Abbott, 2017).

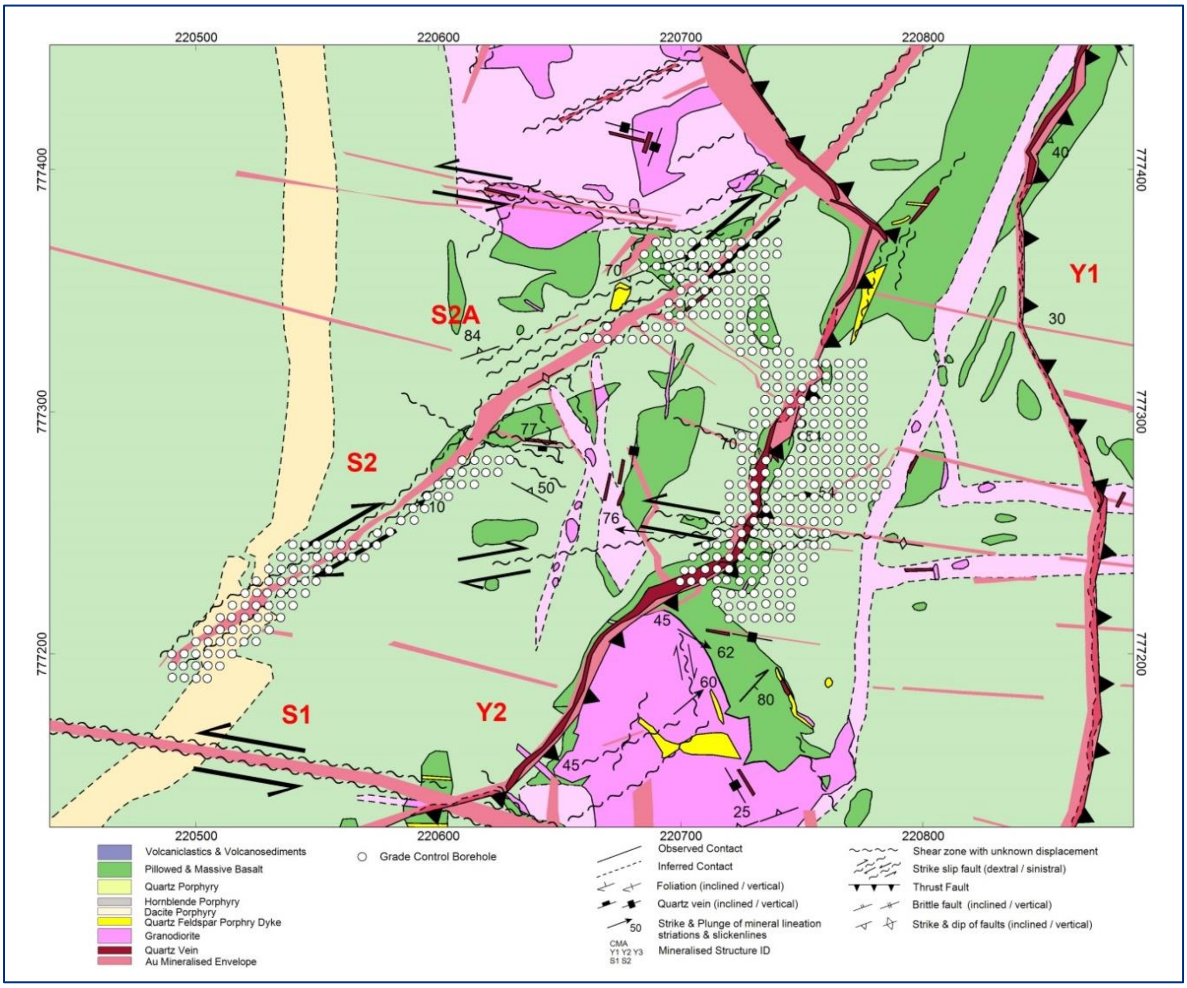


Figure 10-5 Yaouré trial RC grade control: hole locations

10.7 ESIA Hydrological Monitoring and Production Drilling

There have been two phases of drilling at Yaouré for hydrological monitoring and testwork and for investigations associated with the Environmental and Social Impact Assessment Study (ESIA). The first was in October 2015 with holes YRC0753WO to YRC0767WP totalling 1,477m (10 observation wells and 5 production wells). The second program was compelted in 2017 with 10 exploratory holes (YRC1155-YRC1160 & YRC1171WO-YRC1174WP, 1,122 m). Six holes failed to encounter significant water, three were equipped as observation bores and one as a pumping bore. Hole locations are shown in Figure 10-6.

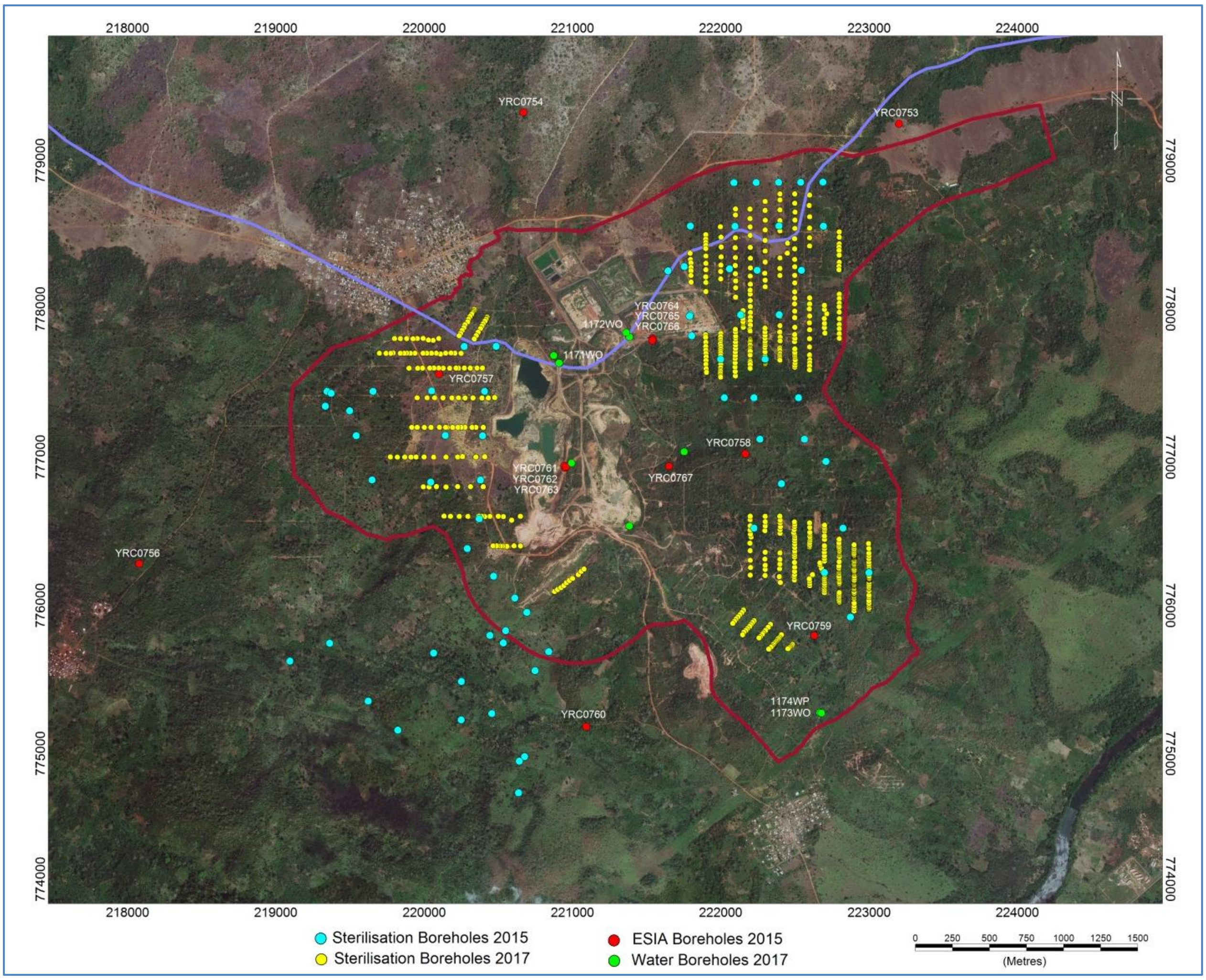


Figure 10-6 Yaouré water monitoring and sterilisation hole locations

10.8 Sterilisation Drilling

There have been two sterilisation drilling programs at Yaouré. The first was completed between 24 March and 27 June 2015, with 69 RC holes totalling 6,718 m (YRC0768B to YRC0835).

The second program, completed between 17 May and 28 July 2017, covered the proposed sites for the metallurgical plant, tailings storage facility, waste rock dumps and the CMA South pit. This program totalled 20,423 m in 659 predominantly aircore holes (Figure 10-6).

10.9 Auger Drilling

During April and May 2015, Amara drilled 251 vertical auger holes (2,173 m) in the remnant heap leach pads (Cissé, 2015). Drilling utilised a vehicle-mounted motorised auger with 100 mm diameter flights. Heaps remaining from CMA's processing operations were drilled at 25 m x 25 m spacing; the heap remaining from Cluff's operation was drilled at 50 m x 50 m spacing. Samples were collected at one metre intervals and the depths at which plastic liners were intersected were recorded. The average thickness of the CMA heaps is seven metres; the Cluff heap average 11 metres thickness. Hole locations are shown in Figure 10-7.

All samples were weighed, with average 3-5 kg samples recovered from each metre of advance. Samples were riffle split to 2-3 kg nominal mass for submission to sample preparation and assay.

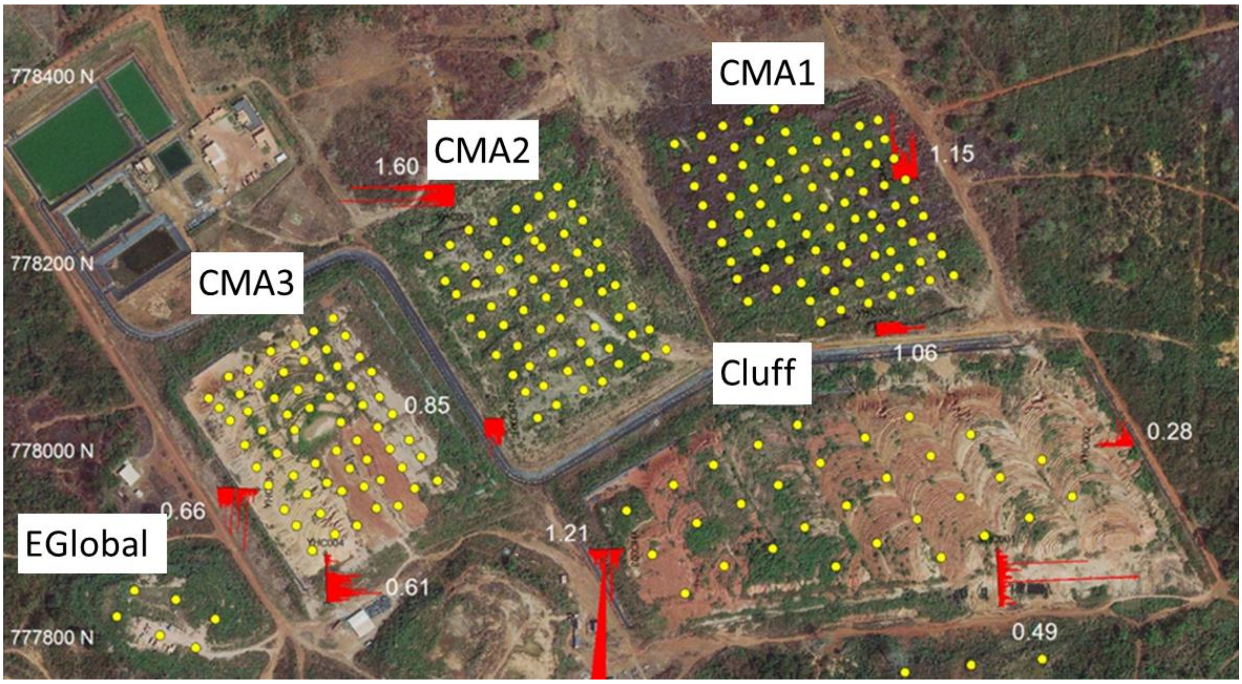


Figure 10-7 Heap leach auger drilling

Further auger drilling (37 holes, 410 m) was undertaken in February 2017 to gain material for metallurgical test work with holes spaced at approximately 75 m x 75 m. Samples were not individually assayed and the results of those holes have not been applied to inform the estimates of Mineral Resources and Mineral Reserves.

Also in 2017, 11 of the auger holes drilled in 2015 were twinned by HQ triple-tube diamond core holes in order to verify the auger sampling.

10.10 RAB Logging and Sampling

Sampling was carried out under the supervision of a company geo-technician. Samples were captured through a cyclone at one metre intervals in high-density polyethylene bags, then split using a riffle splitter into nominally 3 kg subsamples. Samples were logged for colour, weathering, rock type, veining and fabric.

RAB drill hole data have not been used to inform estimates of Mineral Resources and Mineral Reserves reported herein.

10.11 Aircore Drilling Logging and Sampling

The majority of aircore holes drilled during 2017 were for the purpose of sterilising areas proposed for mine infrastructure. Samples were collected through a cyclone and logged at one metre intervals but assay samples comprised "spear" samples composited over four metre intervals.

Two traverses of holes located north-west of Yaouré pit (YAC0201-YAC0223) were sampled at one metre intervals, weighed and each sample riffle split to produce a nominally 3kg subsample. These holes are included in the data that inform the Mineral Resource and Mineral Reserve estimates described in this report.

10.12 RC Drilling Logging and Sampling

RC drilling and sampling applied by BRGM are unknown. Those applied by Cluff in drilling during 2005-2007 (ARC series holes) are not thoroughly documented but it is known that the majority of samples were collected in one metre intervals and riffle split to produce a subsample weighing approximately 1 kg. Sample condition logs and sample weights are not available.

RC holes drilled in 2011-2012 (YRC0180 – YRC0672) were predominantly sampled in one metre intervals and sample quality and sample condition (dry, damp, wet) qualitatively logged. Sample weights are not available. Samples were riffle split to nominally 3 kg subsamples.

For RC holes drilled by Amara and Perseus in the period 2014-2017 (YRC0673 onward plus trial grade control holes), samples were collected at one metre intervals, sample quality and sample condition were qualitatively logged and the bulk samples weighed at the drill site. Samples were riffle split to produce nominally 3 kg subsamples that were then weighed at the rig site and again after drying at the sample preparation laboratory thus permitting calculation of moisture contents. The combination of hole diameter, bulk sample weight and dry subsample weight, in conjunction with an estimated density, permits quantitative estimates of RC sample recoveries.

For RC holes drilled by Amara and Perseus, a small quantity of chips were sieved from each metre sample, logged by the site geologist and then stored in plastic sample chip trays. The chip trays were subsequently photographed. Features logged include colour, weathering, oxidation, rock type, alteration, fabric, veining and presence of sulphides.

10.13 Diamond Core Drilling, Logging and Sampling

Diamond core drilling, logging and sampling methods employed by BRGM are not recorded.

In drilling Phases 1 to 3, diamond drilling was initiated with HQ (63.5 mm) coring through the weathered material, with a reduction to NQ once competent fresh rock was intersected, generally at a depth of about 60 m. Holes were then continued in NTW or NQ (56 mm, 47.6 mm respectively) core diameters.

For the Phase 4 infill drilling programme, HQ was maintained to a greater depth than for the previous phases, to an average depth of 170 m. In Phases 5 and 6, the reduction to NQ reverted back to the intersection of fresh rock which was stable for casing purposes at an average depth of 60 m.

In Phase 7 diamond core holes that were not pre-collared, HQ triple tube coring (61.1 mm) was employed through weathered rock with a reduction to NQ or NQ2 (50.5 mm) in fresh rock.

In all diamond core holes drilled by Cluff, Amara and Perseus, drill core in competent rock has been oriented using Reflex ACT II RD equipment or similar.

Drill core handling and logging procedures include:

- Assembling core in an angle-iron holder and marking a top of core orientation line;
- Assigning a confidence value to each oriented section based on the number of matching orientations. A value of 1 indicates orientation line based on only one orientation mark, 2 indicates orientation line based on two matching orientation marks, 3 indicates orientation line based on more than two matching orientation marks;
- The total length of recovered core is recorded by a geo-technician and metre interval marks are drawn. The core run length, recovered core length, solid core length, RQD, fracture frequency, and rock type are logged and recorded;
- The core is transferred into metal core boxes. Core boxes are labelled with the hole number, box number and the starting and ending depths of that core box. Plastic core blocks are placed between runs, recording the run length and hole depth;
- The core trays are then transported to the core yard for further logging.

Additional logging includes recording of colour, weathering, oxidation, rock type, fabric, veining, alteration and sulphide mineralisation. Structural logging of oriented core includes recording of alpha and beta angles of fault planes, joints, veins and contacts. Selected core holes are also logged in more detail for geotechnical data.

Diamond core is routinely photographed prior to cutting.

Drill core is normally sampled in uniform one metre intervals with adjustment to sample intervals of 0.3 to 1.3 meters at vein, rock type or alteration contacts. Sample intervals are marked and, in competent materials, the core sawn in half using a diamond saw. Core through friable, weathered materials is halved using a spatula or similar. The entire half core is submitted for sample preparation.

10.14 Sampling Quality

10.14.1 Introduction

Estimates of Mineral Resource and Mineral Reserves reported herein have been informed by a subset of the available drill hole data (Table 10-2) based on the geographic limits of the model.

From visual comparison of results from surrounding drilling, Perseus identified 451 metres of drilling from three BRGM and 12 Cluff RC holes (Table 10-3) for which gold grades appear to be overstated, probably due to down-hole contamination. These intervals were excluded from the estimation dataset.

The discussions of sampling quality below refer only to samples that inform the estimates and are summarised from Abbott (2017).

Table 10-2 Resource area drilling database

Phase	Type	No. Holes	Metres of drilling					
			Auger	RAB	AC	RC	Diamond	Total
BRGM	RC	82	-	-	-	5,082	-	5,082
	Diamond	2	-	-	-		155	155
	Subtotal	**84**	**-**	**-**	**-**	**5,082**	**155**	**5,237**
Cluff	RC	676	-	-	-	45,645	-	45,645
	Diamond	62	-	-	-	-	6,483	6,483
	Subtotal	**738**	**-**	**-**	**-**	**45,645**	**6,483**	**52,128**
Amara	Auger	252	2,173	-	-	-	-	2,173
	RAB	82	-	1,076	-	-	-	1,076
	RC	130	-	-	-	21,472	-	21,472
	Diamond	463	-	-	-	-	127,906	127,906
	Subtotal	**927**	**2,173**	**1,076**	**-**	**21,472**	**127,906**	**152,627**
Perseus	Auger	37	410	-	-	-	-	410
	Aircore	50	-	-	2,030	-	-	2,030
	RC	267	-	-	-	20,557	-	20,557
	RC GC	417	-	-	-	12,709	-	12,709
	Diamond	121	-	-	-	6,643	11,756	18,399
	Subtotal	**892**	**410**	**-**	**2,030**	**39,909**	**11,756**	**54,105**
Total	Auger	289	2,583	-	-	-	-	2,583
	RAB	82	-	1,076	-	-	-	1,076
	Aircore	50	-	-	2,030	-	-	2,030
	RC	1,155	-	-	-	92,756	-	92,756
	RC GC	417	-	-	-	12,709	-	12,709
	Diamond	648	-	-	-	6,643	146,299	152,942
	RC & DDH	2,220	-	-	-	112,108	146,299	258,407
	Total	**2,641**	**2,583**	**1,076**	**2,030**	**112,108**	**146,299**	**264,096**

Table 10-3 BRGM & Cluff RC intervals excluded from resource dataset

Hole	Hole Depth (m)	Excluded Interval (m)			Average Au g/t
		From	To	Length	
AN0200	65	36	65	29	1.72
AN0209	80	60	80	20	1.16
AN0218	85	68	85	17	1.67
ARC0026	110	60	110	50	0.40
ARC0049	116	54	116	62	2.22
ARC0250	75	60	75	15	0.97
ARC0253	85	68	85	17	0.70
ARC0375	65	50	65	15	0.81
ARC0376	65	36	65	29	0.81
ARC0428	75	44	75	31	0.95
ARC0438	65	48	65	17	0.52
ARC0446	65	42	65	23	1.21
ARC0470	65	48	65	17	0.51
ARC0716	75	66	75	9	0.73
ARC0724	100	0	100	100	1.42
Total				**451**	**1.21**

10.14.2 RC Sample Condition Logging

Amara and Perseus RC and aircore field procedures included recording of sample moisture status with samples assigned to dry, moist, slightly wet or wet categories. Following his site visit, Abbott (2017) concluded that Perseus samples logged as moist have little apparent moisture and, in terms of sample quality can be considered as effectively dry.

Sample condition logs are available for around 95.2% and 99.5% of the Amara and Perseus resource RC drilling, along with 99.9% of Perseus aircore drilling within the resource area and 99.3% of Perseus RC GC drilling. No sample condition logging is available for BRGM and records for Cluff RC drilling are incomplete.

Table 10-4 and Figure 10-8 summarise sample condition logging by weathering domain and drilling depth respectively. The table and figure exclude intervals without sample condition logs and drill intervals in dump and fill. Notable features including the following:

- Combined slightly wet and wet samples represent insignificant proportions of the Amara and Perseus RC drilling.
- Amara and Perseus drilling shows comparable trends, with Perseus holes having a slightly higher proportion of samples logged as moist, slightly wet and wet.
- Only around 3% of the combined RC samples are logged as slightly wet or wet.
- For Perseus drilling, very few samples are logged as slightly wet or wet for depths of less than approximately 60 metres depth. Below this depth, the proportion of such samples increases with depth and averages around 17% below 100 metres.
- Amara drilling includes very few slightly wet or wet samples for depths of less than approximately 40 metres. Below this depth, the proportion of such samples increases with depth and averages around 17% from approximately 75 to 100 metres. For rare deeper drilling the proportion of slightly wet or wet samples is notably lower. This trend may reflect variations in drilling equipment and techniques for deeper holes.
- Amara's drilling shows a cyclic trend, with proportionally more samples logged as moist, slightly wet to wet at six metre intervals representing the start of the dominant six metre drilling rods. Although less distinct, Perseus's drilling shows a similar trend.

Table 10-4 RC Sample condition logging by weathering domain

	Number of logged samples					Proportion of samples				
	Dry	Moist	S. Wet	Wet	Total	Dry	Moist	S. Wet	Wet	Total
Amara Resource RC										
Laterite	293	325	-	23	641	46%	51%	-	4%	100%
CW Upper	578	790	2	4	1,374	42%	57%	0.1%	0%	100%
CW Lower	630	807	11	7	1,455	43%	55%	0.8%	0%	100%
Partial Weath.	659	773	64	10	1,506	44%	51%	4%	1%	100%
Fracture Weath.	743	526	122	27	1,418	52%	37%	9%	2%	100%
Subtot. Weath.	2,903	3,221	199	71	6,394	45%	50%	3%	1%	100%
Fresh	10,650	1,397	435	232	12,714	84%	11%	3%	2%	100%
Subtotal	**13,553**	**4,618**	**634**	**303**	**19,108**	**71%**	**24%**	**3%**	**2%**	**100%**
Perseus Resource RC										
Laterite	652	875	-	23	1,550	42%	56%	-	1%	100%
CW Upper	1,446	2,837	2	4	4,289	34%	66%	0.05 %	0%	100%
CW Lower	1,502	2,996	11	8	4,517	33%	66%	0.2%	0%	100%
Partial Weath.	1,576	2,959	64	11	4,610	34%	64%	1%	0%	100%
Fracture Weath.	2,413	2,532	122	33	5,100	47%	50%	2%	1%	100%
Subtot. Weath.	7,589	12,199	199	79	20,066	38%	61%	1%	0%	100%
Fresh	20,599	2,321	509	367	23,796	87%	10%	2%	2%	100%
Subtotal	**28,188**	**14,520**	**708**	**446**	**43,862**	**64%**	**33%**	**2%**	**1%**	**100%**
Subtotal Combined RC										
Subtotal Weath	10,492	15,420	398	150	26,460	40%	58%	2%	1%	100%
Fresh	31,249	3,718	944	599	36,510	86%	10%	3%	2%	100%
Subtotal	**41,741**	**19,138**	**1,342**	**749**	**62,970**	**66%**	**30%**	**2%**	**1%**	**100%**
Perseus Aircore										
Laterite	162	88	-	-	250	65%	35%	-	-	100%
CW Upper	139	376	-	-	515	27%	73%	-	-	100%
CW Lower	49	408	-	-	457	11%	89%	-	-	100%
Partial Weath.	123	481	-	-	604	20%	80%	-	-	100%
Fracture Weath.	77	125	-	-	202	38%	62%	-	-	100%
Subtot. Weath.	550	1,478	-	-	2,028	27%	73%	-	-	100%
Fresh	550	1,478	--	-	2,028	27%	73%	-	-	100%
Subtotal	**28,188**	**14,520**	**708**	**446**	**43,862**	**64%**	**33%**	**2%**	**1%**	**100%**

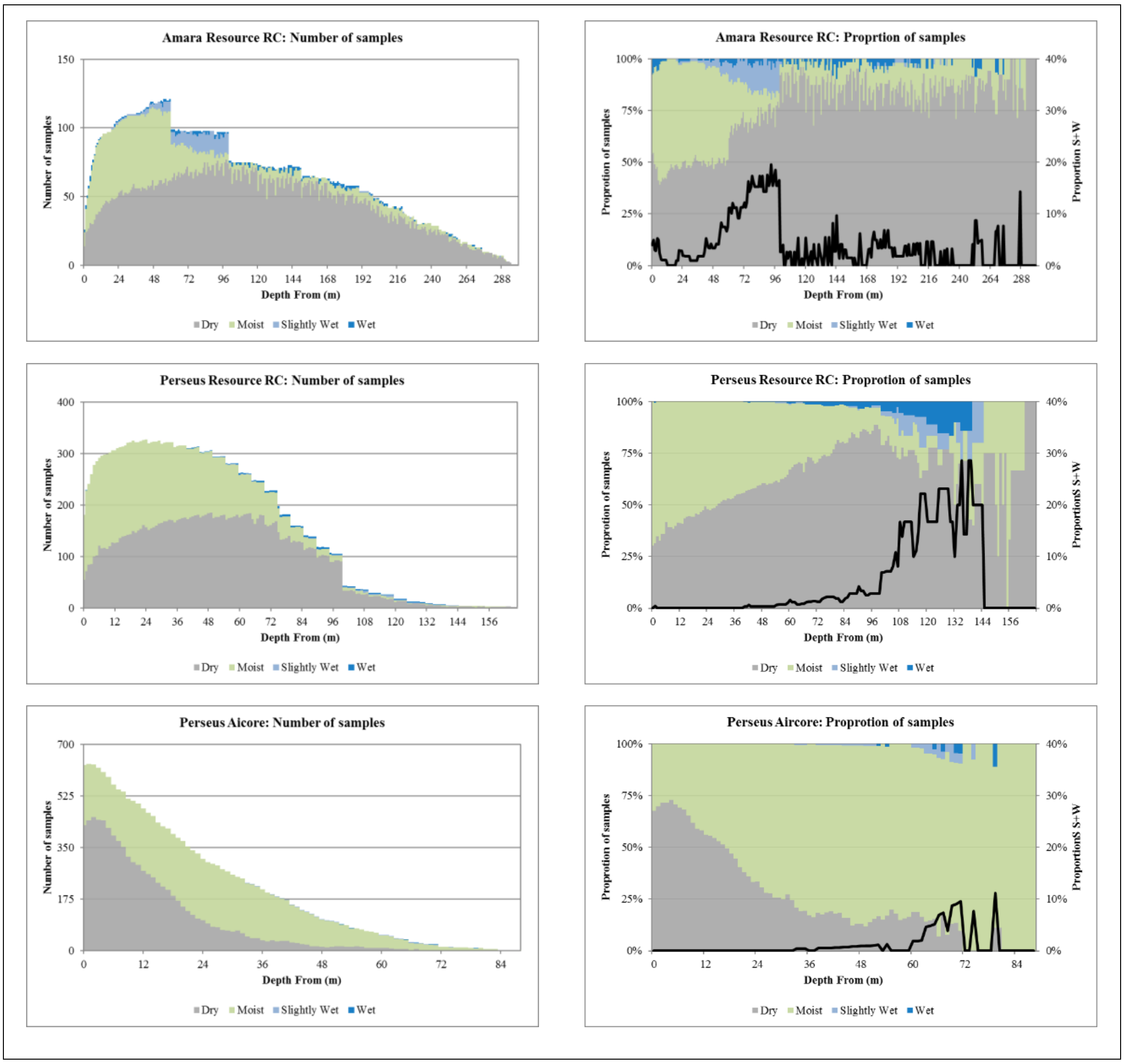


Figure 10-8 RC sample condition by drilling depth

10.14.3 RC Sample Recoveries

Recovered sample weights are available for around 78% and 99.5% of Amara and Perseus RC drilling respectively. No recovered sample weights are available for BRGM and Cluff RC drilling.

Perseus's sample preparation procedures included weighing of assay sub-samples before and after oven drying, measuring the moisture content for each sample.

The sample recovery for each weighed sample was estimated based on:

- Bit diameter
- Bulk density, using the mineralisation domain/weathering subdomain combinations applied to estimate Mineral Resources; and
- Moisture content.

Recovery by Weathering Domain and Sample Condition

Table 10-5 summarises average estimated aircore and RC sample recoveries by weathering domain. The data indicate that:

- For each data set, average recovery generally increases with decreasing weathering;
- Average recovery for Amara's 2014 drilling is 77.6%, consistent with reasonable quality RC drilling;
- Average recovery for Amara's 2015 drilling is 85%, consistent with good quality RC drilling;
- Average recovery for Perseus RC drilling is 82.5%, consistent with good quality RC drilling; and
- At around 68%, average recovery for Perseus aircore drilling is somewhat less than would be consistent with good quality aircore drilling.

The rare fresh samples logged as slightly wet or wet show notably lower average estimated recoveries than dry samples (Table 10-6). This trend supports Perseus's protocol of changing to diamond core drilling at depth, where RC drilling may struggle to produce dry, high recovery samples.

Table 10-5 RC and aircore sample recovery by weathering domain

Drilling Group	Weathering	Number Samples	Estimated Recovery Minimum	Estimated Recovery Average	Estimated Recovery Maximum
Amara 2014 Resource RC	Laterite	319	3.7	41.1	112.4
	CW Upper	688	12.4	60.2	149.0
	CW Lower	748	15.8	71.7	141.9
	Partial Weath.	755	16.9	75.0	165.7
	Fracture Weath.	962	9.2	81.2	157.1
	Fresh	11,994	5.3	79.9	216.7
	Subtotal	**15,466**	**3.7**	**77.6**	**216.7**
Amara 2015 Resource RC	Laterite	150	3.4	72.1	148.9
	CW Upper	149	24.3	80.8	131.0
	CW Lower	158	25.4	86.7	325.5
	Partial Weath.	244	18.7	80.0	149.9
	Fracture Weath.	169	27.4	94.3	161.1
	Fresh	460	18.6	88.0	163.9
	Subtotal	**1,330**	**3.4**	**84.6**	**325.5**
Perseus Resource RC	Laterite	907	3.2	54.7	157.2
	CW Upper	2,912	3.6	66.9	158.3
	CW Lower	3,058	6.7	79.1	194.8
	Partial Weath.	3,097	2.2	79.8	159.3
	Fracture Weath.	3,679	2.7	88.8	196.8
	Fresh	11,068	4.4	90.7	171.3
	Subtotal	**24,721**	**2.2**	**83.5**	**196.8**
Perseus Aircore	Laterite	37	7.6	47.2	84.1
	CW Upper	189	8.7	71.1	117.7
	CW Lower	203	15.2	70.8	106.4
	Partial Weath.	164	16.8	69.0	101.1
	Fracture Weath.	111	18.5	60.3	154.0
	Subtotal	**704**	**7.6**	**67.6**	**154.0**

Table 10-6 RC sample recovery by sample condition

Sample Condition	Amara (Fresh)		Perseus (Fresh)		Combined (Fresh)	
	Number	**Avg. Recov.**	**Number**	**Avg. Recov.**	**Number**	**Avg. Recov.**
Dry	10,744	82%	9,936	92%	20,680	87%
Moist	1,404	69%	923	86%	2,327	76%
Slightly Wet	59	76%	74	63%	133	69%
Wet	191	56%	135	65%	326	60%
Total	**12,398**	**80%**	**11,068**	**91%**	**23,466**	**85%**

Recovery by Drilling Depth

Figure 10-9 shows average estimated aircore and RC sample recovery by down-hole depth subdivided by drilling phase. Notable features of these plots include the following:

- Samples from shallow depths show lower average recoveries than deeper samples. This is consistent with the comparatively low average recoveries shown for laterite and upper completely weathered material described above;
- For Perseus and 2014 Amara RC drilling, average recoveries show a distinctly cyclic trend with lower values at six metre increments representing the first sample of each six metre drill rod; and
- The comparatively small set of samples from 2015 Amara RC drilling show a cyclic trend reflecting the three metre drill rods used for this phase.

Industry experience indicates that cyclic recovery depth versus trends are common for RC drilling and generally reflect material lost as the driller blows the hole clean at the start of each rod, with good quality RC drilling typically showing recovery variation between first and subsequent samples of around 10% to 15% (Abbott, 2017). In cases where the down-hole recovery variability is extreme it can reflect depth measurement inaccuracies, or very low sample recoveries associated with wet samples at the start of rods.

At around 10% the variability in average recoveries between first and subsequent samples of each rod shown by 2014 Amara drilling is indicative of good quality RC drilling. The 2015 Amara drilling shows notably greater down-hole variability. The extent to which this reflects the small size of the dataset is uncertain.

At around 15%, the variability in average recoveries between first and subsequent samples of each rod shown by Perseus's drilling is greater than shown by 2014 Amara drilling.

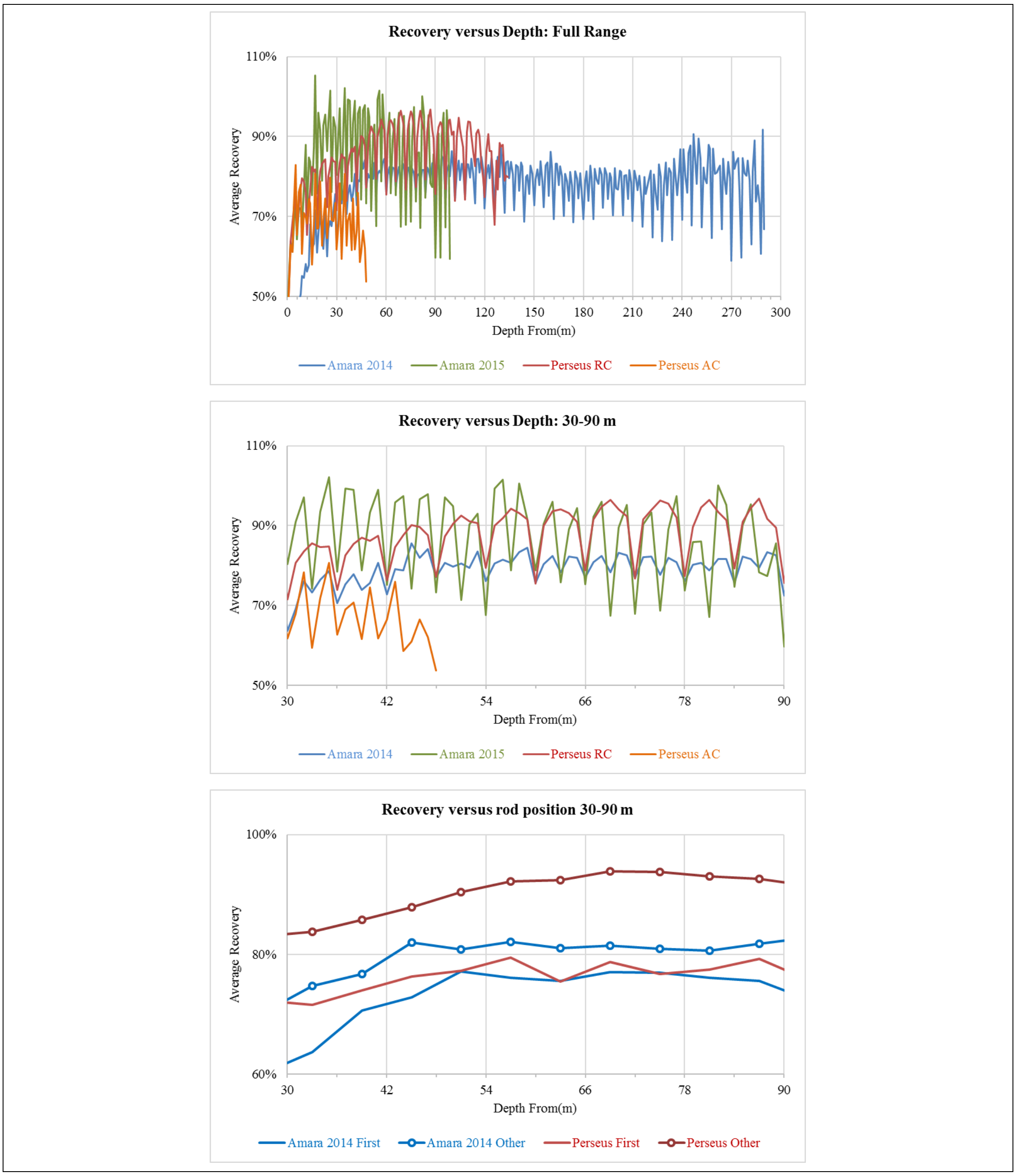


Figure 10-9 RC sample recovery by drilling depth

Gold Grade versus Recovery

The available bulk density data indicate there is a slight association between lower average densities and higher gold grades. A slight apparent association between higher gold grades, and lower estimated average recoveries might thus be expected.

The plots in Figure 10-10 show average gold grades for increments of estimated RC sample recovery for fresh samples. To reduce the impact of a small number of outliers, gold grades were cut to 10 g/t for preparation of these plots. As expected there is a very slight trend for lower average gold grades with increasing sample recovery, reflecting lower average densities for higher grade samples. This trend is considered of no concern for the current study and the available information indicates that there is no association between lower RC recoveries and biased samples which could significantly affect confidence in estimated resources.

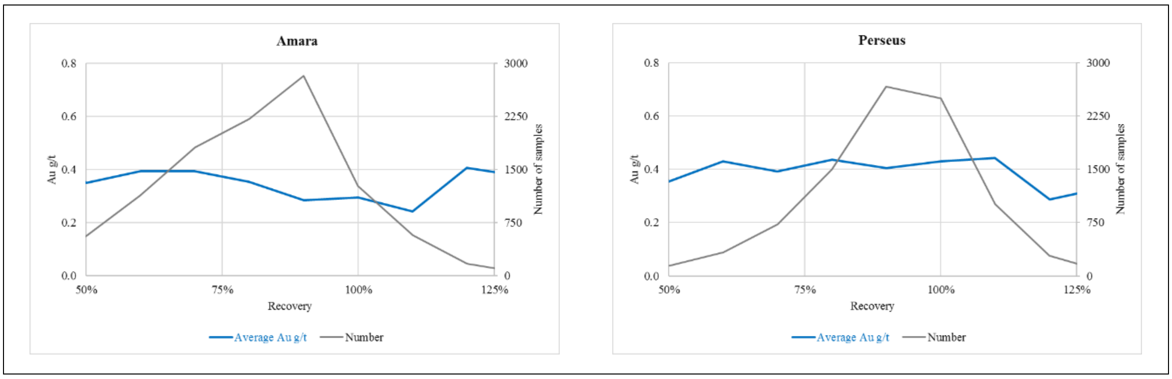


Figure 10-10 Gold grade versus recovery for fresh RC samples

10.14.4 Diamond Core Recovery

Core recovery measurements are available for around 95% of the combined Yaouré diamond drilling, including 95% and 99.5% of Amara and Perseus diamond drilling respectively. No recovery information is available for Cluff or BRGM diamond drilling.

Core recovery measurements are recorded as recovered lengths for core runs that range from 0.05 to 10.7 metres in length and are dominated by three metre intervals. These measurements were composited to three metre intervals to provide a consistent basis for analysis. The summary statistics in Table 10-7 and histograms in Figure 10-11 summarise core recoveries for the three metre composites by weathering domain. Each of the histograms in Figure 10-11 were truncated to exclude rare low and high values, and more clearly show general trends for each dataset.

Notable features of the data include:

- Average recoveries generally increase with decreasing weathering degree.
- For Amara drilling, recovery averages 97.4%, including 99.6% for fresh intervals.
- For Perseus drilling recovery averages 98.5%, including 99.9% for fresh intervals.
- Estimated core recoveries are greater than 100% for around 41% and 48% of Amara and Perseus drilling respectively.

Intervals with recoveries of greater than 100% reflect variable precision in recording of run lengths, and recovered lengths due to the high proportion of recoveries of close to 100%.

Average core recoveries are considered consistent with good quality, representative diamond drilling.

Table 10-7 Diamond core recovery by weathering domain

Weathering Domain		Amara No. Comps.	Amara Recovery (%) Min	Amara Recovery (%) Avg.	Amara Recovery (%) Max	Perseus No. Comps.	Perseus Recovery (%) Min	Perseus Recovery (%) Avg.	Perseus Recovery (%) Max
Laterite		562	5.0	65.7	113.3	51	7.2	64.6	125.0
CW Upper		1,360	1.0	77.8	113.3	95	36.7	87.3	106.7
CW Lower		1,588	0.8	84.9	117.6	126	43.9	91.8	127.3
Partial Weath.		1,152	6.8	91.3	115.7	147	31.0	95.0	114.7
Fracture Weath.		1,520	15.8	94.3	128.3	204	16.9	96.3	131.9
Fresh		35,259	13.2	99.6	157.8	3,218	33.1	99.9	128.3
Total	Laterite	562	5.0	65.7	113.3	51	7.2	64.6	125.0
	Weath. other	5,620	0.8	87.0	128.3	572	16.9	93.5	131.9
	Fresh	35,259	13.2	99.6	157.8	3,218	33.1	99.9	128.3
	Total	**41,441**	**0.8**	**97.4**	**157.8**	**3,841**	**7.2**	**98.5**	**131.9**

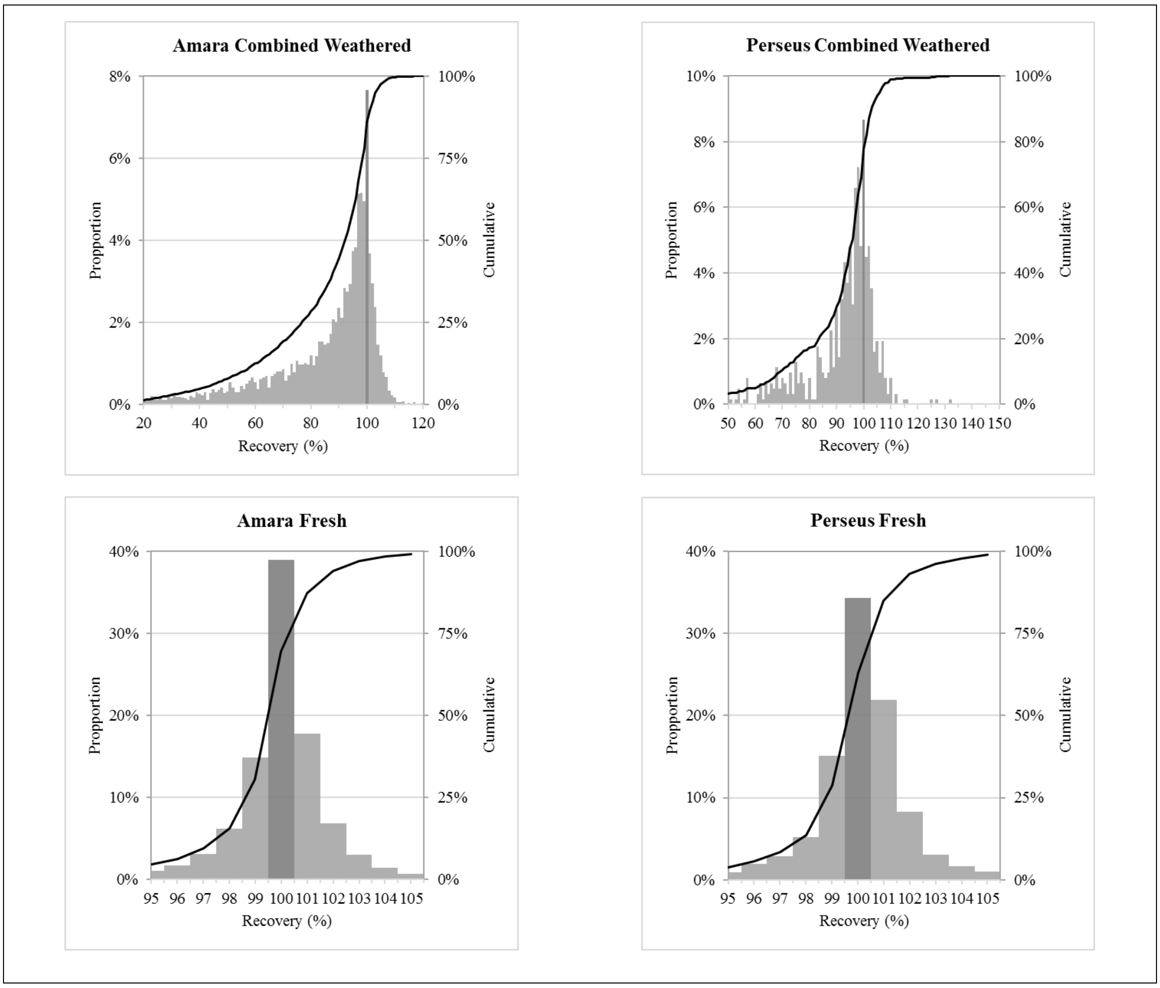


Figure 10-11 Diamond core recovery measurements

Figure 10-12 shows average gold grades for three metre composited core recovery increments in fresh rock material. An upper cut of 10 g/t has been applied to reduce the impact of outlier gold grades. There is no notable association between core recovery and gold grade.

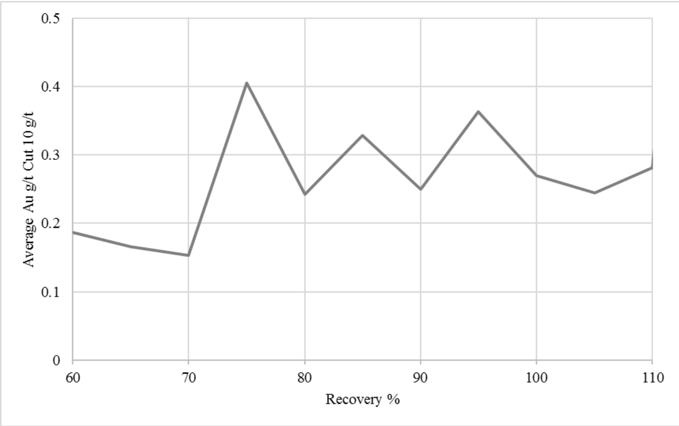


Figure 10-12 Gold grade versus core recovery for fresh rock

10.14.5 RC Field Duplicates

Information available to demonstrate the repeatability of field sampling for Cluff, Amara and Perseus RC drilling, along with Perseus aircore drilling, includes assay results for field duplicate samples. The field duplicates were collected consistently with, and assayed in the same batches as original samples. No field duplicates are available for BRGM RC drilling.

Comparisons of assays of primary and field re-split samples capture the cumulative error associated with sub-sampling and assaying, the majority of which normally arises out of field sampling.

The summary statistics in Table 10-8 and combined scatter (grey dots) and QQ plots (blue lines) in Figure 10-13 summarise field duplicate assay results by drilling phase. For the RC datasets this table and figure include only results from drilling within the resource area. The full set of Perseus AC samples is included to give a reasonable size dataset. This approach is justified by the consistency of sampling procedures. The plots in Figure 10-14 are truncated at 15 g/t, more clearly showing correlation for typical gold grades.

The data indicate that:

- Field duplicates for Cluff resource RC drilling represent an average frequency of around one duplicate per 21 primary samples. With the exception of comparatively rare poorly correlating pairs the duplicate assays generally correlate well with original samples.
- Field duplicate assays available for Amara resource area RC drilling represent an average frequency of around one duplicate per 17 primary samples. These data generally correlate well with original samples showing proportionally fewer poorly correlating pairs than either Cluff or Perseus RC duplicates.
- Perseus resource and trial grade control holes were sampled consistently and the duplicates from these groups were combined for analysis giving 2,198 duplicates representing approximately one duplicate per 15 primary samples. Although most pairs show reasonable correlation, consistent with Amara RC duplicates, there are proportionally more poorly correlating pairs giving comparatively poorer correlation statistics. Reasons for this variability are uncertain.
- Field duplicates were collected from Perseus AC drilling at an average frequency of approximately one duplicate per 15 primary samples. These holes were primarily drilled for exploratory and sterilisation drilling, and have generally notably lower gold grades than the RC resource datasets. The duplicates show comparable correlation to the RC data.

Each dataset shows generally reasonable repeatability consistent with industry experience of good quality sampling for comparable mineralisation and sampling styles and confirms the repeatability of the RC and AC field sampling.

Table 10-8 RC field duplicates

Full Range								
Au g/t	**Cluff RC**		**Amara RC**		**Perseus RC**		**Perseus AC**	
	Orig.	**Dup.**	**Orig.**	**Dup.**	**Orig.**	**Dup.**	**Orig.**	**Dup.**
Number	1,939		1,107		2,200		367	
Mean	**0.35**	**0.36**	**0.30**	**0.30**	**0.38**	**0.39**	**0.11**	**0.10**
Mean dif.		**2%**		**2%**		**2%**		**-12%**
Variance	10.9	16.3	1.68	1.76	1.83	1.88	0.16	0.15
Coef. Var.	9.34	11.21	4.32	4.36	3.53	3.53	3.71	4.05
Minimum	0.01	0.001	0.005	0.01	0.01	0.01	0.01	0.01
1st Quartile	0.02	0.02	0.01	0.01	0.02	0.02	0.01	0.01
Median	0.05	0.05	0.02	0.02	0.05	0.05	0.03	0.03
3rd Quartile	0.19	0.19	0.08	0.08	0.20	0.19	0.06	0.06
Maximum	114	152	16.2	17.9	33.8	30.6	4.68	5.26
Correl. Coef.	0.98		0.98		0.89		0.89	
0.1 to 30 g/t								
Au g/t	**Cluff RC**		**Amara RC**		**Perseus RC**		**Perseus AC**	
	Orig.	**Dup.**	**Orig.**	**Dup.**	**Orig.**	**Dup.**	**Orig.**	**Dup.**
Number	688		240		759		46	
Mean	**0.62**	**0.60**	**1.29**	**1.32**	**1.04**	**1.06**	**0.50**	**0.50**
Mean dif.		**-4%**		**2%**		**2%**		**1%**
Variance	1.87	1.34	6.46	6.78	4.64	4.77	0.93	0.97
Coef. Var.	2.19	1.93	1.96	1.98	2.08	2.06	1.93	1.95
Minimum	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
1st Quartile	0.17	0.17	0.17	0.18	0.18	0.17	0.13	0.12
Median	0.27	0.27	0.35	0.34	0.37	0.36	0.17	0.16
3rd Quartile	0.53	0.56	0.87	0.85	0.94	0.93	0.32	0.33
Maximum	21.1	17.1	16.2	17.9	33.8	30.6	4.68	5.26
Correl. Coef.	0.83		0.98		0.87		0.97	

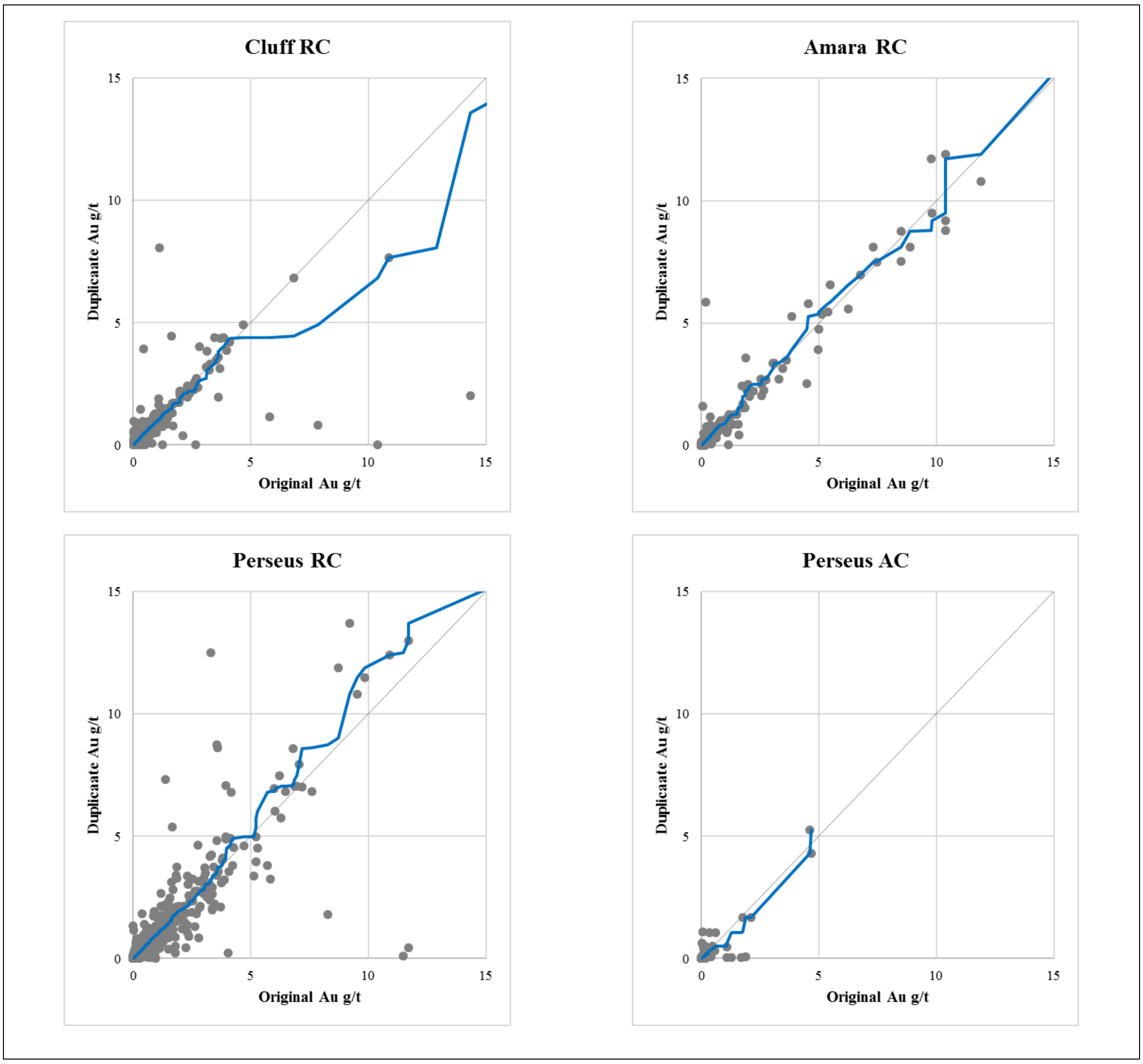


Figure 10-13 RC field duplicates

10.14.6 Duplicate Core Samples

Information available to demonstrate repeatability of field sampling for Amara diamond core drilling includes quarter core duplicate samples. No core duplicate assays are available for BRGM, Cluff or Perseus diamond drilling.

The Amara duplicates were assayed in the same batches as original samples and provide an indication of the repeatability of core sampling and test for sample misallocation.

Table 10-9 and Figure 10-14 summarise Amara core duplicate assays. The combined scatter (grey dots) and QQ plots (blue line) in Figure 10-14 are truncated at 20 g/t and 6 g/t respectively, excluding a small number of high grade pairs in order to provide a clearer indication of correlation for typical gold grades.

The core duplicates show generally reasonable repeatability consistent with the industry experience of core duplicates for comparable mineralisation styles.

The core duplicates tend to show slightly higher average grades than the original samples, most notably for gold grades less than 6 g/t. Reasons for this trend are uncertain. It may reflect an artefact of the comparatively small dataset. The magnitude of grade difference is comparatively small and does not significantly impact confidence in the current estimates.

Table 10-9 Amara core duplicates

Au g/t	Full Range		< 30 g/t		0.1 to 30 g/t		0.1 to 10 g/t	
	Orig.	Dup.	Orig.	Dup.	Orig.	Dup.	Orig.	Dup.
Number	2,670		2,667		436		424	
Mean	**0.25**	**0.25**	**0.21**	**0.23**	**1.16**	**1.26**	**0.87**	**0.97**
Mean dif.		**-4%**		**8%**		**9%**		**11%**
Variance	2.51	1.46	1.01	1.22	5.07	6.12	1.92	2.46
Coef. Var.	6.22	4.93	4.69	4.78	1.95	1.96	1.59	1.62
Minimum	0.01	0.01	0.01	0.01	0.10	0.10	0.10	0.10
1st Quartile	0.01	0.01	0.01	0.01	0.19	0.20	0.19	0.20
Median	0.01	0.01	0.01	0.01	0.37	0.39	0.35	0.38
3rd Quartile	0.07	0.06	0.06	0.06	0.93	0.99	0.83	0.89
Maximum	45.0	22.6	18.4	20.9	18.4	20.9	9.10	9.52
Correl. Coef.	0.75		0.88		0.87		0.83	

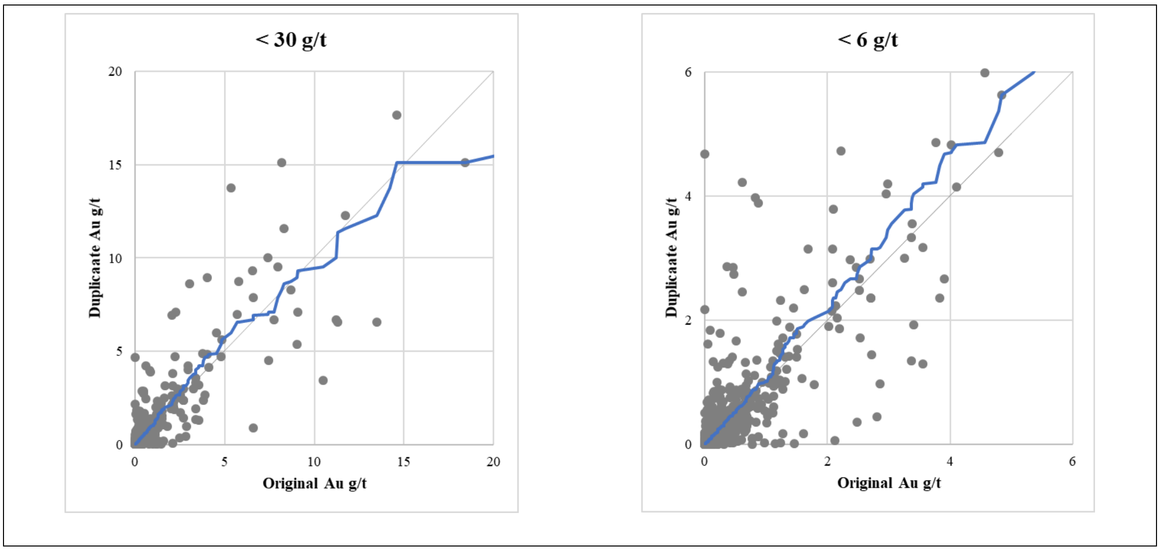


Figure 10-14 Amara core duplicates

10.14.7 BRGM and Cluff Drilling

Introduction

No data are available to directly demonstrate the reliability of sampling and assaying by BRGM and compilation of quality control data for the Cluff drilling is incomplete at the time of reporting.

Perseus and Amara drilling did not include deliberate twinning of older holes, however some hole paths are in close proximity to older holes providing closely spaced assays for comparison.

Two metre composited fire assay grades of from Amara and Perseus RC and diamond drilling were compared with nearest-neighbour composited gold grades from older drilling. Reliability of sampling and assaying for Amara and Perseus RC and diamond drilling has been established by comprehensive QAQC and these comparisons provide an indication of the reliability of the BRGM and Cluff RC data.

Cluff BLEG versus Amara and Perseus Fire Assay

Two metre down-hole composited BLEG grades from Cluff RC sampling were compared with composited fire assay grades from Amara and Perseus RC and diamond drilling. This included two sets of pairs selected within the separation distances:

- 3 metres east-west by 3 metres north-south and 3 metres vertical;
- 4 metres east-west by 6 metres north-south and 4 metres vertical.

The datasets used for selecting pairs do not include the intervals from Cluff RC drilling excluded from resource estimates (Table 10-3, above).

Each paired dataset includes a substantial proportion of very low grade composites. To provide a consistent basis for comparison of gold grades for mineralised samples, the review datasets exclude pairs grading less than 0.05 g/t and rare pairs grading greater than 10 and 12 g/t respectively. Average separation distances for the two datasets are 2.0 and 4.0 metres respectively.

The statistics in Table 10-10 and QQ plots in Figure 10-15 summarise the paired datasets by weathering domain. This table and figure demonstrate that for both sets of pairs, Cluff BLEG assays give slightly lower average gold grades than the fire assay datasets. This variability is consistent with the partial extraction BLEG analyses.

The comparatively small difference in average grades shown by paired comparisons supports the use of the Cluff BLEG assays in the current estimates. Cluff drilling focussed on the Yaouré zone, and their inclusion in resource estimates represents a pragmatic approach. It is warranted by the benefit of including these data in constraining estimates for the highly variable and variably oriented Yaouré mineralisation which is less well defined by broader spaced later drilling.

Table 10-10 Cluff BLEG vs. Amara and Perseus fire assay pairs

Within 3 by 3 by 3m						
Au g/t	**Weathered**		**Fresh**		**Combined**	
	Cluff BLEG	**Am./Pers. FA**	**Cluff BLEG**	**Am./Pers. FA**	**Cluff BLEG**	**Am./Pers. FA**
Number	277		290		567	
Mean	**0.63**	**0.68**	**0.77**	**0.80**	**0.70**	**0.74**
Mean dif.		**9%**		**4%**		**6%**
Coef. Var.	1.54	1.66	1.44	1.56	1.49	1.61
Minimum	0.05	0.05	0.05	0.05	0.05	0.05
1st Quartile	0.12	0.12	0.17	0.14	0.14	0.13
Median	0.27	0.27	0.42	0.32	0.33	0.30
3rd Quartile	0.67	0.64	0.92	0.90	0.81	0.80
Maximum	8.24	8.90	8.41	8.21	8.41	8.90
Within 4 by 6 by 4m						
Au g/t	**Weathered**		**Fresh**		**Combined**	
	Cluff BLEG	**Am./Pers. FA**	**Cluff BLEG**	**Am./Pers. FA**	**Cluff BLEG**	**Am./Pers. FA**
Number	462		454		916	
Mean	**0.67**	**0.69**	**0.84**	**0.89**	**0.75**	**0.79**
Mean dif.		**3%**		**6%**		**5%**
Coef. Var.	1.75	1.94	1.51	1.64	1.63	1.78
Minimum	0.05	0.05	0.05	0.05	0.05	0.05
1st Quartile	0.11	0.11	0.17	0.14	0.14	0.12
Median	0.26	0.27	0.42	0.33	0.31	0.29
3rd Quartile	0.64	0.55	0.93	0.93	0.80	0.77
Maximum	11.7	11.3	10.5	11.0	11.7	11.3

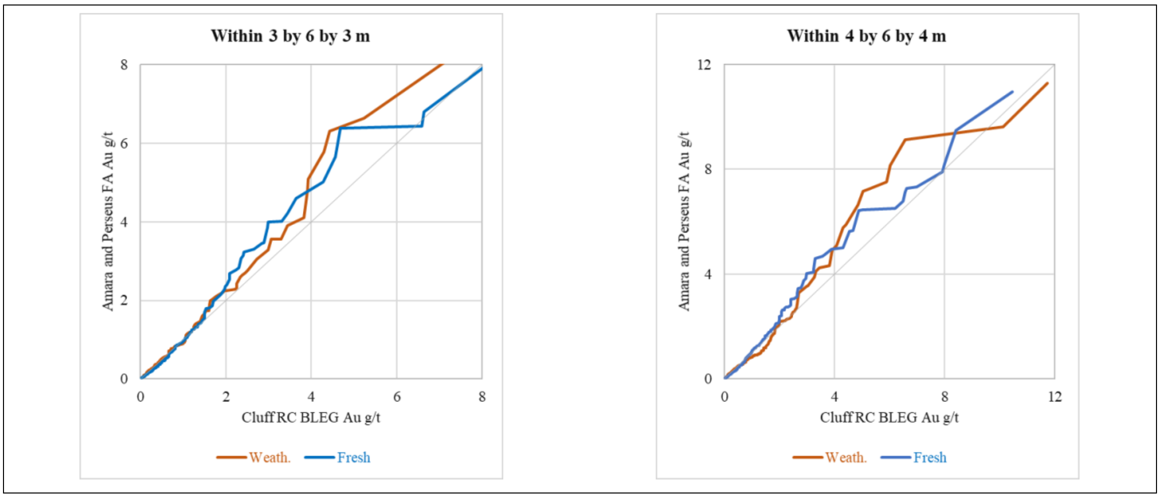


Figure 10-15 Cluff BLEG vs. Amara and Perseus fire assay pairs

BRGM, Amara and Perseus fire assay

BRGM's resource area drilling includes RC and diamond core samples analysed by BLEG and fire assay. These data are dominated by BLEG assays of RC samples and were combined for paired data comparisons.

Two metre down-hole composited assay grades from BRGM's drilling were compared with composited fire assay grades from Amara and Perseus RC and diamond drilling. This included two sets of pairs selected within the separation distances:

- 3 metres east-west by 3 metres north-south and 3 metres vertical.
- 4 metres east-west by 6 metres north-south and 4 metres vertical.

Each of the paired datasets includes substantial proportions of very low gold grade composites. To provide a consistent basis for comparison of gold grades for mineralised samples, the review datasets exclude pairs grading less than 0.05 g/t, and a small number of pairs grading greater than 6 g/t. Average separation distances for the two datasets are 1.7 and 3.5 metres respectively.

As shown in Table 10-11 and Figure 10-16, for both sets of pairs the BRGM composites give slightly higher average gold grades than the combined Perseus-Amara datasets. Reasons for this trend are uncertain; it may simply reflect an artefact of the small datasets.

The comparatively small difference in average grades shown by the paired comparisons supports the use of BRGM data in the current estimates. As evaluation of the project continues, additional investigations, possibly including twin or replacement holes may be warranted.

Table 10-11 BRGM vs. Amara and Perseus fire assay pairs

Within 3 by 3 by 3m						
Au g/t	**Weathered**		**Fresh**		**Combined**	
	BRGM BLEG/FA	**Am./Pers. FA**	**BRGM BLEG/FA**	**Am./Pers. FA**	**BRGM BLEG/FA**	**Am./Pers. FA**
Number	66		58		124	
Mean	**0.75**	**0.71**	**0.45**	**0.39**	**1.10**	**1.06**
Mean dif.		**-6%**		**-12%**		**-4%**
Coef. Var.	1.51	1.54	1.62	1.01	1.27	1.36
Minimum	0.05	0.05	0.06	0.05	0.05	0.06
1st Quartile	0.15	0.14	0.11	0.13	0.24	0.15
Median	0.31	0.33	0.21	0.27	0.53	0.48
3rd Quartile	0.72	0.71	0.38	0.50	1.41	0.99
Maximum	5.46	5.83	4.41	2.33	5.5	5.8
Within 4 by 6 by 4m						
Au g/t	**Weathered**		**Fresh**		**Combined**	
	BRGM BLEG/FA	**Am./Pers. FA**	**BRGM BLEG/FA**	**Am./Pers. FA**	**BRGM BLEG/FA**	**Am./Pers. FA**
Number	98		123		221	
Mean	**0.47**	**0.45**	**0.81**	**0.68**	**0.66**	**0.58**
Mean dif.		**-5%**		**-16%**		**-12%**
Coef. Var.	1.49	1.09	1.41	1.63	1.50	1.56
Minimum	0.06	0.05	0.05	0.05	0.05	0.05
1st Quartile	0.12	0.17	0.16	0.10	0.15	0.12
Median	0.23	0.30	0.36	0.23	0.28	0.26
3rd Quartile	0.40	0.53	0.81	0.74	0.63	0.60
Maximum	**4.41**	**3.49**	**5.46**	**5.83**	**5.46**	**5.83**

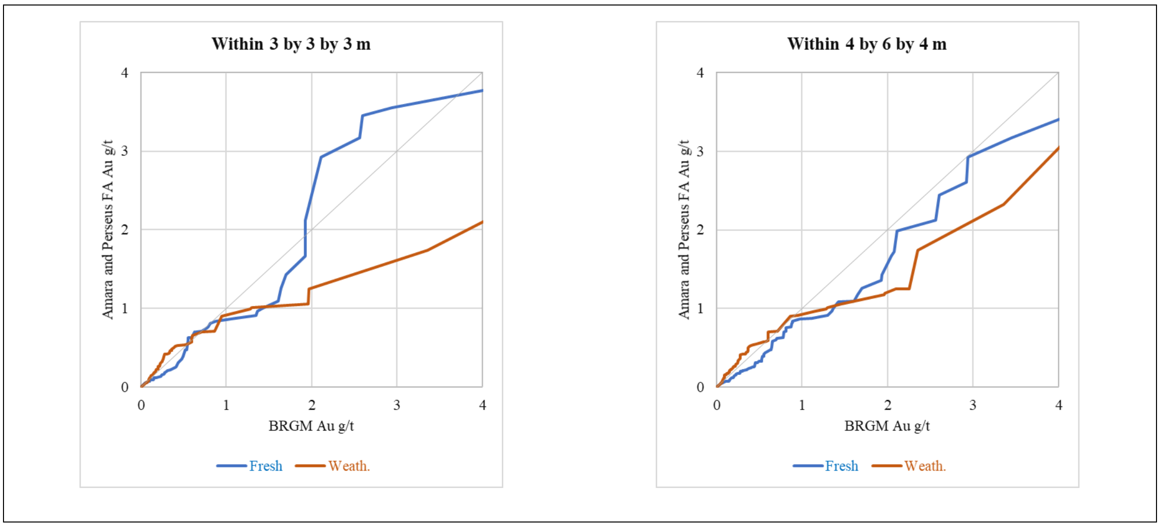


Figure 10-16 BRGM vs. Amara and Perseus fire assay pairs

10.14.8 Auger Sampling Quality

In 2017 Perseus drilled eleven triple-tube diamond holes within three metres of auger holes previously drilled by Amara to sample the leach heaps (Figure 10-17). The twin diamond holes provide a useful check of the reliability of the auger sampling. Diamond core samples were analysed by Actlabs consistently with other samples from Perseus drilling.

One of the twinned auger holes (YAG0066) has incomplete assay coverage, resulting in ten pairs of twinned holes suitable for analysis. Separation distances for these pairs range from 0.01 to 2.8 metres and average 0.8 metres.

Heap intercept length and gold grades for the twinned holes are summarised in Table 10-12 and Figure 10-18. This table and figure demonstrate that although, as expected there is significant scatter for individual pairs, average intercept lengths and thicknesses from the twinned holes are very similar. This consistency confirms the general reliability of the auger sampling.

Average gold grades for the top three metres of one pair of twins (YAG0129 and YAG0299D), show significant variability. This appears to reflect short scale variability in gold grades inherent in the heaps, and does not affect confidence in the general consistency of paired auger and diamond holes.

The available information has established that the heap leach auger sampling is representative and free of any biases or other factors that may materially impact the reliability of the sampling.

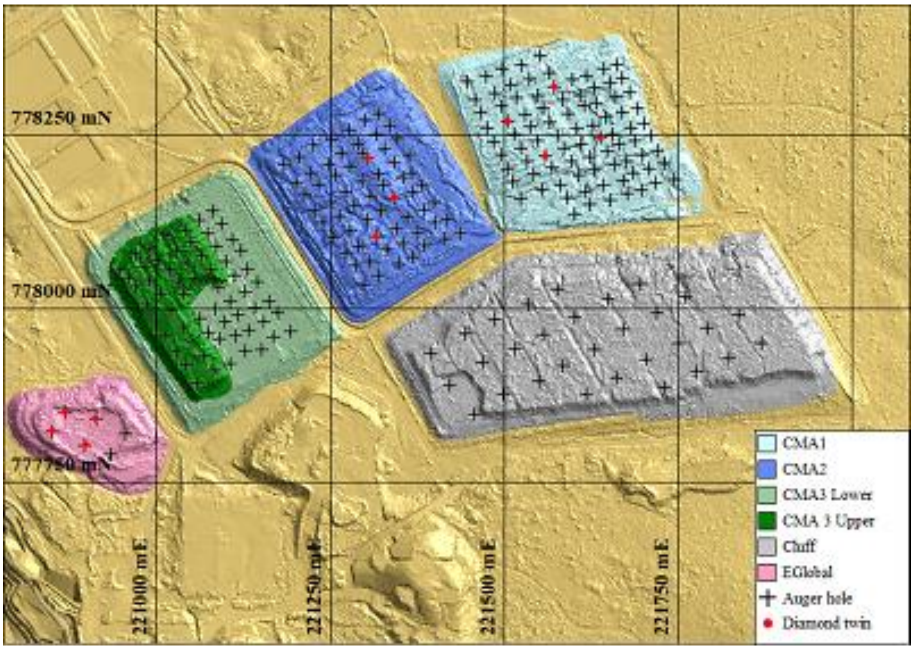


Figure 10-17 Heap leach components and drilling

Table 10-12 Heap leach diamond twins

Drill hole			Length (m)			Au g/t		
Auger	Diamond		Auger	DDH	Dif.	Auger	DDH	Dif.
YAG0100	YAG0289D		10.0	10.0	0%	0.96	0.92	-4%
YAG0102	YAG0290D		11.0	11.0	0%	1.03	0.86	-17%
YAG0103	YAG0291D		12.0	12.0	0%	1.35	1.19	-12%
YAG0104	YAG0292D		14.0	14.0	0%	0.81	1.40	73%
YAG0069	YAG0294D		13.0	13.0	0%	1.33	1.39	5%
YAG0182	YAG0295D		11.0	11.0	0%	1.25	1.37	10%
YAG0045	YAG0297D		5.0	5.0	0%	1.87	2.03	8%
YAG0050	YAG0298D		6.0	6.0	0%	2.82	1.36	-52%
YAG0158	YAG0300D		6.0	6.0	0%	1.15	0.98	-15%
YAG0129	YAG0299D	0-3 m	3	3	0%	2.09	4.10	96%
		3-6 m	3.0	3.0	0%	1.61	1.44	-10%
		Total	6.0	6.0	0%	1.85	2.77	50%
Total			**94.0**	**94.0**	**0%**	**1.32**	**1.34**	**2%**
Total less 0-3m YAG129/299D			**91.0**	**91.0**	**0%**	**1.29**	**1.25**	**-3%**

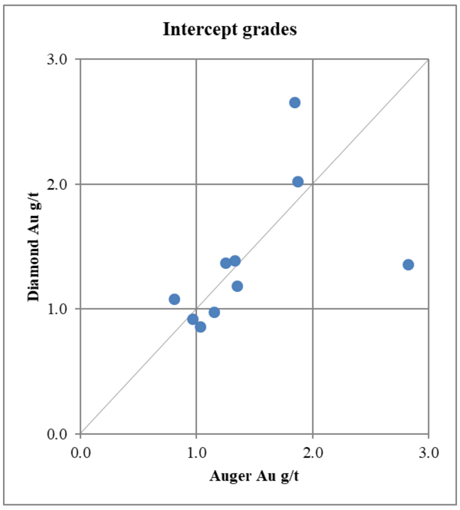


Figure 10-18 Heap leach diamond twins

10.15 Significant Drill Intersections

The majority of diamond core and RC holes drilled within the resource area have intersected gold mineralisation. The assays from holes drilled prior to 2017 were reported in public announcements on Cluff/Amara 19 January, 19 June, 14 August, and 3 December in 2012, 4 February, 22 May and 16 July in 2013, 8 July, 6 August, 13 August, 3 September, 22 September, 15 October and 5 November in 2014.

The reporting criteria for the intersections presented in the following tables are:

- minimum width of 2 m;
- cut-off of 0.4 g/t gold;
- internal dilution of up to 2 m, at less than 0.4 g/t permitted for continuity.

A number of composite intersections have been aggregated on the basis that the mineralisation forms a single geological zone with a minimum grade of 0.4 g/t. Internal material below this grade, with a width greater than 2 m, is included in the calculation of the weighted average grade of the aggregate intersection. Intersections that exceed a value of 50 when intersection width (m) is multiplied by gold grade (g/t) are shown in Table 10-13 (diamond core), Table 10-14 (RC) and Table 10-15 (RC grade control).

Table 10-13 Yaouré diamond core intersections (>50 m g/t)

* indicates aggregate intersection in which a number of composite intersections have been aggregated on the basis that the aggregate intersection forms a single geological zone with a minimum gold grade of 0.4 g/t. Internal waste below this grade with a greater width than 2 m is included in the calculation of the weighted average grade of the aggregate intersection.

Hole ID	From (m)	To (m)	Interval (m)	Au (g/t)	Structure	Phase
YDD0003	55.45	76.50	21.05	2.62	S2	1
YDD0008	31.90	45.15	13.25	9.22	S2	1
YDD0014	36.80	68.40	31.60*	1.57	S2	1
YDD0021	35.30	63.67	28.40*	3.24	S4	1
YDD0036	170.40	175.33	4.93	21.82	S9	2
YDD0041	186.97	207.22	20.35	3.55	S1 II	2
YDD0047	188.64	214.71	26.07	2.23	Y2	2
YDD0048	57.77	67.90	10.13	7.15	CMA	2
YDD0051	59.35	94.44	35.09*	1.51	S1 II	2
YDD0054	421.67	427.84	6.17	9.06	Y2	3
YDD0056	542.75	553.09	10.34	5.58	S1 II	3
YDD0059	40.92	47.43	6.51	9.39	Y2	3
YDD0060	111.88	129.68	17.80	4.44	S1 II	3
YDD0062	188.65	233.37	44.72*	1.39	S2	3
YDD0065	348.00	393.00	45.00*	3.24	S1 II	3
YDD0068	102.88	141.02	38.14*	3.67	CMA	3
YDD0073	69.00	77.00	8.00	9.47	Y1	3
YDD0073	144.85	188.00	43.15*	1.78	Y1AS	3
YDD0079	196.00	225.00	29.00	3.24	CMA	3
YDD0081	35.70	104.00	68.30*	1.52	S9	3
YDD0083	322.00	375.00	53.00*	1.17	Y2 / YII	3
YDD0084	21.00	25.20	4.20	12.44	Y1S	3
YDD0084	75.00	83.00	8.00	8.46	Y1S	3
YDD0090	261.00	270.00	9.00	6.87	S1 II	3
YDD0110	392.00	405.00	13.00	5.59	CMA	3
YDD0118	23.00	44.00	21.00	7.83	S1 II	4
YDD0130	338.00	346.00	8.00	8.28	S1 II	4
YDD0132	155.70	167.00	11.30	5.53	CMA	4
YDD0133	161.00	183.00	22.00	2.56	CMA	4
YDD0141	157.00	196.00	19.00	4.37	CMA	4
YDD0142	211.00	220.00	9.00	7.21	CMA	4
YDD0152	203.00	217.00	14.00	3.91	CMA	4
YDD0153	292.00	327.00	35.00*	2.03	CMA	4
YDD0183	115.00	133.00	18.00	2.85	S1	5
YDD0184	244.00	266.00	22.00	2.25	S1	5
YDD0187	232.00	251.00	19.00	3.27	Y2	5
YDD0193	158.00	163.00	5.00	11.71	S1 II	5
YDD0193	192.00	223.00	31.00	3.58	S2	5
YDD0208	66.00	83.00	17.00	3.09	CMA	5
YDD0211	80.00	96.00	16.00	3.62	CMA	5

Hole ID	From (m)	To (m)	Interval (m)	Au (g/t)	Structure	Phase
YDD0215	180.00	189.00	9.00	7.51	S2	5
YDD0215	192.00	197.00	5.00	11.32	S2	5
YDD0216G	249.00	291.00	42.00	3.20	S1 II	5
YDD0222	184.00	186.00	2.00	45.80	S1 II	5
YDD0224	114.00	118.00	4.00	15.72	S1 II	5
YDD0229R	179.00	184.00	5.00	17.01	S1 II	5
YDD0229R	230.00	233.00	3.00	24.76	Y2	5
YDD0232	292.00	306.00	14.00	3.57	S1 II	5
YDD0233	275.00	292.00	17.00	3.72	S1 II	5
YDD0236	155.00	174.00	19.00	3.64	CMA	5
YDD0240	158.00	168.00	10.00	6.08	CMA	5
YDD0242G	261.00	265.00	4.00	25.24	S1 II / Y1	5
YDD0243	170.00	193.00	23.00	3.12	CMA	5
YDD0250	107.00	120.00	13.00	4.71	CMA	5
YDD0252	65.00	68.00	3.00	17.67	CMAS	5
YDD0253	176.00	186.00	10.00	5.96	CMA	5
YDD0256	116.00	147.00	31.00	4.21	CMA	5
YDD0261	253.00	267.00	14.00	4.59	CMA	5
YDD0264	117.00	125.00	8.00	8.48	Y2	5
YDD0268	145.00	154.00	9.00	7.01	CMA	5
YDD0268	159.00	179.00	20.00	3.14	CMA	5
YDD0271	228.00	237.00	9.00	5.54	CMA	5
YDD0273	86.00	90.00	4.00	17.05	Y2	5
YDD0273	239.00	259.00	20.00	4.09	S1 II	5
YDD0274	233.00	235.00	2.00	41.20	S1 II	5
YDD0278	90.00	115.00	25.00	4.13	CMA	5
YDD0290	321.00	347.00	26.00	3.08	S1 II	5
YDD0291	109.00	120.00	11.00	5.38	CMA	5
YDD0292	279.00	286.00	7.00	16.09	CMA	5
YDD0309	141.00	163.00	22.00	3.99	CMA	5
YDD0341	170.00	182.00	12.00	5.75	CMA	5
YDD0345	193.00	208.00	15.00	6.61	CMA	5
YDD0348	120.00	139.00	19.00	3.20	CMA	5
YDD0353	100.00	113.00	13.00	4.02	CMA	5
YDD0358	75.00	83.00	8.00	6.48	CMA	5
YDD0358	106.00	111.00	5.00	10.38	CMA	5
YDD0366	79.00	96.00	17.00	7.27	CMA	5
YDD0374	0.00	10.00	10.00	4.97	S1 II	5
YDD0374	78.00	87.00	9.00	13.10	S1 II	5
YDD0378	234.00	239.00	5.00	15.32	S1 II	5
YDD0403	253.00	263.00	10.00	5.33	CMA	5
YDD0403	327.00	346.00	19.00	5.46	S1 II	5
YDD0408	227.00	235.00	8.00	6.97	CMA	5
YDD0428	75.00	79.00	4.00	34.00	S2 II	6

Hole ID	From (m)	To (m)	Interval (m)	Au (g/t)	Structure	Phase
YDD0434	30.00	51.00	21.00	3.72	Y2 / S1 II	6
YDD0436	3.00	36.00	33.00	3.37	S4	6
YDD0444	163.00	168.00	5.00	39.60	S1 II	6
YDD0447	48.00	57.00	9.00	14.49	Y2	6
YDD0452	92.00	109.00	17.00	4.03	S9	6
YDD0455	34.00	66.00	32.00	2.63	S2	6
YDD0460	67.00	83.00	16.00	8.25	S2	6
YDD0470	68.00	98.00	30.00	3.17	CMA	7
YDD0474	107.00	134.00	27.00	3.61	CMA	7
YDD0476	57.00	69.00	12.00	5.14	S1 II	7
YDD0479	78.00	104.00	26.00	20.46	S1	7
YDD0480	84.00	117.00	33.00	2.38	S2	7
YDD0489	173.00	193.00	20.00	3.71	CMA	7
YDD0491	131.00	144.70	13.70	4.09	CMA	7
YDD0496	37.00	52.20	15.20	5.17	S1	7
YRC0837D	94.00	117.00	23.00	4.20	CMA	7
YRC0838D	104.00	122.00	18.00	2.79	CMA	7
YRC0840D	74.00	90.00	16.00	6.47	CMA	7
YRC0844D	116.02	127.00	10.98	5.39	CMA	7
YRC0845D	130.80	145.00	14.20	4.56	CMA	7
YRC0889D	93.00	111.45	18.45	3.86	CMA	7
YRC0890D	87.00	99.00	12.00	5.63	CMA	7
YRC0891D	90.00	110.33	20.33	6.49	CMA	7
YRC0897D	119.90	134.00	14.10	4.40	CMA	7
YRC0899D	121.00	133.00	12.00	4.96	S2	7
YRC0902D	141.00	161.00	20.00	6.31	CMA	7
YRC0904D	65.00	71.65	6.65	15.01	CMA	7
YRC0905D	139.00	156.00	17.00	3.11	CMA	7
YRC0924D	187.50	196.90	9.40	6.49	CMA	7
YRC0938D	32.00	44.00	12.00	5.22	Y1S	7
YRC0947D	146.00	174.00	28.00	3.13	CMA	7
YRC0948D	167.00	180.00	13.00	5.47	CMA	7
YRC0950D	152.00	170.00	18.00	4.12	CMA	7
YRC0952D	113.00	121.00	8.00	6.44	CMA	7
YRC0955D	66.00	98.00	32.00	2.65	CMA	7
YRC0957D	120.10	136.00	15.90	4.81	CMA	7
YRC0965D	142.00	157.80	15.80	3.93	CMA	7
YRC0966D	150.00	160.00	10.00	6.57	CMA	7
YRC0972D	206.00	231.00	25.00	2.59	CMA	7
YRC1082D	159.00	174.00	15.00	4.58	CMA	7
YRC1083D	158.00	174.00	16.00	6.75	CMA	7
YRC1142D	196.00	223.00	27.00	6.59	CMA	7
YRC1143D	171.00	188.90	17.90	10.53	CMA	7
YRC1149D	163.75	176.00	12.25	6.12	CMA	7

Hole ID	From (m)	To (m)	Interval (m)	Au (g/t)	Structure	Phase
YRC1150D	180.00	214.00	34.00	3.51	CMA	7

Table 10-14 Yaouré RC intersections (>50 m g/t)

Hole ID	From (m)	To (m)	Interval (m)	Au (g/t)	Structure	Phase
YRC0677	191.00	210.00	19.00	2.70	CMA	5
YRC0682	184.00	215.00	31.00	5.40	CMA	5
YRC0686	149.00	155.00	6.00	10.42	CMA	5
YRC0688	48.00	70.00	22.00	9.13	CMA	5
YRC0690	176.00	200.00	24.00	4.05	CMA	5
YRC0694	117.00	144.00	27.00	4.38	CMA	5
YRC0698	108.00	144.00	36.00	4.17	CMA	5
YRC0705	186.00	193.00	7.00	9.00	CMA	5
YRC0708	220.00	231.00	11.00	4.54	CMA	5
YRC0711	117.00	133.00	16.00	4.65	CMA	5
YRC0715	98.00	109.00	11.00	5.18	CMA	5
YRC0717	91.00	113.00	22.00	2.71	CMA	5
YRC0731	96.00	106.00	10.00	6.74	CMA	5
YRC0731	200.00	206.00	6.00	8.99	CMA	5
YRC0733	127.00	162.00	35.00	3.20	CMA	5
YRC0738	219.00	239.00	20.00	4.68	CMA	5
YRC0742	98.00	106.00	8.00	9.56	S1 II	5
YRC0744	87.00	102.00	15.00	5.51	CMA	5
YRC0747	129.00	166.00	37.00	1.48	CMA	5
YRC0878	31.00	48.00	17.00	5.38	CMA	7
YRC0922	82.00	87.00	5.00	13.62	CMA	7
YRC0923	104.00	114.00	10.00	5.79	CMA	7
YRC0931	1.00	4.00	3.00	164.59	S9	7
YRC0932	94.00	114.00	20.00	6.71	CMA	7
YRC0964	75.00	83.00	8.00	6.57	S2	7
YRC0975	44.00	50.00	6.00	11.96	Y2	7
YRC0976	29.00	45.00	16.00	3.38	S1 II	7
YRC1029	74.00	90.00	16.00	3.81	Y1S	7
YRC1038	32.00	63.00	31.00	1.66	S4	7
YRC1050	68.00	108.00	40.00	4.47	S1 II	7
YRC1053	50.00	71.00	21.00	2.39	S2	7
YRC1054	26.00	31.00	5.00	10.48	S1 II	7
YRC1079	3.00	48.00	45.00*	2.28	S1	7
YRC1126	17.00	61.00	44.00	1.32	Y2	7
YRC1132	58.00	70.00	12.00	5.03	S1 II	7
YRC1135	4.00	28.00	24.00	2.55	S1	7

Table 10-15 Yaouré grade control intersections (>50 m g/t)

Hole ID	From (m)	To (m)	Interval (m)	Au (g/t)	Structure	Phase
YGC0004	20.00	30.00	10.00	5.33	Y2	G Control
YGC0009	0.00	22.00	22.00	2.29	S1 II / Y2	G Control
YGC0010	12.00	24.00	12.00	4.97	S1 II	G Control
YGC0011	21.00	27.00	6.00	9.24	Y2	G Control
YGC0019	9.00	20.00	11.00	16.67	Y2	G Control
YGC0062	9.00	21.00	12.00	6.84	Y2	G Control
YGC0148	4.00	32.00	28.00	2.54	S2	G Control
YGC0153	19.00	27.00	8.00	7.43	S2	G Control
YGC0229	16.00	32.00	16.00	11.13	S1 II	G Control
YGC0275	5.00	20.00	15.00	3.85	Y2	G Control
YGC0312	11.00	29.00	18.00	4.81	S2	G Control
YGC0313	1.00	14.00	13.00	4.36	S2	G Control
YGC0354	16.00	28.00	12.00	7.70	S2	G Control
YGC0361	13.00	28.00	15.00	3.46	S2	G Control
YGC0362	3.00	19.00	16.00	4.94	S2	G Control
YGC0367	8.00	28.00	20.00	2.54	S1 II	G Control
YGC0368	5.00	28.00	23.00	2.47	S2	G Control
YGC0375	0.00	28.00	28.00	2.06	S1 II	G Control
YGC0380	8.00	29.00	21.00	2.69	S1 II	G Control
YGC0415	24.00	33.00	9.00	28.52	S2	G Control
YGC0416	22.00	30.00	8.00	56.83	S2	G Control

11. Sample Preparation, Analyses and Security

11.1 Introduction and Summary

This chapter describes:

- sample preparation procedures, gold assaying techniques and laboratories used;
- quality control measures applied and the results thereof;
- methods used for density determinations and the validity of results; and
- security measures taken to ensure the integrity of samples.

Assessments of quality control measures have been summarised from Abbott (2017).

From mid-2013, Amara and Perseus have routinely monitored assay results for blanks, standards and coarse and fine duplicate samples as results arrive from assay laboratories. Sample preparation and assay procedures and quality control measures have remained essentially unchanged throughout that period. Re-assays are routinely requested for batches of samples with "failed" assays for blanks or standards. Re-assays, in addition to the original assays, are stored in a digital drill hole database with assays from the most reliable laboratory job prioritised as "final" data.

The quality control regime, in conjunction with the results of inter-laboratory check assays, demonstrate that sampling by Amara and Perseus is representative and free of any biases or other factors that may materially impact the reliability of the sampling.

No information is available to directly demonstrate the sampling and assaying reliability for drilling by BRGM and the compilation of quality control data for Cluff drilling is incomplete at the time of reporting. Confirmation of the reliability of those data is provided by nearest neighbour comparisons with other sampling types which suggest Cluff BLEG assays tend to give slightly lower average gold grades than fire assay datasets, consistent with the partial extraction nature of BLEG analysis. Although less comprehensively established than for other sampling types, this comparison confirms the reliability of BRGM and Cluff sampling and assaying with sufficient confidence for the current estimates.

Amara and Perseus routinely performed immersion density measurements on oven-dried samples of diamond core. Inter-laboratory checks and comparisons of data grouped by rock type and weathering horizon suggest that Amara density measurements are biased high by an average of about 3%.

Table 11-1 shows a summary of the drilling and sampling completed by successive companies that have worked on the project.

Table 11-1 Yaoure Project – Summary of drilling and trenching sample preparation, assaying and quality controls

Date	Company	Drill Type	Meters	No Samples	Sample Prep Lab	Assay Lab	Assay Technique	QAQC
1987-2002	BRGM/CMA	DD	12915	6161	NA	NA	NA	NA
		RC	8669	8480	NA	NA	NA	NA
2005-2007	Cluff Gold	DD	6484	5853	Abilab-Ouaga	Abilab-Ouaga	FA	1:20 Fdup, 1:40 Blk, 1:20 Std
		RC	53056	51333			BLEG	1:10 Fdup, 1:20 Tripl, No Blk, No Std
2008-2009	Cluff Gold	TR	1871	1289	Abilab + Site lab	Abilab + Site lab	FA + BLEG	1:20 Fdup, 1:40 Blk, No Std
2010	Cluff Gold	RC	8714	11362	Site lab	Site lab	BLEG	1:20 Fdup, 1:20 Blk
		RAB	480					
		AC	1884					
2011	Cluff Gold - Phase 1	DD	3066	4122	SGS-Yakro	SGS-Tarkwa	FA	1:20 Fdup, 1:40 Blk, 1:20 Std
		RC	1669	1566	Site lab	Site lab	BLEG	1:20 Fdup, 1:20 Blk, 1:20 Tripl, No Std
		RAB	14293	13680				
Jan-Apr 2012	Cluff Gold - Phase 2	DD	6442	6884	SGS-Yakro	SGS-Tarkwa	FA	1:20 Fdup, 1:40 Blk, 1:20 Std
		RC	12881	12808	Site lab	Site lab	BLEG	1:20 Fdup, 1:20 Blk, 1:20 Tripl, No Std
		RAB	8771	7761				
May-Nov 2012	Amara - Phase 3	DD	23545	23806	BV-Abj, SGS-Yakro, Intertek-Yakro	BV-Abj, SGS-Tarkwa, Intertek-Tarkwa	FA	1:20 Fdup, 1:25 Blk, 1:20 Std
		RC	21425	21047	Site lab	Site lab	BLEG	1:20 Fdup, 1:25 Blk, 1:50 Std
		RAB	13994	12630				
Jan-Jun 2013	Amara - Phase 4	DD	15435	15039	Intertek-Yakro + Site Lab	Intertek Tarkwa	FA	1:20 Fdup, 1:25 Blk, 1:20 Std, 1:20 Pdup (for site lab samples)
May-Oct 2014	Amara - Phase 5	DD	68995	67248	Site lab	Actlabs-Ouaga	FA	1:20 Fdup, 1:20 Blk, 1:20 Std, 1:20 Pdup
		RC	16638	16173				
Apr-Aug 2015	Amara - Phase 6	DD	11904	11626	Site lab	Actlabs-Ouaga	FA	1:20 Fdup, 1:20 Blk, 1:20 Std, 1:20 Pdup
		RC	6718	6638				
		Channel	4659	4653				
Dec 2016-July 2017	Perseus – Phase 7	DD	12583	10366	Site lab	Actlabs-Ouaga	FA	1:20 Fdup, 1:20 Blk, 1:20 Std, 1:20 Pdup
		RC	41641	35160				
		AC	18083	5661				

Notes to Table 11-1
Ouga = Ougadougou, Burkina Faso
Yakro = Yamoussoukro, Côte d'Ivoire

Site lab = Yaouré site sample preparation and assay laboratory
BV-Abj = Bureau Veritas, Abidjan, Côte d'Ivoire
Fdup = field re-split of RC sample or quarter core duplicate sample
Pdup = duplicate pulp prepared from the same crushed sub-sample
Blk = analytical blank
Std = standard (certified reference material)

11.2 Sample Preparation and Assay Laboratories

Abilab Ougadougou is part of the ALS Laboratory Group but is not itself accredited by any independent authority.

SGS Yamoussoukro is a sample preparation facility only and not accredited by any independent authority. The SGS Tarkwa laboratory is not ISO 17025 accredited, however all services at SGS Tarkwa are provided with a quality assurance protocol in line with ISO 17025, the quality accreditation system for commercial laboratories.

Intertek Yamoussoukro is a sample preparation facility only and not accredited by any independent authority. The Intertek Minerals Ltd laboratory in Tarkwa operates under the umbrella of its technical centre for geochemical services at Intertek/Genalysis Services Pty Ltd in Australia (NATA Accreditation No: 3244), and its methods are based on ISO 17025 accredited methods.

Bureau Veritas Abidjan laboratory is accredited under ISO 9001:2008 for testing of metals and minerals (certificate no. 44 100 160145-103).

Actlabs Burkina Faso sarl Ougadougou laboratory is accredited under ISO 9001:2208 for provision of testing and development services for the geological and mining industries.

Each of Abilab, SGS, Intertek, Burea Veritas and Actlabs is independent of the Issuer.

Since mid-2013, Amara and latterly Perseus have operated a sample preparation facility at Yaouré site. That facility and the personnel operating it are not independent of the Issuer. During major drilling campaigns by Amara and all drilling undertaken by Perseus, operation of the sample preparation facility has been directed by a supervisor seconded from Actlabs.

11.3 Sample Preparation and Analyses

11.3.1 BRGM and CMA, 1987-2002

Sampling and Assaying

Between 1987 and 2002, BRGM and CMA conducted RC and core drilling through successive campaigns to evaluate targets generated from soil sampling and ground geophysics.

Records indicate that a total of 178 core holes (12,915 m) 135 RC holes (8,669 m) were completed at Angovia 1 (CMA deposit) as well as at other satellite targets (mainly at Angovia 2 and at Kouakougnanou). BRGM has also dug 206 trenches (17,610m) and 79 pits (404 m).

Historical records indicate assay results for a total 23,457 samples, including 6,161 diamond core samples, 8,480 RC samples, 8,417 trench samples and 399 pit samples. Data are available for two diamond core holes and 100 RC holes drilled by BRGM; the CMA drill hole data are no longer available. Records indicate that BRGM samples were assayed by Abilab, Ougadougou by BLEG but there is no information available as to the sample preparation procedures or quality control measures applied by BRGM.

Density determinations

Density determinations (g/cm^3) by BRGM are shown in Table 11-2. The upper oxides include the mottled zone at the base of the lateritic horizon, through to approximately 5-10m above the base of oxidation. The zone between this horizon and the top of sulphides is the lower oxides (transitional zone).

Table 11-2 Insitu Bulk Dry Densities -BRGM

Year	Company	Location	Material	Nos. Tests	Dry density
1990	BRGM	North and South Zones	Upper oxides	6	1.51
1990	BRGM	North and South Zones	Lower oxides	4	2.24
1991	BRGM	North Zone	Upper oxides	37	1.6
1991	BRGM	North Zone - oxide	Lower oxides	32	1.99
1993	BRGM	South Zone	Upper oxides	17	2.35
1993	BRGM	South Zone	Lower oxides	4	2.34

Details of the methodology and sample locations are not available. The results from the 1993 work appear to be considerably higher than would be expected in oxidized material. BRGM's density measurements have not been used to inform the current Mineral Resource and Mineral Reserves.

11.3.2 Cluff, 2005-2007

Sampling and Assaying

Following the closure of the CMA mine in 2004, Cluff drilled 775 RC holes (53,056 m) and 62 diamond core holes (6,484 m), some of which were twins to RC holes. The programs were aimed at delineating oxide resources at Prospects 2, 3, 4 (Yaouré) and at Angovia 2.

All 51,333 RC drill samples and 5,853 core samples were prepared and assayed at Abilab laboratory in Ouagadougou, Burkina Faso.

RC and core samples were collected over one meter intervals. RC samples were riffle split to produce a sub-sample weighing approximately 1 kg and assayed for gold using a cyanide dissolution (Bulk Leach Extraction Gold; BLEG) without further sample preparation. Core samples of half cut core and were crushed to -2 mm, pulverized and assayed using fire assay on 50g charge with AAS finish.

For the RC drilling, only field duplicates (1:10) and triplicates (1:20) were inserted. There were no Blanks and no Standards in the consignments.

For the diamond core samples, QAQC insertions consisted of field duplicates (1:20), blanks (1:40) and standards (1:20).

Bulk Density Measurements

For the 2006 resource estimate, SRK Consulting (UK) Ltd. (SRK) excavated two metallurgical pits to a maximum depth of 8 m and obtained an average density of 1.87 g/cm^3 for oxide material.

For the 2007 resource estimate by consultants Auverdi, a total 541 density measurements from drill core were available. Core pieces were dried, wrapped in plastic film and weighed in air, immersed in water and weighed again. Table 11-3 summarises results (g/cm^3) by rock type and weathering horizon. The resource estimate by Auverdi applied constant densities value of 1.87 g/cm^3 and 2.75 g/cm^3 for fresh rock.

Table 11-3 Bulk Dry Densities – Cluff Gold, 2007

Lithology/Weathering	W1	W2	W3	W4	W5	W6	Average
Andesite	2.93	2.65	2.48	2.21			2.79
Laterite					2.01	1.91	1.91
Medium Grained Intrusive	2.56						2.56
Mottled					1.60	1.48	1.59
Oxidized bedrock		2.57	2.43	2.50			2.47
Quartz Vein	2.77	2.70	2.44				2.67
Saprolite				2.28	1.84	1.89	1.88
Soil						1.70	1.70
Basalt	2.78	2.73	2.43	2.47			2.74
Average	2.86	2.68	2.46	2.29	1.82	1.89	2.44

11.3.3 Cluff, July 2009 - 2010

Cluff resumed drilling in July 2009, undertaking RAB drilling at Blangan (480 m) and RC drilling at Kongonza (5,008 m) and the southern end of Yaoure deposit (3,146 m). Some aircore drilling (1,884m) was also conducted on the eastern side of Blangan, at Kongonza NW and in the southern part of the Yaouré pit.

These programs successfully defined mineralisation at Blangan (mined), at the southern end of the Yaoure pit (subsequently mined) and at Kongonza (unmined).

A total 11,062 one-metre samples were prepared and assayed at the Yaouré site laboratory using BLEG. Each entire sample, approximately 3.5 kg, was dried at a temperature of 105 °C for a minimum of 12 hours, jaw crushed to a nominal 75% passing 2 mm, then pulverised in a Keegor mill to a nominal 85% passing 75µm. A 500 g sub-sample of the pulp was weighed into a five-litre leach bottle and leached with one litre of cyanide solution (0.50% cyanide strength, pH 10.50–11.5). Gold was determined from the leached solution by AAS with a detection limit of 10 ppb. Blanks (547 samples, 1:20) field duplicates (604 samples, 1:20) and standards (1 to 2 samples per batch, average 1:100) were been inserted in the consignments.

11.3.4 Yaouré Phase 1, June 2011 – December 2011

In early 2011, oxide resources were exhausted at the Angovia gold mine. This coincided with the outbreak of the civil unrest in Côte d'Ivoire and all mining and exploration activities ceased in February-March 2011. Work resumed in June 2011 with RAB drilling and with RC and DD drilling directed at delineating sulphide gold resources.

Diamond Core Sampling and Assaying

From August to December 2011, a total of 29 diamond core holes (3,066 m) were completed (YDD0001 to YDD0029). Apart from six holes (1,101 m) drilled at the Kongonza prospect (YDD0015 to YDD0020), all the other holes were drilled from within the Yaouré open pit.

Sample intervals were based on geological logging. Primary samples were taken at regular 1 m intervals, with adjustments to the sample interval being made to account for geological contacts and significant core loss.

A total 4,122 samples of diamond sawn half core were submitted for assay. Samples were prepared at the SGS sample preparation facility in Yamoussoukro. The entire sample was oven dried at 105°C before being crushed in a jaw crusher to 85% passing 2mm. A riffle split portion of 1.5 kg was then pulverized in an LM2 pulverizer to 85% passing 75 microns.

All samples were assayed at SGS Laboratories in Tarkwa, Ghana, using Fire assay on 50g charge, AAS finish with a lower detection limit of 0.01 ppm. Screen Fire ("metallurgical") assays were performed on 500 g sub-samples 39 samples that returned >10 g/t or that had visible gold. Blanks (113 samples, 1:40), field duplicates (quarter core, 232 samples, 1:20) and ten types of Rocklabs standards (227 samples, 1:20) were inserted in the consignments.

Density determinations

During Phase 1 of diamond core drilling, a total 363 density determinations were been completed at the Yaoure site lab. Core samples were weighted wet, oven dried to constant weight and then weighed again dry is measured. Samples were then wrapped tightly in plastic film, immersed in water and the volume of the displaced water was measured. Average densities (g/cm^3) per rock type and per weathering horizon are shown in Table 11-4.

Table 11-4 Bulk Dry Densities – Cluff Phase 1 DD Drilling

Lithology/Weathering	Completely Weathered	Partially Weathered	Weathered on Fractures	Fresh	Average
Laterite	1.97				1.97
Undiff. Felsic				2.75	2.75
Granodiorite	2.56	2.48	2.78	2.90	2.81
Undiff. Intrusive			2.34		2.34
Undiff. Basalt		2.73	2.77	3.02	2.96
Quartz Vein	2.71	2.59	2.71	2.65	2.66
Undiff. Proterozoic	1.65	2.08	2.63		1.93
Average	2.05	2.57	2.76	2.98	2.87

RAB Sampling and Assaying

RAB drilling started on 16th of June 2011 with the objective of testing the Zone North gold-in-soil anomalies located east of CMA deposit. By December 2011, a total of 687 RAB hole (14,293 m) had been completed.

A total of 13,680 samples were collected on 1m intervals. The samples were all prepared and assayed at the Yaouré site laboratory using the sample preparation and the BLEG assaying protocols described in Section 11.3.3, above. Blanks (1:20, 614 samples) and field duplicates (1:10, 1,153 samples) were inserted in the sample batches; no reference standards were used.

Assays from RAB drill holes have not been used to inform the Mineral Resource and Mineral Reserve estimates described in this report. The information in this section is included for context only.

RC Sampling and Assaying

From 15th of October 2011, an RC drilling program was initiated to infill and test extensions to the Kongonza deposit. By December 2011, 21 holes (1,669 m) holes had been completed. As for the RAB, samples were collected on 1m intervals (1,566 samples) and assayed at the site laboratory using the sample preparation and the BLEG assaying protocols described above. Blanks (1:20, 97 samples), field duplicates (1:10, 193 samples) and triplicates (1:20, 96 samples) were inserted in the sample batches; no reference standards were used.

Assays from drill holes at Kongonza have not been used to inform the Mineral Resource and Mineral Reserve estimates described in this report. The information in this section is included for context only.

11.3.5 Yaouré Phase 2, January - April 2012

Diamond Core Sampling and Assaying

The second phase of drilling (16th January 2012 to 27th April 2012) to evaluate sulphide mineralisation included 24 core holes (6,442 m; YDD0030 to YDD0053). As for Phase 1, samples were predominantly taken at regular one metre intervals, with adjustments being made to account for geological contacts and significant core loss.

A total of 6,884 samples of diamond sawn half core were submitted for assay. All samples were prepared at SGS laboratory in Yamoussoukro before being dispatched to SGS analytical laboratory in Tarkwa, Ghana. Screen fire assays were performed on 500g sub-samples for seven samples that returned >10 g/t or samples with visible gold. The sample preparation and assaying techniques remained the same as described in Section 11.3.3, above. Blanks (181 samples, 1:40), field duplicates (quarter core, 382 samples, 1:20) and seven types of Rocklabs Standards (367 samples, 1:20) were inserted in the consignments.

Bulk Density Measurements

A total 483 density determinations were completed at the Yaouré site laboratory during the Phase 2 drilling, using the water displacement method. Average densities (g/cm^3) per rock type and per level of weathering are shown in Table 11-5.

Table 11-5 Bulk Dry Densities – Cluff Phase 2 DD Drilling

Lithology/Weathering	Completely Weathered	Partially Weathered	Weathered on Fractures	Fresh	Average
Laterite	2.06				2.06
Undiff. Felsic	1.95	2.43	2.70	2.91	2.75
Granodiorite			2.82	2.82	2.82
Intermediate Intrusive			2.49	2.64	2.57
Undiff. Basalt	2.40	2.71	2.93	3.01	2.98
Quartz				2.88	2.88
Undiff. Proterozoic	1.95	1.87			1.95
Undiff. Tuff				2.94	2.94
Volcaniclastics				2.94	2.94
Average	1.99	2.59	**2.85**	2.98	2.81

RAB Sampling and Assaying

RAB drilling was continued during the Phase 2 drilling period with a total of 575 holes (8771 m) drilled. A total 7,761 samples collected over one metre and two metre intervals were prepared and analysed using BLEG at the Yaoure site laboratory. Blanks (1:20, 445 samples) and field duplicates (1:10, 808) have been inserted in the sample batches. No standards were used.

Assays from RAB drill holes have not been used to inform the Mineral Resource and Mineral Reserve estimates described in this report. The information in this section is included for context only.

RC Sampling and Assaying

During the Phase 2 period, RC drilling was carried out at Kongonza and at Angovia 2 South with a total of 159 holes (12,881 m) drilled. A total 12,808 samples were collected at 1m intervals, prepared and assayed at the site laboratory using BLEG with a lower detection limit of 0.01 ppm.

Blanks (1:20, 789 samples), field duplicates (1:10, 1,580 samples) and triplicates (1:20, 788 samples) were inserted in the sample batches. No standards were used.

Assays from drill holes at Kongonza and Angovia 2 have not been used to inform the Mineral Resource and Mineral Reserve estimates described in this report. The information in this section is included for context only.

11.3.6 Phase 3, May - November 2012

Diamond Core Sampling and Assaying

Phase 3 drilling (05th May, 2012 to 08th November 2012) marks the first drilling campaign undertaken after Cluff changed its Amara Mining in April 2012 and a change of focus to targeting sulphide resources in both Yaouré and CMA deposits in an enlarged target area of 2.1 km in a N-S direction by up to 1.1 km in an E-W direction.

Phase 3 drilling comprised 59 diamond core holes (22,682 m; YDD0054 to YDD0112) and the deepening of nine Phase 2 holes (YDD0031, 0032, 0035, 0037, 0040, 0042, 0044, 0047 and 0053; 863 metres). Drilling was aimed at achieving a nominal 200m grid spacing over the enlarged target area.

A total 23,806 diamond sawn half core samples were collected on nominal 1m intervals and submitted to different laboratories for sample preparation and assaying:

- 404 samples (Hole YDD0088) were prepared and assayed at Bureau Veritas Laboratory in Abidjan using Fire assay on 40g charge, AAS finish.
- 3,802 samples from holes YDD0054 to 0071, 0081, 0085, 0090, 0091, 0096, 0100, 0102, 0105, 0109 and 0110 (from 0 to 184m only) were prepared at SGS facility in Yamoussoukro and assayed at SGS laboratory in Tarkwa Ghana by fire assay on 50g charge, AAS finish. The SGS Tarkwa analytical laboratory was visited by Amara personnel on 13th of April 2012 and the SGS sample preparation laboratory in Yamoussoukro was visited on 15th of April 2012. Reports detailing perceived issues were submitted to the laboratories and remedial actions were discussed.
- 19,600 samples from holes YDD0055 to 0087, 0089, YDD0092 to 0099, 0101, 0103, 0104, YDD0106 to 0108, 0111, 0112, and all nine extensions of previous holes were prepared at the Intertek sample preparation facility in Yamoussoukro and assayed at the Intertek assay laboratory in Tarkwa, Ghana using fire assay on 50g, AAS finish. The Intertek Tarkwa analytical laboratory was visited by Amara personnel on 04th of April 2013. A report detailing perceived issues was submitted to Intertek and remedial actions were discussed.

In addition, metallic screen fire assay on 500g sub-samples was conducted for 76 samples that had visible gold or had returned >10 g/t.

For all the laboratories used, the sample preparation technique was the same: Oven dry the entire sample at 105°C for minimum 12 hours, crush entire sample in a jaw crusher to 85% passing 2mm, pulverize 1.5 kg riffle split in an LM2 pulveriser to 85% passing 75 microns.

The control sample insertion rates were the same for all the laboratories: Blanks 1:25 (895 samples), field duplicates 1:20 (1,375 samples) and seven types of Rocklabs standards 1:20 (1340 samples).

Bulk Density Measurements

A total 990 density determinations were completed at the Yaoure site laboratory during the Phase 3 drilling, using the water displacement method. The samples were approximately 10-22 cm half core and full core. Density measurements covered the entire range of rock types at various depths and with different states of weathering. Average densities (g/cm^3) per rock type and per weathering horizon are shown in Table 11-6.

Table 11-6 Bulk Dry Densities – Perseus Mining, Phase 3 DD Drilling

Lithology/Weathering	Completely Weathered	Partially Weathered	Weathered on Fractures	Fresh	Average
Pisolithic Laterite	2.11				2.11
Laterite	2.15			1.90	2.12
Backfill	1.55				1.55
Undiff. Felsic		2.14	2.61	2.76	2.69
Granodiorite			2.66	2.72	2.72
Hornblende Porphyry				2.77	2.77
Intermediate Intrusive			2.66		2.66
Undiff. Basalt	2.00	2.24	2.80	2.87	2.84
Mafic Intrusive			2.73	2.85	2.84
Quartz Vein				2.76	2.76
Undiff. Proterozoic	1.69	2.20	2.57	2.53	1.90
Undiff. Tuff				2.79	2.79
Volcaniclastics	2.50	2.38		2.73	2.69
Average	1.80	2.22	2.74	2.84	2.75

RAB Sampling and Assaying

RAB drilling was continued during the Phase 3 drilling period at Govisou and the NW trend of Kongonza. A total of 673 holes (13,994 m) were drilled completed up to the end of October 2012. A total 12,630 samples collected over 1m to 2m intervals were prepared and analyzed using BLEG at the Yaouré site laboratory. Blanks (1:20, 712 samples) and field duplicates (1:10, 983 samples) were inserted in the sample batches. Commercial standards from Rocklabs were used from September 2012 and were inserted at a rate of 1:100 (31 samples).

Assays from RAB drill holes have not been used to inform the Mineral Resource and Mineral Reserve estimates described in this report. The information in this section is included for context only.

RC Sampling and Assaying

During the Phase 3 program, RC drilling was continued at Kongonza and at Angovia 2 South. The Govisou and Magazine prospects were also RC drilled. A total 313 holes (21,425 m) 313 holes were completed between May and 29th September 2012. A total 21,047 samples were collected on 1m intervals, prepared and assayed at the site laboratory using BLEG with a lower detection limit of 0.01 ppm.

Blanks (1:20, 1,327 samples), field duplicates (1:10, 2,641 samples) and triplicates (1:20, 1,323 samples) were inserted in the sample batches. Rocklabs commercial standards were used from September 2012 at a rate of 1:50 (176 samples).

Assays from drill holes at Kongonza, Angovia 2 Govisou and Magazine have not been used to inform the Mineral Resource and Mineral Reserve estimates described in this report. The information in this section is included for context only.

11.3.7 Phase 4 Drilling, January - June 2013

Diamond Core Sampling and Assaying

During the fourth phase of drilling (14th January 2013 to 04th June 2013), a total 47 diamond core holes (15,435 m) were drilled (YDD0113 to YDD0158), mostly infilling the CMA North and Central deposits to 100m spacing. The samples were systematically taken on 1m intervals and sampling was not based on the geological logging. Adjustments to the sample interval were made to account for significant core loss.

A total 15,039 samples of diamond sawn half core were submitted for assay. In June 2013, a sample preparation facility was set up at Yaouré. A total 3213 samples from holes YDD0131, 0150 and YDD0152 to 0158 were prepared at the site facility. The remaining 11,826 samples were prepared at Intertek laboratory in Yamoussoukro. All the 15,039 samples were assayed by Intertek analytical laboratory in Tarkwa, Ghana. A total 52 screen fire assays on 500g were performed on samples that returned >10 g/t or samples with visible gold. The sample preparation and assaying techniques remained the same as described in Section 11.3.6,above, for both site facility and the Intertek sample preparation facility in Yamoussoukro. Blanks (951 samples, 1:25), field duplicates (quarter core, 893 samples, 1:20) and six types of Rocklabs Standards (896 samples, 1:20) were inserted in the consignments. For the sample batches prepared at the site facility, pulp duplicates (178 samples) were also inserted at a rate of 1:20 and the number of blanks was increased in the logged mineralized zones.

Bulk Density Measurements

A total 726 density determinations were completed at the Yaoure site laboratory during the Phase 4 drilling, using the water displacement method. Average densities (g/cm^3) per rock type and weathering horizon are shown in Table 11-7.

Table 11-7 Bulk Dry Densities – Perseus Mining, Phase 4 DD Drilling

Lithology/Weathering	Fresh	Completely Weathered	Weathered on Fractures	Partially Weathered	Average
Unconsolidated Pisolith Laterite		1.80			1.80
Undifferentiated Laterite		2.29			2.29
Backfill		1.52			1.52
Undiff. Felsic Rock	2.75	2.01		2.34	2.66
Granodiorite	2.76		2.64		2.74
Hornblende Porphyry	2.79				2.79
Undiff. Intermediate Intrusive	2.68		2.72	2.53	2.69
Pillowed Basalt	1.07				1.07
Undiff. Basalt	2.88	1.78	2.78	2.32	2.84
Mafic Intrusive	2.82				2.82
Quartz Vein	2.72		2.63		2.70
Undiff. Proterozoic	2.94	1.73	2.69	2.39	2.15
Volcanoclastics	2.79			2.19	2.76
Average	2.86	1.82	2.74	2.35	2.75

11.3.8 Phase 5 Drilling, May - October 2014

Diamond Core Sampling and Assaying

In Phase 5 drilling (1st May 2014 to 19th October 2014) 252 diamond core holes (68,995 m) of core were drilled (YDD0159 to YDD0409, and YDD0371B). The program was aimed at infilling both Yaouré and CMA deposits to a drill spacing of 100m by 50m. Half core samples were systematically taken on 1m intervals, and sampling was not based on the geological logging. Adjustments to the sample interval were made to account for significant core loss.

A total 67,248 diamond sawn half core samples were submitted for assay. All the samples were prepared at the Yaoure sample preparation facility using the same methods as in Phase 4. All the samples were assayed at Actlabs laboratory in Ougadougou, Burkina Faso. ActLabs Burkina holds ISO 9001:2008 Certification and is audited by an external auditing body. Actlabs Burkina participates in CANMET PTP-MAL proficiency testing for Au twice per year, a prerequisite to maintaining ISO 17025 accreditation. The Oudadougou laboratory operates under the umbrella of Activation Laboratories in Ancaster, Canada, which is accredited to the ISO 17025 standard. No screen fire assay was performed during Phase 5 drilling.

Blanks (4,150 samples, 1:20), field duplicates (4,217 samples, 1:20), pulp duplicates (4,080 samples, 1:20) and seventeen types of Rocklabs Standards (4,267 samples, 1:20) were inserted in the consignments.

Bulk Density Measurements

During Yaoure Phase 5 drilling in 2014, a total of 7,535 density determinations were made at the Yaoure site laboratory using a film-coated water immersion technique on dry drill core samples. The average sample length was 24 cm. The summary of the density results (g/cm^3) is presented in Table 11-8.

Table 11-8 Bulk Dry Densities – Perseus Mining, Phase 4 DD Drilling

Lithology/Weathering	Fresh	Completely Weathered	Weathered on Fractures	Partially Weathered	Average
Unconsolidated Pisolithic laterite		1.73			1.73
Laterite		2.03			2.03
Backfill		1.79			1.79
Undiff. Felsic intrusive	2.77	2.12		2.31	2.72
Granodiorite	2.79	2.20	2.68	2.40	2.78
Hornblend Porphyry	2.79				2.79
Undiff. Intermediate Intrusive	2.85		2.70		2.83
Basalt	2.92	1.97	2.76	2.35	2.89
Undiff. Mafic Intrusive	2.94				2.94
Quartz Vein	2.70				2.70
Undiff Proterozoic	2.75	1.80	2.65	2.30	2.06
Volcanoclastics	2.69				2.69
Average	2.90	1.83	2.72	2.32	2.76

RC Sampling and Assaying

During the Phase 5 campaign, RC drilling was completed at CMA only. A total of 75 holes (16,638 m) were drilled between 11th of April and 17th of October 2014. A total 16,173 one-metre samples were collected on 1m intervals. Samples were prepared at the site laboratory and assayed via fire assay on 50g charge, AAS finish, at Actlabs laboratory in Ouagadougou, Burkina Faso.

Blanks (1:20, 1,223 samples), field duplicates (1:20, 995 samples), pulp duplicates (1:20, 1,213 samples) and thirteen types of Rocklabs standards (1:20, 1,233 samples) were inserted in the sample batches.

11.3.9 Phase 6 Drilling, April - August 2015

Diamond Core Sampling and Assaying

Phase 6 drilling (21st April 2015 to 26th August 2015) consisted of 60 new holes holes (YDD0410 to YDD0469, 11,18 6m) and the deepening of 6 Phase 5 holes (YDD0159, 0169, 0181, 0186, 0203, and 0272, 718 m). Phase 6 was focused on filling gaps in drill coverage at Yaouré Central deposit.

A total 11,626 diamond sawn half core samples have been collected systematically on 1m intervals. Adjustments to the sample interval are made to account for significant core loss. All samples were prepared at the Yaouré site facility and assayed at Actlabs laboratory in Ouagadougou, Burkina Faso.

No screen fire assays were performed during Phase 6 drilling.

Blanks (716 samples, 1:20), field duplicates (731 samples, 1:20), pulp duplicates (691 samples, 1:20) and eleven types of Rocklabs Standards (743 samples, 1:20) were inserted in the consignments.

Bulk Density Measurements

During Yaoure Phase 6 drilling, a total of 891 density determinations were made at the Yaoure site laboratory using a film-coated water immersion technique on dry drill core samples. The average sample length was 24 cm. The summary of the density results (g/cm^3) is presented in Table 11-9 .

Table 11-9 Bulk Dry Densities – Perseus Mining, Phase 6 DD Drilling

Lithology/Weathering	Completely Weathered	Partially Weathered	Weathered on Fractures	Fresh	Average
Unconsolidated Pisolithic Laterite	1.85				1.85
Laterite	2.02				2.02
Backfill	1.77				1.77
Undiff. Felsic rock	1.94	2.47		2.79	2.59
Granodiorite		2.46		2.78	2.76
Hornblende Porphyry				2.84	2.84
UndiffIntermediate Intrusive			2.65	2.83	2.79
basalt	1.76	2.36	2.87	2.96	2.82
Undifferentiated Mafic intrusive				3.02	3.02
Quartz Vein				2.67	2.67
Undiff. Proterozoic	1.67	2.67	2.74		2.11
Volcanoclastics	1.79	2.54	2.56	2.78	2.41
Average	**1.78**	**2.50**	**2.79**	**2.89**	**2.72**

RC Sampling and Assaying

During the Phase 6 program, RC condemnation drilling was completed in areas of planned mine infrastructure. A total 69 holes (6,718 m) were drilled between 23rd of April and 27th of June 2015. A total 6,638 one metre samples were submitted for assay. Samples were prepared at the site laboratory and assayed by fire assay on 50g charge, AAS finish, at Actlabs laboratory in Ouagadougou, Burkina Faso.

Blanks (1:20, 409 samples), field duplicates (1:20, 416 samples), pulp duplicates (1:20, 403 samples) and eleven types of Rocklabs standards (1:20, 441 samples) were inserted in the sample batches.

Channel Sampling and Assaying

Channel sampling and shallow trenching in the Yaouré Central pit was carried out from Q1 to Q3 2015. The aim was to better understand the Yaoure mineralization controls and to allow confident projection to surface of the mineralized bodies intersected in drill holes. A total 4,659m of channels were completed and a total 4,653 samples have been collected on 1m intervals. Samples were prepared at the site laboratory and assayed by fire assay on 50g charge, AAS finish, at Actlabs laboratory in Ouagadougou, Burkina Faso. Blanks (1:20, 283 samples), field duplicates (1:20, 280 samples), pulp duplicates (1:20, 282 samples) and five types of Rocklabs standards (1:20, 276 samples) have been inserted in the sample batches.

Channel samples have not been used to inform the Mineral Resource and Mineral Reserve estimates described in this report. The information in this section is included for context only.

11.3.10 Phase 7 Drilling, December 2016 - July 2017

DD Sampling and Assaying

Phase 7 drilling (29th December 2016 to 15th July 2017) consisted of 47 diamond holes (YDD0470 to YDD0516, 5454 m), including two holes (314 m) drilled at Govisou prospect, plus and 84 diamond tails (6,950 m). Eleven short diamond holes (YAG0289D to YAG0300D, 165m) were drilled on the old CMA leach heaps to confirm grades obtained from previous auger drilling and to measure density on the heaps. Total diamond core meters drilled during Phase 7 was 12,583 m. Phase 7 was mainly focused on 25 metre infill resource holes on the existing 50m grid lines for the CMA and Yaouré deposits.

Half core samples were collected with intervals adjusted to geological contacts and adjustments also made to account for intervals of significant core loss. Core was not sampled through long intervals of visually barren core, particularly in the hanging wall of CMA lode. All the samples were prepared at the Yaouré site facility and a total 10,366 samples were assayed at Actlabs laboratory in Ouagadougou, Burkina Faso using fire assay on 50g charge, AAS finish.

No screen fire assays were performed during Phase 7 drilling.

Blanks (512 samples, 1:20), Field Duplicates (521 samples, 1:20), pulp duplicates (515 samples, 1:20) and ten types of Rocklabs Standards (513 samples, 1:20) were inserted in the consignments.

Bulk Density Measurements

During Yaoure Phase 7 drilling, a total of 1,259 density determinations were made at the Yaouré site laboratory using a film-coated water immersion technique on dry drill core samples. The summary of the density results (g/cm^3) is presented in Table 11-10.

Table 11-10 Bulk Dry Densities – Perseus Mining, Phase 7 DD Drilling

Lithology/Weathering	Fresh	Completely Weathered	Weathered on Fractures	Partially Weathered	Average
Unconsolidated Pisolithic Laterite		2.46			2.46
Laterite		1.85		2.20	1.91
Backfill		1.80	2.23		1.88
Heap Leach		1.74			1.74
Feldspar Porphyry	2.67	1.83	2.57	2.11	2.52
Quartz Porphyry	2.68		2.55		2.67
Undiff. Felsic rock	2.65			2.11	2.58
Granodiorite	2.70		2.39	2.51	2.67
Horneblende Porphyry	2.67				2.67
Undiff. Intermediate Porphyry	2.73	1.93	2.68	2.58	2.69
Massive Basalt	2.83	1.63	2.72	2.10	2.79
Basalt	2.78	1.60	2.52	1.95	2.65
Undiff. Mafic Intrusive	2.74			2.71	2.74
Quartz Vein	2.62				2.62
Undiff. Proterozoic	1.98	1.69	2.47	2.11	1.93
Undiff. Volcanoclastic Sediment	2.73			2.16	2.35
Volcanoclastics	2.68		2.52		2.63
Average	**2.78**	**1.72**	**2.58**	**2.06**	**2.65**

RC Sampling and Assaying

Phase 7 RC comprised 417 grade control holes (12,709 m), RC pre-collars for for diamond tails (84 holes, 7,520 m) and resource drill RC holes (284 holes, 22,211m). The total RC drilling meterage was 42,440m. A total 35,160 samples were collected on one-metre intervals. For the holes that were diamond tailed, the RC portions were selectively sampled on one-metre intervals only in the alteration zones; samples in long runs of visually barren rock, mostly in the hanging wall of CMA lode were not submitted for assay.. Samples were prepared at the Youré site laboratory and assayed by fire assay on 50g charge, AAS finish, at Actlabs laboratory in Ouagadougou, Burkina Faso.

Blanks (1:20, 2,033 samples), field duplicates (1:20, 2,218 samples), pulp duplicates (1:20, 2,216 samples) and ten types of Rocklabs standards (1:20, 2,033 samples) were inserted in the sample batches.

AC Sampling and Assaying

Aircore condemnation drilling completed in areas of planned mine infrastructure totaled 18,083m. Two traverses of holes located north-west of Yaouré pit (YAC0201-YAC0223) were sampled at one metre intervals, weighed and each sample riffle split to produce a nominally 3 kg subsample. These holes are included in the data that informs the Mineral Resource and Mineral Reserve estimates described in this report

In aircore holes drilled during 2017 for the purpose of sterilising areas proposes for mine infrastructure, samples were collected through a cyclone and logged at one metre intervals but assay samples comprised "spear" samples composited over four metre intervals.

A total 5,661 aircore samples were prepared at the site laboratory and assayed via fire assay on 50g charge, AAS finish, at Actlabs laboratory in Ouagadougou, Burkina Faso.

Blanks (1:20, 357 samples), field duplicates (1:20, 371 samples), pulp duplicates (1:20, 343 samples) and Rocklabs standards (1:20, 358 samples) were inserted in the sample batches.

11.4 Sample Preparation and Assaying Reliability

11.4.1 BRGM and Cluff Drilling

No data are available to directly demonstrate the reliability of sampling and assaying by BRGM and compilation of quality control data for the Cluff drilling is incomplete at the time of reporting. Indirect assessment of the reliability of BRGM and Cluff sampling is discussed in Section 10 of the report.

11.4.2 Amara Drilling

Coarse Blanks

Amara routinely included samples of un-mineralised granite sourced from outside the project area in assay batches at an average frequency of around one blank for 20 primary samples. In addition to checking for contamination during sample preparation, the coarse blanks provide a check of sample misallocation by field staff, the laboratory and during database compilation.

Amara coarse blanks compiled for the current review include data from all sampling types and sampling outside the resource area. This approach maximises the size of the review dataset and is justified by the consistency in sample preparation and analytical procedures.

Nine coarse blank assays by Intertek with anomalously high gold grades were excluded from the review data. These assays are generally consistent with commonly used standards, or preceded by very low grade samples. Although uncertain these trends suggest that these anomalous values reflect sample misallocation rather than contamination. The apparent misallocation rate of around 1 per 2,060 blanks is considered acceptable and is not considered to significantly reduce confidence in the sampling data.

Table 11-11 summarises blank assay results subdivided by assay laboratory. The plots in Figure 11-1 show the average grade, and proportion of assays of greater than 0.01 for increments of gold grade for the preceding primary sample for the main assay groups. The upper bins in these plots include all samples with preceding sample grades of greater than 10 g/t.

Table 11-11 and Figure 11-1 demonstrate that the coarse blank assays show generally very low gold grades with few samples assaying at above the detection limit.

The blank assay results suggest that the sample preparation for samples from Amara resource drilling is generally free from significant contamination or sample misallocation.

Table 11-11 Amara coarse blank assays

Laboratory	Number Samples	Assay Au g/t			Proportion	
		Minimum	Average	Maximum	> DL	> 0.1 g/t
Actlabs	6,637	0.005	0.005	0.09	0.4%	-
Intertek	1,668	0.005	0.006	0.30	5.3%	0.2%
SGS	445	0.005	0.014	0.33	41%	1.8%
Bureau Veritas	18	0.005	0.009	0.05	17%	-
Yaouré	3,601	0.005	0.006	0.19	13%	0.1%
Total	**12,369**	**0.005**	**0.006**	**0.33**	**6.2%**	**0.1%**

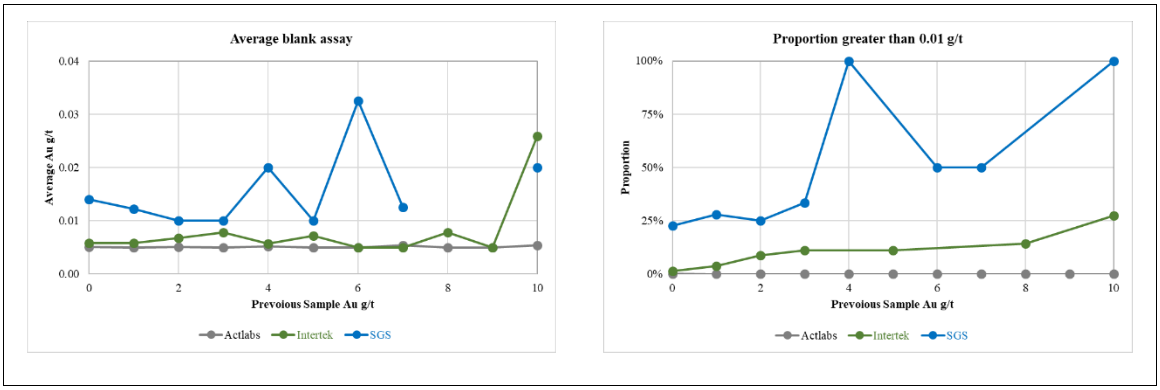


Figure 11-1 Amara coarse blank assays versus previous sample

Coarse Duplicates

Amara's monitoring of sample preparation at the Yaouré sample preparation facility included collection of coarse duplicates for diamond core samples. These duplicates comprise a second split of the primary half-core samples after crushing to a nominal 85% passing 2mm. They test the representivity of the sub-sampling of the crushed coarse material and potential sample misallocation. Coarse duplicates were not collected for RC samples.

Most Amara coarse duplicates are from samples analysed by Actlabs, with an average frequency of approximately one duplicate per 16 primary diamond core samples. A small proportion of the duplicates are from samples analysed by Intertek, which represent an average frequency of around one duplicate per 176 primary core assays by that laboratory.

Table 11-12 and Figure 11-2 summarise Amara coarse duplicate assays by analytical laboratory. The combined scatter (grey dots) and QQ plots (blue line) in Figure 11-2 are truncated at 15 g/t, excluding rare high grade pairs and providing a clearer, consistent indication of correlation for typical gold grades. The table and figure demonstrate that the coarse duplicate assays generally correlate reasonably well with original grades. As expected they show poorer correlation statistics than the fine duplicates described below. Additional notable features of the coarse duplicate results are outlined below:

- Most duplicates have very low gold grades and do not provide a clear indication of sub-sample repeatability for mineralised samples. Selecting pairs with gold grades of greater than 0.1 g/t substantially reduces the size of datasets;

- Most samples show reasonable correlation consistent with industry experience of assaying similar mineralisation styles. There is, however some variability for individual pairs;
- For gold grades of greater than approximately 4 g/t, Actlabs duplicates show slightly higher average grades than the original samples, giving an average grade difference for the combined dataset of around 2%. Reasons for this trend are unclear; it appears to simply reflect an artefact of the small set of higher grade duplicates.

Table 11-12 Amara coarse duplicates

Au g/t	Full Range				0.1 to 30 g/t			
	Intertek		Actlabs		Intertek		Actlabs	
	Orig.	Dup.	Orig.	Dup.	Orig.	Dup.	Orig.	Dup.
Number	199		4,948		32		1,116	
Mean	**0.31**	**0.34**	**0.29**	**0.29**	**1.81**	**2.05**	**1.09**	**1.11**
Mean dif.		**13%**		**3%**		**13%**		**2%**
Variance	2.11	2.82	2.64	2.99	10.4	14.1	5.68	6.35
Coef. Var.	4.76	4.88	5.68	5.89	1.79	1.83	2.19	2.26
Minimum	0.01	0.01	0.01	0.01	0.12	0.12	0.10	0.10
1st Quartile	0.01	0.01	0.01	0.01	0.21	0.22	0.17	0.17
Median	0.01	0.01	0.02	0.02	0.40	0.40	0.33	0.33
3rd Quartile	0.05	0.04	0.09	0.09	1.21	1.27	0.88	0.87
Maximum	**12.8**	**18.5**	**68.0**	**72.7**	**12.8**	**18.5**	**29.4**	**29.4**
Correl. Coef.	0.93		0.98		0.92		0.95	

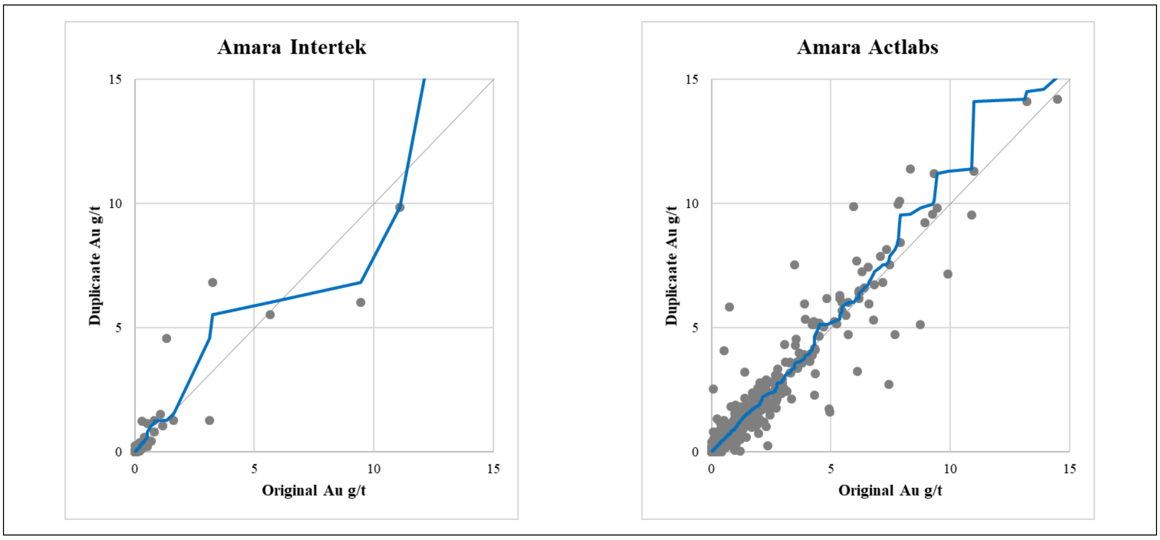


Figure 11-2 Amara coarse duplicates

Pulp repeats

Amara's monitoring of sample preparation at the Yaouré sample preparation facility included assaying of pulp repeats for RC and diamond core samples. These samples comprise a second portion of the pulp prepared from the primary sub-sample. They test representivity of sub-sampling of pulverised material and potential sample misallocation.

The majority of Amara pulp repeats are from samples analysed by Actlabs, with an average frequency of one repeat per 15 primary diamond core samples. A small proportion of the duplicates are from samples analysed by Intertek.

Table 11-13 and Figure 11-3 summarise Amara pulp repeat assays by analytical laboratory. The combined scatter (grey dots) and QQ plots (blue line) in Figure 11-3 are truncated at 15 g/t, excluding rare high grade pairs and providing a clearer, consistent indication of correlation for typical gold grades. The table and figure demonstrate that the pulp repeats generally correlate reasonably well with original grades. As expected they show notably better correlation than the coarse duplicates described above.

Table 11-13 Amara pulp repeats

	Full Range				0.1 to 30 g/t			
Au g/t	**Intertek**		**Actlabs**		**Intertek**		**Actlabs**	
	Orig.	**Dup.**	**Orig.**	**Dup.**	**Orig.**	**Dup.**	**Orig.**	**Dup.**
Number	178		5,309		24		1,221	
Mean	**0.18**	**0.17**	**0.29**	**0.29**	**1.21**	**1.15**	**1.15**	**1.13**
Mean dif.		**-4%**		**-2%**		**-5%**		**-2%**
Variance	0.79	0.56	1.83	1.75	4.61	3.07	5.02	4.66
Coef. Var.	5.05	4.46	4.62	4.59	1.78	1.53	1.94	1.91
Minimum	0.01	0.01	0.01	0.01	0.10	0.14	0.10	0.10
1st Quartile	0.01	0.01	0.01	0.01	0.18	0.23	0.18	0.17
Median	0.01	0.01	0.02	0.02	0.34	0.41	0.35	0.35
3rd Quartile	0.04	0.03	0.09	0.09	1.02	1.01	0.95	0.96
Maximum	**10.0**	**7.19**	**49.1**	**49.8**	**10.0**	**7.19**	**17.8**	**17.1**
Correl. Coef.	0.99		0.99		0.97		0.99	

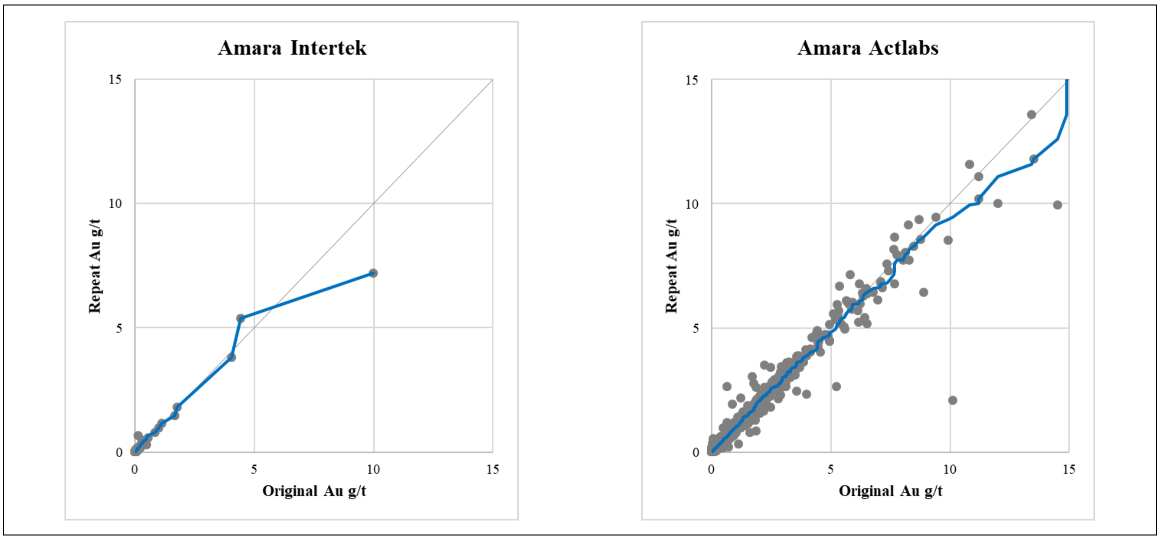


Figure 11-3 Amara pulp repeats

Reference standards

Amara's monitoring of assay reliability included routine submission of blind samples of certified reference standards in assay batches. All reference standards used by Amara were sourced from commercial supplier Rocklabs and have expected gold grades determined by round-robin fire assaying by several commercial laboratories. Expected gold grades for these standards range from 0.08 to 8.67 g/t.

Amara reference standards compiled for the current review exclude 56 samples, for which assay results match expected values so poorly they are suggestive of sample misallocation. In many cases the assay results closely match expected values for other standards, which is strongly suggestive of sample misallocation. The apparent misallocation rate of around 1 per 176 standards is consistent with industry experience of resource datasets and does not significantly reduce confidence in the data.

Table 11-14 and Figure 11-4 summarise reference standards results subdivided by assay laboratory, and Table 11-15 shows a combined summary excluding standards with expected values of less than 0.1 g/t. These tables and figure include standards with more than five assay results and demonstrate that although there is some variability for individual samples, for each laboratory average assay results reasonably reflect expected values, with no evidence of substantial biases.

Notable features of the results for each laboratory include the following:

- Average Intertek and SGS fire assays of low grade standards with expected grades of approximately 0.08 g/t comparatively poorly match the expected values. This variability appears to reflect low assay precision at close to the detection limit and does not significantly affect confidence in SGS assaying.
- For standards with expected values of greater than approximately 4 g/t, average Actlabs assay results are around 1% lower than expected values.
- Average Intertek assay results by are generally around 2% higher than expected values.
- SGS standards average slightly lower than expected values. This dataset is too small for the results to be definitive.
- The small set of Yaouré laboratory BLEG assays of standards average slightly lower than expected values. This trend appears likely to reflect the partial extraction nature of BLEG assays. Assays by this laboratory represent only a small proportion of the estimation dataset and any uncertainty over the reliability of these assays does not significantly affect confidence in estimated resources.

The magnitudes of the grade differences outlined above are not significant at the current level of project assessment. As evaluation of the deposit continues, additional investigations such as further inter-laboratory repeat assays may be warranted.

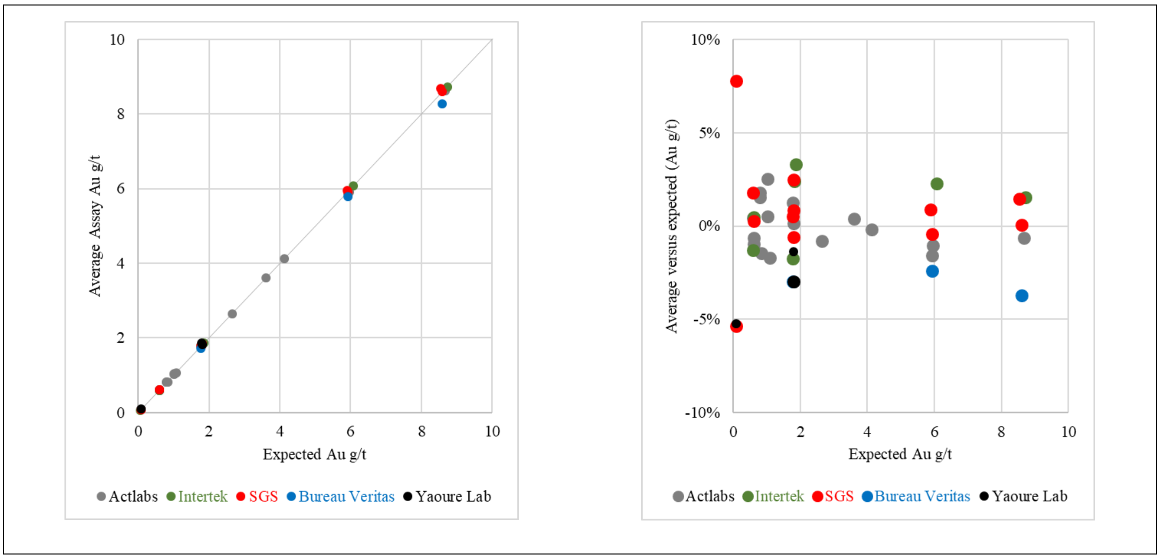


Figure 11-4 Amara standards assays versus expected values

Table 11-14 Amara reference standards results

Standard	Expected Au g/t	Number	Minimum	Average	Maximum	Avg. vs. expected
Actlabs Fire Assay						
SE68	0.60	1323	0.57	0.60	0.84	0%
OXE106	0.61	360	0.57	0.60	0.63	-1%
SE58	0.61	19	0.59	0.60	0.62	-1%
OXE113	0.61	165	0.58	0.60	0.62	-1%
OXF100	0.80	207	0.79	0.82	0.84	2%
OXF125	0.81	130	0.79	0.82	0.85	2%
SF67	0.84	1023	0.58	0.82	0.86	-1%
OXG98	1.02	28	0.99	1.04	1.09	3%
OXG103	1.02	89	0.99	1.02	1.06	1%
SG66	1.09	960	0.85	1.07	1.13	-2%
SI64	1.78	1114	1.73	1.80	1.88	1%
OXI96	1.80	267	1.77	1.80	1.85	0%
SJ80	2.66	212	2.54	2.64	2.72	-1%
OXK119	3.60	70	3.54	3.62	3.84	0%
SK78	4.13	102	3.58	4.13	4.51	0%
SL61	5.93	244	5.70	5.84	6.15	-2%
SL76	5.96	334	5.77	5.90	6.06	-1%
SN75	8.67	144	7.53	8.62	8.82	-1%
Intertek Tarkwa Fire Assay						
OXA89	0.08	99	0.01	0.06	0.10	-25%
OXE106	0.61	36	0.56	0.61	0.64	0%
SE58	0.61	28	0.57	0.60	0.63	-1%
SI64	1.78	568	1.66	1.82	2.02	2%
OXI96	1.80	120	1.72	1.86	2.04	3%
OXI81	1.81	16	1.62	1.78	1.86	-2%
SL61	5.93	579	5.42	6.07	6.46	2%
SN60	8.60	565	7.18	8.73	9.60	2%
SGS Tarkwa Fire Assay						
OXA59	0.08	36	0.05	0.09	0.15	8%
OXA89	0.08	34	0.01	0.08	0.13	-5%
SE29	0.60	54	0.56	0.61	0.67	2%
SE58	0.61	134	0.47	0.61	0.77	0%
SI64	1.78	58	1.44	1.79	1.86	1%
SI25	1.80	17	1.70	1.79	1.96	-1%
OXI96	1.80	12	1.73	1.82	1.92	1%
OXI81	1.81	23	1.42	1.85	2.10	2%
SL34	5.89	16	5.64	5.95	6.52	1%
SL61	5.93	184	5.20	5.91	7.06	0%
SN26	8.54	11	8.13	8.67	9.26	1%
SN60	8.60	188	7.00	8.60	9.69	0%
Bureau Veritas Abidjan Fire Assay						
SI64	1.78	7	1.35	1.73	1.84	-3%
SL61	5.93	7	5.31	5.79	6.08	-2%
SN60	8.60	8	7.82	8.28	8.66	-4%

Yaouré Laboratory BLEG						
OXA89	0.08	110	0.01	0.08	0.09	-5%
OXI96	1.80	91	1.25	1.78	1.87	-1%
OXI81	1.81	18	1.70	1.75	1.82	-3%

Table 11-15 Amara summary of reference standards results

		Number Assays	Au g/t		Average vs. Expected
			Expected	Average Assay	
Actlabs	0.1 to 4 g/t	6,069	1.17	1.17	0%
	> 4 g/t	722	6.49	6.42	-1%
	Combined	**6,791**	**1.74**	**1.73**	**0%**
Intertek	0.1 to 4 g/t	768	1.69	1.73	2%
	> 4 g/t	1,144	7.25	7.38	2%
	Combined	**1,912**	**5.01**	**5.11**	**2%**
SGS	0.1 to 4 g/t	298	1.04	1.05	1%
	> 4 g/t	399	7.26	7.25	0%
	Combined	**697**	**4.60**	**4.60**	**0%**
Bureau Veritas		22	5.58	5.40	-3%
Yaouré Lab.		109	1.80	1.77	-2%
Total		**9,641**	**2.58**	**2.60**	**0%**

Inter-laboratory pulp repeats

Inter-laboratory pulp repeat assays available for samples from Amara's drilling include assaying initiated by Amara, and additional check assaying initiated by Perseus. These datasets cover the main groups of primary assays of Amara's resource drilling.

Inter-laboratory repeats compiled for the current review excludes nine pairs for which assay results match expected values so poorly they are suggestive of sample misallocation.

Batches of repeat assays by Intertek Perth and Intertek Tarkwa included samples of reference standards selected from the range of standards included in primary assay batches (Table 11-16). Average grades reported by Intertek Perth for these standards are around 4% lower than expected values, suggesting these assays may be biased slightly low. For Intertek Tarkwa, assays closely match expected values.

Table 11-17 and Figure 11-5 summarise inter-laboratory repeats of assays from Amara drilling by analytical laboratory. The summaries in Table 11-17 include only gold grades between 0.1 and 20 g/t, excluding significant numbers of very low grade samples and comparatively rare higher grade pairs. This approach provides a clearer indication of correlation for typical gold grades. Similarly, the combined scatter (grey dots) and QQ plots (blue line) in Figure 11-5 are truncated at 20 g/t.

Table 11-17 and Figure 11-5 demonstrate that although individual pairs show considerable scatter, for each dataset, average grades of inter-laboratory repeats generally reasonably match the original assays.

No inter-laboratory repeats are available for BLEG assays by the Yaouré laboratory which represent a small proportion of the estimation dataset.

Actlabs Abidjan assays

Repeats of Actlabs Abidjan assays comprise the following:

- 812 samples assayed by ALS in Johannesburg South Africa or Vancouver Canada. The supplied dataset does not distinguish between secondary assay laboratory for these samples and they were combined for analysis. These samples are from 32 RC and diamond holes drilled during 2014 and 2015.
- 276 samples assayed by Intertek in Perth, Western Australia during 2017. These samples are from 8 RC and diamond holes drilled during 2014.

Notable features of these repeats include the following:

- The combined dataset of ALS repeats average around 4% higher than Actlabs original assays. This trend is strongest for grades of approximately 1 to 3 g/t (Figure 11-6).
- Intertek Perth reports very similar average gold grades to Actlabs. Although uncertain, the potential negative bias in Intertek Perth assays implied by reference standards assays suggests that this may imply the Actlabs assays are slightly negatively biased.
- This potential slight negative bias in Actlabs assaying suggested by inter-laboratory repeats is inconsistent with the results of reference standards described above.

Repeats of original Intertek Tarkwa assays:

Repeats of Intertek Tarkwa assays comprise the following:

- 179 samples assayed by Intertek in Perth, Western Australia during 2017. These samples are from 8 diamond holes drilled during 2012 and 2013.
- For these repeats Intertek Perth reports average grades around 4% lower than Intertek Tarkwa. This trend, which is strongest for grades of around 1 to 4 g/t (Figure 11-6) is consistent with the apparent negative bias in Intertek Perth assays suggested by reference standards.

Repeats of original SGS Tarkwa assays:

Repeats of original SGS Tarkwa assays comprise the following

- 825 samples assayed by Intertek Tarkwa. These samples are from 25 diamond holes drilled during 2012 and 2013.
- 122 samples assayed by Bureau Veritas Abidjan. These samples are from one diamond hole drilled during 2011. It is uncertain how well they represent SGS Tarkwa assays.
- 179 samples assayed by Intertek in Perth, Western Australia during 2017. These samples are from 4 diamond holes drilled during 2011 and 2012.

Notable features of these repeats include the following:

- Intertek Tarkwa reports similar average grades to SGS Tarkwa with an average difference of around 2% and somewhat greater scatter than the other sets of inter-laboratory repeats.
- The comparatively small set of Bureau Veritas assays average significantly higher than the SGS Tarkwa originals. This trend appears to reflect an artefact of the small, potentially unreliable and unrepresentative dataset, and does not significantly affect confidence in general reliability of SGS assaying.
- Intertek Perth reports average grades around 5% lower than Intertek Tarkwa. This trend is consistent with the apparent negative bias in Intertek Perth assays suggested by reference standards.

The magnitudes of the grade differences outlined above, and apparent inconsistencies between several sets of pairs are not significant at the current level of project assessment. They appear likely to primarily represent artefacts of the comparatively small datasets of repeats reflecting mineralisation variability. Additional investigations such as further inter-laboratory repeat assays may be warranted as evaluation of the deposit continues.

Table 11-16 Amara inter-laboratory repeats standards

Expected Value (Au g/t)	Intertek Perth No. Assays	Intertek Perth Average Au g/t Expect	Intertek Perth Average Au g/t Assay	Intertek Perth Avg. vs Expect	Intertek Tarkwa No. Assays	Intertek Tarkwa Average Au g/t Expect	Intertek Tarkwa Average Au g/t Assay	Intertek Tarkwa Avg. vs Expect
< 0.1	1	0.08	0.08	-8%	5	0.08	0.09	8%
0.1 to 2.0 g/t	19	1.17	1.16	-1%	15	0.92	0.90	-2%
> 2.0 g/t	16	7.14	6.79	-5%	11	7.37	7.45	1%
Total	**36**	**3.79**	**3.63**	**-4%**	**31**	**3.07**	**3.10**	**1%**

Table 11-17 Amara inter-laboratory repeats

Au g/t: Subset 0.1 to 20.0 g/t						
	Repeats of Actlabs Assays				Repts of Intertek Tarkwa	
	Actlabs Abidjan	ALS Combined	Actlabs Abidjan	Intertek Perth	Intertek Tarkwa	Intertek Perth
Number	605		220		134	
Mean	**2.32**	**2.41**	**2.83**	**2.80**	**3.68**	**3.51**
Mean dif.		**4%**		**-1%**		**-5%**
Variance	10.6	11.0	12.2	11.4	17.6	15.5
Coef. Var.	1.40	1.38	1.23	1.21	1.14	1.12
Minimum	0.10	0.10	0.11	0.11	0.10	0.10
1st Quartile	0.37	0.37	0.53	0.57	0.63	0.66
Median	0.95	1.00	1.28	1.52	2.01	1.91
3rd Quartile	2.80	3.04	3.79	3.77	5.12	4.81
Maximum	18.3	19.8	16.6	17.0	18.3	16.9
Correl. Coef.	0.97		0.98		0.96	
	Repeats of SGS Tarkwa Assays					
	SGS Tarkwa	Intertek Tarkwa	SGS Tarkwa	Bureau Veritas	SGS Tarkwa	Intertek Perth
Number	**310**		**70**		65	
Mean	**0.91**	**0.93**	**1.37**	**1.57**	**2.00**	**1.91**
Mean dif.		**2%**		**14%**		**-5%**
Variance	2.41	2.48	3.96	6.19	8.84	8.49
Coef. Var.	1.71	1.70	1.45	1.59	1.49	1.53
Minimum	0.10	0.10	0.10	0.10	0.12	0.10
1st Quartile	0.20	0.19	0.21	0.21	0.35	0.30
Median	0.40	0.40	0.68	0.66	0.93	0.87
3rd Quartile	0.92	0.99	1.48	1.42	2.35	2.27
Maximum	12.4	12.8	12.0	14.9	17.1	18.1
Correl. Coef.	0.97		0.90		0.99	

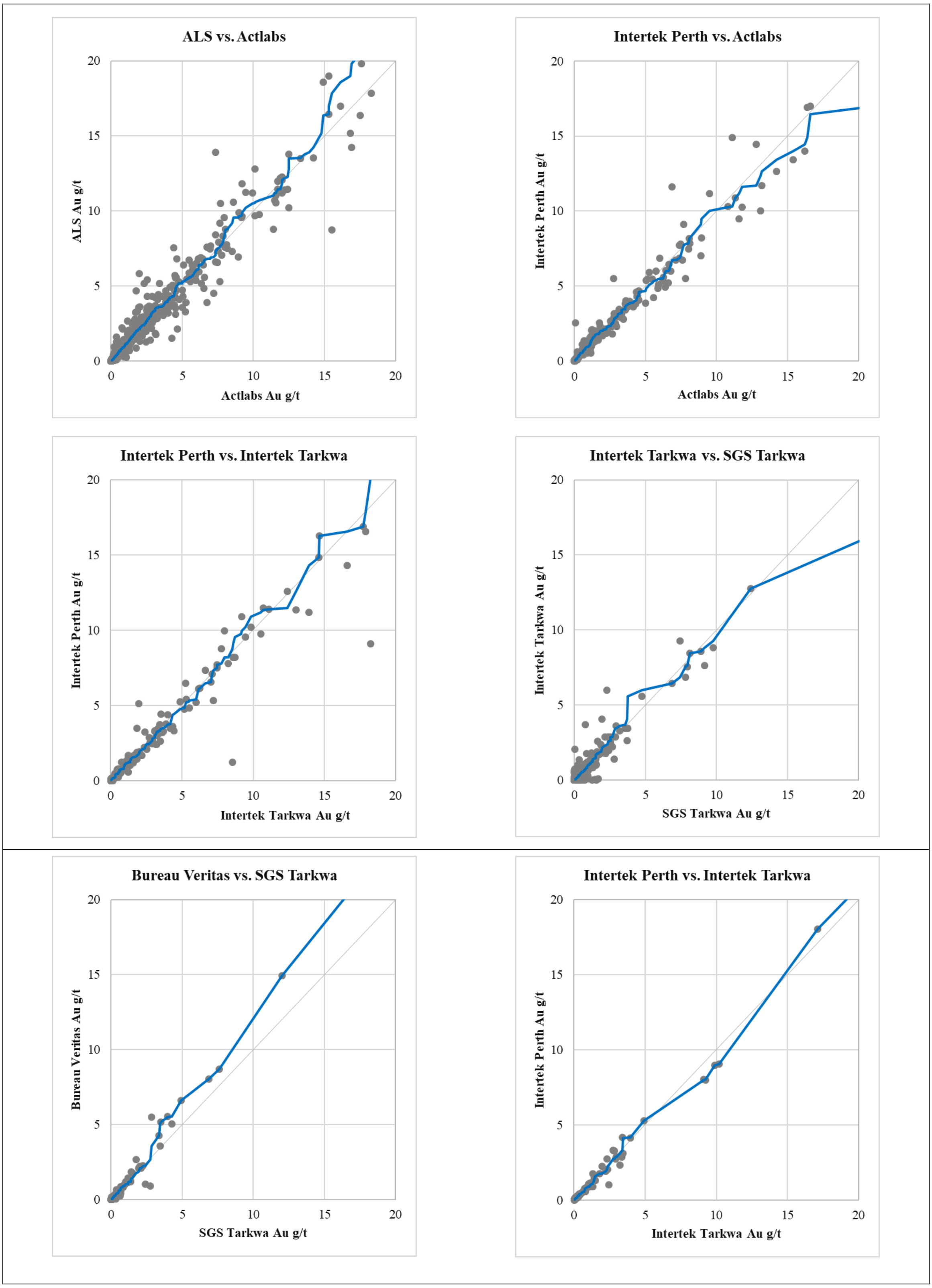


Figure 11-5 Amara inter-laboratory repeats

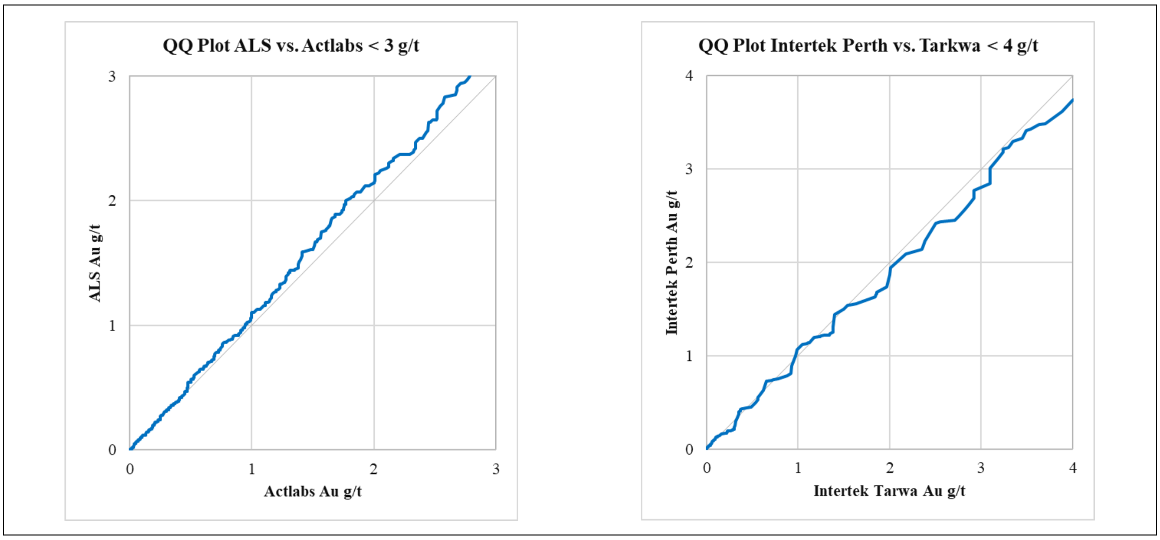


Figure 11-6 Amara inter-laboratory repeats QQ plots

Paired comparison of BLEG and fire assay composites

Two metre down-hole composited BLEG grades from Amara RC sampling were compared with composited fire assay grades from Amara and Perseus RC and diamond drilling. This included the following comparisons:

- Pairs selected with maximum separation of 4 metres east-west by 6 metres north-south and 4 metres vertical.
- Pairs separated with maximum separation of 6 metres east-west by 10 metres north-south and 6 metres vertical. This dataset was produced to give a larger number of pairs for comparison with the smaller dataset of pairs within 4 by 6 by 4 metres. The separation distances are large relative to mineralisation continuity, and results are of uncertain representivity.

Reliability of sampling assaying for Amara and Perseus RC and diamond drilling has been established by comprehensive QAQC and these comparisons provide an indication of the reliability of the Yaouré laboratory BLEG assays.

Each of the paired datasets includes a substantial proportion of very low gold grade composites. To provide a consistent basis for comparison for mineralised samples, the review datasets exclude pairs grading less than 0.05 g/t, and a small number of pairs grading greater than 2 and 5 g/t respectively. Average separation distances for the two datasets are 5.0 and 8.2 metres respectively.

The summary statistics in Table 11-18 and QQ plots in Figure 11-7 summarise the paired comparisons by weathering domain. This table and figure demonstrate that for both sets of pairs, BLEG assays give slightly higher average gold grades than the combined fire assay datasets. Reasons for this trend are uncertain. It may simply reflect an artefact of the small datasets.

Yaouré laboratory BLEG assays represent only a small proportion of the estimation dataset. The comparatively small difference in average grades shown by the paired comparisons supports the use of these assays in the resource estimate. As evaluation of the project continues, additional investigations, possibly including drilling of specifically designed twin or replacement holes may be warranted.

Table 11-18 Amara BLEG vs. fire assay paired comparison

Au g/t	Within 4 by 6 by 4m		Within 6 by 10 by 6 m	
	Amara BLEG	Am./Pers. FA	Amara BLEG	Am./Pers. FA
Number	63		105	
Mean	**0.27**	**0.25**	**0.38**	**0.31**
Mean dif.		**-5%**		**-17%**
Variance	0.07	0.04	0.38	0.20
Coef. Var.	1.00	0.81	1.64	1.43
Minimum	0.05	0.05	0.05	0.05
1st Quartile	0.11	0.13	0.11	0.11
Median	0.17	0.20	0.17	0.20
3rd Quartile	0.29	0.29	0.36	0.32
Maximum	**1.28**	**1.06**	**4.65**	**3.93**

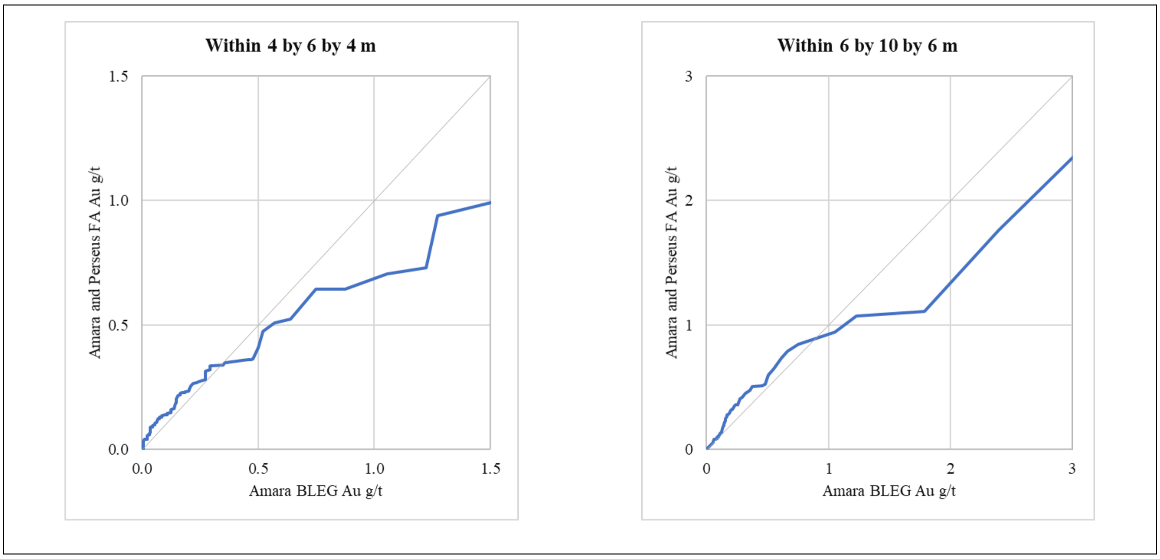


Figure 11-7 Amara BLEG vs. fire assay paired comparison

11.4.3 Perseus drilling

Coarse blanks

Perseus inserted coarse blanks in assay batches at an average frequency of around one blank per 19 primary samples.

Table 11-19 summarises blank assay results for Perseus drilling. The plots in Figure 11-8 show the average grade, and proportion of assays of greater than 0.01 for increments of gold grade for the preceding primary sample. The upper bin in these plots includes all samples with preceding sample grades of greater than 10.0 g/t.

Table 11-19 and Figure 11-8 demonstrate that the coarse blank assays show generally very low gold grades with few samples assaying at above detection and a maximum grade of only 0.01 g/t. There is, however a weak association of proportionally more blanks reporting above detection limit and higher grades in preceding samples. This trend is consistent with very low-level contamination. The magnitude of the potential contamination is generally very low, and these trends do not significantly affect confidence in the data.

The blank assay results suggest that the sample preparation for Perseus drilling is generally free from significant contamination or sample misallocation.

Table 11-19 Perseus coarse blank assays

Laboratory	Number Samples	Assay Au g/t			Proportion	
		Minimum	Average	Maximum	> DL	> 0.1 g/t
Actlabs	2,636	0.005	0.005	0.01	0.04%	-

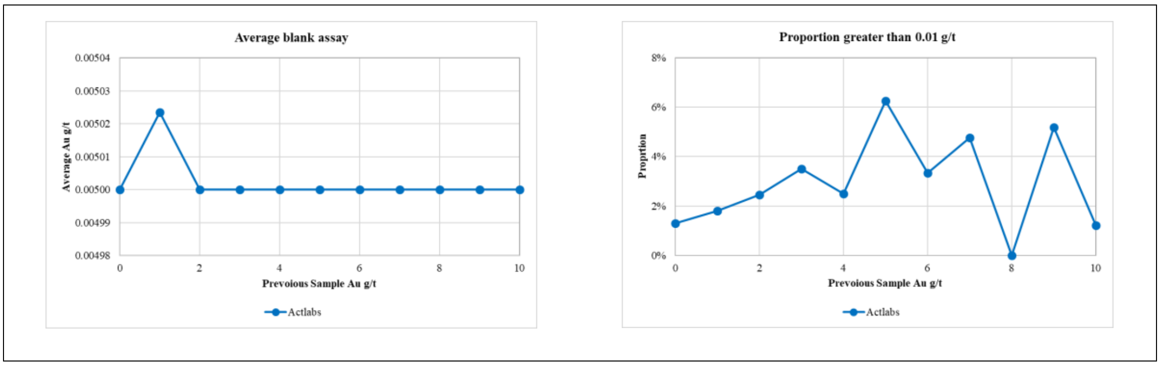


Figure 11-8 Perseus coarse blank assays versus previous sample

Coarse duplicates

Perseus's monitoring of sample preparation included assaying of coarse duplicates for diamond core samples at an average frequency of around one duplicate per 19 primary samples. These duplicates comprise a second split of primary half-core samples after crushing to a nominal 85% passing 2mm. They test the representivity of the sub-sampling of the crushed coarse material and potential sample misallocation. Coarse duplicates were not collected for RC samples.

The summary statistics in Table 11-20 and combined scatter (grey dots) and QQ plots (blue line) in Figure 11-9 summarise Perseus coarse duplicate assays, with notable features including the following:

- The coarse duplicates include an anomalous cluster of three pairs with original gold grades of around 3.4 g/t and duplicate assays of around 0.2 g/t.
- Most duplicates have very low gold grades and do not provide a clear indication of sub-sample repeatability for mineralised samples. Selecting pairs with grades of greater than 0.1 g/t substantially reduces the size of dataset.

With the exception of a small number of poorly correlating pairs, most samples show reasonable correlation, consistent with industry experience of assaying similar mineralisation styles and similar general correlation to coarse duplicates from Amara's sampling.

Table 11-20 Perseus coarse duplicates

Au g/t	Full Range		0.1 to 30 g/t	
	Original	Duplicate	Original	Duplicate
Number	521		188	
Mean	**0.86**	**0.83**	**2.30**	**2.23**
Mean dif.		**-4%**		**-3%**
Variance	6.57	6.04	14.9	13.6
Coef. Var.	2.99	2.97	1.68	1.66
Minimum	0.01	0.01	0.10	0.10
1st Quartile	0.02	0.02	0.28	0.28
Median	0.05	0.05	0.69	0.70
3rd Quartile	0.35	0.38	2.72	2.31
Maximum	**25.7**	**26.1**	**25.7**	**26.1**
Correl. Coef.	0.89		0.86	

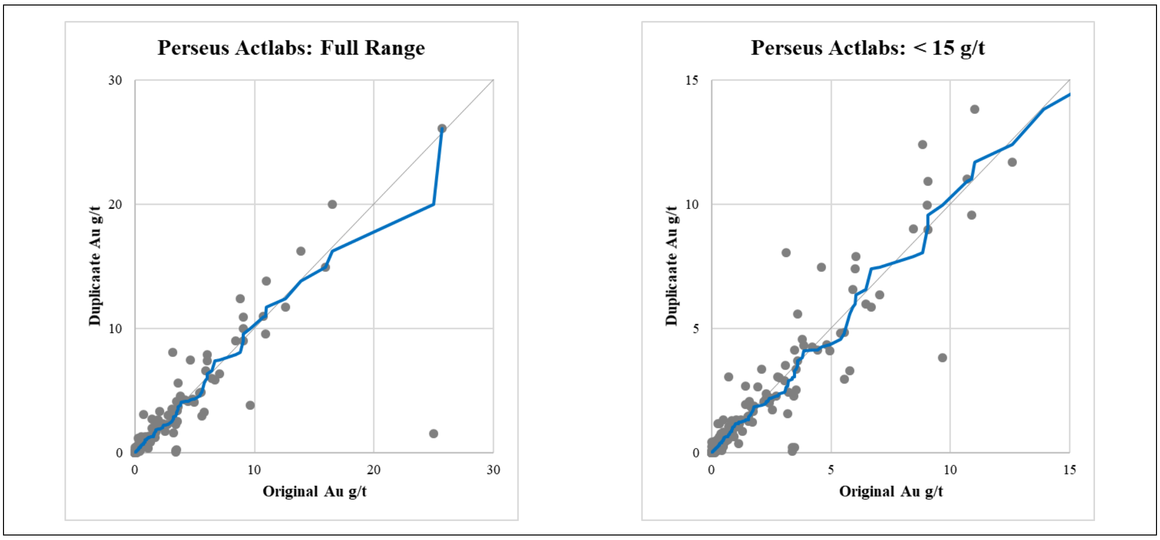


Figure 11-9 Perseus coarse duplicates

Pulp repeats

Perseus's monitoring of sample preparation included assaying of pulp repeats for RC and diamond core samples. These samples comprise a second portion of the pulp prepared from the primary sub-sample. These repeats were assayed in the same batch as original samples and test for the error associated with sub-sampling of pulverised material and sample misallocation.

Perseus pulp repeat assays are summarised in Table 11-21 and the combined scatter (grey dots) and QQ plots (blue line) in Figure 11-10. The table and figure demonstrate that the pulp repeat assays generally correlate reasonably well with original grades. As expected they show notably better correlation than the coarse duplicates described above

Table 11-21 Perseus pulp repeats

Au g/t	Full Range		0.1 to 30 g/t	
	Original	Duplicate	Original	Duplicate
Number	3,053		1,000	
Mean	**0.42**	**0.43**	**1.20**	**1.23**
Mean dif.		**2%**		**2%**
Variance	1.90	1.97	4.90	5.06
Coef. Var.	3.31	3.29	1.85	1.84
Minimum	0.01	0.01	0.10	0.10
1st Quartile	0.02	0.02	0.19	0.19
Median	0.05	0.05	0.40	0.42
3rd Quartile	0.19	0.19	1.07	1.11
Maximum	**24.2**	**19.5**	**24.2**	**19.5**
Correl. Coef.	0.92		0.91	

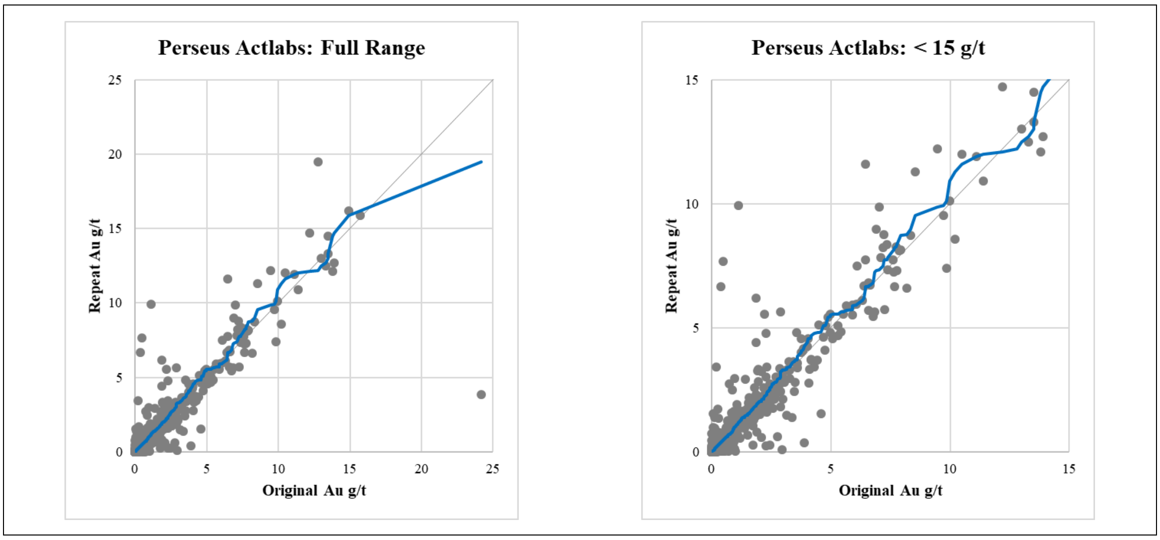


Figure 11-10 Perseus pulp repeats

Reference standards

Perseus routinely included blind samples of certified reference standards in assay batches. These reference standards were sourced from commercial supplier Rocklabs and have expected gold grades of 0.61 to 8.67 g/t determined by round-robin fire assaying by several commercial laboratories.

Perseus reference standards compiled for the current review exclude 22 samples, for which assay results match expected values so poorly they are suggestive of sample misallocation. In many cases the assay results closely match expected values for other standards, which is strongly suggestive of misallocation during field sampling or database compilation. The apparent misallocation rate of around 1 per 176 standards is not considered to significantly reduce confidence in the data

Table 11-22 and Figure 11-11 summarise reference standards results. This table and figure include standards with more than five assay results.

Table 11-22 and Figure 11-11 demonstrate that although there is some variability for individual samples, average assay results reasonably reflect expected values, with no evidence of substantial biases. These results are consistent with earlier Actlabs assaying of Amara samples.

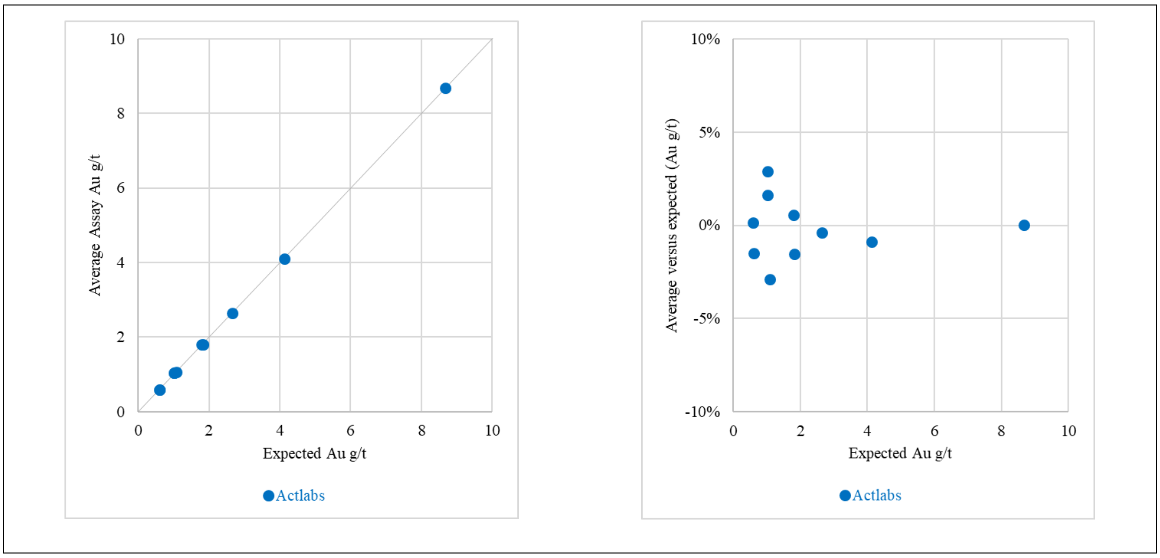


Figure 11-11 Perseus standards assays versus expected values

Table 11-22 Perseus reference standards results

Actlabs Fire Assay						
Standard	**Expected Au g/t**	**Assay results (Au g/t)**				**Avg. vs. expected**
		Number	**Minimum**	**Average**	**Maximum**	
SE68	0.60	560	0.59	0.60	0.62	0%
OXE113	0.61	258	0.59	0.60	0.62	-1%
OXG103	1.02	254	0.99	1.05	1.09	3%
SG84	1.03	12	1.03	1.04	1.06	2%
SG66	1.09	578	0.99	1.05	1.09	-3%
OXI96	1.80	76	1.77	1.81	2.06	1%
OXI121	1.83	120	1.78	1.81	1.84	-2%
SJ80	2.66	487	2.32	2.65	2.70	0%
SK78	4.13	197	3.61	4.10	4.22	-1%
SN75	8.67	69	8.61	8.67	8.75	0%
Total	**1.71**	**2,611**	**0.59**	**1.70**	**8.75**	**-1%**

Inter-laboratory core duplicates

No inter-laboratory pulp repeats are available for samples from Perseus's drilling. During 2017 Perseus delivered 524 samples of quartered diamond core to ALS in Perth, Western Australia for metallurgical test work. Prior to compositing for test-work the individual samples were analysed as inter-laboratory duplicates providing a check of the original Actlabs assays.

One of the ALS duplicate assays matches the original assay value so poorly it is suggestive of sample misallocation. That sample was excluded from the review dataset.

As shown by the comparative statistics in Table 11-23 and combined scatter (grey dots) and QQ plots (blue line) in Figure 11-12, the core duplicate assays generally correlate reasonably well with original assays with no notable difference in average grades. This comparison provides additional support for the reliability of the Actlabs assaying.

As expected, individual pairs show greater scatter than the inter-laboratory pulp repeats of Amara samples described above.

Table 11-23 Perseus inter-laboratory core duplicates

Au g/t	Full Range		0.1 to 30 g/t	
	Original	**Duplicate**	**Original**	**Duplicate**
Number	**523**		**262**	
Mean	**1.55**	**1.53**	**2.83**	**2.80**
Mean dif.		**-1.1%**		**-0.9%**
Variance	8.80	8.23	11.1	9.70
Coef. Var.	1.91	1.87	1.18	1.11
Minimum	0.01	0.01	0.10	0.10
1st Quartile	0.03	0.01	0.50	0.50
Median	0.15	0.13	1.37	1.68
3rd Quartile	1.53	1.73	4.04	3.83
Maximum	16.5	20.7	14.9	14.5
Correl. Coef.	0.87		0.84	

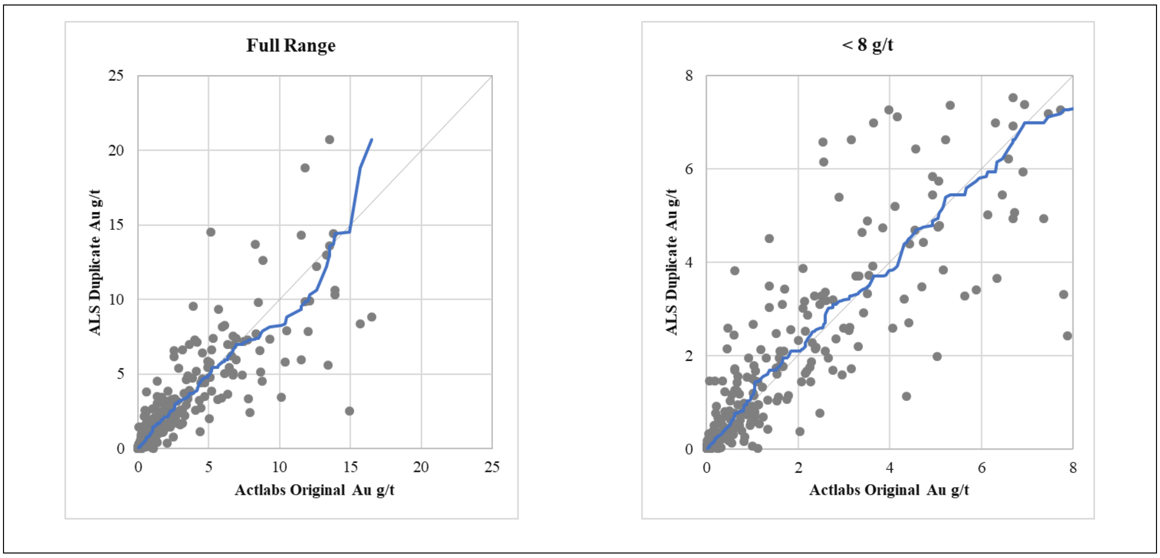


Figure 11-12 Perseus inter-laboratory core duplicates

11.4.4 Reliability of Bulk Density Measurements

Introduction and summary

Amara and Perseus routinely performed immersion density measurements on oven-dried samples of diamond core. The samples were wrapped in plastic prior to measurement to prevent water absorption.

Supplied information includes 11,024 density measurements of diamond core including 765 and 1,259 measurements by Amara and Perseus respectively. Core lengths recorded for the samples tested range from 0.03 to 0.56 metres and averaging 0.23 metres.

Average results of independent repeat wax coated check measurements closely match Perseus measurements, confirming the accuracy of Perseus measurements. Independent repeats and comparison with Perseus measurements suggest Amara density measurements are biased high by an average of around 3%.

Data reviews

Information available to demonstrate reliability of Amara and Perseus density measurements includes independent check measurements by Bureau Veritas and Enval Laboratoire d'Analyses Minières (ELAM) respectively.

The Bureau Veritas repeats of Amara measurements included plastic wrapping. ELAM repeats of Perseus measurements included measurements with plastic wrapping and wax coating respectively. Industry experience indicates that density measurements of plastic wrapped core can be less reliable than measurements using the general industry standard method of wax coating.

Table 11-24 and Figure 11-13 summarise the repeat density measurements by weathering type, with notable features including the following:

- Bureau Veritas measurements give generally lower values than Amara's with an average difference of around 3%.
- ELAM plastic wrapped measurements give generally lower values than Amara's with an average difference of around 3%.
- ELAM wax coated measurements generally closely match Amara's measurements with no notable difference in average values.

Reasons for the differences between Bureau Veritas and Amara measurements are unclear, and from the repeat information it is uncertain whether the difference reflects a bias in Amara or Bureau Veritas measurements.

The close agreement between ELAM wax coated and Perseus measurements supports the reliability of the Perseus data.

Reasons for the differences between ELAM plastic wrapped measurements and Perseus measurements are unclear. Potential reasons include incomplete purging of air from the wrapped samples by ELAM.

Table 11-25 and Figure 11-14 compare density values for Amara and Perseus measurements for fresh mafic intervals which represent the majority of remnant mineralisation. The summary statistics in

Table 11-25 and plots in the upper section of Figure 11-14 show a clear tendency for Perseus measurements to show lower average density than Amara. Perseus and Amara drill holes test different areas and this comparison is not definitive.

Averaging density measurements by increments of assayed gold grade as, shown by the lower sections of Table 11-25 and Figure 11-14 demonstrate a general association between decreasing density and increasing gold grades. Amara measurements show consistently higher average values than Perseus.

The general association between lower average densities and higher average gold grades is expected for the mineralisation style and reflects the association between higher grades and stronger alteration. The magnitude of this trend is comparatively slight and does not significantly affect confidence in the current estimates.

Although not individually definitive, the consistent trends shown by Bureau Veritas repeats and comparisons with Perseus measurements are strongly suggestive of the Amara measurements being biased high by around 3%.

Table 11-26 summarises average density measurements by mineralisation and weathering domain. Average values shown for Amara measurements in this table include factoring (multiplied by 0.97) to reflect the apparent overstatement these values

Table 11-24 Density repeats

Bureau Veritas versus Amara				
Weathering Zone	**Number**	**Average Density (t/m3)**		
		Perseus	**Bureau Veritas**	**Difference**
Partially weath.	4	2.32	2.46	6%
Fracture weath.	6	2.84	2.82	-1%
Fresh	240	2.96	2.87	-3%
Total	**250**	**2.94**	**2.86**	**-3%**

ELAM versus Perseus						
Weathering Zone	**Number**	**Average Density (t/m^3)**				
		Perseus	**ELAM Plastic**	**Plastic vs Perseus**	**ELAM Wax**	**Wax vs Perseus**
Partially weath.	5	2.30	2.27	-2%	2.36	2%
Fracture weath.	5	2.49	2.39	-4%	2.49	0%
Fresh	89	2.79	2.72	-3%	2.78	0%
Total	**99**	**2.75**	**2.68**	**-3%**	**2.75**	**0%**

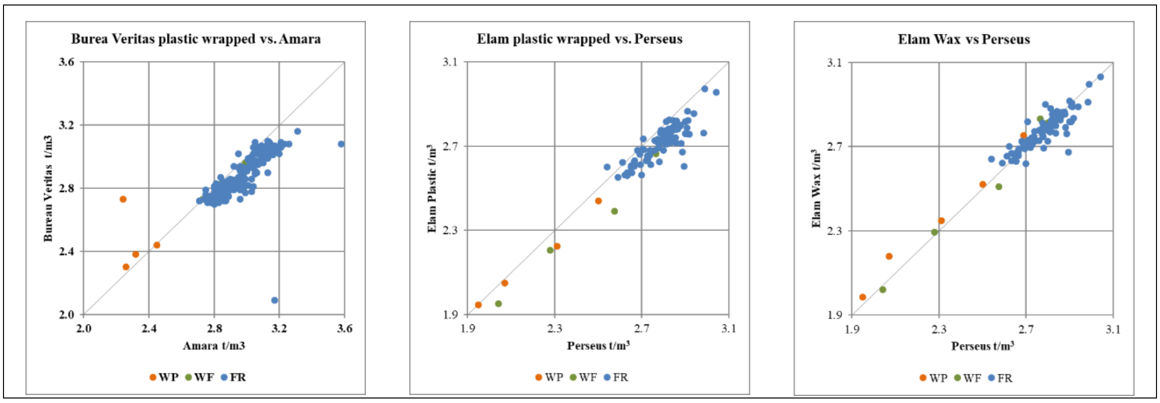


Figure 11-13 Density repeats

Table 11-25 Density measurements for fresh mafic mineralisation

t/m^3		Amara	Perseus	Difference
Number		7,458	958	87.2%
Mean		**2.89**	**2.78**	**3.7%**
Minimum		1.08	1.09	-0.6%
1st Quartile		2.78	2.71	2.5%
Median		2.88	2.77	3.7%
3rd Quartile		3.02	2.86	5.4%
Maximum		4.93	4.35	11.7%
Average of Assayed samples	< 0.3 g/t Au	2.91	2.80	-4%
	> 0.3 g/t Au	2.83	2.76	-3%
	Combined	**2.90**	**2.79**	**-4%**

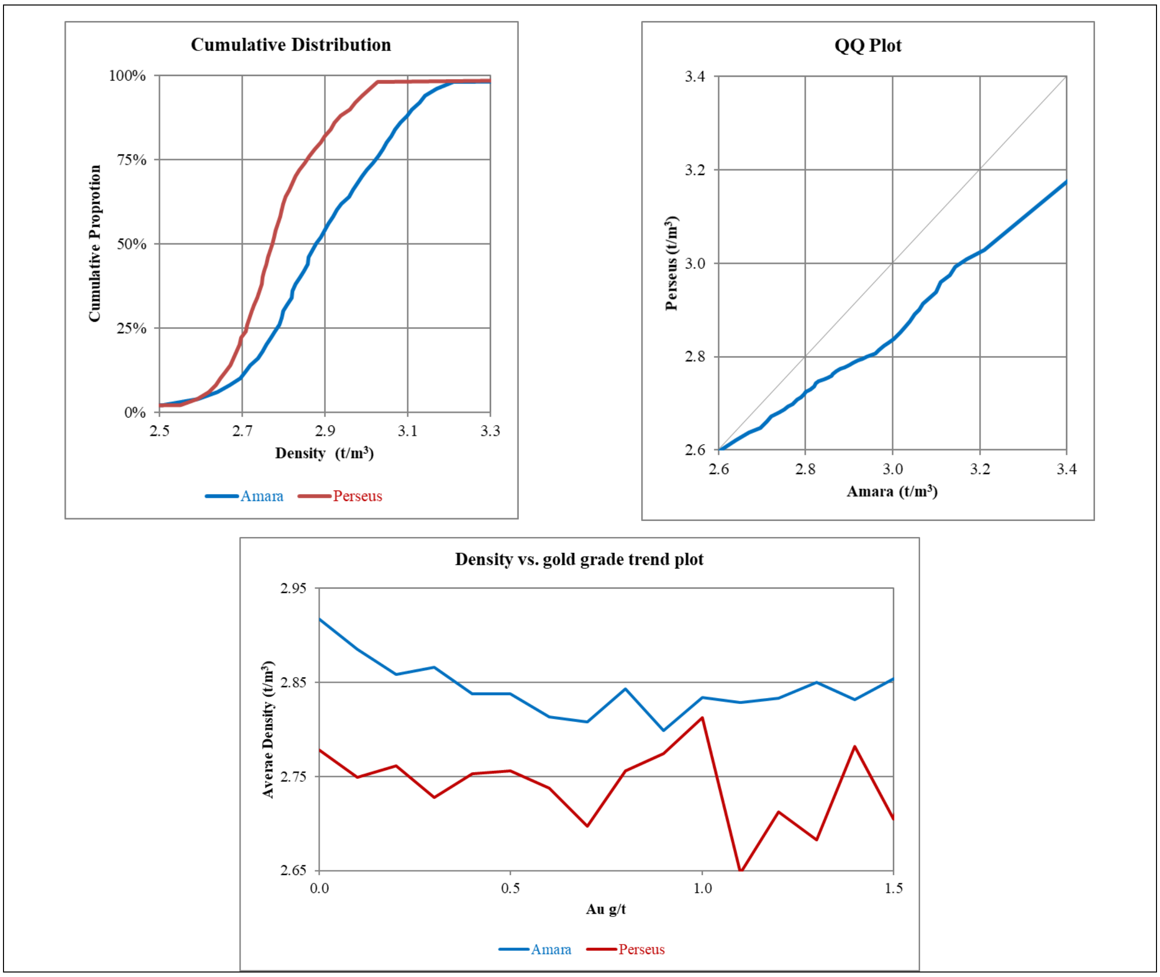


Figure 11-14 Density measurements for fresh mafic mineralisation

Table 11-26 Density measurements by modelling domain

Domain		Amara x 0.97		Perseus	
Mineralisation	Weathering	Number Measurements	Average t/m^3	Number Measurements	Average t/m^3
All	1	95	1.89	23	1.83
1	6	88	2.84	-	-
2	2	17	1.63	3	1.74
	3	18	1.76	2	1.85
	4	22	2.09	2	2.16
	5	31	2.35	3	2.27
	6	140	2.66	7	2.62
3 and 4	2	116	1.59	16	1.55
	3	172	1.71	16	1.70
	4	129	2.06	19	2.02
	5	199	2.38	25	2.61
	6	2741	2.83	315	2.85
5	2	34	1.76	2	1.55
	3	61	1.8	7	1.99
	4	49	2.07	12	2.28
	5	57	2.37	20	2.45
	6	968	2.73	555	2.75
6	2	3	1.63	-	-
	4	9	2.13	-	-
	5	3	2.23	-	-
	6	107	2.81	-	-
7 and 9	2	49	1.56	4	1.57
	3	102	1.79	6	1.67
	4	81	2.09	8	2.05
	5	144	2.44	15	2.43
	6	3889	2.83	59	2.76
8	2	3	1.78	-	-
	3	1	1.95	-	-
	4	6	2.11	-	-
	5	35	2.55	5	2.47
	6	737	2.7	58	2.68

11.5 Chain of Custody and Security

There is no information available concerning security of samples from drilling by BRGM.

Samples from Cluff drilling that were analysed by BLEG at the Yaouré site laboratory were at all times in the custody of Cluff. Cluff's samples that were prepared and assayed by Abilab, Ougadougou (2005 – 2007) were transported from site to the laboratory by commercial carriers. There is no information available as to the chain of custody or security.

Samples from drilling by Cluff and Amara that were prepared at SGS Yamoussoukro, Intertek Yamoussoukro and Bureau Veritas Abidjan were transported to the respective sample preparation facilities by Cluff or Amara personnel. Samples that were then transported from each of the

Yamoussoukro facilities to SGS and Intertek Tarkwa laboratories were in the custody of the respective laboratory.

From mid-2013 onward, all samples have been prepared by Amara, and subsequently Perseus, personnel at the Yaouré site facility. During the Phase 5 and Phase 7 campaigns, a laboratory supervisor was seconded from Actlabs to supervise operation of the site facility. Kraft envelopes, each containing approximately 250 g of pulverised material, were packed in boxes of approximately 20, sealed with packaging tape and then those boxed in larger cartons also sealed with packaging tape prior to shipment to Actlabs, Ougadougou, by Actlabs personnel.

Additional sample security measures include:

- secure transportation of the core from the rig site to the core yard at Yaoure, an average distance of less than 1 km;
- core is kept in a designated core logging and storage area;
- sample shipments are accompanied by forms listing box contents, method of transport, personnel sending and receiving the samples and date and time of departure;
- confirmation of receipt of the shipment by the laboratory is sent by email to Yaouré noting date of receipt, nature of seals at the time of receipt, and whether all samples were received;
- shipping and assay turnaround times are monitored;
- coarse reject samples were returned to Yaouré from external preparation laboratories. Those from mineralised intercepts are securely stored under cover; and
- The remaining portions of sample pulps were returned to Yaouré, catalogued and securely stored under cover.

12. Data Verification

12.1 Summary

Verification checks undertaken by the author to confirm the validity of the Yaouré drilling database compiled for the current study include the following:

- checking for internal consistency between and within database tables;
- comparison of assay values between nearby holes;
- comparisons between assay results from different sampling phases;
- spot check comparisons between database entries and original field sampling record; and
- comparison of assay entries with laboratory source files.

These checks were undertaken using the working database compiled by MPR and check both the validity of Perseus's master database and potential data-transfer errors in compilation of the working database.

The author's database checks showed no significant inconsistencies. The available information indicates that the drilling database has been carefully compiled and validated, and in the author's opinion forms an appropriately reliable basis for resource estimation.

12.2 Cluff and BRGM drilling

No original sampling records or laboratory source files are available for Cluff or BRGM drilling. Direct database checks were limited to consistency checks between, and within database tables which showed no significant inconsistencies.

With the exception of a small number of anomalous intervals excluded from resource estimates, comparison of assay results from Cluff and BRGM drilling with nearby drilling from other phases, including nearest neighbour comparisons of composited gold grades showed no significant anomalies. These comparisons support the general reliability of BRGM and Cluff data.

12.3 Amara drilling

Consistency checks between and within database tables for Amara's RC and diamond drilling showed no significant inconsistencies.

While visiting the Yaouré site in March 2017, the author compared original field sampling sheets to database entries for selected Amara RC and diamond drilling. Initially, sample records for every approximately tenth hole were checked, with additional checking concentrating on sequences of holes or sampling groups where minor inconsistencies were noted.

The sampling sheet checks included 9,543 intervals from 33 diamond holes and 11 RC holes and 428 auger samples. These checks, which represent around 7% of Amara resource area RC and diamond sampling showed no significant inconsistencies. Minor inconsistencies noted by the review include the following:

- The database excluded 132 field, coarse or pulp duplicates for sequences of drill holes;
- The database excluded 24 "triplicate" samples (second duplicates);
- For seven end of hole samples, database depth entries slightly differed from hard copy records. These inconsistencies mostly reflected rounding, and affected assay, collar and geological tables.

During the site visit, the author also compared database down-hole survey entries with hard copy records for around 10% of Amara RC and diamond holes. Virtually all of these records had incorrect survey method entries, and 24 inconsistent azimuth or dip entries were noted.

The inconsistencies noted in the March review have been generally corrected in the database supplied for the current review.

For 112,722 sample intervals which represent 74% of the Amara resource RC and diamond sampling the author compared database assay entries with laboratory source files supplied by Perseus. For 99.8% of checked samples database entries matched source file records. The small proportion of inconsistencies appear to reflect the database including portions of assay batches repeated due to, for example, failed reference standards which were either not included in the supplied files, or not correctly merged for the database checks. For these samples, the differences in gold grades between database entries and source files are generally small and these inconsistencies do not impact general database confidence.

12.4 Perseus drilling

Consistency checks between, and within database tables for Perseus's AC, RC and diamond drilling showed no significant inconsistencies in the database used for the current estimates.

For sample intervals which represent 95% of Perseus RC and diamond drilling, including trial GC drilling, the author compared database assay entries with laboratory source files supplied by Perseus. No laboratory source files were supplied for AC drilling.

For 99.4% of checked samples database entries match source file records. The small proportion of inconsistencies appear to reflect the database including repeated portions of assay batches, for which results were not included in the supplied files, or not correctly merged for the database checks. For these samples, the differences in gold grades between database entries and source files are generally small and these inconsistencies do not impact general database confidence.

13. Mineral Processing and Metallurgical Testing

13.1 Historical Metallurgical Testwork

The metallurgy of Yaouré sulphide mineralisation has been examined in five previous testwork programs commissioned by Amara with four having been conducted by SGS Mineral Services UK Ltd (SGS; SGS 2012a, 1012b, 2013a, 2013b) and the fifth program conducted in 2014 by Wardell Armstrong International (WAI; Wardell Armstrong, 2015). All five programs are summarised in Amec ter Wheeler (2015).

The metallurgical testwork programs conducted by SGS ran between January 2012 and November 2013. The SGS programs determined the following:

- Whole ore cyanide leaching generally achieved gold extractions exceeding 90% with moderate cyanide consumption. Gold extraction was observed to improve with fineness of grind down to a P80 of 106 µm. The tests indicated there was minimal benefit in grinding finer;
- Extended leaching tests showed a peak extraction around 24 hours with falling extraction to 48 hours. Repeat testing with activated carbon did not achieve higher leach extractions suggesting that preg-robbing was not an issue, but no satisfactory explanation was provided for this trend;
- Gravity concentration was able to recover approximately 30% of the gold into a concentrate. The combined extraction from leaching the concentrate and tailing was no greater than whole ore leaching;
- Similarly, flotation achieved good recovery on some samples but the combined flotation and leach extraction was lower than that achieved by whole ore leaching. Flotation response between samples was variable; and
- The Bond rod mill work index was measured for one composite sample and a value of 26.3 kWh/t was obtained. This ranked the Yaouré material tested as among the hardest of all rocks tested by SGS. The Bond ball mill work index was found to be 13.9 kWh/t, close to the median value of SGS tests.

The main results from the WAI program were as follows:

- No deleterious elements were noted in assays performed. The organic carbon content was generally below 0.03%. The majority of the gold mineralisation was associated with pyrite and silicates;
- Bond rod mill work indices for the Yaouré zone averaged 18.9 kWh/t which is categorised as 'hard' while the CMA zone averaged 15.3 kWh/t which is 'moderate';
- Bond ball mill work indices averaged 16.7 kWh/t and 12.6 kWh/t for the Yaouré and CMA zones which are 'hard' and 'moderate', respectively;
- Bond abrasion indices averaged 0.27 for the sulphide domains which is considered moderate;
- SMC A x b value for the Yaouré zone averaged 20.6 which is characterised as 'very hard' while the CMA zone averaged 28.6 which is characterised as 'hard';
- Gold recovery to a gravity concentrate averaged 45.8% across all domains. E-GRG testing indicated that gravity recoverable gold could be up to 53.8%;
- Flotation gold recoveries of up to 87.8% were achieved, but this was less than the whole of ore leach extraction and did not allow discarding the flotation tail. Variability flotation testwork on the main domains showed only the CMA zone achieved gold recoveries above 90%;
- Cyanide gold leach extractions were highest at a P80 grind size of 75 µm with extractions of between 90 and 93% across all domains. Oxygen addition was beneficial kinetically for cyanide leaching but showed similar final extractions to air addition. Cyanide consumption ranged from

0.4 kg/t NaCN to over 2 kg/t NaCN for the oxide samples. Most of the cyanide leach tests had cyanide added during the test to maintain cyanide concentration; and

- Thickening testwork determined that a unit area of 1.13 $m^2/t.h$ was required for the oxide composite and 0.13 $m^2/t.h$ for the sulphide composite.

13.2 DFS Metallurgical Testwork

13.2.1 Introduction

In 2017 Perseus instigated a metallurgical testwork program aimed to achieve the following objectives:

- Select the most suitable processing route;
- Determine the optimum plant operating parameters for the ore types to be processed;
- Evaluate the variability in metallurgical performance for the range of ore types, weathered states and mineralisation styles; and
- Obtain engineering design data required for plant design.

The testwork program included the following stages:

- Selection of samples for comminution, gold and silver extraction and physical characterisation testwork that were representative of the range of Yaouré mineralised ore types, oxidation states, locations and head grades;
- Comminution variability testwork carried out on individual samples representing the range of mineralised material types and spatial distributions within the target area and on composites to represent specific mill feed blends expected during the life of the project;
- Ore type master composite optimisation testwork program. Formation of ore type master composites by combining selected drill core intervals representing the main mineralised material types.
    - Mineralogy and gold and silver extraction testwork to be carried out to assess the key elements present in each material type and to identify differences in leaching characteristics;
    - Testwork to be carried out to develop the optimal process conditions for the economic optimum maximum gold recovery and minimum reagent consumption;
    - Determine the engineering parameters necessary for process plant design. Viscosity and thickening testwork to be completed on 100% oxide and 100% fresh composites to determine the range in expected slurry characteristics;
- Variability testwork. The selected optimal processing scheme developed from the master composite programs is used for the variability extraction testwork. Comminution and gold and silver extraction variability testwork to be carried out on individual samples representing the range of mineralised material types, grades and spatial distributions within the target and on composites made up to represent specific periods of the project.

The testwork program was modified due to delays in sample drilling with testwork focussing on the CMA fresh master composite since this was representative of the majority of the ore (67% of tonnes and 79% of contained gold) to be treated. The balance of the ore types were tested in the variability phase following the process route selected for the CMA fresh ore.

Details of the program and outcomes are reported in Lycopodium (2017) and the appendices thereto, a summary of which is presented below.

13.2.2 Sample Selection

The ore tonnage and contained gold distribution of the Mineral Reserve is shown in Table 13-1.

Table 13-1 Tonnage and Gold Distribution by Ore Type

Ore Type	Tonnage Distribution %	Gold Distribution %
Leach heaps	5.8	3.8
Oxide/transition	19.2	11.8
CMA basalt	67.1	79.2
Yaouré basalt	5.0	3.5
Yaouré granodiorite	3.2	2.0

Comminution Samples

Eighteen comminution samples were selected from pre-existing core samples; eight samples of CMA basalt, six of Yaouré granodiorite and five of Yaouré basalt. Figure 13-1 shows the locations of mid-points of sample intervals plan view.

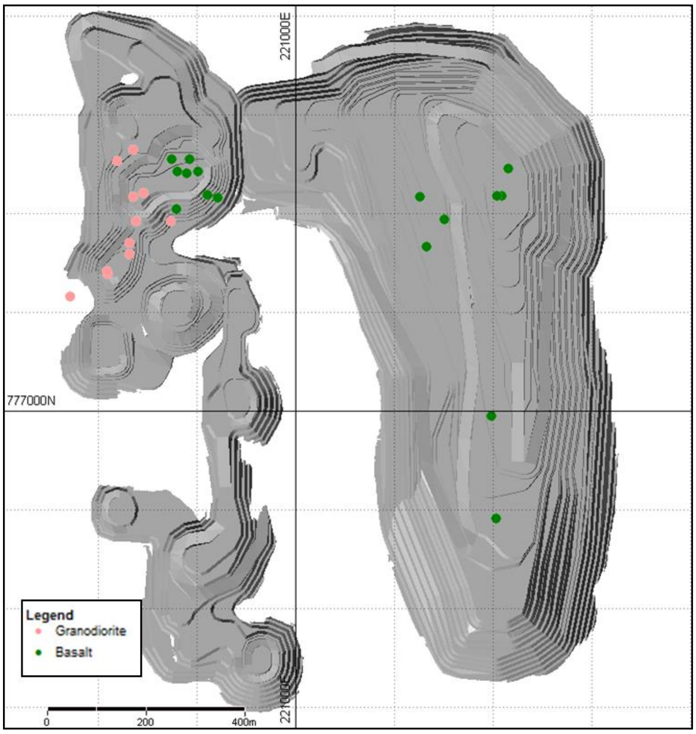


Figure 13-1 Comminution Sample Locations

Metallurgical Composite Samples

A total of five composite samples were generated from existing drill core, new drill core and RC chips to represent:

- CMA ore;
- Yaouré granodiorite-hosted ore;
- Yaouré basalt Y-type mineralisation;
- Yaouré basalt S-type mineralisation;
- Oxide ore.

The samples were selected to give a spatial distribution of ore within a preliminary pit shell available at the time. Figure 13-2 shows locations of mid-points of the sample intervals used to make up each of the composite samples.

The majority of samples are quarter core from each respective drill hole interval. Where quarter core was not available, samples were riffle split from stored RC drill sample reject portions. Approximately 5 kg was riffle split for each one-metre reject sample.

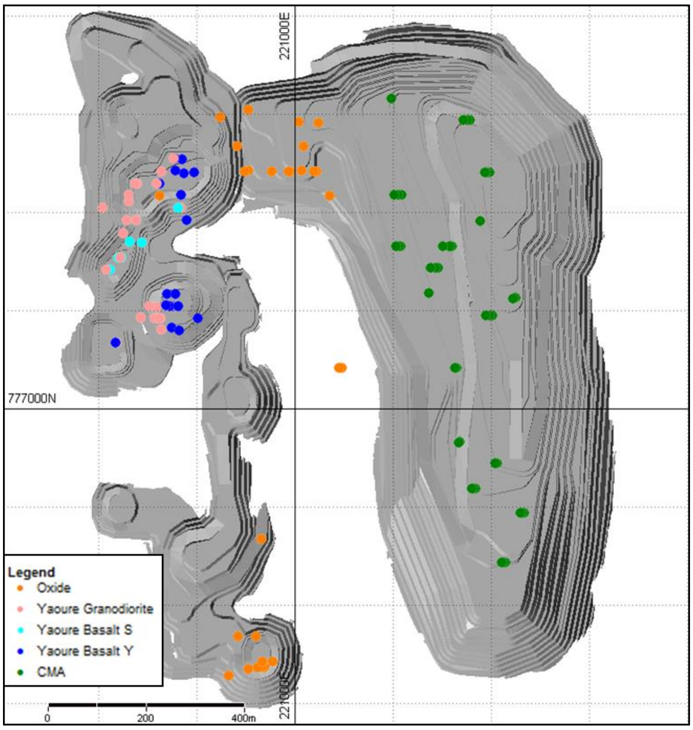


Figure 13-2 Metallurgical Composite Sample Locations

In addition to the samples of remnant mineralisation, sample composites were generated from each of the five existing heap leach dumps CMA 1, CMA 2, CMA 3, Cluff and E Global. The heap leach samples were generated from a 37 auger hole program conducted on the heaps in February 2017. Locations of the auger samples are shown in Figure 13-3.

For each auger hole samples of each metre were collected and weighed. Each metre sample was riffle split and the individual splits combined to make a composite of the hole.

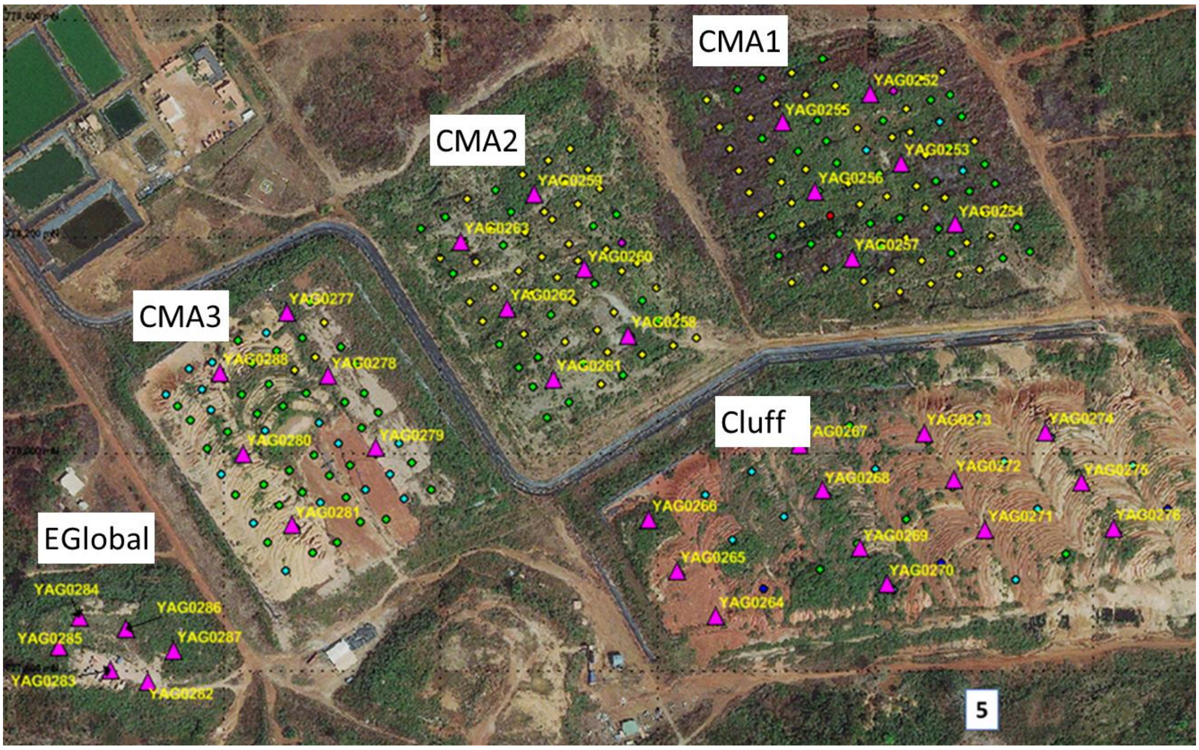


Figure 13-3 Heap Leach Composite Sample Locations

Variability Samples

A total of 78 variability samples were generated from existing core, new core and existing RC material:

- 10 x oxide
- 8 x transition
- 36 x CMA
- 6 x Yaouré granodiorite
- 9 x Yaouré basalt S
- 6 x Yaouré basalt Y
- 3 x Porphyry

Mid-points of each of the drill hole intervals that make up the samples are shown in Figure 13-4.

The samples are considered representative of the mineralisation spatially and in terms of grade and rock properties.

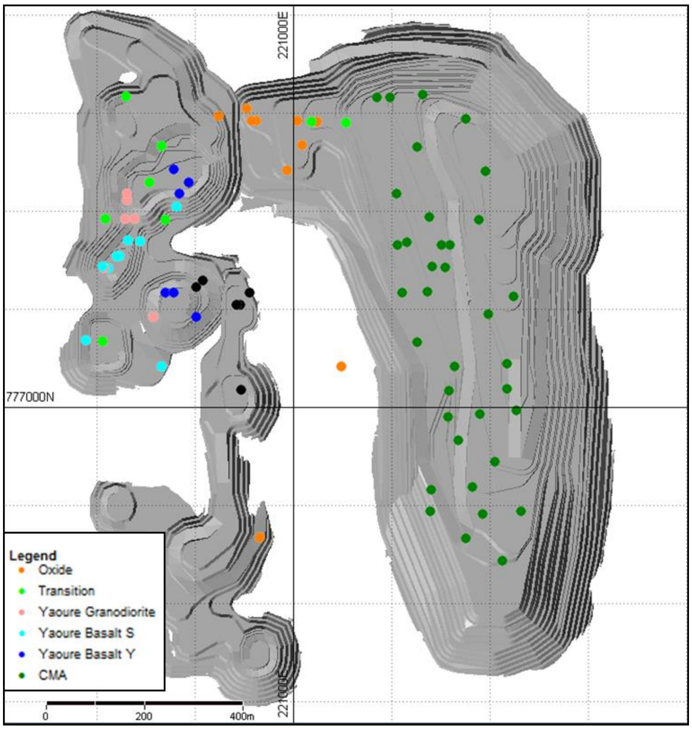


Figure 13-4 Locations of Variability Samples

13.2.3 Comminution Testwork

A comminution testwork program was undertaken to determine the ore physical characteristics to allow modelling of the grinding energy required for size reduction to facilitate a crushing and milling circuit design appropriate for the plant throughput and feed type.

The following comminution tests were performed on the seven fresh CMA composites, the master composite, six Yaouré (YAO) granodiorite-hosted ores and five Yaouré basalt-hosted ores.

- SMC tests (@ -22.4+19.0 mm with the master composite tested using the -31.5+26.5 mm size fraction);
- Bond Abrasion Index (Ai) determination;
- Bond Ball Mill Work Index (BWi) determination (@ 106 µm closing screen to yield a P_{80} of 75 µm); and
- Bond Rod Mill Work Index (RWi) determination (@ 1,180 µm closing screen to yield a P_{80} of approximately 750 µm).

The target grind size of P_{80} of 75 µm was determined from the grind-recovery test described below.

Results of the testwork are summarised in Table 13-2.

OMC Mineral Consultants (OMC, 2017) reviewed the comminution testwork to allow modelling of the grinding energy required.

Table 13-2 Comminution Testwork Results Summary

Composite	Ai G	BWi kWh/t	DWi kWh/mm^3	SG	Ta	Axb
CMA Master Comp	0.1057	13.54	7.34	2.79	0.35	37.8
CMA Basalt Composite						
COMM-1	0.1524	13.65	8.63	2.8	0..3	32.4
COMM-2	0.1836	12.92	7.61	2.77	0.34	36.5
COMM-3	0.1049	14.17	8.4	2.8	0.31	33.5
COMM-4	0.2405	14.35	8.02	2.79	0.32	34.6
COMM-5	0.1128	10.30	5.9	2.78	0.44	47.4
COMM-6	0.1359	12.91	8.41	2.78	0.31	33.4
COMM-7	0.2118	13.83	8.41	2.78	0.31	33.3
YAO Granodiorite Composite						
COMM-8	0.2106	14.20	10.05	2.74	0.26	27.6
COMM-9	0.1402	13.88	9.23	2.75	0.28	30.1
COMM-10	0.3376	15.60	11.24	2.72	0.23	24.0
COMM-11	0.1032	11.91	3.65	2.58	0.71	71.0
COMM-12	0.2632	16.30	13.41	2.71	0.19	20.0
COMM-13	0.3274	17.22	10.58	2.73	0.24	25.8
YAO Basalt Composite						
COMM-14	0.1040	12.98	7.21	2.74	0.36	38.2
COMM-15	0.0873	14.96	10.31	2.76	0.25	26.8
COMM-16	0.1006	16.39	11.93	2.79	0.22	23.0
COMM-17	0.1554	17.97	12.65	2.74	0.2	22.0

13.2.4 Metallurgical Testwork – CMA Master Composite

Composite Head Analyses

Duplicate gold analyses were performed by standard fire-assay on sub-samples split from the master composite with the balance of the elements being determined by ICP scan or standard assay techniques. Key results are summarised in Table 13-3. The CMA master composite averaged 2.10 g/t Au, but the variance in the individual assays suggests the presence of significant quantities of coarse gold or highly localised fine gold concentrations. The CMA fresh composite grade agrees well with the LOM average CMA fresh ore grade of 2.08 g/t.

Table 13-3 Head Assays on the CMA Master Composite

Composite ID	Au g/t		Ag (ppm)	As (ppm)	$C_{organic}$ (%)	$S_{sulphide}$ (%)	Sb (ppm)
	Au_{1-2}	Au_{ave}					
CMA Master	1.84/2.36	2.1	0.6	<10	0.03	0.52	0.4

Mineralogical Analysis by QEMSCAN and XRD

A CMA Master Composite sub-sample was ground to P_{80}:75 µm and subjected to gravity separation with both the gravity concentrate and tail being submitted for quantitative mineralogical (QEMSCAN) and XRD analysis.

Pyrite is the main sulphide mineral, making up approximately 19% mass in the gravity concentrate and 1% in the gravity tail. In the concentrate, the pyrite is well liberated (84.5%).

Six coarse free gold grains were observed in the gravity concentrate. Native gold (essentially gold-silver alloy, with less than 8% Ag) was the only gold phase detected by QEMSCAN.

A total of 53 gold grains were detected of which 16 were liberated, ranging in size from 5 µm to 38 µm, and made up 74.0% of the elemental gold. The remaining gold grains were smaller than 15 µm (mostly smaller than 10 µm) and occurred in the pyrite.

Gold detection by QEMSCAN cannot be considered representative due to the low gold grade and possible nugget effect.

Silicates make up the majority of the gangue minerals with lesser carbonates, Fe-oxides, Ti minerals and apatite.

Grind-Recovery Test Series

Cyanidation tests with and without removal of gravity gold prior to leaching were performed on the master composite at different grind sizes to evaluate the effect of gravity and grind size on gold extraction.

Cyanidation test work was performed at target grind sizes of P_{80} 106, 90, 75, 63 and 53 µm following on from historical testwork which had variously nominated 106 µm and 75 µm P_{80} grinds as being optimal. During the leach tests, intermediate solution samples were removed to determine gold, silver, and arsenic dissolutions. The grind/gravity/extraction results are summarised in Table 13-4.

Table 13-4 Grind Size Sensitivity and Gravity Test Work – CMA Master Composite

Test No	Grind	Test Type	Calc Head	Au Extraction % @ Time hours								Residue	Reagent Consumption (kg/t)	
	P80 um		Au (g/t)	0	2	4	8	16	24	36	48	Au (g/t)	NaCN	Lime
WH7089	106	DCN	2.21	0.0	74.5	84.5	90.3	91.0	91.0	91.0	91.0	0.20	0.67	0.50
WH7090	90	DCN	2.60	0.0	72.6	86.2	87.8	90.0	90.5	91.5	91.5	0.22	0.67	0.48
WH7091	75	DCN	2.56	0.0	82.1	90.8	91.3	91.9	92.4	93.0	93.0	0.18	0.67	0.49
WH8092	63	DCN	2.11	0.0	79.8	88.9	90.3	91.6	92.2	92.2	92.9	0.15	0.67	0.49
WH8093	53	DCN	1.81	0.0	83.6	90.9	91.6	93.2	93.2	93.2	93.9	0.11	0.67	0.50
WH7246	106	Gravity DCN	1.82	14.3	74.9	80.6	83.4	84.9	85.3	87.5	87.9	0.22	0.50	0.87
WH7247	90	Gravity DCN	1.94	10.8	74.9	80.2	85.1	87.6	89.0	89.0	89.7	0.20	0.47	0.77
WH7248	75	Gravity DCN	1.94	12.1	74.0	77.4	81.1	86.2	88.7	90.0	90.7	0.18	0.33	0.71
WH7249	63	Gravity DCN	2.23	17.9	77.4	82.0	86.8	90.0	91.2	91.8	92.4	0.17	0.58	0.75
WH7250	53	Gravity DCN	2.28	16.0	71.5	76.0	81.0	91.2	92.4	93.0	93.0	0.16	0.54	0.79

Gravity Assessment

The effect on overall gold extraction following inclusion of a gravity concentration stage prior to leaching was evaluated as part of the grind sensitivity testwork. The grind sensitivity testwork was conducted with and without a gravity stage prior to leaching.

For the gravity testwork, each composite was ground to 80% passing (P_{80}) 850 µm and processed in a Knelson concentrator to produce a gravity concentrate and tail. Free gold and silver in the gravity concentrate was recovered using mercury with the amalgam assayed to extinction to determine the contained gold and silver. Amalgam tails (gravity concentrate with free gold and silver removed) and gravity tails were recombined and milled to the required grind size prior to leaching. The gravity / leaching testwork results indicate that:

- Between 11 and 18% free gold is present in the CMA master composite. Free silver content is between 4 and 8% for the CMA master composite. The low gravity recoverable gold (GRG) content is not consistent with the variability in calculated head suggesting that GRG liberation was poor at 850 µm;
- Removal of gravity gold prior to leaching appears to have slowed leach kinetics for all grind sizes. This is counterintuitive suggesting other differences between tests. Sizing of the leach residues was performed, but only served to confirm that the P_{80} values were very similar to the target grind sizes;
- Removal of gravity gold prior to leaching had minimal impact on final gold extraction;
- Cyanide and lime consumptions were comparable with and without gravity.

Whilst the laboratory testwork did not typically show a recovery benefit from the gravity stage, inclusion of a gravity step improves the reproducibility of the testwork by removing any slow leaching coarse 'spotty' gold providing more consistent gravity tails grades for comparison of subsequent leach testwork results.

Cyanide Concentration Test Series

Gold extraction versus cyanide concentration tests were conducted on gravity tailings from the CMA master composite at the selected primary grind P_{80} 75 µm. The leach tests were conducted for 48 hours at a slurry density of 40% solids with oxygen sparging. Cyanide concentrations of 0.15%, 0.05% and 0.025% NaCN were evaluated in addition to the baseline test using NaCN of 0.1% NaCN (WH7248). The NaCN concentrations were initially set to their targets, and then allowed to decay to the baseline of 0.025 g/L where they were maintained for the remainder of each test. Leach solution samples were removed at 2, 4, 8, 16, 24, 36 and 48 hours to evaluate leach kinetics.

The results of these tests demonstrate that, for the CMA master composite, gold extraction is not sensitive to cyanide concentration over the range tested. Overall gold recoveries were between 90 and 91% irrespective of initial cyanide concentration.

Based on the results from this test series, an initial cyanide concentration of 0.05% NaCN was selected for further testwork.

Slurry Density Test Series

Slurry densities of 40%, 45%, 50%, and 55% solids were tested on the gravity tailings from the master composite ground to the target size of P_{80} 75 µm. Leaching of the gravity tailings was carried out for 48 hours with oxygen sparging during each test to achieve 20 to 25 mg/L DO. NaCN was initially adjusted to 0.05% NaCN, and then allowed to decay to 250 ppm and maintained at this level. Solution samples were removed at 2, 4, 6, 8, 12, 18, and 24 hours and assayed for leach kinetics.

Although overall gold extractions at 48 hours leach duration were very similar suggesting that slurry density had little impact on leaching, it was observed for the tests conducted at 50% and 55% solids, that the gold leach kinetics were significantly slower than for the lower slurry density tests conducted at 40% and 45% solids.

Repeat tests were conducted with 0.75 kg/t NaCN addition at 50% and 55% solids. In both cases, overall extraction results were similar to the earlier tests but leach kinetics were faster in the repeat test with 0.75 kg/t NaCN addition. Similarly increased kinetics were not noted in the original cyanide optimisation testwork, once again suggesting that there are other factors influencing the testwork outcomes with variability between sub-samples displaying greater extraction rate differences than the variables investigated.

Based on this test series, a slurry density of 40% solids was established as the preferred leach condition.

Leach Optimisation Testwork

Leach enhancement cyanidation tests were conducted on P_{80} 75 µm ground gravity tailings generated from the CMA master composite to evaluate the potential benefits of air sparging, oxygen (O_2) sparging to maintain dissolved O_2 (DO) at >20 ppm, alkaline pre-aeration with O_2 and addition of lead nitrate to the leach feed at three different dosages. Baseline tests were carried out at a leach pulp density of 40% solids with 0.05% NaCN addition and a total leach retention time of 48 hours.

These tests demonstrated that O_2 sparging significantly improved the initial leach kinetics but gold extraction was essentially complete after 24 to 30 hours of leaching when either air or oxygen was used for sparging.

It was decided to use air sparging for all testing following this outcome.

Pre-aeration did not have any effect on leach kinetics or cyanide consumption, and as such, was eliminated from further evaluation.

Similar to the results observed for the oxygen sparging test, tests using higher addition rates of lead nitrate were found to improve the initial leach kinetics but overall resulted in similar gold extraction rates in comparison with using air sparging alone. As such, the use of lead nitrate was not adopted as part of the leach enhancement program.

Demonstration Leach Tests at Selected Conditions

Three parallel whole of ore leach tests were conducted at P_{80} 75 µm grind, no gravity recovery, air sparged at 40% solids to confirm recoveries and reagent consumption under the selected test conditions. The results are presented in Table 13-5.

For these sub-samples, it appears that under the selected leach conditions, a whole ore leach can achieve similar gold recoveries compared to the previous gravity / leach tests. The whole of ore leaches achieved gold extractions between 91.7 and 93.6% and typical reagent consumption was noted in the bottle roll tests.

Table 13-5 Demonstration Whole of Ore Leach Tests

Test No	Calc Head	Au Extraction % @ Time hours								Tail	Reagent Consumption (kg/t)	
	Au (g/t)	0	2	4	8	16	24	36	48	Au (g/t)	NaCN	Lime
WH7694	2.05	0	53.4	81.3	89.0	90.4	91.1	91.7	91.7	0.17	0.28	0.89
WH7695	2.73	0	45.6	76.9	88.5	90.0	91.6	92.6	93.0	0.19	0.24	0.94
WH7696	2.45	0	46.5	74.7	87.1	91.7	91.7	92.2	92.2	0.19	0.28	0.87
WH7734	2.40	0	47.5	59.6	66.8	72.3	80.4	88.4	93.3	0.16	0.78	0.36
WH7735	2.17	0	39.0	51.4	58.6	70.3	81.2	88.8	93.6	0.14	0.85	0.39

An ICP scan of the bulk leach tails solution was conducted to check if there were any deleterious ions in solution that needed to be addressed. As can be seen from the data in Table 13-6 the solution has very few elements with significant solution concentrations. Elements reporting as below detection limit are omitted from the summary table.

Table 13-6 Bulk Leach Tails Solution Assay

Element	WH7735 Cyanidation Tailings
CN_{free}	76.2
CN_{wad}	89.2
pH	9.57
Ag	0.14
Al	26.2
Cu	9.90
Fe	21.6
K	10.0
Mg	11.0
Mn	0.35
Mo	0.15
Na	338
Ni	0.40
Pb	<0.05
Sr	0.12
Ti	0.60
V	0.16
Zn	0.88
Zr	0.10

Data are in mg/L unless otherwise stated

Diagnostic Leach Testwork

Cyanidation testing of the CMA master composite has consistently displayed a refractory component that is not recoverable at a P_{80} 75 µm grind. A sub-sample (CMA Master Composite) was submitted for multi-stage diagnostic gold leach testwork to establish the nature of the refractory gold. Results are summarised in Table 13-7.

Table 13-7 CMA Master Composite – Diagnostic Gold Leach

Diagnostic Stage	Gold Content	Gold	
		g/t	%
Amalgamation on Gravity Con	Free gravity	1.18	50.15
Direct Leach	Cyanide soluble	0.99	42.25
Dil. HCl Digest/Direct Leach	Carbonate and/or labile sulphides (e.g.	0.02	0.96
Dil. HNO3 Digest/Direct Leach	pyrrhotite) locked	0.14	6.04
Aqua Regia Digest	Arsenical Mineral (arsenopyrite) locked	0.009	0.38
Total Fire Assay Smelt	Pyritic sulphide mineral locked	0.005	0.21
	Silicate (gangue) and / or graphitic carbon encapsulated		
Total Gold Content		**2.34**	**100.00**

13.2.5 Metallurgical Testwork – Minor Ore Composites

Composite Head Analyses

Composite samples representing the minor ore types were made up from subsamples of the variability intercepts:

- Yaouré Basalt S;
- Yaouré Basalt Y;
- Yaouré Granodiorite;
- Yaouré Oxide.

Testing adopted the processing conditions determined for the CMA fresh ore, with a grind recovery investigation being conducted to better understand the ore characteristics.

Duplicate gold analyses were performed by standard fire-assay on sub-samples split from the master composites along with assays for silver and arsenic. Results are summarised in Table 13-8. As for the CMA master composite, the variance in the individual assays suggests a strong localised nugget or spotty gold effect.

Table 13-8 Head Assays for Minor Ore Composites

Composite ID	Au (g/t)		Ag (ppm)	As (ppm)
	$Au_{1,2}$	Au_{ave}		
Oxide	2.19 / 3.65	2.92	0.6	30
Basalt Y	2.23 / 2.64	2.44	0.6	10
Basalt S	2.49 / 2.65	2.57	0.6	60
Granodiorite	1.71 / 3.13	2.42	0.6	10

Grind-Recovery Test Series

Cyanidation tests with gravity gold recovery by amalgamation prior to leaching were performed on the ore type composites at different grind sizes to evaluate the effect of gravity and grind size on gold extraction.

Cyanidation test work was performed at target grind sizes of P_{80} 106, 90, 75, 63 and 53 µm in line with the work on the CMA composite. During the leach tests, intermediate solution samples were removed to determine gold, silver, and arsenic dissolutions to allow leach kinetics to be determined.

The gravity tails cyanidation testwork was conducted at 40% solids with air sparging and 0.5 kg/t NaCN with a 48 hour leach duration.

The grind / gravity / extraction results are summarised in Table 13-9. The results typically indicate the following:

- Leach kinetics indicated that gold leaching was rapid for the fresh composites with the bulk of the gold dissolution occurring within eight hours. The oxide leaching was very slow, however, despite having removed the gravity gold fraction. The poorer mass transfer rates with the viscous slurry are partly responsible, but subsequent testing indicated that mineralisation may be an issue as well. This is supported by the improved extraction with finer grinding discussed below;
- The oxide extractions improve significantly with finer grinding suggesting an optimum P_{80} of 60 µm. This grind is likely to be achieved with these softer ores being preferentially finer ground in

blend with harder fresh ore. The need for fine grinding suggests a degree of gold locking with gangue minerals;

- Increased fineness of grind typically achieves lower residue grades and higher gold extractions for the fresh ores, but this is a relatively minor improvement considering increasing costs with grind fineness. Optimum grind sizes for these ores would typically be P_{80} 90 µm for the basalt and 75 µm for the granodiorite. As for the CMA testing, comparison of results is made difficult by the variability in calculated heads between tests; and
- Cyanide and lime consumptions were comparable across the grind size range. Cyanide and particularly lime required are higher for the oxide composite with likely clay buffering effects. The Yaouré fresh ores behaved similarly to the CMA composite.

Leach kinetics indicated that gold leaching was fairly rapid initially, but slowed down thereafter. This could relate to the slower leaching electrum fraction noted in the mineralogy.

Table 13-9 Grind Size Sensitivity and Gravity Test Work – Minor Ore Composites

Test No	Grind	Composite	Calc Head	Au Extraction % @ Time hours								Residue	Reagent Consumption (kg/t)	
	P80 um		Au (g/t)	0	2	4	8	16	24	36	48	Au (g/t)	NaCN	Lime
WH8177	110	Oxide	2.48	26.4	63.6	69.3	75.1	79.3	81.8	85.1	88.3	0.29	0.30	3.01
WH8178	89		2.37	35.0	72.1	78.0	82.3	86.4	88.2	90.2	92.4	0.18	0.36	2.64
WH8179	74		2.60	38.6	76.9	81.4	85.6	88.6	90.7	93.0	93.3	0.18	0.32	2.64
WH8180	60		2.12	37.1	82.5	87.0	90.0	92.7	94.3	95.0	96.2	0.08	0.32	3.08
WH8181	56		2.19	36.6	82.4	87.1	89.8	92.3	93.3	95.4	96.3	0.08	0.36	2.65
WH8162	106	Basalt Y	2.64	49.6	82.7	88.3	90.2	91.3	91.8	92.3	92.8	0.19	0.25	0.32
WH8163	90		2.69	53.1	84.8	89.7	92.1	92.9	93.9	94.2	04.4	0.15	0.29	0.35
WH8164	73		2.26	50.0	84.8	90.3	91.9	93.5	93.8	93.8	03.8	0.14	0.25	0.34
WH8165	58		2.31	48.8	88.1	91.6	93.5	93.8	94.1	94.4	04.4	0.13	0.25	0.37
WH8166	54		2.15	40.4	87.8	92.6	93.9	94.9	04.9	94.9	04.9	0.11	0.24	0.32
WH8167	112	Basalt S	2.85	28.6	79.0	83.1	86.7	88.2	89.6	89.6	90.5	0.27	0.25	0.31
WH8168	90		2.30	33.0	83.4	86.6	88.5	88.8	90.9	91.2	91.8	0.19	0.21	0.32
WH8169	74		1.95	22.3	81.4	86.7	88.9	89.2	89.6	90.3	90.3	0.19	0.29	0.29
WH8170	61		2.09	28.0	84.8	87.3	88.3	90.0	90.3	91.3	91.6	0.18	0.24	0.30
WH8171	53		2.04	26.7	85.5	89.1	90.9	90.9	90.9	91.2	92.2	0.16	0.29	0.31
WH8172	105	Granodiorite	2.85	51.8	84.5	89.9	92.4	93.7	94.1	94.4	94.4	0.16	0.17	0.34
WH8173	87		2.55	56.8	88.0	92.0	92.9	93.4	94.0	94.5	94.5	0.14	0.17	0.30
WH8174	72		3.46	56.7	89.2	93.0	94.7	94.9	95.7	95.7	95.7	0.15	0.17	0.26
WH8175	60		2.45	51.7	90.0	93.9	94.8	95.1	95.9	95.9	95.9	0.10	0.17	0.27
WH8176	55		2.62	49.7	89.5	93.7	95.8	96.7	96.7	96.7	96.9	0.08	0.21	0.27

13.2.6 Metallurgical Testwork – Variability Samples

Confirmatory testing of the process flowsheet using the selected test conditions established for the CMA master composite was conducted on the variability composites representing the various ore sources, weathered states, grade ranges and mineralisation styles. These tests were conducted at a target grind P_{80} size of 75 µm with gravity concentration using amalgamation to recover the free gold. Cyanidation of the gravity tailing was carried out for 48 hours at 40% solids with air sparging. NaCN concentration was initially adjusted to 0.05% NaCN and allowed to decay to 250 ppm NaCN.

CMA Variability Testwork

Results of tests conducted on the CMA variability composites are summarised in Table 13-10 and Table 13-11.

The samples in Table 13-10 are those that contributed to the master composite sample; those in Table 13-11 are additional variability samples. Overall gold extraction was fairly consistent and moderately well aligned with the master composite results.

Table 13-10 Grind Size Sensitivity and Gravity Test Work – CMA Variability Samples (Var #11-28)

Sample No	Test No	Assay Head	Calc Head	Au Extraction % @ Time hours								Residue	Reagent Consumption (kg/t)	
		Au (g/t)	Au (g/t)	0	2	4	8	16	24	36	48	Au (g/t)	NaCN	Lime
11	WH7736	1.57	1.52	34.9	76.9	78.9	79.8	82.6	83.1	83.5	83.5	0.25	0.22	0.51
12	WH7737	2.02	1.89	30.2	78.2	80.9	81.7	83.9	84.7	85.0	85.7	0.27	0.25	0.44
13	WH7738	1.36	1.68	55.1	79.6	89.7	93.6	95.2	95.6	95.6	96.4	0.06	0.29	0.78
14	WH7739	2.40	1.99	33.8	83.5	84.6	86.8	88.9	89.2	89.6	90.2	0.20	0.22	0.51
15	WH7740	1.51	1.95	30.0	81.9	86.4	90.1	91.6	93.0	93.7	94.4	0.11	0.22	0.71
16	WH7741	2.20	2.75	53.8	81.9	84.4	85.1	86.2	86.2	87.4	87.6	0.34	0.22	0.52
17	WH7742	2.56	2.17	29.7	82.0	83.7	85.0	85.7	86.9	87.2	87.5	0.27	0.17	0.47
18	WH7743	2.52	2.43	47.8	84.5	86.9	87.8	89.3	89.8	90.4	90.9	0.22	0.22	0.70
19	WH7744	2.28	2.96	54.0	88.5	90.7	90.9	91.9	92.1	92.3	92.6	0.22	0.17	0.47
20	WH7745	1.65	2.01	23.2	73.7	83.6	88.2	90.0	90.7	91.7	93.0	0.14	0.24	0.36
21	WH7746	1.64	4.10	33.3	50.5	64.5	89.5	95.0	96.7	97.3	98.3	0.07	0.32	1.05
22	WH7747	1.52	1.83	39.4	80.8	84.4	86.8	87.9	88.3	89.4	90.2	0.18	0.28	0.47
23	WH7748	1.27	1.13	44.8	84.7	87.3	88.6	89.9	92.3	92.9	92.9	0.08	0.29	0.36
24	WH7749	1.77	2.74	38.9	84.7	87.1	89.0	89.5	90.5	91.2	91.2	0.24	0.24	0.34
25	WH7750	1.38	1.68	41.7	83.7	87.6	89.8	91.4	92.7	92.7	93.4	0.11	0.18	0.30
26	WH7751	3.53	3.68	29.9	84.2	89.4	92.5	93.3	93.6	94.0	94.0	0.22	0.25	0.41
27	WH7752	1.43	1.71	26.9	82.3	84.4	88.6	89.5	89.5	89.9	90.6	0.16	0.25	0.32
Average		1.98	2.33	38.5	80.0	84.2	87.5	89.1	89.8	90.4	90.9	0.21	0.23	0.51

Table 13-11 Grind Size Sensitivity and Gravity Test Work – CMA Variability Samples (Var #29-46)

Sample No	Test No	Assay Head	Calc Head	Au Extraction % @ Time hours								Residue	Reagent Consumption (kg/t)	
		Au (g/t)	Au (g/t)	0	2	4	8	16	24	36	48	Au (g/t)	NaCN	Lime
29	WH7981	1.28	1.11	41.1	85.1	87.8	89.7	90.3	91.0	91.0	91.0	0.10	0.17	0.32
30	WH7982	1.37	1.59	35.0	82.3	84.1	86.8	88.2	89.9	89.9	89.9	0.16	0.17	0.32
31	WH7983	0.40	0.63	35.6	67.7	75.9	82.7	87.2	89.4	93.7	93.7	0.04	0.22	0.64
32	WH7984	4.92	3.69	28.2	78.2	81.8	84.1	86.0	87.5	89.0	89.7	0.38	0.21	0.30
33	WH7985	1.83	1.65	31.5	75.5	83.5	86.6	87.0	89.1	89.1	89.1	0.18	0.22	0.52
34	WH7986	0.63	0.85	40.7	81.4	84.9	86.6	87.4	88.2	88.2	88.2	0.10	0.22	0.31
35	WH7987	2.24	2.38	46.2	84.7	89.0	90.2	91.4	92.3	92.6	92.9	0.17	0.22	0.34
36	WH7988	1.46	1.44	29.4	80.4	81.9	85.4	85.9	86.4	87.8	88.2	0.17	0.24	0.31
37	WH7989	1.24	2.40	58.8	79.4	88.6	91.0	91.6	92.8	93.3	93.3	0.16	0.22	1.04
38	WH7990	2.39	2.07	36.4	84.8	87.3	88.4	89.4	90.0	90.4	90.4	0.20	0.22	0.30
39	WH7991	2.56	2.76	29.7	79.3	83.3	83.6	85.9	86.4	86.9	87.3	0.35	0.24	0.31
40	WH7992	2.52	2.75	42.8	84.2	86.4	89.0	90.3	90.8	91.0	91.3	0.24	0.22	0.32
41	WH7993	1.18	2.24	25.4	59.2	74.7	89.4	93.8	95.1	96.3	96.9	0.07	0.22	0.59
42	WH7994	1.97	1.86	35.0	81.0	82.9	84.9	85.6	86.0	86.7	87.1	0.24	0.28	0.33
43	WH7995	2.63	2.48	51.0	86.9	89.3	90.4	90.7	91.0	91.3	91.5	0.21	0.21	0.30
44	WH7996	3.34	2.81	32.6	73.4	76.3	78.6	81.1	83.8	87.2	88.6	0.32	0.25	0.28
45	WH7997	2.63	2.74	31.3	80.8	84.5	85.3	87.9	88.4	88.4	88.9	0.31	0.25	0.30
46	WH7998	2.48	2.33	37.6	84.0	86.9	88.7	90.5	90.8	91.1	91.4	0.20	0.25	0.32
Average		2.06	2.10	37.1	79.4	83.8	86.8	88.4	89.4	90.2	90.5	0.20	0.22	0.40

Yaouré Oxide Variability Testwork

The oxide variability samples were leached following the standard gravity / cyanidation test conditions. The results of these tests are shown in Table 13-12.

Results for the oxide variability samples were surprisingly mixed with some good gravity and leach extractions, but very poor results from Samples 3 and 4. Duplicate repeat assaying of the residues from these poor extraction tests indicated good repeatability between the averages of the assays, but larger difference between individual assays than expected. This suggests that the spotty gold occurrence arises as much from localised clusters of fine gold particles as much as individual coarse grains.

Repeat testing of Samples 3 and 4 was conducted at lower density (35% solids) and as a CIL test as there was minor organic carbon present (0.4%) in Sample 3. The Sample 3 gold extraction improved marginally to 78% with no preg-robbing being evident, but Sample 4 achieved 87% extraction at 35% solids showing that the slurry viscosity did have an impact. This improved recovery was not reflected in the recovery estimates as these were based on standardised test conditions.

Table 13-12 Oxide Samples – Variability Test Results

Sample No	Test No	Assay Head	Calc Head	Au Extraction % @ Time hours								Residue	Reagent Consumption (kg/t)	
		Au (g/t)	Au (g/t)	0	2	4	8	16	24	36	48	Au (g/t)	NaCN	Lime
VAR-01	WH8116	0.69 / 0.41	0.94	23.3	98.2	98.2	98.9	99.7	98.9	97.5	96.8	0.03	0.25	3.59
VAR-02	WH8117	0.73 / 0.74	0.91	16.0	96.9	96.9	99.3	99.3	99.3	98.5	97.8	0.02	0.25	3.77
VAR-03	WH8118A	1.56 / 1.25	2.02	18.5	49.7	54.8	62.6	67.1	69.2	72.2	74.8	0.51	0.36	2.89
VAR-03	WH8118B	1.56 / 1.25	2.06	18.2	48.8	53.8	61.5	66.0	68.0	71.0	73.5	0.55	0.36	2.89
VAR-04	WH8119A	2.10 / 2.65	1.98	6.56	54.6	57.6	61.2	65.9	70.0	72.4	73.8	0.52	0.25	4.67
VAR-04	WH8119B	2.10 / 2.65	1.98	6.56	54.6	57.6	61.2	65.9	70.0	72.4	73.8	0.52	0.25	4.67
VAR-05	WH8120	3.40 / 3.48	4.11	22.7	77.8	81.0	85.2	86.9	88.2	90.5	92.5	0.31	0.25	3.85
VAR-06	WH8121	3.66 / 3.38	3.48	13.7	76.7	82.6	83.4	88.3	89.1	89.1	90.2	0.34	0.33	3.19
VAR-07	WH8122	5.08 / 0.74	2.64	73.4	97.8	98.1	98.3	98.3	98.6	98.9	98.9	0.03	0.37	2.20
VAR-08	WH8123	1.33 / 0.66	1.03	49.4	84.3	88.5	94.8	94.8	95.5	95.5	96.1	0.04	0.37	2.81
VAR-09	WH8124	0.40 / 0.41	0.64	32.0	95.2	95.2	96.3	97.4	97.4	98.4	98.4	0.01	0.30	3.16
VAR-10	WH8125	2.44 / 2.61	2.96	41.0	85.6	88.8	90.3	93.4	93.4	93.8	95.6	0.13	0.32	2.18

Yaouré Transition Variability Testwork

The transition variability samples were leached following the standard gravity / cyanidation test conditions. The results of these tests are shown in Table 13-13. The transition samples show the mixed influences of the fresh and oxide behaviour with generally fast leach kinetics and high gold extractions. One sample contradicts the trend with a slower leaching fraction and notably poorer extraction with no apparent explanation.

Table 13-13 Transition Samples – Variability Test Results

Sample No	Test No	Assay Head	Calc Head	Au Extraction % @ Time hours								Residue	Reagent Consumptio n (kg/t)	
		Au (g/t)	Au (g/t)	0	2	4	8	16	24	36	48	Au (g/t)	NaCN	Lime
TRN-VAR-75	WH8126	3.09 / 3.34	2.09	52.5	88.4	91.2	92.6	94.9	94.9	94.9	95.2	0.10	0.29	0.72
TRN-VAR-76	WH8127	4.74 / 5.41	6.10	61.6	90.6	93.3	94.9	95.6	95.8	96.1	96.7	0.20	0.17	0.53
TRN-VAR-77	WH8128	2.41 / 5.05	4.73	73.4	92.8	94.5	96.1	97.0	97.3	97.5	97.5	0.12	0.21	1.37
TRN-VAR-78	WH8129	1.39 / 1.15	1.28	19.8	67.4	71.4	76.5	80.4	80.9	83.0	85.1	0.19	0.25	3.34
TRN-VAR-79	WH8130	10.2 / 10.5	10.1	46.2	87.6	90.4	93.8	95.6	96.0	97.1	97.3	0.27	0.30	3.01
TRN-VAR-80	WH8131	1.27 / 1.20	1.17	32.9	84.9	89.3	89.9	90.6	91.7	91.7	92.3	0.09	0.24	0.39
TRN-VAR-81	WH8132	2.47 / 2.20	2.96	57.1	88.7	92.9	95.1	95.4	96.1	96.5	97.0	0.09	0.18	0.98
TRN-VAR-82	WH8133	1.05 / 0.84	1.20	55.9	89.7	91.5	92.7	93.3	94.4	95.0	95.0	0.06	0.07	0.51

Yaouré Sulphide Ores Variability Testwork

The Yaouré fresh variability samples were leached following the standard gravity / cyanidation test conditions. The variability samples were grouped by host lithology into basalt S and Y (YBS, YBY), granodiorite (YG) and porphyry (YPOR). The results of these tests are shown in Table 13-14. Results for the Yaouré fresh variability samples were quite consistent with generally faster leach kinetics and higher overall gold extractions than the CMA samples. The lower basalt S gold extraction from the composite sample was not repeated for the variability sample group.

Table 13-14 Yaouré Sulphide Samples – Variability Test Results

Sample No	Test No	Assay Head	Calc Head	Au Extraction % @ Time hours								Residue	Reagent Consumption (kg/t)	
		Au (g/t)	Au (g/t)	0	2	4	8	16	24	36	48	Au (g/t)	NaCN	Lime
YG-VAR-47	WH8134	0.62 / 1.43	1.15	65.8	91.4	92.6	93.9	93.9	93.9	93.9	93.9	0.07	0.15	0.36
YG-VAR-49	WH8135	1.34 / 3.06	0.93	63.6	91.8	92.6	94.2	95.7	95.7	95.7	95.7	0.04	0.15	0.32
YG-VAR-51	WH8136	1.42 / 1.06	2.37	78.1	96.5	97.4	97.7	98.0	98.3	98.3	98.3	0.04	0.24	0.32
YG-VAR-52	WH8137	0.75 / 0.61	0.81	40.0	83.4	87.9	90.6	90.6	90.6	91.4	91.4	0.07	0.14	0.35
YG-VAR-53	WH8138	2.72 / 3.14	2.12	46.3	87.8	89.9	91.6	92.6	93.5	93.9	93.9	0.13	0.17	0.25
YG-VAR-54	WH8139	5.31 / 5.81	6.35	84.5	95.1	96.7	97.4	98.1	98.6	98.7	98.9	0.07	0.22	0.34
YBS-VAR-55	WH8140	2.43 / 5.94	2.02	49.1	85.5	88.4	90.2	90.9	92.2	92.6	92.6	0.15	0.22	0.32
YBS-VAR-56	WH8141	7.32 / 5.95	6.01	42.5	86.9	89.9	91.5	92.7	93.4	93.4	93.8	0.37	0.25	0.30
YBS-VAR-57	WH8142	0.72 / 0.98	0.84	34.5	86.2	87.1	89.6	90.5	91.3	92.1	92.9	0.06	0.22	0.31
YBS-VAR-58	WH8143	1.77 / 1.64	1.86	34.2	84.2	87.3	87.7	88.5	90.0	90.3	91.4	0.16	0.22	0.33
YBS-VAR-59	WH8144	2.31 / 1.96	2.23	47.8	87.2	88.9	90.8	91.5	91.5	92.4	92.4	0.17	0.17	0.33
YBS-VAR-60	WH8145	3.40 / 2.89	5.95	54.7	91.2	94.0	95.4	96.4	96.4	96.6	96.8	0.19	0.22	0.30
YBS-VAR-61	WH8146	23.7 / 26.6	28.4	67.6	92.6	94.8	96.3	96.9	97.1	97.2	97.6	0.69	0.24	0.45
YBS-VAR-62	WH8147	3.45 / 2.95	2.85	37.6	72.0	88.1	91.4	92.9	92.9	93.9	94.4	0.16	0.39	0.36
YBS-VAR-63	WH8148	3.03 / 2.08	2.11	21.9	82.5	84.6	85.6	88.3	90.0	91.6	91.9	0.17	0.17	0.39
YBY-VAR-65	WH8149	1.69 / 3.09	2.54	71.3	93.4	94.5	95.4	95.7	95.7	95.9	96.5	0.09	0.17	0.32
YBY-VAR-66	WH8150	3.26 / 3.14	3.67	50.3	85.0	87.6	89.0	89.8	90.4	90.4	90.7	0.34	0.17	0.34
YBY-VAR-67	WH8151	2.99 / 4.85	3.31	54.9	87.4	89.2	89.8	90.9	91.5	92.2	92.2	0.26	0.17	0.35
YBY-VAR-68	WH8152	4.67 / 2.83	4.37	58.7	88.8	91.6	92.7	93.6	94.5	94.5	94.5	0.24	0.32	0.34
YBY-VAR-69	WH8153	3.34 / 2.62	2.73	49.0	85.0	87.2	88.0	88.2	89.2	89.5	89.7	0.28	0.24	0.37
YBY-VAR-70	WH8154	1.31 / 1.66	1.06	25.7	83.4	88.3	90.4	93.1	93.1	94.3	94.3	0.06	0.31	0.39
YPOR-VAR-72	WH8155	1.16 / 1.77	1.12	40.7	87.5	91.5	92.2	92.8	93.4	94.0	94.6	0.06	0.14	0.38
YPOR-VAR-73	WH8156	1.76 / 2.11	1.84	38.4	88.5	92.6	94.2	94.2	94.9	95.7	95.7	0.08	0.17	0.39
YPOR-VAR-74	WH8157	2.20 / 2.42	2.57	64.6	93.5	95.8	95.8	96.4	96.6	96.9	96.9	0.08	0.29	0.38

Heap Leach Tails Dump Testwork

A number of heap leach dumps from previous owners remain on-site. It is proposed to process these through the CIL plant to supplement overall gold production. Composite samples from each of the dumps were prepared and sub-sampled for gravity / cyanidation testing in line with the selected testing conditions. The results of these tests are shown in Table 13-15. Sample grades are relatively high with good gravity and leach extractions.

Table 13-15 Heap Leach Tails Samples – Variability Test Results

Sample No	Test No	Assay Head	Calc Head	Au Extraction % @ Time hours								Residue	Reagent Consumption (kg/t)	
		Au (g/t)	Au (g/t)	0	2	4	8	16	24	36	48	Au (g/t)	NaCN	Lime
CMA1	WH7760	1.12	1.15	23.9	71.4	78.4	82.8	84.6	85.2	86.4	87.0	0.15	0.25	1.11
CMA2	WH7761	2.34	2.55	60.5	86.1	89.0	91.8	92.1	92.7	93.5	93.7	0.16	0.21	1.13
CMA3	WH7762	10.32	12.11	73.6	91.2	94.0	96.1	97.3	98.4	98.6	98.8	0.14	0.32	1.12
Cluff	WH7763	0.22	0.90	73.1	89.7	92.2	93.0	93.0	93.7	94.5	94.5	0.05	0.29	1.32
EGlobal	WH7764	1.16	1.56	63.4	85.0	87.8	88.7	89.6	90.9	91.8	92.6	0.12	0.20	1.48

13.2.7 Other Metallurgical Testwork

Additional testwork was undertaken to examine:

- Carbon adsorption kinetics. Carbon loading kinetics are within the range typically observed in CIL operations;
- Cyanide detoxification using each of SO_2/air hydrogen peroxide. Slurry detoxification using the SO_2 / air oxidation achieved CN_{WAD} concentrations in the discharge liquor of less than 1 ppm CN_{WAD}. The reaction required copper sulphate addition to catalyse the reaction to achieve the optimum discharge level. Hydrogen peroxide detoxification of the effluent solution achieved 12 mg/ L in the discharge catalysed by copper after 30 minutes residence time with the maximum molar ratio trialled. Soluble copper is not present in sufficient concentration to catalyse the cyanide detoxification reaction;
- Oxygen uptake rates. The results indicate that the oxygen demand is not particularly high for the CMA fresh ore although this would probably be greater for the oxides. Although the oxygen uptake demand is typically low, the addition of oxygen instead of air to the CIL tanks is noted as an option for future expansion of the CIL plant as it will assist in the oxidation of any reactive sulphides and improve leach kinetics such that higher throughput rates will not compromise metallurgical recovery;
- Effects of pulp rheology. The oxide master composite indicates that this slurry is highly viscous in nature and will cause handling difficulties when pumping, agitating and passing through the trash, safety and intertank screens. The viscous oxide slurry could also result in low mass transfer rates and poor dissolved oxygen levels in the leach and adsorption. If high ex-pit oxide feed blends are envisaged, the use of viscosity modifiers is recommended.
- Thickening and settling rate. Settling rates were fast with high underflow densities with the exception of the oxide sample. The oxide sample required higher feed dilution and lower flux rates and only achieved 45% underflow density. If it is planned to incorporate thickening in the flowsheet, the facility to bypass the oxides should be in place or operation should be on blended feeds with a lower proportion of oxide material. Although the oxide thickening performance is poor, this appears to be mainly related to the fineness of the material. This could possibly be addressed with a coagulant or combination of flocculants.
- Tailings settling and geochemistry (Knight Piésold, 2017a; Knight Piésold, 2017b).

14. Mineral Resource Estimates

14.1 Introduction

Yaouré Mineral Resources are based on drill data supplied by Perseus in September 2017, which within the resource area includes 2,220 RC and diamond core holes for 258,407 metres of drilling, along with 50 AC holes and 289 auger holes.

Mineral Resources for remnant mineralisation were estimated by Multiple Indicator Kriging (MIK) of two metre down-hole composited assay grades from RC and diamond drill holes, and comparatively minor AC drilling. The MIK estimates incorporate a variance adjustment to reflect open pit mining selectivity, a method that has been demonstrated to provide reliable estimates of gold resources achieved in open pit mining for a wide range of mineralisation styles.

The previously processed heap leach pads are included in the Mineral Resource as well as remnant in situ Mineral Resources. An average gold grade was assigned to each heap component from the de-clustered average cut grades of auger samples. A density of 1.4 t/m^3 was assigned to the heaps on the basis of volumetric measurements on samples collected from approximately 1 to 1.5 metres below surface

Micromine software was used for data compilation, domain wire-framing and coding of composite values and GS3M was used for resource estimation. The resulting estimates were imported into Micromine for resource reporting.

The Mineral Resource estimates have been classified and reported in accordance with NI 43-101 guidelines and classifications adopted by CIM Council in November 2004.

Mineral Resources for remnant mineralisation are reported within an optimal pit shell generated using the mining and processing parameters used for developing Mineral Reserves and a gold price of $US1,800 per ounce. They are reported at a cut-off grade of 0.4 g/t reflecting the average cut-off grade for the optimal pit. This same cut-off was used for heap leach estimates. Mineral Resources that are not Mineral Reserves do not have demonstrated economic validity. Available information indicates that the Mineral Resource Estimates have reasonable prospects of eventual economic extraction as defined by CIM guidelines (CIM, 2014) and are unlikely to be materially impacted by known environmental, permitting, legal, title, taxation, socio-economic, marketing, political or other relevant factors.

14.2 Modelling Domains

Mineralised domains used for resource estimation were interpreted by the author on the basis of two metre down-hole composited gold grades and geological wire-frames supplied by Perseus. The domains delineate zones within which the tenor and spatial trends of mineralisation are similar and are designated as Domains 1 to 9.

Surfaces representing the base of laterite, base of complete weathering, base of partial weathering and base of fracture associated weathering (top of fresh rock) were interpreted by Perseus from drill hole geological logs. These surfaces were combined with the mineralised domains for MIK modelling, including density assignment. The combined weathering domains range from around 9 to 88 metres in thickness with fresh rock occurring at an average depth of around 48 metres below pre-mining surface.

For density assignment the completely weathered zone was subdivided into upper and lower zones at the zone vertical mid-point giving six weathering domains, which are designated as Subdomains 1 to 6.

Perseus supplied surfaces representing the base of complete and partial oxidation respectively. Although not directly used for resource estimation, the block model was coded by these surfaces to facilitate assignment of metallurgical parameters in mine planning.

Table 14-1 summarises the mineralisation domains and weathering subdomains used for the estimates including the domain codes used for coding estimation composites and block models.

Figure 14-1 shows the intersection of the mineralised domains with pre-mining topography relative to drill traces. Figure 14-2 shows example cross sections of the mineralised domains relative to drill hole traces within 12.5 metres of each section, coloured by composited gold grades.

Table 14-1 Modelling domains

Mineralised domains	
Domain	**Description**
1	Western footwall background zone comprising generally un-mineralised metabasalt.
2	Northern background zone comprising rarely mineralised volcanoclastics.
3	Eastern metabasalt hangingwall to CMA mineralisation. Drill holes in this zone show comparatively rare intercepts of elevated gold grades.
4	Central zone. Drilling within this area includes rare discontinuous intercepts.
5	Main CMA mineralisation.
6	CMA South mineralisation.
7	Yaouré Zone metabasalt.
8	Yaouré Zone granodiorite.
9	Yaouré footwall zone representing moderately easterly inclined grade mineralisation adjacent the footwall background domain.
Mineralised domains	
Domain	**Description**
1	Laterite
2	Completely weathered upper
3	Completely weathered lower
4	Partially weathered
5	Fracture weathered
6	Fresh

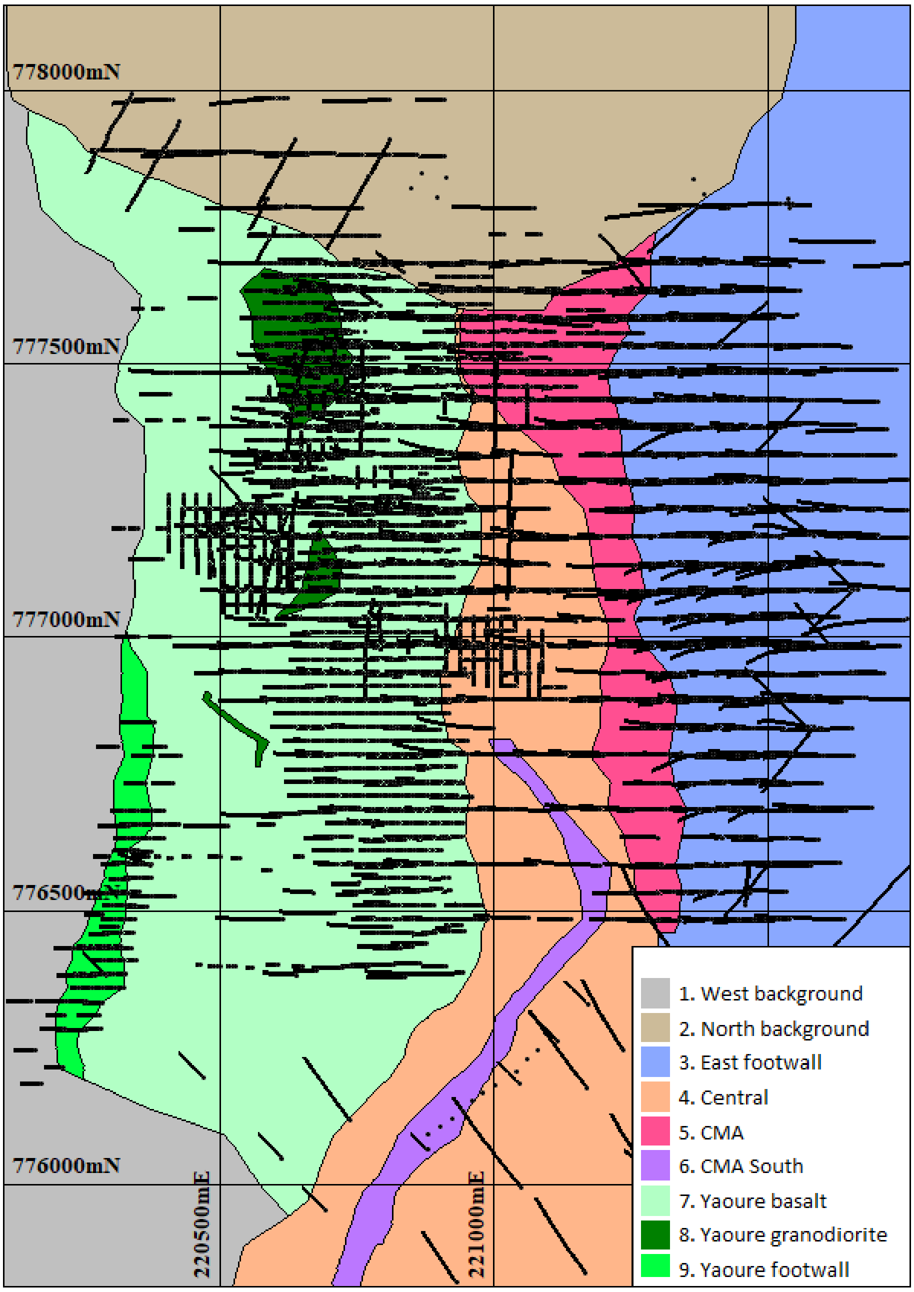


Figure 14-1 Mineralised domains and drill hole traces

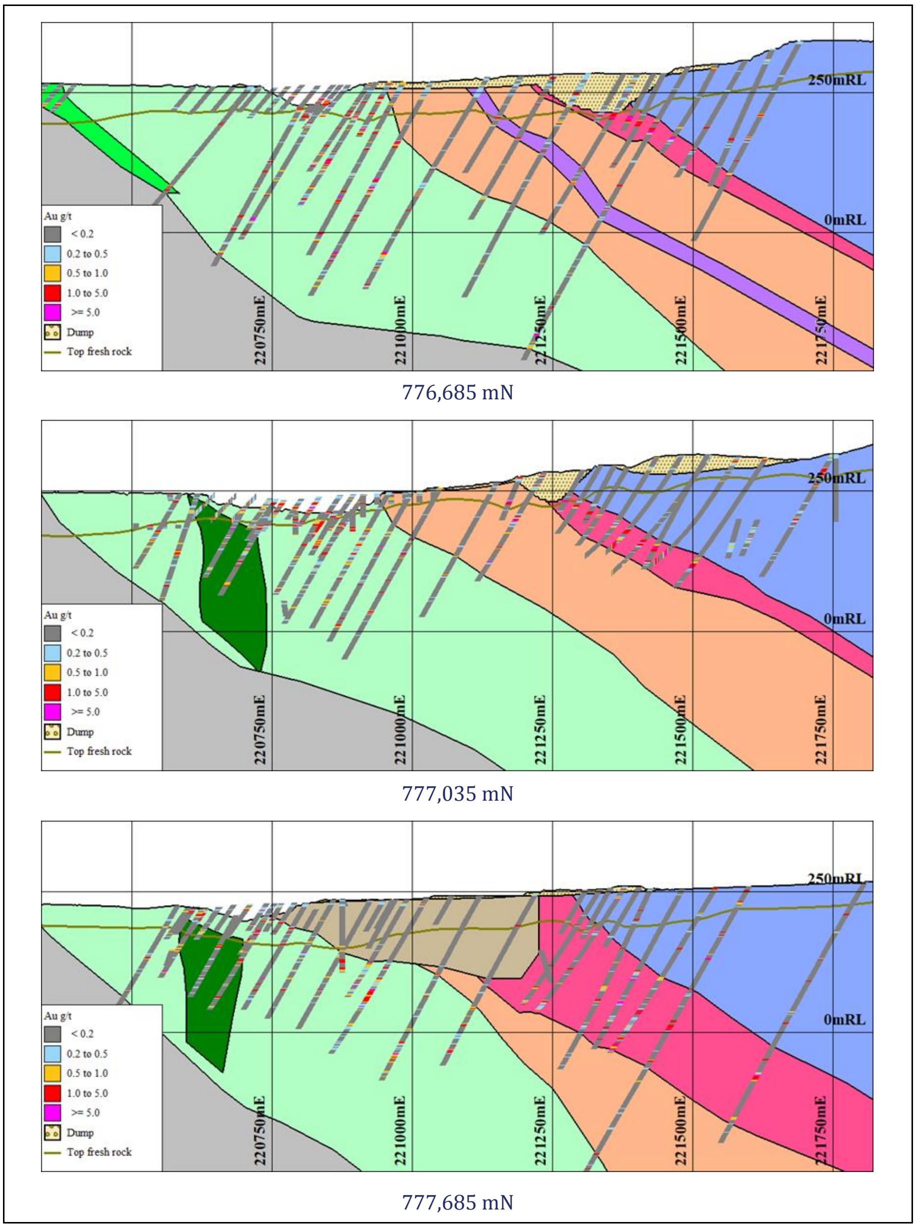


Figure 14-2 Modelling domains and drilling section views

Refer to Figure 14-1 for mineralised domain key

14.3 Composite Dataset

The MIK estimates are based on two metre down-hole composited assay grades including all AC, RC and diamond drilling within the resource area, with the following exceptions:

- Perseus's trial RC GC drilling was generally excluded, with the exception of the southwest area of trial GC drilling area which is not tested by any resource drilling. For this area GC holes were selected on a nominal 10 by 25 metre pattern to give a dataset of comparable spacing to general resource drilling.
- Composites from heap leach, dump and back-fill material were excluded.
- Deliberately un-assayed intervals from Perseus's drilling through the CMA hanging wall are interpreted to be barren were assigned gold grades of 0.001 g/t.
- From visual comparison of results from surrounding drilling, Perseus identified 451 metres of drilling from 15 Cluff RC holes for which gold grades appear to be overstated. These intervals were excluded.

Table 14-2 presents summary statistics for the estimation dataset subdivided by mineralised domain and simplified weathering domain. For this table composites are subdivided into laterite (Subdomain 1), combined weathered (Subdomain 2 to 5) and fresh (Subdomain 6) groups. Notable features of the statistics in this table include the following:

- For each mineralised domain Subdomain 1 composites show reasonably consistent, low grade mineralisation with average gold grades around 0.2 g/t;
- Weathered and fresh components of the background mineralised domains (Domains 1 and 2) have very low average gold grades demonstrating that the domaining has successfully assigned the majority of mineralised intervals to the mineralised domains;
- Coefficients of variation for mineralised domain composites are generally high at around 4 to 5 reflecting the highly variable nature of the gold grades.

Table 14-2 Estimation dataset statistics (Au g/t)

Dom.	Weath.	No.	Mean	Coef. Var	Min	25th %ile	Median	75th %ile	Max.
1	Lat.	35	0.08	0.58	0.010	0.04	0.08	0.10	0.21
	Weath.	1,034	0.06	2.26	0.005	0.01	0.02	0.05	1.91
	Fresh	1,009	0.06	5.15	0.005	0.01	0.02	0.03	6.78
2	Lat.	413	0.23	1.65	0.001	0.09	0.14	0.23	4.92
	Weath.	2,421	0.05	7.47	0.001	0.01	0.01	0.03	14.6
	Fresh	1,202	0.02	3.44	0.001	0.01	0.01	0.01	1.65
3	Lat.	599	0.15	3.10	0.001	0.00	0.05	0.13	7.36
	Weath.	5,735	0.10	7.03	0.001	0.00	0.01	0.04	25.1
	Fresh	11,773	0.05	8.49	0.001	0.01	0.01	0.02	25.7
4	Lat.	356	0.35	1.75	0.008	0.16	0.24	0.33	6.41
	Weath.	2,473	0.25	20.1	0.002	0.01	0.03	0.07	242
	Fresh	9,600	0.08	6.21	0.001	0.01	0.01	0.04	22.7
5	Lat.	237	0.24	0.98	0.001	0.13	0.19	0.29	1.91
	Weath.	3,403	0.39	3.42	0.001	0.03	0.08	0.23	21.7
	Fresh	9,491	0.82	2.67	0.001	0.01	0.06	0.43	45.5
6	Lat.	14	0.26	0.55	0.060	0.15	0.20	0.40	0.49
	Weath.	202	0.37	2.27	0.005	0.01	0.11	0.31	7.30
	Fresh	883	0.41	3.16	0.005	0.02	0.07	0.29	26.3
7	Lat.	3,038	0.33	3.62	0.005	0.12	0.20	0.33	54.1
	Weath.	18,475	0.32	6.06	0.001	0.03	0.05	0.16	154
	Fresh	35,230	0.34	4.55	0.005	0.02	0.04	0.17	107
8	Lat.	218	0.47	3.29	0.005	0.15	0.22	0.36	21.4
	Weath.	1,937	0.60	3.23	0.004	0.06	0.18	0.49	50.9
	Fresh	8,148	0.47	4.20	0.004	0.04	0.13	0.39	86.8
9	Lat.	192	0.21	2.61	0.015	0.09	0.11	0.17	5.25
	Weath.	1,160	0.21	2.51	0.005	0.03	0.05	0.16	9.78
	Fresh	203	0.41	2.79	0.005	0.02	0.05	0.23	9.53

14.4 Estimation Parameters

14.4.1 Model extents and block sizes

The block model frame work used for MIK modelling covers the full extents of the composite dataset. It includes panels with dimensions of 12.5 metres east-west by 25 metres north-south by 5 metres vertical. The panel size reflects the spacing of data available to inform the estimates and the proposed mining bench height.

14.4.2 Indicator thresholds and class grades

For determination of indicator thresholds and bin mean grades, the estimation dataset was grouped by mineralised domain and weathering subdomain, with composites generally subdivided into laterite, combined weathered and fresh datasets for each mineralised domain. As shown in Table 14-3, several smaller datasets were further combined. The laterite portion of Domain 6 which contains very few composites was estimated using indicator statistics derived from the laterite component of Domain 5.

Composites from Cluff and BRGM RC drilling were excluded from the datasets used for determination of indicator thresholds and bin means. This approach reduces the impact of these comparatively clustered data, which are of lower confidence than the other resource datasets, on estimated resources.

Composites for weathered portions of Domain 4 include an anomalously high grade intercept in hole YDD118 (22m @ 7.5 g/t). This hole was excluded from the dataset used for determination of indicator thresholds and class mean grades. The full dataset was used for estimation.

For each mineralised domain and weathering domain combination, indicator thresholds were defined using a consistent set of thresholds representing the following percentiles of each dataset: 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.75, 0.8, 0.85, 0.9, 0.95, 0.97 and 0.99.

All bin grades were selected from the bin mean grade, with the exception of the upper bin which was selected on a case by case basis. Table 14-3 shows upper bin thresholds and bin mean grades and describes with the methodology used to determine upper bin grades. Upper bin grades were generally derived from the bin median, or bin mean excluding two or three outlier composite grades. This approach reduces the impact of small numbers of extreme gold grades on estimated resources and in the author's experience is appropriate for MIK modelling of highly variable mineralisation such as the Yaouré project

Table 14-3 Upper bin thresholds and bin grades (Au g/t)

Dom.	Weath.	Threshold	Bin Grade	Source of bin grade
1	All	0.928	0.928	Threshold
2	Laterite	1.585	1.790	Mean excluding two outliers
	Weath.	0.557	0.880	Median
	Fresh	0.268	0.490	Median
3	Laterite	2.440	3.130	Median
	Weath.	1.610	2.737	Median
	Fresh	0.800	1.436	Median
4	Laterite	1.870	2.053	Mean excluding two outliers
	Weath.	1.330	2.578	Mean excluding three outliers
	Fresh	1.010	1.710	Median
5	Laterite	1.110	1.500	Median
	Weath.	6.710	10.890	Median
	Fresh	10.480	13.619	Median
6	Laterite	1.110	1.500	Median (From Domain 5)
	Weath.	4.440	5.100	Median
	Fresh	4.605	6.901	Mean excluding two outliers
7,8,9	Laterite	3.207	3.960	Median
7	Weath.	4.575	8.645	Median
	Fresh	5.130	7.795	Median
8	Weath.	9.935	13.091	Mean excluding two outliers
	Fresh	4.725	7.365	Median
9	Weath+ Fresh	4.257	6.960	Mean excluding two outliers

14.4.3 Variogram models

Indicator variograms were modelled for the main mineralised domains. For determination of variance adjustment factors a variogram model of composite gold grades was also developed for each of these datasets. Some domains contain too few regularly spaced composites for meaningful variogram modelling. As summarised in Table 14-4, these domains were estimated using variograms modelled from more comprehensively drilled domains.

Composited gold grades within the laterite zone show flat lying continuity, notably differing from continuity of underlying zones. For estimation of the laterite subdomain, variograms were modelled from a combined dataset of laterite composites. Below the base of laterite, for each mineralised domain, gold grades show comparable continuity within the weathered and fresh zones. Variably weathered and fresh composites were combined for variogram modelling.

As examples of these models, Figure 14-3 presents three dimensional variogram surface maps of the median indicator variogram model for Domains 7 to 9 and Domain 5 at 70% of sill. These plots demonstrate that the variogram models reflect dominant mineralisation trends.

Table 14-4 Variogram models applied to estimation domains

Domain	Weathering Subdomains	Variograms
All	Laterite	Modelled for combined dataset
1	Weathered and Fresh	Use Domain 7 and 8
2	Weathered and Fresh	Use Domain 7 and 8
3	Weathered and Fresh	Use Domain 4
4	Weathered and Fresh	Modelled
5	Weathered and Fresh	Modelled
6	Weathered and Fresh	Use Domain 5
7 and 8	Weathered and Fresh	Modelled for combined dataset

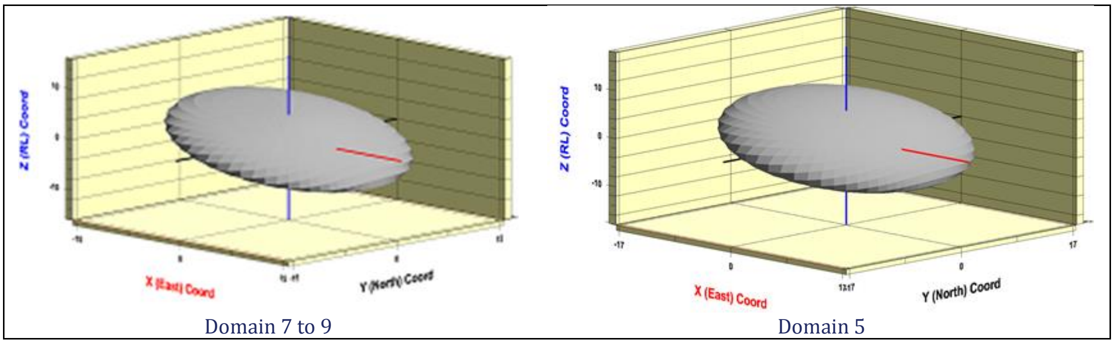


Figure 14-3 Example three dimensional variogram model plots

14.4.4 Search passes

The four progressively more relaxed search criteria used for MIK estimation are presented in Table 14-5. The search ellipsoids were aligned with the general mineralisation orientation.

Table 14-5 Estimation search passes

Search Pass	Radii (m) (x,y,z)	Minimum Data	Minimum Octants	Maximum Data
1	30 x 60 x 10	16	4	48
2	45 x 90 x 15	16	4	48
3	45 x 90 x 15	8	2	48
4	90 x 90 x 22.5	8	2	48

14.4.5 Variance adjustment

Estimated resources include a variance adjustment to give estimates of recoverable resources for selective mining dimensions of 4 metres east by 6 metres north by 2.5 metres in elevation with high quality grade control sampling on an 5 by 8 by 1.25 m pattern. These selectivity criteria were specified by Perseus. The variance adjustments were applied using the direct lognormal method and the adjustment factors listed in Table 14-6.

The author’s experience indicates that the variance adjustments applied to the current estimates can be reasonably expected to provide appropriately reliable estimates of potential mining outcomes at the assumed mining selectivity without the application of additional mining dilution, or mining recovery factors.

Table 14-6 Variance adjustment parameters

Domain	Panel to Block Adjustment	Information Effect	Total Adjustment
1	0.156	0.539	0.084
2	0.156	0.539	0.084
3	0.166	0.506	0.084
4	0.166	0.506	0.084
5	0.317	0.903	0.286
6	0.317	0.903	0.286
7	0.156	0.539	0.084
8	0.156	0.539	0.084
9	0.187	0.655	0.122

14.4.6

14.4.7 Bulk densities

Bulk densities were assigned to remnant mineralisation by mineralisation domain and weathering subdomain (Table 14-7). Assigned densities were derived from the average of immersion measurements of diamond core with Amara results factored to compensate for the apparent slight bias in these data.

Table 14-7 Densities assigned to remnant mineralisation (t/bcm)

Weathering Subdomain	Mineralised Domain				
	2	3 & 4	5 & 6	1,7 & 9	8
Laterite	1.85	1.85	1.85	1.85	1.85
CW Upper	1.65	1.60	1.75	1.55	1.65
CW Lower	1.75	1.70	1.80	1.80	1.75
Partial Weath.	2.10	2.05	2.05	2.10	2.10
Fracture Weath.	2.35	2.40	2.35	2.45	2.55
Fresh	2.65	2.85	2.75	2.80	2.70

14.5 Classification of Estimates

Confidence categories were applied to the MIK estimates on a block-by-block basis based on the number and location of data available to inform estimates in each block. This is based on the principle that larger numbers of samples, which are more evenly distributed within the search neighbourhood, will provide a more reliable estimate. Resource classification also considered the quality of the informing geological, survey and assay data, and confidence in geological and mineralisation models.

In the author's opinion, the available sampling information does not define mineralisation at the Yaouré project with sufficient confidence for estimation of Measured Resources. Model estimates are classified as Indicated and Inferred by estimation search pass and two sets of sectional polygons defining areas of consistently spaced drilling for each model row. The classification process comprised two stages as follows:

- **Stage One:** Estimates informed by search pass 1 within polygons defining the outer limits of any consistently 25 by 50 metre (east, north) spaced drilling including some areas of wider spaced drilling were classified as Indicated, and all other panels classified as Inferred. This stage ensures Indicated resources are restricted to areas of reasonably consistent drilling, and do not, for example include isolated Search 1 panels within areas of generally Inferred resources;
- **Stage Two:** Rare search 2 and 3 panels within areas of general 25 by 50 metre drilling defined by a second set of polygons were classified as Indicated. This stage ensures all isolated search 2 and 3 panels within reasonably closely drilled areas are classified as Indicated. Such panels are commonly proximal to the as-mined surface, which due to the Search 1 octant requirements are not informed by this search pass.

This approach assigns estimates based on drilling reasonably approximating 25 by 50 metre and closer spacing as Indicated and estimates for more broadly sampled mineralisation as Inferred category. Inferred estimates extend to a maximum of around 75 metres from drilling. For the Yaouré Zone the majority of Indicated resources are informed by drilling spaced at around 25 by 25 metres.

The plots in Figure 14-5 show the polygons used in the first and second classification stages in blue and red respectively.

14.6 Heap Leach Estimates

Mining by CMA and Cluff produced four heap leach pads. Cluff removed material from one of the CMA pads (CMA 3) and re-used the resulting surface as a heap leach pad for Yaouré ore (CMA 3 Upper). The material removed from CMA 3 forms a fifth heap designated as Eglobal.(Figure 14-4). Power auger drilling undertaken by Amara through these dumps at generally 25 by 25 to 50 by 50 metre spacing and confirmatory twin hole diamond drilling shows elevated gold grades in these heaps.

Volumes of the heap leach pads have been defined by the triangulated LiDAR surface, and a surface representing the pre-mining topography produced by Perseus. In the area of the heap leach pads, the pre-mining topography reflects the elevations at which plastic heap liners were intersected in the auger sampling.

Available information indicates that, rather than continuous zones of higher and lower gold grades as might be expected for in situ mineralisation, gold grades within the heaps are likely to be erratically distributed. Selective mining above cut-off grades is therefore not considered feasible.

An average gold grade was estimated for each heap component from the de-clustered average gold assay grades of auger samples inclusive of upper cuts selected for each volume. The uppercuts generally approximate the 97th percentile of each dataset and reduce average grades by around 7%. De-clustered grades were calculated from the average of Ordinary Kriged block models produced for each heap component from cut auger sample grades. The CMA3 heap was subdivided into upper and lower lifts for grade assignment.

A density of 1.4 t/m^3 was assigned to the heaps on the basis of 11 volumetric measurements from approximately 1 to 1.5 metres below surface.

All heap estimates are classified as Indicated reflecting the level of confidence in the sampling information and reasonably consistent drill spacing for each heap.

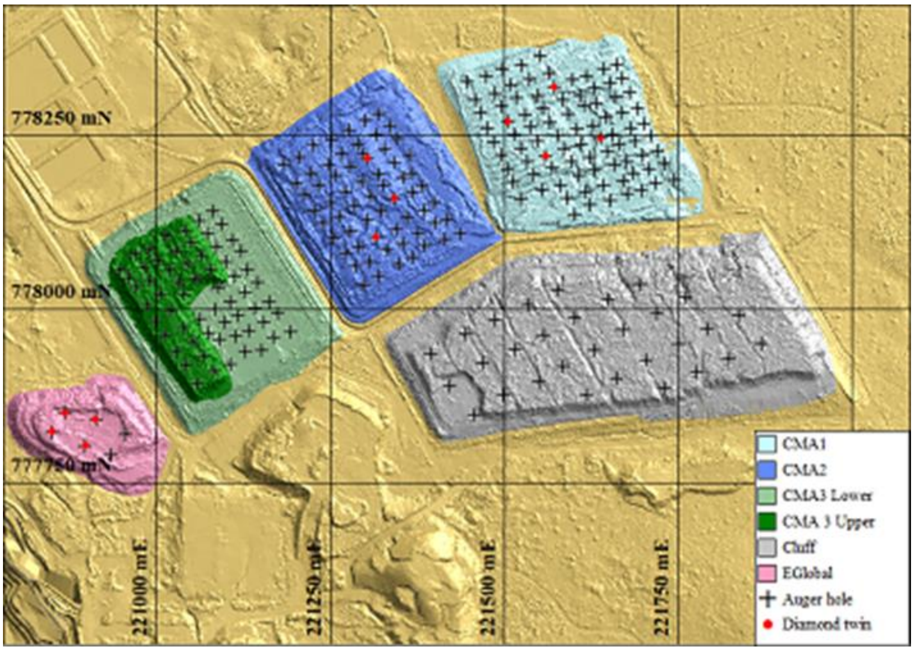


Figure 14-4 Heap leach components and drilling

14.7 Pit Shell Constraint

To provide estimates with reasonable prospects for eventual economic extraction, Mineral Resources are reported within an optimal pit shell generated using the mining and processing parameters used for developing Mineral Reserves and a gold price of $US1,800 per ounce (Table 14-8).

At $US1,800 per ounce the optimisation parameters give cut-off grades ranging from around 0.25 g/t for completely oxidized material to around 0.45 g/t for un-oxidized material. Mineral Resources are reported at a cut-off grade of 0.40 g/t reflecting average cut-off grade applied by material type. Heap leach estimates are also reported at this cut-off.

Mineralisation within the resource pit comprises numerous zones within 1.4 kilometres east-west by 2.1 kilometres north south and extending to a maximum depth of around 340 metres below surface.

Table 14-9 shows Mineral Resources estimated for the Yaouré Gold Project. The figures in this table are rounded to reflect the precision of the estimates.

Table 14-8 Resource pit shell optimisation parameter summary

Item	Value	
Gold price	$US1,800/ounce	
Average mining cost	$US2.98/tonne	
Average ore cost	$US18.72/tonne	
Average metallurgical recovery	90%	
Wall angles	Weathered	33.5° to 44.2°
	Transition	39.8° to 52.2°
	Fresh	34.0° to 58.9°

Table 14-9 Yaouré Gold Project Mineral Resource Estimates. Effective date 3rd November 2017

Indicated Resources			
Zone	**Mt**	**Au g/t**	**Au moz**
CMA	24.8	1.81	1.44
Yaouré	16.5	0.81	0.43
Subtotal	41.3	1.41	1.87
Heap leach	1.8	1.02	0.06
Total	**43.1**	**1.39**	**1.93**
Inferred Resources			
Zone	**Mt**	**Au g/t**	**Au moz**
CMA	16	1.2	0.6
Yaouré	30	0.9	0.9
Subtotal	46	1.0	1.5
Heap leach	-	-	-
Total	**46**	**1.0**	**1.5**

14.8 Model Reviews

14.8.1 Comparison with composite grades

Model reviews included comparison of estimated block grades with informing composites. These checks comprised inspection of sectional plots of the model and drill data and review of swath plots and showed no significant issues.

Figure 14-5 shows example cross-section plots of the model estimates at 0.4 g/t cut off relative to the mineralised domains, drill hole traces coloured by composited grades and resource pit. The upper and lower plots in this figure show the resource panels scaled by the estimated recoverable proportion above 0.4 g/t coloured by the estimated gold grade above this cut off and resource category respectively. This figure demonstrates that the model estimates are consistent with the informing composites.

When viewing Figure 14-5 it should be noted that there are situations where the model blocks appear to be un-correlated to the mineralised intercepts in the neighbouring drill holes. This is occurring because of the way the resource model blocks have been presented. The model blocks plotted are only those that contain an estimated resource above 0.4 g/t cut off and the proportion above cut off has been used to scale the dimension of the model block for presentation purposes. The scaling occurs about the model block centroid co-ordinate and therefore introduces the apparent mismatch between data and the resource model blocks.

The swath plots in Figure 14-6 compare average estimated grades with average composite gold grades for the Yaouré and CMA zones within the resource pit by northing. For preparation of these plots, composite grades were cut by the upper bin grade for each mineralised domain/weathering subdomain reducing the impact of a small number of outlier grades.

The plots in Figure 14-6 show that although the model estimates are more smoothed than the average composite grades, they generally closely follow trends shown by composite mean grades with the exception of areas of variably spaced sampling.

Local differences between average composite and model grades commonly reflect areas where comparatively close spaced holes test higher grade mineralisation, and lower grade mineralisation is more sparsely drilled. The differences between average estimated grades and composite grades for CMA around 7,767,000 mN shown in Figure 14-6 are an example of this trend, and are expected from the drilling distribution.

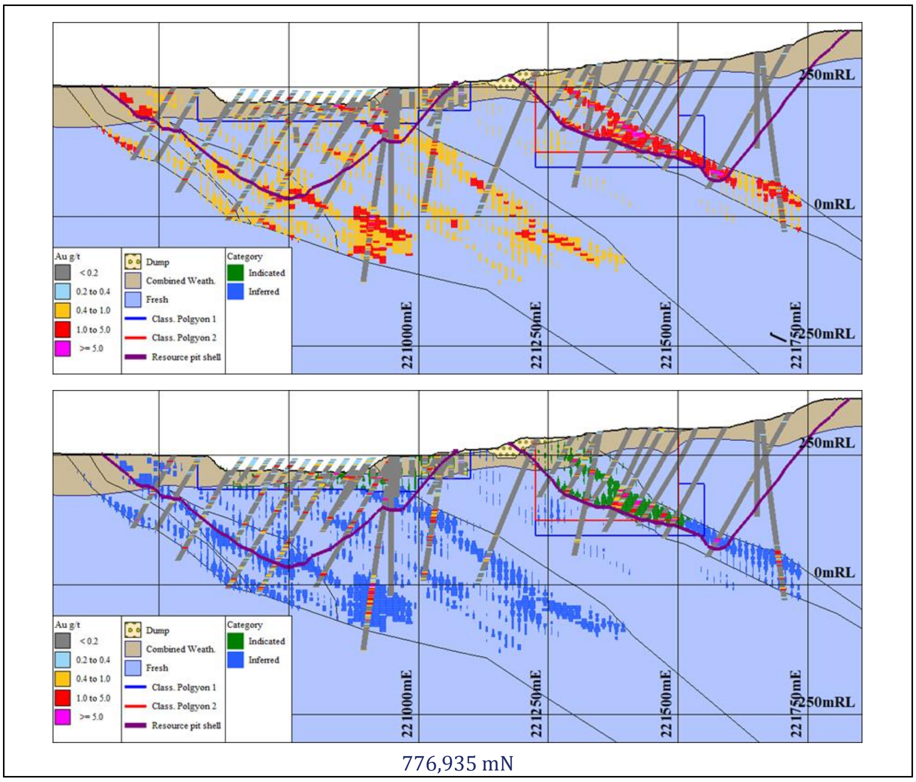


Figure 14-5 Example section views of model estimates at 0.4 g/t cut off

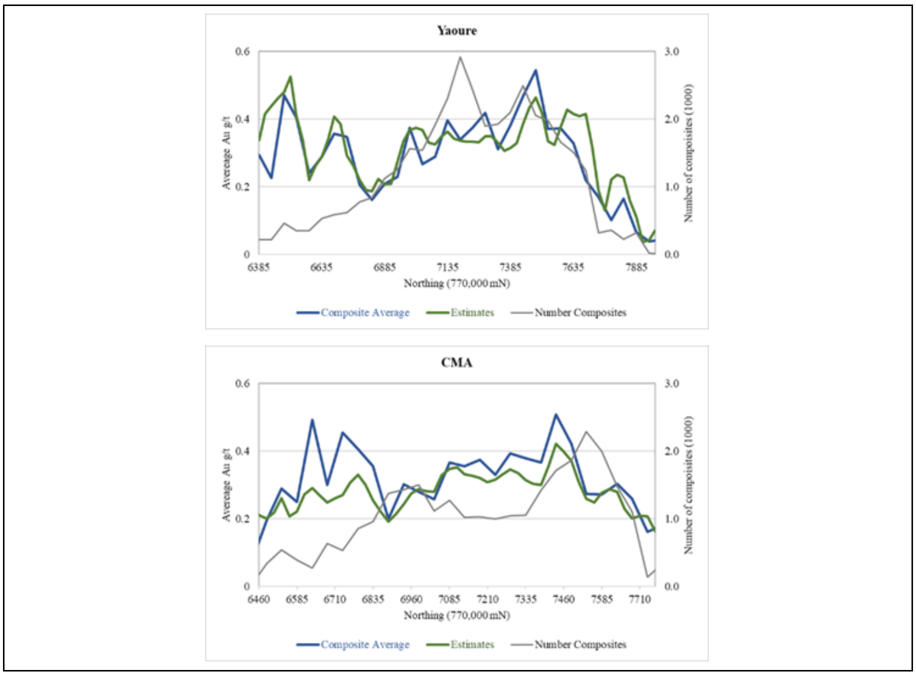


Figure 14-6 Model estimates versus composite grades

14.8.2 Comparison with reported production and trial GC models

The estimation dataset includes drill holes through the mined Yaouré pit and the model includes estimates for this volume, thus allowing comparison of model estimates with production for this area. Available production estimates are of uncertain reliability and the lack of information about ore selection practises hinders detailed comparison.

Reported production lies reasonably close to the grade-tonnage curve of the. MIK model reported within the mined Yaouré pit volume with closest match at approximately 0.53 g/t cut off. The upper section of Table 14-10 compares model estimates at this cut off with reported production.

In the author's experience, for highly variable mineralisation such as Yaouré a volume equivalent to several months production is generally required for meaningful GC to resource comparisons. At the mining rate envisaged by Perseus, the area of trial GC drilling represents around three weeks of production and is too small to provide more than a general indication of model performance. The lower section of Table 14-10 compares the MIK estimates with estimates from first pass GC models developed by MPR for the volumes tested by trial GC drilling at a cut-off grade of 0.55 g/t. This cut off was selected as an approximate average reserve cut off for the variably oxidised material included in this comparison.

Considering uncertainties associated with production estimates and the small volume tested by trial GC drilling, the comparisons in Table 14-10 reasonably support the MIK estimates.

Table 14-10 Model estimates versus Yaouré production and trial GC models

Model estimates versus Yaouré production			
	Kt	**Au g/t**	**Au koz**
Resource model	2.11	0.94	63.4
Reported production	1.81	0.93	54.0
Difference	-14%	-1%	-15%
Model estimates versus trial GC models at 0.55 g/t cut off			
	Kt	**Au g/t**	**Au koz**
Resource model	234	1.07	8.04
Grade control models	263	1.08	9.14
Difference	12%	1%	14%

15. Mineral Reserve Estimates

15.1 Introduction

This section summarises the main considerations in relation to estimation of Mineral Reserves and provides references to the sections of the study where more detailed discussions of particular aspects are covered.

The Mineral Reserves were compiled with reference to NI 43-101 and The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC 2012).

15.2 Mineral Reserve Statement

Mineral Resources are reported inclusive of Mineral Reserves, (that is, Mineral Reserves are not additional to Mineral Resources). Mineral Reserves may be subdivided into Proven Mineral Reserves and Probable Mineral Reserves categories to reflect the confidence in the underlying Mineral Resource data and modifying factors applied during mine planning. A Proven Mineral Reserve can only be derived from a Measured Mineral Resource while a Probable Mineral Reserve is typically derived from an Indicated Mineral Resource. Note that a Probable Mineral Reserve can also be made up of a Measured Mineral Resource should the Qualified Person have reason to downgrade the confidence of the estimation.

The Mineral Reserves for the Yaouré Gold deposit have been independently estimated by RPM. As summarised in Table 15-1, a total of 26.8 Mt of Probable Ore was estimated as at 3rd November 2017.

Table 15-1 Open Pit Mineral Reserve Estimate. Effective date 3rd November 2017

	Proved			Probable			Proved + Probable		
Location	Ore Mt	Grade Au g/t	Gold Moz	Ore Mt	Grade Au g/t	Gold Moz	Ore Mt	Grade Au g/t	Gold Moz
CMA	-	-	-	20.7	1.97	1.31	20.7	1.97	1.31
Yaoure	-	-	-	4.7	1.04	0.15	4.7	1.04	0.15
Sub-Total	-	-	-	25.3	1.80	1.47	25.3	1.80	1.47
Leach Pads	-	-	-	1.4	1.14	0.05	1.4	1.14	0.05
Total	-	-	-	26.8	1.76	1.52	26.8	1.76	1.52

Notes:

5. *The Statement of Mineral Reserves has been compiled under the supervision of Mr. Joe McDiarmid who is a full time Principal Mining Engineer employed by RPM Advisory Services Pty Ltd and is a Member of the Australasian Institute of Mining and Metallurgy (AusIMM). Mr. McDiarmid has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration to qualify as a Qualified Person as defined under CIM.*
6. *Tonnages are dry metric tonnes*
7. *Gold price: 1,200 USD/troy ounce*
8. *Figures reported are rounded to reflect accuracy which may result in small tabulation errors.*

15.3 Mineral Reserve Cut-off Grades

The Mineral Reserves have been estimated using gold cut-off grades determined from the latest cost estimation and metallurgical recoveries that vary by deposit, lithology, oxidation and weathering. RPM completed a processing break-even cut-off calculation for the various mineralisation types and locations and presented these to Perseus for review. Perseus subsequently selected a series of raised cut-off grades that provided a suitable economic margin for the materials processed. The final raised cut-off grades for CMA, Yaouré and the Heap Leach Pads are shown in Table 15-2.

Cut-off grade optimisation is a process often undertaken to maximise project cash flow. A cut-off grade optimisation study has not been undertaken, and completion of such a study has the potential to increase Project NPV.

Table 15-2 Mineral Reserve Cut-off Grades

		Completely Oxidised		
Ore Source	**Units**	**Weathered**	**Transition**	**Fresh**
CMA - Basalt and Volcanoclastic	g/t	0.40	0.45	0.50
Yaouré - Basalt and Volcanoclastic	g/t	0.40	0.45	0.65
Yaouré - Granodiorite	g/t	0.40	0.45	0.65
		Partially Oxidised		
Ore Source	**Units**	**Weathered**	**Transition**	**Fresh**
CMA - Basalt and Volcanoclastic	g/t	0.40	0.45	0.50
Yaouré - Basalt and Volcanoclastic	g/t	0.40	0.45	0.65
Yaouré - Granodiorite	g/t	0.40	0.45	0.65
		Not Oxidised		
Ore Source	**Units**	**Weathered**	**Transition**	**Fresh**
CMA - Basalt and Volcanoclastic	g/t	0.40	0.45	0.50
Yaouré - Basalt and Volcanoclastic	g/t	0.40	0.45	0.65
Yaouré - Granodiorite	g/t	0.40	0.45	0.65
		All Oxidation and Weathering States		
Ore Source	**Units**	**CMA1**	**CMA2**	**EGlobal**
Leach Pad	g/t	0.45	0.45	0.45

15.4 Mineral Reserve Dilution and Ore Loss

In any mining operation a degree of ore loss and dilution can be expected. This has the general effect of altering the ore tonnages and grades predicted in the geological model. Factors influencing the loss and dilution include;

- The structure of the deposit;
- The mining method;
- The size and type of the mining equipment; and
- Grade control practices.

The selective mining unit ("SMU") defines the smallest size of material that can be selectively mined using a style and size of digging unit. Based on the proposed mining method, excavator size and structure of the mineralisation, an SMU of 4 m east-west, 6 m north-south and 2.5 m vertical was chosen as appropriate by RPM, in consultation with MPR Geological Consultants (MPR) and Perseus.

The blocks in the geological model are at a fixed dimension of 12.5 m east-west, 25 m north-south and 5 m vertical which is larger than the selected SMU size. To model loss and dilution the SMU dimensions were provided to MPR who applied a log-normal adjustment within the grade estimation process to represent the grade distributions expected within blocks of that SMU size. MPR have stated that the geological model presented to RPM includes expected mining loss and dilution and is therefore a Run-of-Mine (ROM) model. The senior Perseus geologist has confirmed that this methodology has given good correlation with grade control results at the Company's Edikan operation. On this basis, no additional loss and dilution adjustments were applied by RPM.

15.5 Mineral Reserve Pit Determination and Modifying Factors

The economic pit limits were estimated using the Geovia Whittle 4X pit limit optimisation software ("Whittle 4X"). The terminology "pit limit optimisation" refers to a process which aims to identify the highest value economic mining limits (pit shape) for a given series of inputs and constraints.

It does not "optimise" the Project development as practical elements such as blending strategy; water management, equipment optimisation, labour optimisation, etc. are beyond this level of optimisation.

The general approach to identifying the final economic pit limits is:

1. Identify any physical constraints to mining, for example, mining titles and infrastructure;
2. Define the economic input parameters, for example, mining, processing and administration costs;
3. Estimate mining modifying factors, for example, ore loss and dilution;
4. Estimate metallurgical modifying factors, for example, process plant ore recovery;
5. Define the pit slope design requirements (overall slope including ramps);
6. Import all the above parameters, including geological model into the pit limit optimisation software;
7. Run the pit limit optimisation software to produce a series of nested pit shells at increasing product selling prices;
8. Analyse results; and
9. Select a preferred ultimate pit shell to guide the pit design.

A key outcome of the process is a series of 3D surfaces or "nested pit shells" based on a range of product selling prices. Each of these shells represents a surface that defines the break-even economic limit for a specific set of revenue assumptions. The metal price sensitivity analysis is conducted by applying a "Revenue Factor" ("RF") to the base case metal price. That is, a 100% revenue factor pit shell results from multiplying the metal sales prices by 100%. A 70% RF pit shell indicates the shape of the pit and mineable quantities at 70% of the metal sales price. The outcomes are very important in showing the sensitivity of the deposit to varying economic factors, including product price, and is a key consideration in the selection of the optimal pit shell for mine planning.

The nested shells also indicate which areas should be mined first to deliver the greatest value and are therefore used as a key input to the development strategy for the deposit. The ideal pit development strategy to maximise cashflow involves mining successive pit shells from lowest revenue factor (say, 50% RF) to the highest (say, 100%). That is, a pit shell based on a Revenue Factor of 50% would have a higher margin than one at a Revenue Factor of 80% and hence would be sequenced to be mined first.

Selection of the optimal pit is normally based on a balance between maximising the mineable quantity and discounted cashflow. RPM recommends that the ultimate pit design be re-examined in future mine planning studies should inputs or constraints vary.

15.5.1 Mining Lease and Physical Mining Constraints

Physical constraints are typically surface features which limit the allowable extent of mining. Examples include critical infrastructure, mining titles, property ownership and environmentally sensitive areas.

The current Mining Permit Application covers a sufficient surface extent and does not constrain the mining or dumping limits. RPM is not aware of any other surface constraints to the project such as waterways, existing structures or major roadways. RPM does note that a number of features with social importance, such as grave sites, exist around the pit area. Perseus have advised that these can be relocated and thus will not impede the mining operation.

The village of Angovia is located about 500 m north-west of the mine and while this will require special attention to blasting methods it will not impede the mining operation.

No geological constraints were applied to the pit optimisation, with Measured and Indicated Mineral Resources used to determine the pit limits. To review the potential of the deposit, additional optimisation runs were completed using Indicated and Inferred Mineral Resources.

15.5.2 Geological Block Model and Topography

The resource block model was prepared by MPR Geological Consultants and presented to RPM in CSV format. This was subsequently imported by RPM into Surpac Mining Software for use in mine planning and analysis.

The block model used Multiple Indicator Kriging (MIK) estimation to assign gold grades and block proportions at a range of defined cut-off grades for each block in the model. No sub-blocking was used. All blocks in the model were 12.5 m east-west, 25 m north-south and 5 m vertical. Geological coding, such as rock type and weathering, was presented as block proportions.

In addition to grade, the key model attributes used in mine planning which impacted on costs, recovery and pit slopes were;

- Deposit
  - CMA
  - Yaouré
- Rock type
  - Granodiorite
  - Volcaniclastic
  - Basalt
  - Backfill Waste
  - Heap Leach Pads
- Oxidation
  - Completely Oxidised
  - Partially Oxidised
  - Not Oxidised
- Weathering

  - Weathered
  - Transition
  - Fresh
- Resource Category
  - Measured
  - Indicated
  - Inferred

The current surface topography was coded into the model with blocks flagged according to the proportion below the surface. The source topography was based on a LiDAR survey completed in 2017.

The original pre-backfilled topography in the CMA pit was created by Perseus, being estimated based on historic survey information and drill intercepts of in situ rock at the base of the backfill.

15.5.3 Geotechnical Parameters

Geotechnical studies have been completed by Pitt & Sherry geotechnical consultants (Pitt & Sherry, 2017). The contents of that report are summarised herein.

The geotechnical database from which the geotechnical model has been derived has been quality controlled and is considered to be of quality commensurate with defining Mineral Reserves. The geotechnical database consists of:

- Geological logging database conducted by Perseus staff on drill core from predominantly 2014, 2015 and 2017 drill campaigns;
- Geotechnical logging data, including rock mass parameters and oriented structures, conducted by Perseus staff on drill core from predominantly 2014, 2015 and 2017 drill campaigns; and
- Rock materials database derived from previous testing data and more focused testing as part of the 2017 drill campaign.

The geotechnical database has been added to with observations from existing pits allowing some development of large-scale structure model and performance of regolith (laterite/saprolite/saprock) material. The geotechnical drilling database has been interrogated by both Perseus staff (to update to current logging codes and some re-logging) and by Pitt & Sherry to remove any inconsistencies within the database. A materials testing database has been developed from previous soils and rock testing in addition to rock testing from the 2017 drill campaign, with all tests being conducted to appropriate international standards.

The geotechnical model is relatively simple and corresponds with the geological models developed by Perseus staff. The rock mass has been divided into three broad geotechnical domains; regolith (completely and partially weathered material), transition zone (fractured weathered material) and fresh rock (includes slightly weathered and fresh material). The regolith domain has been sub-divided by lithology (volcanoclastic and basalt/intrusive/granodiorite domains). The transition and fresh rock domains have been divided into basalt (includes some intrusives) and granodiorite (granodiorite is not significant in the CMA area).

The regolith domain in generally between 40m and 60m thick and comprises a thin laterite layer at the surface and variable thickness of saprolite and saprock below. Material strengths are generally low and rotational failure may be expected to be the controlling failure mechanism. The regolith domain is subdivided into basalt/granodiorite and volcanoclastics derived material. The volcanoclastics derived material is expected to perform slightly worse than weathered basalt/granodiorite. The stability of regolith material will be highly sensitive to groundwater pore pressures within the slope. Dewatering of the regolith domain would be expected to be very slow given the low permeability of the material. A mining sequence that quickly mines into the more broken transition material below would improve the rate at which slopes within the regolith drain and potentially result in less stability issues. However, some failures may occur in water seep areas or related to large rainfall events. A larger catch berm at the base of the regolith domain is recommended. Some areas of thin regolith exposure may be acceptable without a larger catch berm at the base of the regolith. Given the thin layer of transition material below the regolith, this catch berm may be better placed at the base of the transition zone (in the top of the fresh rock) than located within the transition zone material itself. Some localised dewatering of damp areas may be required within the regolith exposures. The diversion of surface water runoff from entering the pit will greatly assist stability of the Regolith domain.

The transition zone (weathered fractured material) is approximately 20m thick and is located between the base of the regolith domain and top of the fresh Rock. The stability of the transition zone is most likely to be controlled by planar sliding and wedge sliding failures from jointing. The placement of a catch-berm at the base of the Regolith may be better placed at the base of the transition zone to improve the longevity of this catch-berm.

The fresh rock domain comprises rock with a very strong to extremely strong UCS and is classified as a good to very good rock mass. Instability issues are expected to be governed by jointing within the rock mass leading to planar sliding and wedge-sliding failures. The fresh rock domain is divided into five wall orientation sub-domains for the CMA pit and four orientation sub-domains for the Yaouré mining area. It has been indicated that pre-split blasting is planned on all walls adjacent to planned blasts, with trim blasting to occur on all CMA North and East wall blasts. Pre-splitting and trim blasts will assist in lowering blast damage and reduce potential instability issues caused by blasting. Good blasting practices have been assumed in all stability assessments. Potential structural stability issues are expected in the South walls of both the Yaouré and CMA mining areas, slope angles have been reduced in these areas to remain within set probabilities of failure. Structural mapping as mining progresses will be required to confirm or adjust the structural model and re-assess stability if required.

The existing CMA pit was backfilled with waste mined from the previous Yaouré pit and the backfill material will mostly be removed as part of planned mining. However, one section of the planned CMA West wall will consist of backfill material. Conservative assumptions on material properties of this material have been made to determine likely performance and slope parameters of exposed backfill. The performance of this backfill will be sensitive to water (groundwater and rainwater) and will require good drainage and interception of surface runoff from entering the material as much as possible.

Determined slope parameters for exposures in rock are presented in Table 15-3

Table 15-3 Slope Parameters for Rock Exposures

Mining area	Material	Wall	Bench height (m)	Batter slope angle	Berm width (main/intermediate)	IRSA
CMA	Fresh rock	North (West)	20	80/80	7/1.5	58.9
		North (East)	20	80/80	7/1.5	58.9
		East	20	80/80	7.5/1.5	57.9
		South	10	55	5	39.8
	WF (Transition zone)	South	10	55	5	39.8
		West	10	75	6	49
		All other walls	10	80	6	52.2
Yaouré	Fresh Granodiorite	North	10	80	5	55.9
		East	10	80	5	55.9
		South	10	55	5	39.8
		West	10	80	5.5	54
	Fresh Basalt	North	10	80	5	55.9
		East	10	80	5.5	54
		South	10	65	5	47
		West	10	80	5	55.9
	WF - Granodiorite	South	10	55	5	39.8
	WF - Basalt	South	10	80	7	48.8
	WF - all other walls	All except South wall	10	80	6	52.2

Slope parameters determined for regolith and fill exposures are presented in Table 15-4.

Table 15-4 Slope Parameters for Regolith and Fill Material

Wall/material	Bench height (m)	Batter slope angle	Berm width (m)	IRSA
Slopes > 40m	10	60	6	40.3
Slopes < 40m	10	60	4.5	44.2
Volcaniclastic (all heights)	10	60	6	40.3
Backfill	10	45	7	30.5

The initial pit optimisation used Inter Ramp Slope Angles (IRSA) to model the slope angles. Based on these results an initial pit design was completed that incorporated ramps. Using this design the IRSA were subsequently adjusted to include an additional layback to allow for the ramps.

15.5.4 Metallurgical Factors

Metal recoveries were determined by Lycopodium Consultants (Lycopodium, 2017) based on the results of metallurgical test work conducted by ALS (ALS, 2017), the results of which are summarised in Section 13 of this report. The resulting recoveries provided to RPM are shown in Table 15-5. For CMA fresh ore, the recoveries are modelled using a grade based equation. A graphical representation of this equation is shown in Figure 15-1.

Table 15-5 Processing Gold Recoveries

Ore Source and Rock Type	Units	Heap Leach	Fully Oxidised	Partially Oxidised	Fresh
CMA - Granodiorite	%		91.6%	89.8%	(100 x (Au - (0.095 x $Au^{0.94}$) - 0.011) / Au)%
CMA – Basalt/Volcaniclastic	%		91.6%	89.9%	(100 x (Au - (0.095 x $Au^{0.94}$) - 0.011) / Au)%
Yaouré - Granodiorite	%		91.6%	89.9%	90.1%
Yaouré – Basalt/Volcaniclastic	%		91.6%	89.9%	90.1%
Heap leach - CMA 1	%	84.5%			
Heap leach - CMA 2	%	82.5%			
Heap leach - E Global	%	83.7%			

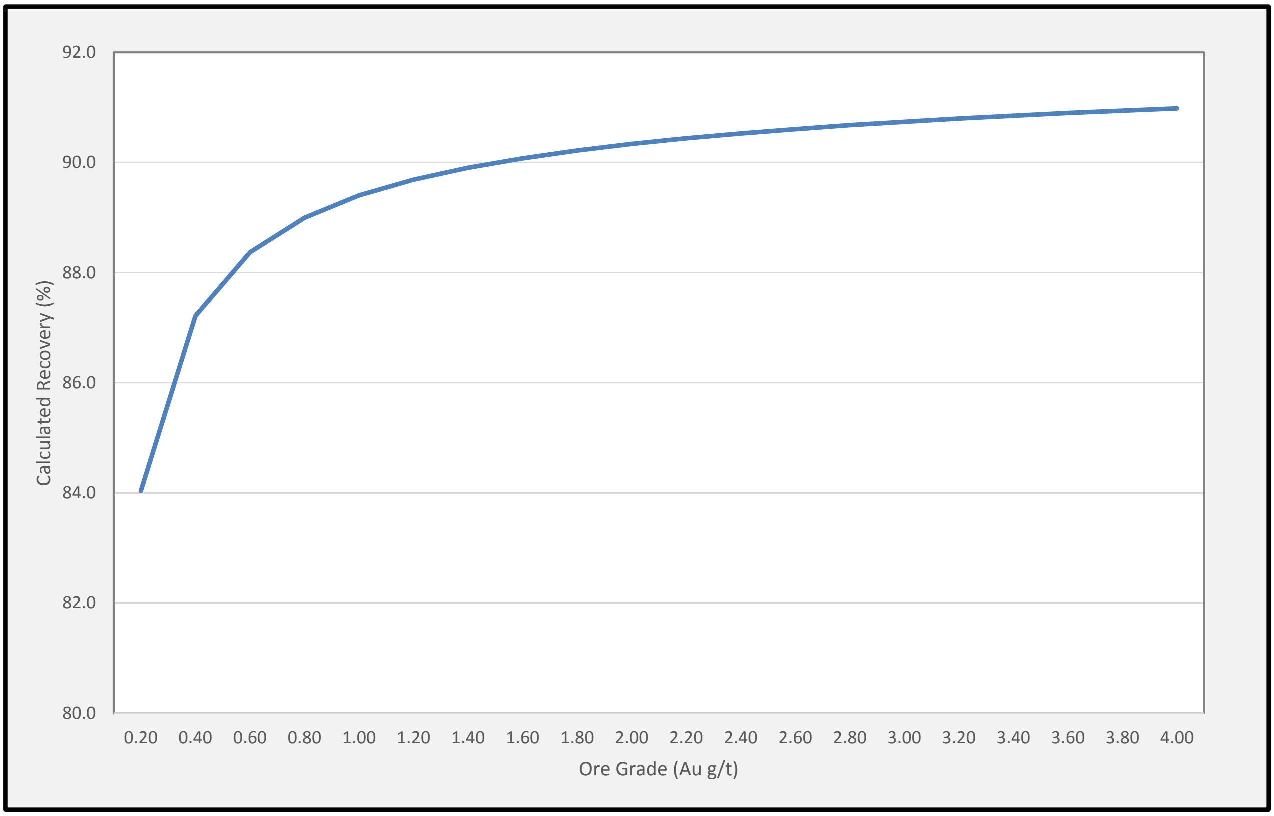


Figure 15-1 Calculated CMA Fresh Ore Gold Recoveries for a Range of Ore Grades

15.5.5 Operating Costs

Estimates of mining and processing costs are discussed in Section 21 of the report and are summarised in Table 15-6 and Table 15-7, respectively.

The Study was completed in four mine planning stages, with each iteration increasing the level of detail and accuracy.

The mining costs, including load and haul and other related operational costs, were obtained from mining contractor quotations based on the pit design and schedule. Drill and blast costs were obtained from a detailed assessment of the rock characteristics and expected powder factors at the planned bench heights (George Boucher Consulting, 2017). Operator administration, grade control, ore rehandle and other site costs were provided by Perseus based on experience from their operating mines in West Africa. These costs were reviewed by RPM and found to be reasonable.

The processing costs and recoveries were determined by Lycopodium based on metallurgical test work (lycopodium, 2017). In the final stage of the project the operating costs and processing recoveries were refined to reflect the latest contractor pricing and updates to the metallurgical test work.

In the final stage of the study (Stage 4) the various mining contractors were also asked to update their submissions based on refinements to the production schedule. To confirm the project viability for the revised costs and parameters, a final pit optimisation was completed. RPM found that these resulted in a slightly larger pit shell being produced, thus confirming the economics had not been adversely impacted. As this increase in pit size was minimal the existing detailed pit designs were not altered.

Table 15-6 Mining Costs

Description	Units	Heap Leach Pad	Weathered	Transition	Fresh
Waste Mining					
Drill and Blast Basalt & Volcaniclastic	USD/t waste	-	-	0.90	1.11
Drill and Blast Granodiorite	USD/t waste	-	-	1.41	1.55
Load & Haul	USD/t waste	1.47	1.47	1.15	0.84
Haulage Cost Per Vertical Metre	USD/t waste per m vert	0.004	0.004	0.004	0.006
Ore Mining					
Drill and Blast Basalt & Volcaniclastic	USD/t ore	-	-	1.28	1.59
Drill and Blast Granodiorite	USD/t ore	-	-	1.41	1.55
Load & Haul	USD/t ore	1.19	1.19	0.88	0.61
Haulage Cost Per Vertical Metre	USD/t ore per m vert	0.004	0.004	0.005	0.007
Other Mining Costs					
Dayworks	USD/t rock	0.06	0.06	0.06	0.06
Presplit	USD/t rock	-	-	-	0.07
Contractor Fixed	USD/t rock	0.40	0.40	0.40	0.40
Mine Rehabilitation	USD/t rock	0.01	0.01	0.01	0.01
Fixed Mining Cost	USD/t rock	0.16	0.16	0.16	0.16
Dewatering - In pit	USD/ t rock	0.00	0.00	0.00	0.00
Dewatering - Wall depressurisation	USD/ t rock	0.00	0.00	0.00	0.00
Other Ore Costs					
Grade Control	USD/t ore	-	0.85	0.85	0.85
Rehandle Cost	USD/t ore	0.73	0.73	0.73	0.73

Table 15-7 Processing Costs

Ore Source and Rock Type	Units	Leach Pad	Weathered	Transition	Fresh
CMA - Granodiorite	USD/t ore	9.51	9.51	11.03	12.58
CMA - Basalt & Volcaniclastic	USD/t ore	9.51	9.51	11.03	12.58
Yaouré - Granodiorite	USD/t ore	9.51	9.51	11.03	16.45
Yaouré - Basalt & Volcaniclastic	USD/t ore	9.51	9.51	11.03	16.86

Table 15-8 General and Administration Costs

Ore Source and Rock Type	Units	Leach Pad	Weathered	Transition	Fresh
CMA - Granodiorite	USD/t ore	3.30	3.30	3.30	3.30
CMA - Basalt & Volcaniclastic	USD/t ore	3.30	3.30	3.30	3.30
Yaouré - Granodiorite	USD/t ore	3.30	3.30	3.30	4.35
Yaouré - Basalt & Volcaniclastic	USD/t ore	3.30	3.30	3.30	4.46

15.5.6 Metal Selling Price, Royalties and Selling Costs

The gold selling price (Table 15-9) was based on the long term consensus forecast available at the time of this study. The royalty rates and selling costs (Table 15-10) were supplied by Perseus.

The combined royalty is composed of a direct 0.5% Community Development Fund and 3.5% royalty to the government. The selling costs are composed of gold transport and marketing costs.

Table 15-9 Metal Selling Price

Description	Units	Value
Gold Price	US$/tr oz	1,200

Table 15-10 Royalty and Refining Costs

Description	Units	Values
Royalty	% of Gross Revenue	3.5%
Community Development Fund	% of Gross Revenue	0.5%
Refining Charge	USD/tr oz	1.02

15.5.7 Pit Shell Selection

Pit optimisation was completed on a range of Revenue Factors (RF) generating a single optimum pit shell for each gold price factor which is referred to a series of nested pits. These nested pits were used to:

- Complete a high-level review of the sensitivity of the deposit to changes in gold price (or operating costs);
- Gain a high-level insight into the potential mining strategy; and
- Perform an analysis determining the incremental mineable material and economics for each successive shell.

Key criteria used in selecting the final pit shell included:

- Maximise cash flow;
- Maximise resource recovery;
- Balance between maximising ore and minimising incremental strip ratio; and
- Operation requirements including practical pit size and shape.

Analysis of the pit shell results indicated that the incremental margin per recovered ounce of gold decreases as the pit size approaches the optimum pit. The lower margin means that the last few incremental shells are at a higher risk to price fluctuations. This suggests a strategy of mining to a shell slightly smaller than the 100% RF (Optimum) pit so that the margin at the edge of the pit is more resilient to price.

In addition to the sensitivity and shell analysis results, a high level Life-of-Mine (LOM) discounted cash flow was generated within Whittle using selected shells to represent cutbacks and ore production constrained to the proposed milling rate. This confirmed that the lower margin incremental material at or near the optimum pit (100% RF) did not substantially contribute to Project value.

Based on the pit optimisation results, Perseus selected the 84% RF pit shell to guide the detailed pit design. The detailed practical pit designs incorporate haulage ramps, berms (catch benches), suitable batter angles and other design criteria for each of the CMA and Yaouré open pits.

Note that only material with a Resource classification of Measured or Indicated is considered when determining a Reserve.

15.6 Production Scheduling and Economic Modelling

The detailed pit designs were evaluated against the updated geological block model to determine the tonnages, grades, rock codes and classifications of the material within the pits. The design was then split into smaller cutbacks. The resulting quantities were then used to prepare a life-of-mine schedule.

Once completed, the scheduled quantities were input into an economic model that assigned operating and capital costs to determine the overall economic viability of the project. If the project is found to be viable then that portion of the Mineral Resource within the pit that generated revenue can be deemed an economic Mineral Reserve.

15.7 Mineral Reserve Sensitivity

The economic sensitivity of the project has been reviewed at a high level using pit optimisation software and in detail in Section 22 of the report. As in any mineral project, the results of the economic analysis represent forward looking information that is subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here. Areas of uncertainty that may materially impact Mineral Reserve estimation include:

- Commodity price and exchange rate assumptions,
- Capital and operating cost estimates,
- Geotechnical slope designs for pit walls, and
- Metallurgical performance (gold recovery).

A high level price sensitivity assessment of the deposit to a range of metal prices is presented graphically in Figure 15-2 and Figure 15-3 with the selected optimum (highest undiscounted cash value) pit shell highlighted. Pit optimisation sensitivity analysis indicates that the deposit is very sensitive to changes in gold price, with a 10% variation in price changing the ore tonnage by 9-12%.

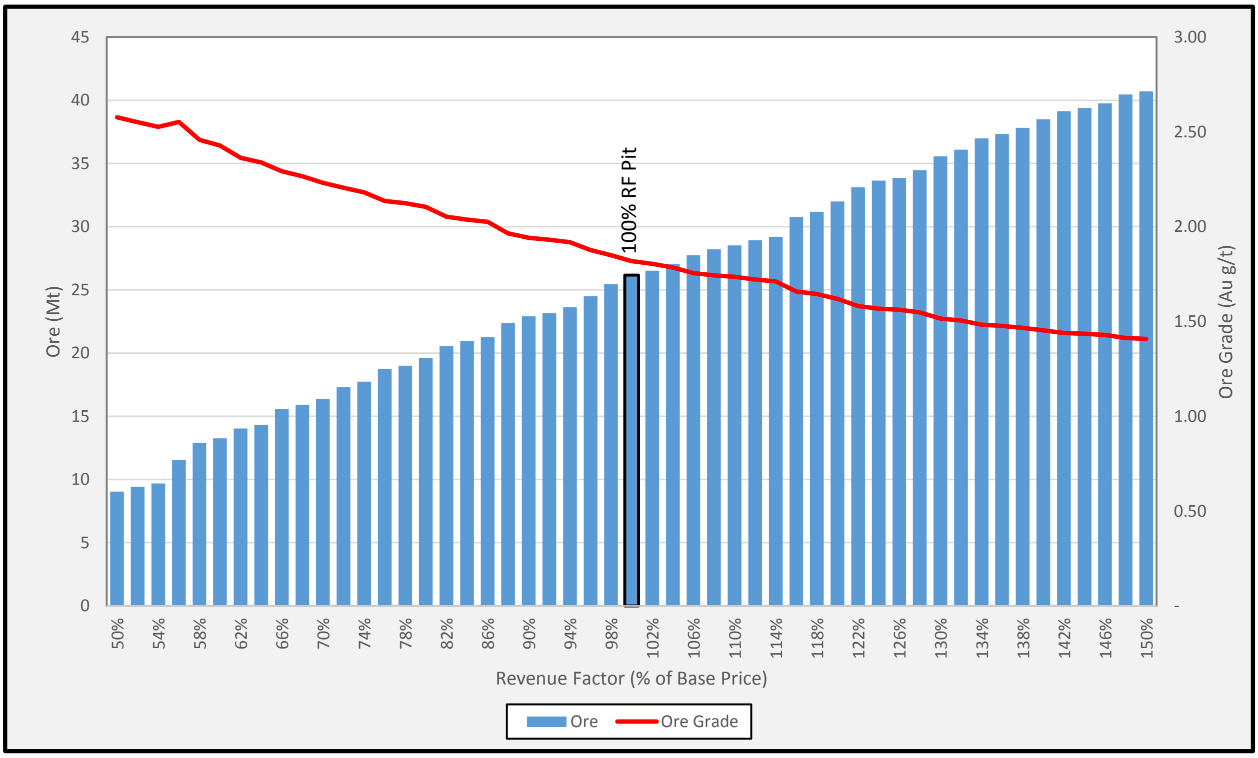


Figure 15-2 Pit Optimisation Price Sensitivity - Ore and Ore Grade

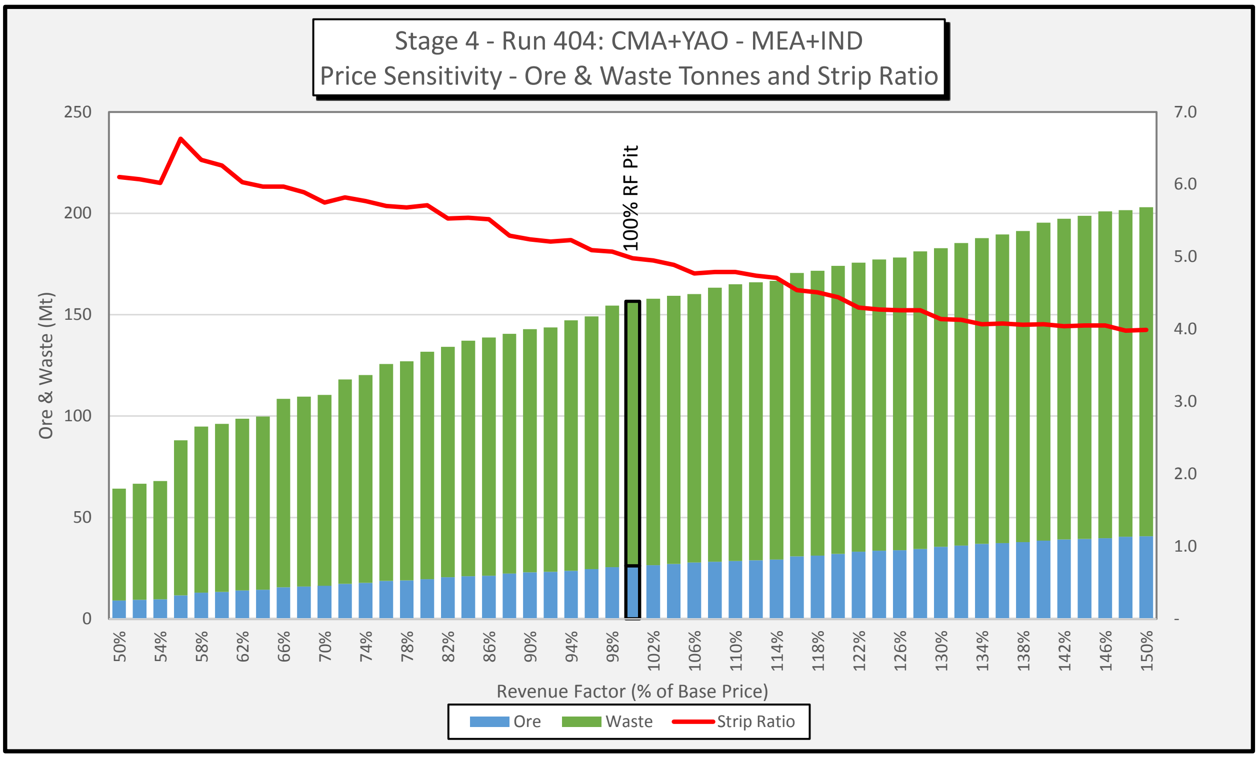


Figure 15-3 Pit Optimisation Price Sensitivity – Ore and Waste

16. Mining Methods

16.1 Introduction

The chosen mining method is conventional open pit mining utilising hydraulic excavators and standard off-highway rear dump trucks. In ore, mining bench heights are 5 m with 2.5 m flitches for selective mining to minimise ore loss and waste rock dilution. Waste blocks adjacent to ore will be mined on 5 m benches, while bulk waste more distant from the ore zone will be mined on 10 m benches.

Trucks will haul ore to surface ore stockpiles, with waste being hauled to, and disposed in, waste disposal dumps. Stockpile rehandle will be by front-end loaders.

Drill and blast practices will be employed to break the rock. Drill and blast techniques will be applied to minimise open pit wall damage and minimise ore loss and waste dilution.

16.2 Selective Mining Method

The proposed mining operation will use a selective mining method to minimise ore loss and waste rock dilution. The mining rate averages approximately 26.5 Mt/year total movement for the life of mine to deliver ore feed to support the target processing rate of 3.3 Mt/year. The operation is planned to be operated by a mining contractor. The mining contractor's activities include stripping free dig material such as topsoil, clays and highly weathered rock near surface, as well as removing backfill in the CMA pit. Fresh rock, which is the dominant rock type, will require significant drilling and blasting, and will form the main material mined by the mining contractor.

To balance waste stripping and ore grades the pits are designed to mine to the ultimate boundary limit using cutbacks. Access to the pit will be by 24 m wide haul roads and ramps incorporating a 10 percent gradient with windrow and drain. Single lane ramps will be used as required especially towards the end of pit life to maximise ore recovery and minimise waste mining. Rock will be hauled to surface with ore placed on stockpiles at the ROM pad and waste dumped to waste disposal dump.

Ore and waste in transition and fresh rock will be drilled and blasted prior to excavation. The mine will undertake conventional drilling and blasting activities with pre-splitting in all transition and fresh rock to assure stable wall conditions.

Reverse circulation (RC) drilling will be completed for grade control with samples taken on 2m composites, with the assays used to define the ore boundaries.

Loading operations will be performed by hydraulic excavator with waste rock mined in 10 m benches in bulk mining regions and 5 m benches in the pit production zones. Ore will be mined in 2.5 m flitches for selective mining to minimise ore loss and waste rock dilution. Hydraulic excavators and off-highway rear dump trucks will be appropriately matched by the mining contractor. Smaller excavator equipment will be used for ore mining operations.

The mined material will be hauled to the designated destination being either the ore stockpile, the crusher feed bin (direct dump) or waste dumps. The operation will be supported by front-end loaders for ore stockpile rehandle.

Waste rock will be placed in an ex-pit waste rock dump within the mining lease. Backfilling of the open pits is not anticipated given the continuing mineral potential of the region.

The potential for acid mine drainage has been examined in detail and, based on testwork, is not expected to present any significant issues. Samples for potentially acid forming rock will be taken and assayed to ensure that waste disposal practices adapt as new information is gained.

16.3 Pit and Dump Design

Two open pits will be mined during the proposed life of the Project. The CMA pit is the main open pit as measured by gold production and will be mined in three cutbacks. The Yaouré pit will be mined as a northern and southern cutback.

16.3.1 Site Layout and Pit Designs

The proposed site layout is shown in Figure 16-1.

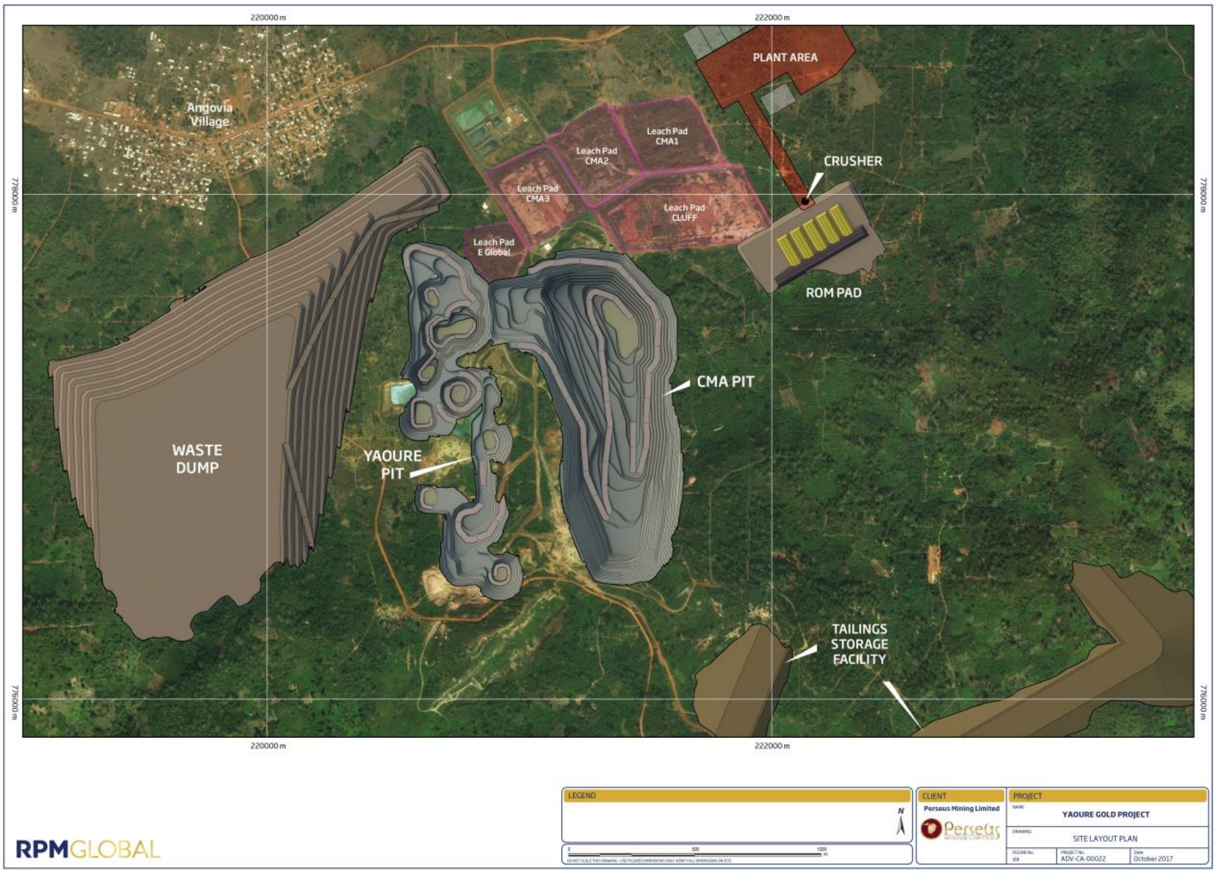


Figure 16-1 Yaouré Project Site Layout

16.3.2 Pit Design Parameters

The pit design parameters including berm widths, batter angles, berm spacing and haul road widths and gradients are based on geotechnical reports and the largest mining truck size considered appropriate for the Project. This truck size has been confirmed by correspondence with Mining Contractors.

Depending on the degree of selectivity required ore will be mined using 2.5m flitches and 5m benches. Where selectivity is not required, such as in bulk waste will be mined, 10m benches are proposed.

The mine design parameters are shown in Table 16-1. As discussed in Section 15, bench heights, batter angles and berm widths vary by mineralisation location and by the degree of weathering. In areas of stable fresh rock 20m final benches incorporating a 1m stand-off at 10m will be used.

Table 16-1 Mine Design Parameters

Description	Unit	Value
Ore Bench Height	m	5
Flitch Height	m	2.5
Height between Berms	m	variable
Safety Berm Width	m	variable
Batter Angle	degree	variable
Minimum Mining Width	m	100
Ramp Gradient	%	10
Double Lane Ramp Width	m	24
Single Lane Ramp Width	m	14

Plan views of the ultimate pits for CMA and Yaouré are shown in Figure 16-2 and Figure 16-3, respectively.

Figure 16-2 CMA Cutback 3 – Ultimate Pit Limit

Figure 16-3 Yaouré North and South Cutbacks

16.3.3 Waste Dump Design Parameters

For ease of rehabilitation, the waste dumps were designed to have an overall slope gradient of approximately 1:3. Perseus has completed a waste dump design for a single ex-pit waste dump located west of the open pits and using a 10m bench height and 15m berms. This dump is sufficient to impound any waste materials that are mined and not placed in the tailings dams, ROM pad or used in other construction earthworks. An in situ to dump swell factor of 1.2 has been used to convert from Bank Cubic Metres (BCM) to dumped volume.

16.3.4 Geotechnical Parameters

The geotechnical parameters are discussed in Section 15.4.3.

16.3.5 Drill and Blast Design

Blast modelling and analysis has been completed for the Project to develop drill and blast designs to support the delivery of the mine plan and pit designs (George Boucher Consulting, 2017).

The key drill and blast design considerations are:

- Extremely hard/high strength fresh rock (for the largest rock domain by volume, 80th percentile unconfined compressive strength (UCS) is 217 MPa for fresh basalt);
- Very widely spaced joints (true mean spacing of 3m for the largest domain);
- The environmental effects of blasting, for example a town is located about 650m from the closest part of the Yaouré pit;
- Base case primary crusher topsize dimension of 800mm (selected by Perseus); and
- Selection of blasthole diameter to achieve:
  - Fragmentation targets;
  - Control of ore dilution and ore loss; and
  - Control damage to open pit walls.

16.4 Open Pit Mining Operations

A mining contractor will be engaged to undertake mining from both the CMA and Yaouré pits. The mining contractor will be responsible for:

- Clearing and grubbing, topsoil stockpiling;
- Waste stripping;
- Drilling and blasting;
- Excavate and haulage of ore and waste;
- Ore stockpile and waste dump management;
- Ancillary services including dewatering, pumping and haul road construction/maintenance.

Grade control drilling will be completed under a separate contract. Grade control samples will be transported to a regional commercial laboratory for analysis.

16.5 Production Schedules

This section outlines the mining and processing schedules completed by Perseus. RPM reviewed the outcomes by independently preparing a separate schedule, hereafter referred to as the "Check Schedule".

The RPM Check Schedule validates the Perseus derived schedules which are used for Financial Evaluation.

16.5.1 Mine Scheduling

The mining production profile is based on the Open Pit Mineral Reserve in Table 15-1.

The mining schedule supplies the highest grade ore for processing at any given point in time to maximise project economics. Ore is mined from the CMA pit, the Yaouré pit and small previously processed heap leach stockpiles.

The CMA pit is the source for the majority of the gold and has higher gold grades than the Yaouré pit and heap leach stockpiles. However, access to CMA ore is delayed due to oxide waste backfill placed in the pit by the previous mine operator, and waste stripping required to allow access to the ore. Initial mining therefore targets heap leach stockpiles while CMA backfill is removed and pre-stripping is carried out. Total material movement from the pits and leach heaps averages 26.5 million tonnes per year and is a maximum of 33.3 million tonnes per year during Year 1 when the heap leach and CMA backfill are mined.

The CMA pit is mined in three stages over a five year period. The highest grade ore is preferentially fed to the processing plant. The ore will be stockpiled in high, moderate and lower grade ranges to allow ore blending and processing of the highest grading ores.

The Yaouré pit is mined after the completion of the CMA pit, with the highest grading material available at that time from either the Yaouré pit or stockpiles being fed to the processing plant.

Mining is completed after 6 years of operation, with rehandling of stockpiled ore occurring thereafter until stockpiles are depleted.

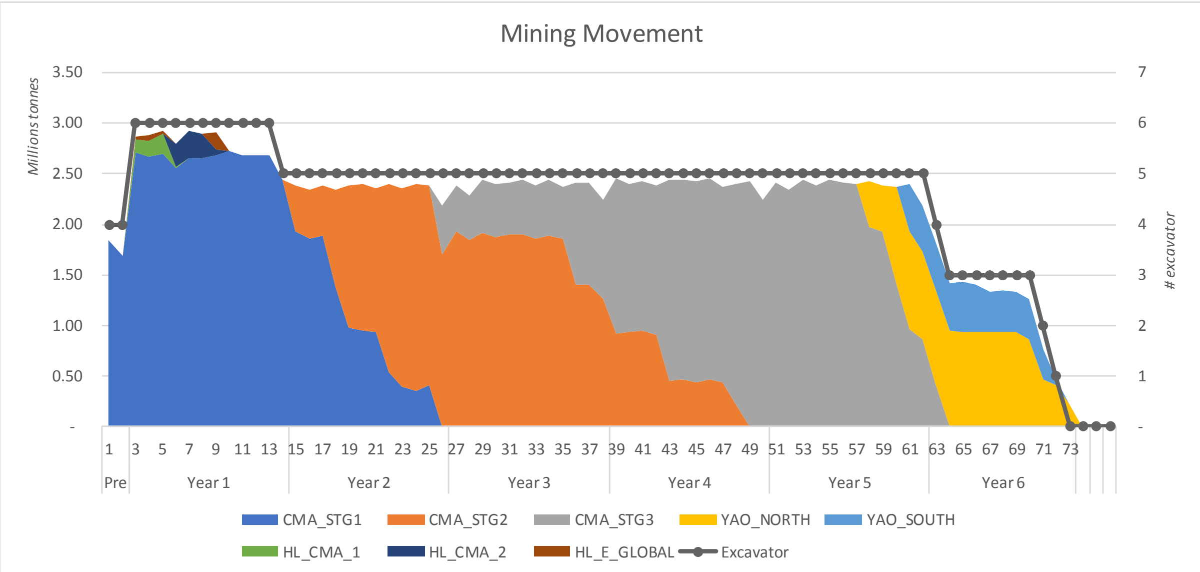


Figure 16-4 Scheduled Monthly Material Movement by Cutback

The vertical rate of advance employed in the mining schedule is shown in Figure 16-5. A maximum vertical mining rate of 80 m/year was nominated by Perseus based on experience at the Company's other operations.

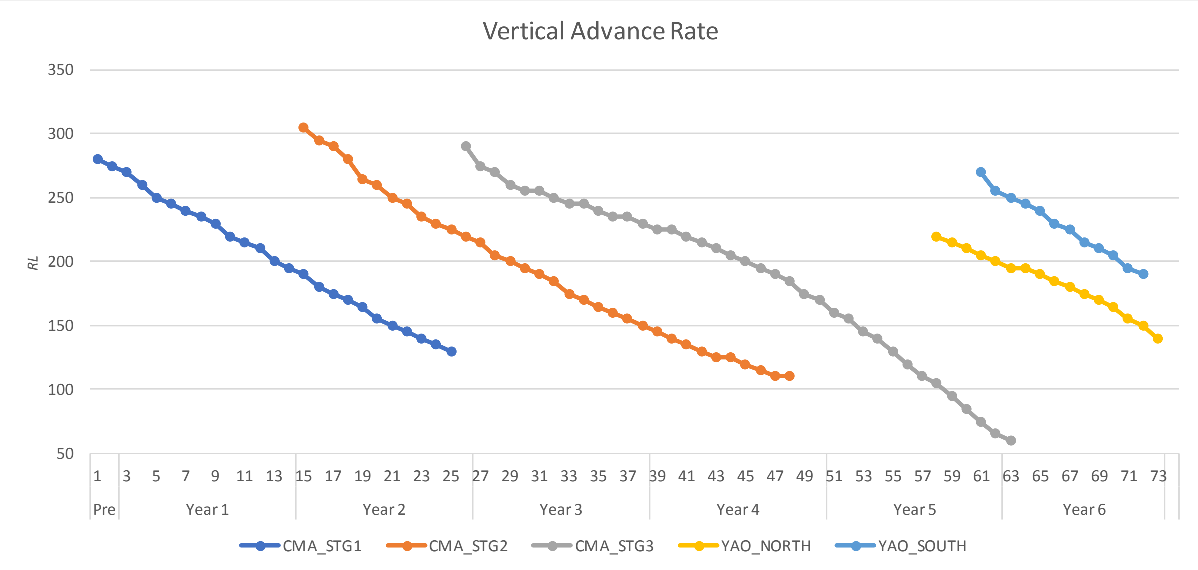


Figure 16-5 Monthly Vertical Rate of Mining Advance by Cutback

16.5.2 Processing Schedule

The mining and processing strategies focus on maximising the return on investment by optimising recoverable ounces. In general the highest grade material available is preferentially delivered to the processing plant over the life of mine. The tonnes processed in any period take into consideration the material variable throughput rate and mill run time.

The processing rate is nominally 3.3 million tonnes per year over an 8.5 year mine life. The average gold production in each of the first 5 years of the project is 216,000 ounces at an average head grade of 2.28g/t Au and an average metallurgical recovery of 90%. The Project is planned to recover 1.37 million ounces over the 8.5 year period.

The production profile is shown in Figure 16-6 and Figure 16-7.

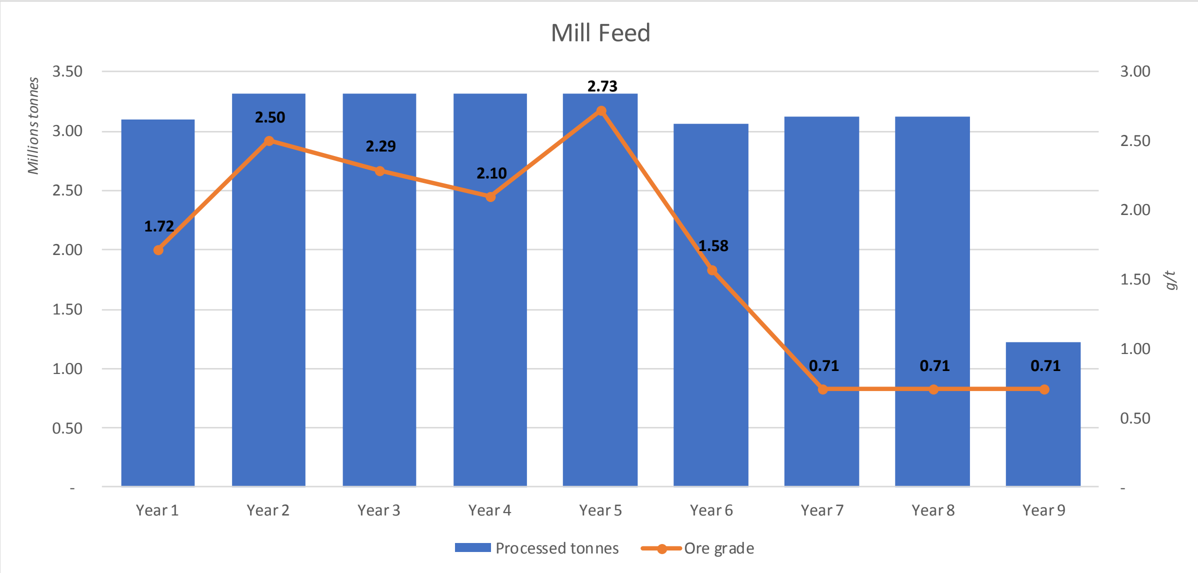


Figure 16-6 Annual Tonnes and Grade to Mill

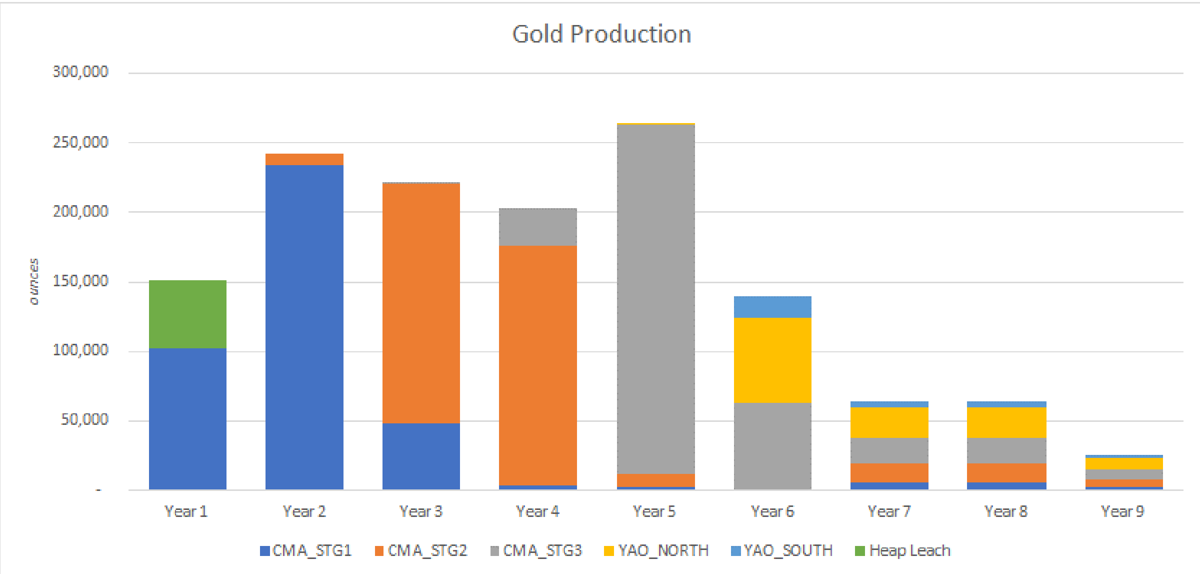


Figure 16-7 Annual Gold Production by Source

16.5.3 Check Schedule

RPM independently developed mining and processing schedules for the Yaouré Gold Project.

Scheduling was performed using RPM's Open Pit Metals Solution (OPMS) package. To better balance ore production and strip ratio, the final CMA pit was divided into three separate cutbacks and the final Yaouré pit divided into two separate cutbacks. All cutbacks were modelled as triangulated solids. These solids, along with the geological block model, were imported into OPMS. The solids were split into smaller mineable blocks with their corresponding grades, classification and material types calculated from the block model. A dilution factor was not applied to the grades as Perseus directed that the dilution was already included in the geological block model.

The schedule was setup to include production equipment operating parameters such as availabilities, utilisation, production rates and haulage speeds. A full haulage network was established from every bench and mining blocks to the crushers and waste dumps to suit the 100t class rear-dump truck selected for modelling. A series of scheduling rules, including mining precedence, advance rates and mining restrictions were applied to simulate the actual mining process.

The results of the Check Schedule indicate very close agreement with the schedule developed by the Perseus option and supported its use for financial evaluation.

16.6 Mining Equipment

The mining equipment selection is based on the preferred approach adopted by the mining contractor. To identify likely equipment requirements, both RPM and Perseus provided a Request for Quotation ("RFQ") to a number of mining contractors active in West Africa. The purpose of the Perseus RFQ was primarily to refine the initial contractor estimates following further mine planning.

The mining equipment nominated by the five mining contractors responding to the RPM RFQ process is presented in Table 16-2.

Table 16-2 Nominated Mining Fleet by Mining Contractors

Description	Capacity	Contractor 1	Contractor 2	Contractor 3	Contractor 4	Contractor 5
Excavator	230 - 300t	2	2	5	3	2
Excavator	100 - 140t	1	3	1	1	1
Rear Dump Truck	90t	28	29	30	24	29
Top Hammer Drills	102 - 152 mm ϕ	11	7	4	7	7
Front End Loader	Nominal 4.5m3	2	1	0	0	0
Front End Loader	9.5m3	0	0	1	2	0
Dozer	302 - 384 kW	6	4	8	7	6
Grader	216 kW	3	3	2	2	3
Grade Control Drill	RC	3	1	1	1	0
Water Truck	70,000 litres	4	0	2	2	0
Water Truck	20 - 30,000 litres	0	3	0	0	3
Rock Breaker	37t	1	0	1	2	0
Service Trucks		2	0	2	2	2
Pit Pumps		10	0	0	6	3

16.6.1 Load and Haul

Careful management of ore loss and dilution has been a key mining principal throughout the assembly of the DFS.

The mining contractors nominated two classes of excavator as follows:

- 230t to 300t class excavator for mining bulk waste; and
- 100t to 140t class excavator for selective mining of ore and mixed waste / ore zones.

RPM has undertaken numerous equipment trade-off studies in developing countries and the general conclusion is that, due to low labour costs, the economies of scale of larger equipment does not provide a significant advantage. If anything they create a greater operational risk due to the large size, access to spare parts and additional training. Furthermore, when ore loss and dilution is accounted for, smaller equipment generally are preferred and are more readily sourced by a mining contractor.

Standardisation of the truck fleet to 90t rear dump trucks for both classes of excavator is prudent and will support maintenance and training programs.

The mining fleet nominated by the mining contractors is considered to support the key principal of ore loss and dilution management, whilst taking advantage of lower drill and blast costs in bulk waste.

RPM was not tasked to determine the breakdown of ore and waste material that will be mined on 5m and 10m bench heights. It is presumed that there is sufficient bulk waste material to support the continuous operation of 230t to 300t class excavators and so take advantage of the lower drill and blast rate associated with bulk waste.

Questions raised from outliers in the excavator and truck fleet numbers, notably the excavator numbers nominated by Contractor 3 and the truck numbers nominated by Contractor 4, will be removed through the mining contract tendering process.

16.6.2 Drill and Blast

An independent assessment of drill requirements was undertaken (George Boucher Consulting, 2017), the results of which are summarised in Table 16-3.

Table 16-3 Summary of Drill Requirements – LOM Average Number of Drill Units

	Pantera 1500	DML Required
Minimum Estimated LOM Mean Drill Units Required	**4.6**	**0.8**

Note: Drill estimate is based upon:
1. Instantaneous drill penetration rates as shown in Table 7.1 "Yaoure Drill and Blast Analyses – DFS Report"
2. 5,200 engine hours per unit/year, with 85% of this time spent actually drilling (Note this requires industry best practice in utilisation of drills)
3. Engine hours exclude long distance drill tramming

16.6.3 Ore Rehandle

High grade ore will be rehandled from ore stockpile to the crusher bin by front-end loader (FEL). Low grade ore and heap leach feed will be rehandled by FEL and truck combination and dumped directly into the crusher bin.

Due to variances in the Contractor submission costs for ore rehandle, Perseus estimated its own rehandle cost for financial modelling based on experience at the Company's Edikan mine.

16.6.4 Ancillary Support

In general, the ancillary support equipment received in the mining contractor submissions appears adequate at this phase of study for dozers, graders, water-carts and service trucks.

17. Recovery Methods

17.1 Design Criteria Development

17.1.1 Introduction

The information presented in this section of the report derives from Lycopodium (2017) and the appendices thereto.

The programme of comminution and metallurgical testwork has provided information about the physical characteristics and metallurgical response of the main mineralised material types. The process design criteria were developed based on the CMA fresh ore as this will be the major ore type processed over the life of mine. The relative contributions of each material type and their proposed sequence of treatment over the life of mine were considered for sizing the comminution circuit.

A SABC (open circuit SAG mill followed by closed circuit ball mill and recycle pebble crushing) comminution circuit was selected and has the advantage of being able to accommodate the wide spectrum of material competencies. The grind sensitivity and subsequent variability testwork suggest that all material types are grind sensitive with gold extraction increasing with fineness of grind. The grind optimisation evaluations allowed a P_{80} grind size of 75 µm to be selected. Diagnostic leach evidence that most of the residual gold is locked with arsenical minerals suggests that this would be liberated with finer grinding, but this is not justified by the quantity of locked gold and the incremental cost.

Although the available ore composite testwork results suggested that the gravity recovery stage added little or no improvement to the final gold extraction, a gravity circuit has been included in the process plant flowsheet with the following benefits:

- The clear evidence of coarse gold or 'spotty' mineralisation with the variable assays and leach performance is best addressed by inclusion of a gravity circuit. The gravity circuit will limit potential spikes of high grade material passing through to the leach circuit, allowing more consistent operation of the adsorption and elution circuits;
- Leach kinetics are improved, particularly at the start of the leach, by removing the gravity recoverable gold. This improves the carbon profile and ensures lower gold solution losses in practice;
- Intensive cyanidation of the gravity concentrate has improved potential of leaching semi-refractory minerals which were also evident in the diagnostic leaches;
- If gravity recoverable gold is present in the feed and is not recovered in the milling circuit, this will tend to get trapped in launders and hoppers and become a theft risk during maintenance downtime.

The gravity circuit has been based on treating a pre-concentrated fraction of the cyclone feed stream as there is evidence of high GRG content in some samples and, with the mass pull required, if cyclone underflow were treated, the circuit water balance may constrain optimisation of the gravity circuit operation.

The gravity / gold leach testwork on the CMA fresh variability samples showed that cyanide leaching produced a range of extractions from 83% to 98% gold and that initial leaching rates were high with evidence of a generally small slow leaching fraction that continued to leach throughout the tests. No preg-robbing characteristics were evident, so the plant design will comprise a direct leach stage ahead of the CIL circuit with air sparging in the tanks. The CIL circuit will have a residence time of 29 – 35 hours depending on leach feed density.

A pre-leach thickener has not been included in the flowsheet as the oxide start-up will not suit thickening being very fine as received and exhibiting slow settling rates and low underflow densities.

No evidence of deleterious elements in the leach solution was noted, so operation of adsorption and desorption should be simple. Cyanide detoxification of the tails stream is included and the testwork has been completed on this process to allow confirmation of the basic engineering design and operating costs.

17.1.2 Selected Process Flowsheet

The treatment plant design incorporates the following unit process operations:

- Primary crushing with a single toggle jaw crusher to produce a coarse crushed product;
- A live stockpile from which ore will be reclaimed to feed the milling circuit;
- A SABC milling circuit comprising a SAG mill in closed circuit with a pebble crusher and a ball mill in closed circuit with hydrocyclones to produce an 80% passing 75 micron grind size;
- Gravity concentration and removal of coarse gold from the milling circuit recirculating load and treatment of gravity concentrate by intensive cyanidation and electrowinning to recover gold to doré;
- A leach and carbon in leach (CIL) circuit of one leach stage followed by six stages of leaching with carbon present for gold adsorption, providing a total of 29 hours leach time at the design leach feed density;
- A split AARL elution circuit treating loaded carbon, electrowinning and gold smelting to produce doré; and
- Tailings pumping to the tailings storage facility (TSF).

17.1.3 Key Process Design Criteria

The key process design criteria listed in Table 17-1 form the basis of the detailed process design criteria and mechanical equipment list.

Table 17-1 Summary of Key Process Design Criteria

	Units		Source
LOM ore blend		78% primary, 22% saprolite / transition	Perseus
Plant capacity	t/y	3,000,000	Perseus
Gold head grade	g/t Au	1.82	Perseus
Design gold recovery	%	93	Testwork
Crushing plant utilisation	%	80	Lycopodium
Plant utilisation	%	91.3	Lycopodium
SMC Axb	kWh/t	31.5	Testwork/OMC
Bond ball mill work index (BWi)	kWh/t	14.7	Testwork/OMC
Abrasion index (Ai)		0.223	Testwork/OMC
Milling grind size	µm	75	Testwork
Leach circuit residence time	hrs	29	Testwork
Leach slurry density	% w/w	40	Lycopodium
Number of leach tanks		1	Lycopodium
Number of CIL tanks		6	Lycopodium
Elution circuit type		Split AARL	Lycopodium
Elution circuit size	t	10	Lycopodium
Frequency of elution	strips/week	8	Lycopodium
Tailings WAD cyanide concentration	ppm	<150	Perseus

17.2 Metallurgical Recoveries and Reagent Consumptions

17.2.1 Gold Recovery

Plant gold recoveries and reagent consumption have been estimated based on the results of the CMA variability testwork at a P_{80} grind size of 75 µm. Although the spread of gold extractions seems quite wide, the majority of the results are clustered around the mean with extractions within one standard deviation of the mean ranging from 87.6% to 93.5%. No discernible relationship between gold extraction and head grade or gravity recovery and head grade could be found, but there is a weak correlation between head and residue grades.

Similar conclusions were drawn from the analysis of the Yaouré fresh ores and the oxide master material.

In order to select recoveries for economic modelling of the project, it was decided to use the median recovery from the variability data sets since the gold extraction results are generally quite closely grouped with a few outliers, both on the high and low sides.

Recovery data were interpolated for the 30 h residence time allowed at 40% solids based on a least squares linear regression for the last 24 h of leaching.

An allowance for a soluble loss of 0.0075 ppm Au in tails solution which is equivalent to 0.011 g Au/t at 40% solids is added to the calculated residue grade.

Table 17-2 Gold Recovery Estimates for Operation at 40% Solids

Ore Type	Gold	
	Extraction % @ 30h	Recovery (%)
Oxide	94.6	93.9
Transition	95.5	95.1
CMA	90.5	89.7
YAO granodiorite	94.8	93.8
YAO basalt S	92.4	91.8
YAO basalt Y	92.7	92.0

17.2.2 Reagent Consumptions

For the CMA fresh variability testing it is appropriate to allow average reagent usage rates for the operating costs although the design values are set to cover the range of dosing rates expected for pump sizing. Cyanide usage includes an allowance for a free cyanide residual (100 mg/L NaCN) with no recovery in the tailings decant water. Additional allowances are made for cyanide usage in elution and for the intensive cyanidation reactor treating the gravity concentrate, although much of this reagent will be recovered to CIL.

Lime usage was consistently lower for the variability tests than in the composite series despite modifying pH to the same value of 10.5. With no valid explanation, the average usage rate for the optimised composite tests is proposed. Lime is expressed on the basis of 90% CaO supplied whereas the lab reagent was 60% CaO.

Lime usage rates for the oxide variability tests were higher than the fresh requirement so dedicated usage estimates were made for the oxide and heap leach ores. Perseus advised the tonnage weighted blend of ex-pit oxide and recovered heap leach dump material on which to base the reagent usage rates.

Table 17-3 Estimated Plant Reagent Consumptions (@ P80 75 µm)

Ore Type	Consumption	
	NaCN kg/t	Lime kg.t
Oxide	0.44	1.73
Fresh CMA	0.39	0.30

17.3 Process and Plant Description

17.3.1 ROM Pad

The Run of Mine (ROM) pad will be used to provide a buffer between the mine and the plant. The ROM stockpile will allow blending of ore feed stocks, and will ensure a consistent feed type and feed rate to the plant. ROM ore will be loaded into the crushing circuit feed bin (ROM bin) either by direct tipping from the mining haul trucks or by reclaiming from the stockpiles by front end loader (FEL).

17.3.2 Crushing and Grinding Circuit

ROM ore will be drawn from the ROM bin at a controlled rate by an apron feeder and discharged onto a vibrating grizzly. The grizzly oversize will report to the jaw crusher for primary crushing. The jaw crusher product together with grizzly undersize will report to the primary crusher discharge conveyor feeding directly to the coarse ore stockpile.

Ore will be withdrawn from the coarse ore stockpile and fed via the mill feed conveyor to the SAG mill. Lime and SAG mill grinding media will be added to the mill feed conveyor as required.

The grinding circuit will consist of a SAG mill in open circuit, a pebble crusher and a ball mill in closed circuit with hydrocyclones.

The SAG mill will discharge via a pebble dewatering screen, and oversize consisting of pebbles and worn steel grinding media, will discharge onto the pebble transfer conveyor. Worn media will be removed by a magnet and pebbles will be crushed in the pebble crusher and will report back to the SAG mill conveyor. The screen undersize will gravitate to the mill discharge hopper and will be pumped to the hydrocyclone cluster for size classification.

The cyclone underflow (coarse material) will report to the ball mill feed chute for further grinding. The cyclone overflow (product size material) will gravitate to the trash screens prior to leaching.

17.3.3 Gravity Circuit

Feed for the gravity circuit will be pumped direct from the mill discharge hopper by a separate set of slurry pumps. The gravity circuit will consist of two parallel circuits each containing a screen and concentrator. The feed stream will gravitate to one of two vibrating 'degritting' screens to remove coarse (+2 mm) material and fragments of broken mill balls. This oversize will return to ball mill feed. The undersize stream from the screens will gravitate to one of two 48 inch centrifugal concentrators. The tails slurry from the centrifugal concentrators will gravitate to the mill discharge hopper. The concentrators will be operated on a semi-batch basis with periodic discharge of the coarse, high SG material (gravity concentrate) to the concentrate storage hopper ahead of the intensive leach reactor (ILR).

The ILR will process the concentrate once per day in a rotating drum leach vessel. Cyanide and caustic will be introduced into the slurry and the drum will be rotated for up to 20 hours to leach out gold and silver. At the end of this time the pregnant liquor will be separated from the solids and pumped to the dedicated pregnant liquor tank. Reactor tails will be pumped back to the mill discharge hopper for additional milling to recover any remaining entrained gold and silver.

A dedicated pregnant liquor pump will feed the gravity electrowinning cell in the goldroom with gold recovered onto stainless steel cathodes and barren liquor returned to the pregnant liquor tank. The cathodes from the gravity electrowinning cell will be treated separately to assist in metallurgical accounting. Spent electrolyte will be recycled to the head of the CIL circuit.

17.3.4 Trash Screening

Cyclone overflow will gravitate to two trash screens located in the CIL area for removal of trash material and coarse particles. The underflow from the trash screens will gravitate to the leach and adsorption tanks.

17.3.5 Leach and Adsorption Circuit

The adsorption circuit will consist of one leach tank and six CIL adsorption tanks providing 29 hours residence time at the design plant throughput rate and density. The tanks will be interconnected with launders and slurry will flow by gravity through the tank train.

The trash screen undersize will report to the leach tank. Quicklime added to the mill feed conveyor will ensure that the slurry pH is suitable for cyanidation and sodium cyanide solution will be metered into the CIL circuit. Air from dedicated blowers will be sparged down the shafts of the CIL agitators to provide oxygen to the leach slurry.

Barren activated carbon will be added to the last tank and advanced counter current to the slurry flow. The leached gold will adsorb onto the carbon and be removed from the CIL slurry. Carbon loaded with gold (loaded carbon) will be recovered from the CIL slurry in the second tank in the train via the loaded carbon recovery screen and will report to the elution circuit.

Slurry from the last CIL tank (CIL tails) will gravitate via the carbon safety screen to the tailings hopper.

17.3.6 Elution and Gold Recovery

The following operations will be carried out in the elution and goldroom areas:

- Acid washing of loaded carbon;
- Stripping (elution) of gold from loaded carbon using the split AARL method;
- Electrowinning of gold from pregnant solution;
- Smelting of electrowinning products; and
- Regeneration of barren carbon.

Loaded carbon will be washed with a dilute acid solution to remove contaminants prior to being rinsed with water. The loaded carbon will be eluted with a hot dilute cyanide / caustic solution followed by a hot water wash which will recover the gold from the carbon into the solution. The gold solution (pregnant solution) will be pumped through electrowinning cells and the gold will be recovered onto the cell cathodes. The gold will be removed from the cathodes by high pressure water jets with the gold sludge being filtered and dried prior to smelting with fluxes in a furnace to produce doré bars.

Eluted carbon (barren carbon) will be transferred to the carbon regeneration kiln for reactivation prior to re-use in the CIL circuit.

17.3.7 Tails Disposal

Tailings will be pumped to the TSF and deposited using a peripheral discharge and decant method. Cyclic spigot deposition at various locations will be used to allow consolidation and drying of deposited material into beaches and to direct supernatant water to a pond around the decant tower.

17.3.8 Reagents

Reagents will be stored on site to ensure that supply interruptions do not restrict production. The following reagents will be used in the process.

Quicklime – Quicklime powder will be delivered in bulk tankers and pneumatically transferred into the lime silo. Quicklime will be metered onto the mill feed conveyor for CIL circuit pH control. Bulk bags of quicklime will be procured and stored as an emergency supply.

Cyanide – Sodium Cyanide will be delivered as dry briquettes in bulk bags. The cyanide will be dissolved by mixing with process water and transferred to a storage tank. Cyanide solution will be metered to the concentrate leach and CIL circuit for gold leaching and to the elution circuit for stripping gold from the loaded carbon.

Caustic Soda - Caustic soda (sodium hydroxide) will be delivered as dry 'pearl' pellets in bulk bags. The caustic will be dissolved by mixing with filtered raw water and caustic solution will be metered into the elution circuit for stripping gold from the loaded carbon.

Hydrochloric Acid - Concentrated hydrochloric acid will be delivered in drums. The acid will be diluted with filtered raw water and metered into the elution circuit for acid washing of the loaded carbon.

Activated Carbon - Activated carbon will be delivered in bulk bags and will be added to the carbon quench tank for barren carbon make-up to the CIL circuit.

Grinding Media – SAG and ball mill steel grinding balls will be delivered in drums. Media for the SAG mill will be loaded onto the mill feed conveyor via the emergency feed hopper. Ball mill grinding media will be loaded into ball loading kibbles and lifted to the ball mill feed chute.

Fluxes – Sodium borate (borax), silica flour, sodium nitrate (nitre) and sodium carbonate (soda ash) are used as fluxes for gold smelting. The fluxes will be delivered in 25 kg bags and mixed in small quantities with the gold sludge prior to smelting.

Miscellaneous reagents such as anti-scalents and sulphamic acid will be added to the process as required. These reagents will be supplied by the reagent supplier via their delivery system.

17.3.9 Services

The following plant services have been included in the process plant design.

Raw Water - Raw water extracted from the Bandama River and/or the mine dewatering bores will be pumped to the water storage dam and from there to the plant raw water pond on an as required basis.

Process Water - Process water will consist of the TSF decant return water with raw water make-up as required. TSF decant return water will be pumped to the process water pond where the level will be made up with raw water overflowing from the raw water pond. Process water will be pumped to the milling circuit and for use in the plant.

Filtered Water - Raw water from the raw water pond will be treated in the filtered water treatment plant and report to the filtered water storage tank for use in the process plant.

Gland Water - Filtered raw water from the filtered water storage tank will be used as gland service water.

Fire Water - Fire water for the process plant will be sourced from the raw water pond. The fire water suction from the raw water pond will be at a lower level than the raw water supply suction to ensure a fire water reserve always remains in the pond. A backup diesel driven fire water pump will be provided in addition to the electric fire water pump.

Potable Water - Raw water will be treated in the potable water treatment plant (filtration, chlorination and ultraviolet sterilisation) and will be stored in the potable water tank. Potable water will be distributed to the plant for use in the site ablutions, safety showers and other potable water outlets.

Cooling Water – Cooling water will be pumped to the milling lubrication system heat exchangers from the area package cooling tower. The cooling tower will operate in a closed loop and filtered water will make-up for the evaporation and drift losses. Biocide and anti-scalent will be dosed to the cooling tower system as required.

CIL Air Supply - CIL air will be supplied by dedicated air blowers and will be reticulated to the leach tank and the CIL tanks.

Plant and Instrument Air Supply - Plant and instrument air will be supplied from air compressors and will be filtered and dried before distribution with separate plant and instrument air receivers.

17.4 Power Requirements

17.4.1 Installed Load and Maximum Demand

The plant site-wide electrical power requirements for infrastructure, mining and processing were calculated on the basis of preliminary equipment sizing. The installed load and maximum demand for the Project is summarised below.

Table 17-4 Installed Load and Maximum Demand

Area	Installed Load		Maximum Demand		Average Demand	
	(MW)	(MVA)	(MW)	(MVA)	(MW)	(GWh/y)
Process plant	22.29	24.80	16.18	16.93	12.49	114.8
Site infrastructure	3.54	4.08	1.59	1.82	1.28	11.2
Site total	25.83	28.88	17.77	18.47	13.77	126

Power supply is discussed in Section 18 of the report.

17.4.2 Emergency Power

Emergency power loads from the process plant and plant site infrastructure will be supported by two 2,000 kVA standby rated 11 kV high speed diesel generators located adjacent to the HV plant switchroom. These generators will restore 11 kV distribution to the site to power critical plant and infrastructure loads in the event of an outage from the CI Energies grid connection. A load shedding scheme will ensure a priority system of loads supplied during the outage. The system will also be capable of grid synchronisation to allow transfer to grid power on supply restoration and will also provide the potential to implement grid support functionality if necessary.

Due to the construction duration of the grid connection and site 11 kV distribution, the camp will be supported initially by two low voltage 550 kVA diesel generators located in the camp. Once connected to the site distribution power system these will be left to provide emergency power functionality.

17.5 Water Requirements

The overall site water balance (Knight Piésold, 2017c) indicates that a significant source of clean water is required for the raw water plant and for the process water dam make-up.

A critical supply rate of 139 L/s (3.6 Mm^3/year) is required to prevent process water shortfalls under design dry conditions. When pit dewatering is included in the water balance, this is reduced to 91 L/s (2.4 Mm^3/year). This is governed by the high oxide blends during Year 1 of operation, and river abstraction requirements reduce after this initial period of high oxide blends. For average conditions, this reduces to 123 L/s (3.2 Mm^3/year), and 76 L/s (2.0 Mm^3/year) when pit dewatering is included in the water balance.

Subject to final approval by government authorities, raw water will be predominantly sourced from the Bandama River.

18. Project Infrastructure

18.1 Introduction

The process plant will be located northeast of the CMA open pit, just outside of the 500 m blast zone. The ROM pad preceding the plant will be located and configured to take advantage of the natural terrain. The accommodation camp will be located east of the process plant. A generalised view of the proposed infrastructure layout is shown in Figure 18-1.

The plant location was selected based on the following:

- Minimal haulage distance;
- Ensuring the process plant will be outside the 500 m radius blast zone;
- Placing the plant on the volcaniclastic rock unit as this represents a geological feature with the least potential for gold mineralisation;
- Suitable terrain and likely good founding conditions;
- Ease of site drainage and diversion of natural run-off around the plant site;
- Avoiding culturally sensitive sites and cemeteries.

Although a previously proposed plant site had been drilled, sterilisation of the presently proposed plant site requires assessment. A geotechnical investigation of the site will also be required to confirm ground conditions.

The tailings storage facility will be located southeast of the CMA open pit requiring a 4.1 km tailings pipeline.

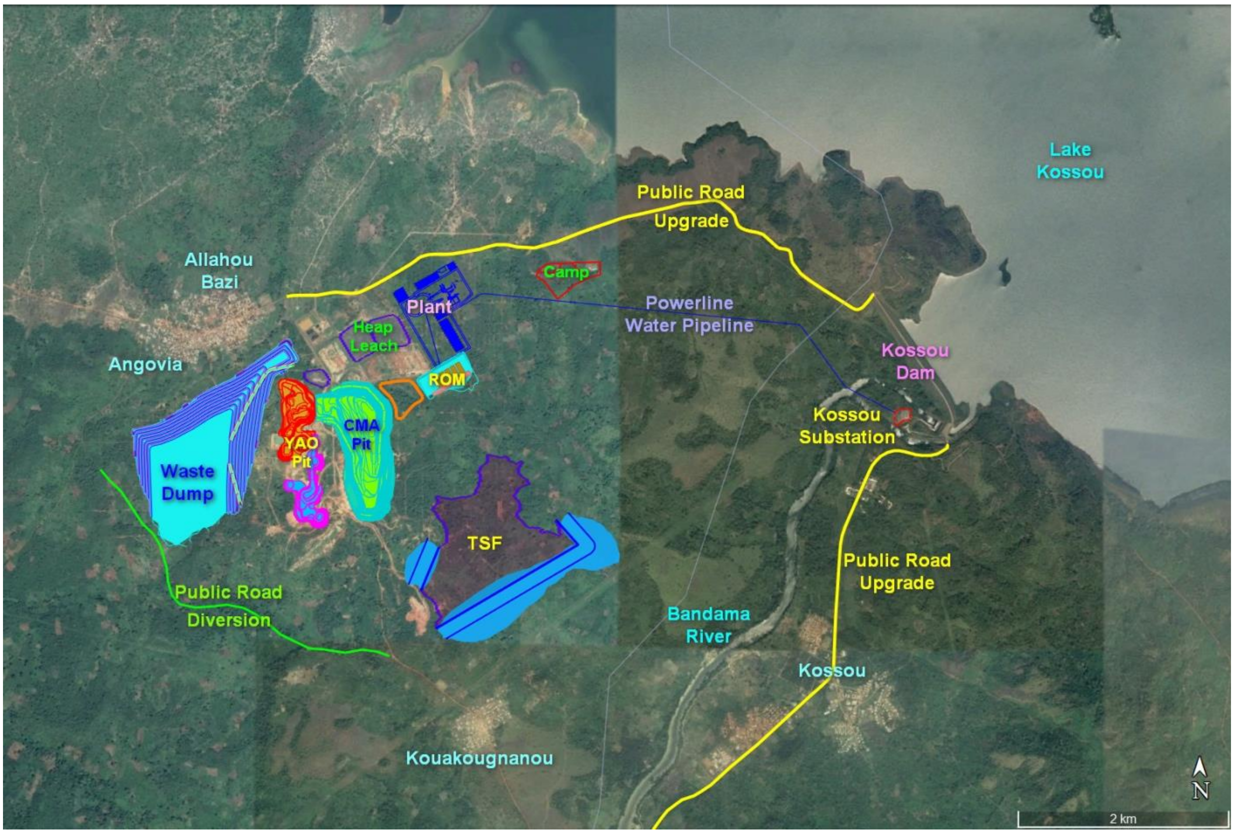


Figure 18-1 Yaouré Project Site Proposed Layout

18.2 Roads

The main access route to site will utilise the multi-lane, modern motorway connecting Abidjan to Yamoussoukro and thence highway A6, with the turn-off to Kossou at Toumbokro village, 28 km north-west of Yamoussoukro. The 16 km provisional road from Toumbokro to Kossou is narrow, in poor condition and the sides are heavily vegetated. This road may be upgraded by the Government prior to Project implementation.

The last 7 km road from site to Angovia is an unpaved public road periodically maintained by the road authority. It is in poor condition and will require an upgrade. It is proposed to upgrade the section of road to Angovia/Allahou Bazi village.

The existing Angovia to Kouakougnanou unpaved road will be impacted by the proposed works and therefore will be realigned. The length of the realigned road will be approximately 6 km and will pass through some relatively steep terrain. The road will be constructed to an unpaved, all-weather standard.

18.3 Buildings

Site buildings will be 'fit for purpose' industrial type structures. The workshop and warehouse will be constructed of a concrete slab on ground with structural steel frame and metal cladding. Offices and amenity buildings will predominantly be prefabricated structures. A security facility, plant office, staff mess, ablutions, plant workshop, water treatment plant, sewage treatment plant, switchyard, reagent storage area and gold room will be located inside the process plant high security area.

A gatehouse with boom gate control, the main administration building, a first aid clinic, staff mess, main warehouse, warehouse yard, LV workshop and car parks will be located in fenced areas adjacent to the process plant.

18.4 Mine Services Area

A separately fenced Mine Services Area (MSA) will be located approximately 400 m west of the process plant area and north of the existing heap leach pads. The mine services facilities will be provided entirely by the mining contractor with Perseus supplying the necessary utilities for the contractor.

The main fuel contractor will supply bulk diesel which will be stored in their storage tanks located in the MSA.

18.5 Workforce Accommodation

A separately fenced new camp will be built approximately 1 km east of the process plant. The camp will be built to accommodate 144 senior staff and specialist workers. This camp will be built on a short turn-off from the upgraded access road and will provide separate wet and dry mess facilities, TV lounge, support buildings, training room and a soccer field. The majority of unskilled workers will be recruited from the surrounding areas and will be expected to find lodging within the local communities.

The camp will be located on a site sloping downwards towards the north with views of Lake Kossou.

The existing decommissioned camp will be upgraded to serve as an early works construction camp for senior management and VIP guests. A construction camp consisting of tents and portable units, relocated from Perseus's Sissingué mine, will be built adjacent to the permanent camp. New tents will be supplemented as required. This construction camp will then be used as supplementary accommodation for junior workers and later for shutdown accommodation.

18.6 Power Supply and Reticulation

On the basis of an average plant throughput of 3.0 Mt/a, the Yaouré gold project is estimated to have a Maximum Demand (running) of 17.8 MW, with an estimated energy consumption of 126 GWh/y.

The power supply will be sourced from the electricity grid. The grid supply from Côte d'Ivoire is by world standards economically priced and more financially favourable than other options including self-generation, as the tariff is based on a mix of hydro and thermal generation.

The company La Société des Energies de Côte d'Ivoire (CI-Energies) own the National Interconnected Transmission System in Côte d'Ivoire and Compagnie Ivoirienne d'Electricite (CIE) manages the electricity generation and transmission network for the Government.

Power for the site will be provided via a proposed new 6 km 225 kV overhead line power line from the nearby CI Energies Kossou substation attached to the Kossou hydroelectric power station (**Figure 18-1**).

Dual 11 kV feeders from the 225/11 kV substation will supply a plant main 11 kV switchboard which will reticulate power to all locations on the site. An emergency generation 11 kV switchboard will also provide a third feeder to the switchboard in the event of a site power failure.

18.7 Emergency Power

Emergency power loads from the process plant and plant site infrastructure will be supported by two 2,000 kVA standby rated 11 kV high speed diesel generators located adjacent to the HV plant switchroom. These generators will restore 11 kV distribution to the site to power critical plant and infrastructure loads in the event of an outage from the CI Energies grid connection. A load shedding scheme will ensure a priority system of loads supplied during the outage. The system will also be capable of grid synchronisation to allow transfer to grid power on supply restoration and will also provide the potential to implement grid support functionality if necessary.

Due to the construction duration of the grid connection and site 11 kV distribution, the accommodation camp will be supported initially by two low voltage 550 kVA diesel generators located in the camp. Once connected to the site distribution power system these will be left to provide emergency power functionality.

18.8 Water Supply

18.8.1 Raw Water Supply

The overall site water balance (Knight Piésold, 2017c) indicates that a significant source of clean water is required for the raw water plant and for the process water dam make-up.

For the Yaouré project, the logical water source is the Kossou Dam or the Bandama River due to their proximity. Government authorities have specified that water should be sourced downstream of the hydroelectric facility at Kossou Dam, i.e. from the Bandama River.

Subject to final approval by government authorities, raw water will be predominantly sourced from the Bandama River at a design flowrate of 550 m^3/h based on a make-up ratio of 1 part water to 1 part ore and a river abstraction period of eight months a year, during the rainy seasons. Raw water will be pumped to a water storage dam adjacent to the process plant from the river abstraction pumps. The storage dam enables an accumulation of water during the wet season and a gradual drawdown in the dry season. Raw water for the process plant will be pumped to the plant site from the water storage dam and will discharge into the raw water pond.

Power for the water abstraction pumps will be sourced from a local diesel powered generator. **Figure 18-1** indicates the proposed water abstraction location and the water pipeline route.

18.8.2 Potable Water and Filtered Supply

Potable water for the site will be sourced from existing bores via a modular water treatment plant. The water treatment facility will include sand filtration, micro filtration, ultraviolet sterilisation and chlorination. Potable water will be stored in the plant potable water tank and will be reticulated to the plant building, site ablutions, safety showers and other potable water outlets in the plant and to the MSA and accommodation camp. Potable water will be stored in the camp potable water tank and will be reticulated to the various consumers. Additional ultra-violet sterilisation units will be installed on outgoing potable water distribution headers.

Filtered water will be pumped from the raw water tank to the filtered water treatment plant and storage tank located in the plant area. Filtered water will then be reticulated to gland seals and the gold room, elution and emulsion facility areas.

18.9 Miscellaneous Infrastructure

Effluent from all water fixtures in the process plant, MSA and accommodation camp will drain to their sewerage header. The sewerage system for each area will drain to a sewer pump station from where it will discharge via a pressure main to a package sewage treatment plant system.

One of the local mobile phone providers will be contracted to install facilities on site and provide a link into the local, national and international telecommunication networks.

Internal communications and IT services will be via a site wide fibre optic network.

A radio network will be established with dedicated operational, security and emergency channels.

A local ground station will be installed to provide global satellite voice and data connection.

The bulk explosives depot and high explosives / detonator magazines will be securely located approximately 1.0 km southeast of the ROM pad on a small elevated and protected plateau.

18.10 Tailings Storage

18.10.1 Tailings Storage Facility Design

The following summary is drawn from Knight Piésold (2017d).

The tailings storage facility (TSF) will consist of a valley storage facility formed by two multi-zoned earthfill embankments, comprising a total footprint area (including the basin area) of approximately 87 ha for the Stage 1 TSF increasing to 162 ha for the final TSF. The TSF is designed to store a total of 30 Mt of tailings (at an annual throughput of 3.3 Mtpa). The TSF will be constructed in annual stages, to defer construction costs and allow the flexibility to adjust the design to ongoing mine planning and operational performance. Further expansion of the TSF to 64 Mt is possible without encroaching on the existing powerline and the downstream settlement of Kouakougnanou.

The TSF embankments will be constructed in annual raises to suit storage requirements, using downstream raise construction methods. A downstream seepage collection system will be installed within and downstream of the TSF embankment, to allow monitoring and collection of seepage from the TSF in the collection sump located downstream of the final TSF downstream toe. A downstream structural fill buttress will be constructed during the initial years of operation to further improve embankment stability and thus provide additional protection to the downstream settlement of Kouakougnanou.

Tailings will be discharged into the TSF by sub-aerial deposition methods, using a combination of spigots at regularly spaced intervals along the TSF embankments to locate the supernatant pond in the northern valley within the TSF basin.

During the early stages of operation, when the risk of water shortages is highest, the deposition plan will be managed to improve water recovery.

The TSF basin area will be cleared, grubbed and topsoil stripped, and a 300 mm depth compacted soil liner will be constructed over the entire TSF basin area as either reworked in-situ material or imported Zone A material.

The TSF design incorporates an underdrainage system to reduce pressure head acting on the compacted soil liner, reduce seepage, increase tailings densities, and improve the geotechnical stability of the embankments. The underdrainage system comprises a network of finger and collector drains, and an embankment upstream toe drain. The underdrainage system drains by gravity to a collection sump located at the lowest point in the basin. A groundwater collection system will be installed beneath the basin compacted soil liner. Solution recovered from the underdrainage and groundwater systems will be released to the top of the tailings mass via submersible pump, reporting to the supernatant pond (pump design by others).

Supernatant water will be removed from the TSF via submersible pumps located within decant towers, constructed at start-up and raised during operation. The supernatant pond will be maintained within the northern valley of the TSF basin. Solution recovered from the decant system will be pumped back to the plant for re-use in the process circuit.

The operational emergency spillway will be constructed on an annual basis as part of the embankment raises. The spillway will be cut into an abutment of the TSF embankment. The closure spillway will be excavated as a cut and fill operation to allow water shedding. In all cases, the spillway channel is designed to discharge downstream of the TSF. The closure spillway will be excavated to ensure all rainfall runoff from the TSF will safely discharge downstream of the TSF (and report off site) after decommissioning of the TSF.

A bunded corridor will be constructed to contain both the tailings delivery pipeline and decant return pipeline between the TSF and Plant Site.

18.10.2 TSF Dam Break Assessment

A preliminary assessment was completed for the embankment and the potential "population at risk", damage to infrastructure and damage to the environment as defined by ANCOLD.

As the population at risk is ">10 – 100" and the Severity of Damage and Loss is "Medium" for Stage 1 and "Major" for the Final TSF, the consequence category of the Yaoure TSF is "High C" for the Stage 1 configuration, and "High B" for the Final configuration. A classification of "High C" was adopted for the Definitive Feasibility Study design. A downstream structural fill buttress will be constructed during the initial years of operation to further improve embankment stability and thus provide additional protection to the downstream settlement of Kouakougnanou.

18.10.3 Monitoring

A monitoring programme for the TSF and WSP has been developed to identify any potential problems which may arise during operations. The monitoring will include:

- Monitoring bores and surface water sampling stations downstream of the TSF and WSP;
- Piezometers within the TSF and WSP embankments to monitor the phreatic surface; and
- Settlement pins on the TSF and WSP embankment crests to monitor embankment movement.

18.10.4 Rehabilitation

At the end of the TSF operation the downstream faces of the embankments will have a slope of 3H:1V, with 5 m wide benches located at 10 m height intervals, for an overall slope profile of 3.5H:1V. The downstream profile will be inherently stable under both normal and seismic loading conditions and will allow for revegetation.

The TSF closure spillway will be excavated after the remaining supernatant water is proven to be suitable for release and during rehabilitation of the tailings surface subsequent to decommissioning.

Rehabilitation of the tailings surface will commence upon termination of deposition into the TSF. The final soil cover for the tailings surface subsequent to decommissioning will be confirmed during operation based on ongoing operational tailings geochemistry test results.

If required, the WSP may be decommissioned by breaching the WSP embankment and backfilling the basin to achieve full drainage.

19. Market Studies and Contracts

19.1 Gold Market

Gold is a commodity freely traded on the world market for which there is a steady demand from numerous buyers. It is also possible to sell gold for delivery at a fixed price at a future date (forward sale). There are a number of refiners in the world whose bars are accepted as "good delivery", for example, through the following associations:

- London Bullion Market Association (LBMA);
- Istanbul Gold Exchange (IGE);
- Shanghai Gold Exchange (SGE);
- The Chinese Gold & Silver Exchange Society. Hong Kong (CG &SES).

19.2 Gold Price

The gold prices selected for delineation of Mineral Reserves and financial evaluation, US$1,200 and US$1,250 per ounce respectively, were nominated by Perseus.

The gold price of US$1,800 per ounce applied to estimate Mineral Resources was nominated by Perseus. The relevant Qualified Person considers that the Mineral Resources represent estimates of material with reasonable prospects for eventual economic extraction.

At the effective date of this report the spot gold price was US$1267 per ounce.

19.3 Transport

It is planned that the gold produced at Yaouré, in the form of doré bars, will be transported by helicopter from site to either Yamoussoukro or Abidjan airport and from there on to a refinery in Europe, Africa or Asia.

19.4 Contracts

A contract for refining Yaouré doré will be entered into closer to first production, after a tendering process. It is usual that the refiner will arrange transport for the doré bars to its refinery, where it will refine the gold to the purity (generally 99.8 to 99.95%) accepted in international markets. The refined gold is credited to the Company's gold account with its bank, to enable it to be sold on international markets or delivered into forward sales contracts. The refiner will deduct transportation costs, insurance, refining and other charges.

20. Environmental Studies, Permitting and Social or Community Impact

20.1 Introduction

The environmental and social point of reference for this section is that the Yaouré Gold Project is in a brownfield area which has been historically subject to various gold mining activities. Artisanal mining can be traced back to the 19th century and is still ongoing, in addition to industrial open pit mining, which has been intermittently undertaken since the 1980s. Other human activities within PR 397 include: villages, agricultural practices, hunting and gathering. These, together with the various mining activities, have caused disturbance to various levels of significance within the Project area of influence.

20.2 ESIA and Baseline Studies

An Environmental and Social Impact Assessment (ESIA; Amec Foster Wheeler & 2D Consulting Afrique, 2015) was carried out to support Amara's application for an exploitation permit. The Assessment complies with the requirements of the environmental legal and regulatory framework of Côte d'Ivoire, the IFC Performance Standard 2012 and other international guidelines and best practices. The ESIA was approved by the Agence Nationale De l'Environnement (National Environment Agency, or ANDE) on 26 September 2016 in Arête No. 0074.

The ESIA will require updating to reflect changes to the proposed mining and processing operations that have arisen out of the Perseus DFS.

Baseline studies, investigations and research were conducted as part of the ESIA by AMEC Foster Wheeler in collaboration with 2D Consulting Afrique as the locally accredited ESIA consultants in Côte d'Ivoire (Amec Foster Wheeler & 2D Consulting Afrique, 2015). They used appropriate scientific methods with data systematically collected on that basis. Baseline studies for the ESIA collected data as detailed in the following sub-sections. Additional studies and assessments have since been conducted by other consultants as part of the DFS.

20.2.1 Climate and Meteorology

The Project is located in the tropical climate zone and is characterised by high temperatures, rainfall and evaporation. Although evaporation is high, the Project is located in an environment with positive natural water balance. Climate data obtained from Yamoussoukro Airport for the period 1994-2001 indicate that the annual average rainfall (1,273 mm) exceeds annual average evaporation (829 mm) by 306 mm. January, February, March and November are, however, water deficit months where evaporation exceeds rainfall. The Project falls into ecological Zone 2 of Côte d'Ivoire, which is an equatorial transition zone. Three seasons can be distinguished, namely: warm and dry (November to March), hot and dry (March to May), and hot and wet (June to October).

Temperature throughout the year is high, with average maximum temperatures varying between 35.0°C and 29.2°C and average minimum temperatures varying between 21.5°C and 17.5°C.

20.2.2 Air Quality

Baseline air quality monitoring was undertaken by Amara between February and June 2015 around the Project area. The average readings for NO_2 concentration, SO_2 concentration and particulate matter PM_{10} concentration were all below the WHO annual mean Air Quality Guidelines. Dust deposition rates were however elevated, yet still typical of other comparable sub-Saharan regions during the dry season. These elevated levels were deemed to be because of a grain mill operating in the area, as well as traffic using the nearby unsealed road.

20.2.3 Noise and Vibration

Baseline noise monitoring was undertaken by 2D Consulting Afrique in February 2015 around the proposed Yaouré Gold Project. The monitoring scheme was devised by Amec Foster Wheeler and monitoring locations were selected to ensure that the noise environment of individual receptors likely to experience the worst-case noise effects from the development was fully characterised. For example, at the village locations, measurement sites were chosen to represent the closest receptors to the mine.

In summary, at the existing villages of Allahou-Bazi, Angovia, Akakro, Allahou Port, Kouakougnanou and Kossou, noise levels measured were all in the region of 45-62 dB LAeq, T. In general, evening noise levels were slightly higher, equal to or lower than daytime noise levels depending upon the level of social activity and traffic movements within the populated areas during this period. In addition, night-time noise levels were generally lower than those measured during the daytime period which indicates the influence of steadier natural noise sources in the surrounding areas such as the birds, insects and animals.

There were no baseline data collected for vibration as that was deemed to be negligible.

20.2.4 Water Management

The main hydrological features present in the Project area are the Kossou Lake, which lies at the northern end of the Project area, and the Bandama River, which flows to the east of the Project boundary. A hydroelectric dam was built on the Bandama River in 1972, and now regulates the water flow on the Bandama River.

The project site is mainly drained by perennial and non-perennial tributaries of the Bandama River. Many stream courses are ephemeral, only flowing during one of the wet seasons. Drainage from the major part of the area of the proposed open pits flows northwards into Kossou Lake. The extreme southern edge of the open pit may drain southwards into a separate tributary catchment which flows into the Bandama (Blanc) River downstream of Kossou Dam.

In general, the waters are all close to neutral in pH, can show elevated concentrations of iron and there have been cases of detectable arsenic in surface water samples. Total cyanide (barely at the limit of detection) has also been detected in some surface water samples and total coliforms, staphylococcus and streptococcus have been detected in all the locations. The bacterial contamination is due to sanitation conditions in the villages upstream of the sample points. Otherwise water quality appears to be acceptable.

20.2.5 Soil and Land Capability

The historic activities in the Project area, including mining, artisanal mining, slash-and burn agriculture and subsistence farming have had a significant impact on the ecosystem, land capability, soil structures as a result of compaction and erosion, and the health of surface water resources where erosion contributed to significant silt loads.

Four major soil groups were identified on site. These groups are closely associated with the rock types from which the soils derive, the topography and general geomorphology of the site, the effects of topographic slope and attitude of the land-forms which directly affect the pedogenetic processes of soil formation and ultimately the soil forms.

The results of the laboratory analysis reveal the differences in the chemistry of the different geologies/lithologies from which the soils are derived and the influence of climate, soil movement and the leaching of the soil nutrients over time.

The concerns around erosion and inter alia compaction, are directly related to the disturbance of the protective vegetation cover and topsoil that will be disturbed during any construction and operational phases of the mining venture. Once disturbed, the effects and actions of wind and water are increased.

20.2.6 Biodiversity

Biodiversity baseline surveys were conducted within the Project area between November 2014 and May 2015 (AMEC Foster Wheeler & 2D Consulting Afrique, 2015). Field surveys were conducted for six groups in total, being birds, reptiles and amphibians, flora, freshwater microalgae, macroinvertebrates and fish, large mammals and small mammals.

There was a particular focus on globally threatened species and species that could trigger Critical Habitat according to criteria 1-3 of the IFC (IFC, 2012). Globally threatened species are species listed either as Critically Endangered (CR EN), Endangered (EN) or Vulnerable (VU) in the IUCN Red List of Threatened Species. They may also include nationally protected species and species not recently assessed by the IUCN Red List, but considered threatened according to expert opinion.

No protected area or internationally recognised areas intersect with the Project area, with the closest protected area being located approximately 12 km west of the Project area (namely the Marahoué Classified Forest). Recent satellite imagery indicates that Marahoué Classified Forest is highly degraded, with many plantations, villages and roads within its boundaries.

Results of the biodiversity baseline study include:

- Birds - 5,333 birds were observed belonging to 172 species from 49 families. The majority of species recorded from the Project area are resident species, with only approximately 17% of the total species that are migratory. Among all species detected, only one is globally threatened according to its IUCN Red List status, and three other species are classified as Near-Threatened;
- Reptiles and Amphibians - relatively high amphibian diversity was recorded from the area, with 29 species. None of the amphibian species are listed as threatened on the IUCN Red List. High reptile diversity was also found in the Project area, with 31 species directly observed. None of these species are listed as threatened, however the majority of these species have not been assessed by the IUCN Red List;
- Flora - 330 species were confirmed to occur within the Project area, including eight species listed as Vulnerable on the IUCN Red List. 54 species were identified as being used locally in traditional medicine, and/or as a source of food, natural dye, soap, or poison for pest species. The vegetation within the Project area was generally found to be highly degraded, and under continuous threat from habitat loss from agriculture and artisanal mining activities;
- Freshwater - the freshwater groups that were considered in this study were microalgae, benthic macroinvertebrates and fish from sample points along Kossou Lake, along the Bandama River and its tributaries and artificial lake created in the old mining pit. 222 taxa (including species and variety) of microalgae were observed during the study. 2776 individual benthic macroinvertebrates were sampled from four groups: insects, molluscs, worms and crustaceans. The results from the microalgae and macroinvertebrate sampling indicate a low water quality in general, with several pollution indicator species present. 64 species of fish were identified, with higher fish diversity observed in the Bandama River than in Lake Kossou and the Bandama tributaries. Two species are threatened according to the IUCN Red List of Threatened Species;
- Large Mammals - 26 species were reported to occur in the area. Among these, three species are listed as Vulnerable on the IUCN Red List of Threatened Species and a further three species are protected under national law. Overall, the large mammal diversity and density were low;
- Small Mammals - eight species were reported to occur, including four micro-mammals and four small carnivore species. None of the species recorded are threatened according to the IUCN Red List.

20.2.7 Landscape and Visual Impact

The word 'visual' as used within this report is taken from the broadest meaning to include visual, scenic, aesthetic and amenity values represented by the built and natural environment.

The project area is located mainly in hilly terrain with elevations between 160 masl (metres above sea level) and 550 masl. The forest savannah mosaic landscape of the Yaouré exploration licence area is dominated by the Mount Yaouré hills in the centre and southern western section of the licence area. The steep slopes associated with Mount Yaouré dominate the south-western topographic section of the project area and support semi-deciduous forest. Plains present in the southern section constitute river valleys and narrow floodplains. The Bandama River flood plain enters the project area from the northeast and gradually descends to the south dominates the south-eastern section. The surrounding area is more open than the south-western section but relative steep slopes are still present.

Generally, the land cover is composed of a mixture of semi-deciduous, bush/grassed savannah, agriculture practices, mining (conventional and artisanal) and villages. The level of transformation is high to moderate in the northern section of the project area primarily due to conventional and artisanal mining activities and agricultural practices.

The northern section of the study area is characterised by extensive mining and exploration activities. These include artisanal mining activities that have continued from historic times within the project area to commercial mining which is ongoing for more or less the past thirty years.

20.2.8 Traffic and Transportation

An assessment of the strategic and local highway network was undertaken for the ESIA to identify the most suitable access route to the site. The assessment was carried out over a period of two days in November 2014.

The main access road used by the Project provides a connection to Bouaflé in the west and Yamoussoukro to the east. A partially tarred and partially gravel road intersects with this main road at the village of Tombokro, which passes through the town of Kossou and across the embankment of the Lake Kossou Dam. This road also continues through to Bouaflé. There are various gravel roads in the exploration area connecting the villages. These are often single track, gravel roads which are in a poor condition. Road use ranges from pedestrians, motorcycles, passenger vehicles to heavy vehicles. There is a potential that an increase in mine vehicles may lead to deterioration in road conditions as well as an increase in accidents.

In terms of transport, a significant majority of households use bicycles as their primary mode of transportation.

There are no railway lines that could be used as an alternative to road transport.

20.2.9 Social Baseline

The Project is located in the Bouaflé Prefecture of the Marahoué Region in Côte d'Ivoire, approximately 40 km northwest of the national capital Yamoussoukro and 25 km from the regional capital Bouaflé. There are various villages and artisanal mining settlements located within, and directly outside of, the former inner exploration licence area, which is the focus of this Project (refer to Figure 4-2). The majority of the population in the Project's area of influence lives in Allahou-Bazi/Angovia, which is located closest to the mine site and a high proportion of the population in the area are foreigners (Burkinabes, Malian, Senegalese and Guineans).

The Bouaflé District is administratively headed by a Prefect. The villages are typically led by Chiefs who are assisted by the Council, composed of the heads of different village families. A village will also have a Committee that oversees the day-to-day functioning of a village. Additional influx into the area may change the social structures of the communities which may lead to social problems like alcohol abuse, physical abuse and associated conflict.

Customary land ownership and land use is acknowledged by Decree No. 71-74 of 16 February 1971. No one can purchase rights to use the land, however land can be used if compensation is paid. Perseus has commenced the process of crop compensation for the farmers, with most having already received an initial component of their compensation monies. The land compensation rates have been disputed by the land owners; however the government will issue a Decree outlining the final land compensation rates that must be paid by the Company. Land compensation will be paid upon receipt of this Decree.

Life expectancy at birth in Côte d'Ivoire is 53 years (WHO 2014). This is below the World Health Organization (WHO) African Region average (58 years) and below the global average (70 years) (WHO 2014). The major causes of illness in the Project area, according to the 2008 health data, are malaria and infections of the respiratory tract, followed by sexually transferable infections, tuberculosis, and diarrhoea. Diarrhoea and dysentery were the most common communicable diseases and Malaria is the dominant vector-borne disease. Sexually transferable infections may increase with the potential influx of people to the area.

There are two rural health care centres in the areas of direct and indirect influence: a government funded health care clinic in Kossou and a small community health care clinic in Angovia. There are also pharmacies in Angovia and Kouakougnanou. An influx of people may place additional pressure on medical services.

In the Project area, households and communities have adopted various livelihood strategies to ensure their basic needs are met, and, in cases where surpluses can be generated, to improve their overall standard of living. Most households in the Project area rely on a multiple-source livelihood system. During the social surveys, 74% of households reported that their revenues derive from at least two or more economic activities. The majority of people surveyed are employed in two main economic sectors: agriculture, including cocoa, coffee, and fruit trees; and artisanal mining.

Food crops produced in the Department of Bouaflé are yam, cassava, plantain, rain-fed rice, lowland rice, corn, peanut, eggplant, okra, pepper, tomato, and cabbage. Fishing activities are mainly restricted to the Bandama River and Lake Kossou.

Although artisanal mining has negative social impacts on the community structure, it also contributes positively either directly (job creation) or indirectly (purchase of supplies and services). However, it should be noted that ongoing government action significantly reduces the number of artisanal miners and the extent of artisanal mining activities in the Project area on a periodical basis.

There is power distribution to most of the villages from the Kossou hydroelectric power station. The power station has sufficient capacity to supply the Project's power requirements. In addition, people also make use of charcoal and wood for household fuel. An influx of workers may also place a greater need on the collection of wood for cooking purposes, leading to additional pressure on biodiversity.

A section of the gravel road between Allahou-Bazi/Angovia and Kouakougnanou/Bopri will have to be realigned around the direct mining footprints for safety reasons. The current distance between these villages is 5.1 km. With the road diversion in place the distance will be increased to 5.9 km, but this will be a well-constructed road that will enhance road safety, especially as the maximum road elevation and gradient will be reduced compared to the existing road. Road width will be increased and proper drainage will be installed.

Potable water is mainly obtained from boreholes or wells and the household survey indicated that 65% of households have no formal sanitation system, indicating the sanitation conditions are extremely poor. There is generally poor management of household, industrial, biomedical and other types of waste, indicating that chemical exposures may exist for the general population.

In terms of telecommunication, people are mainly dependant on mobile networks for telephone services, with varying reception. National television and radio reception are, however, good.

Throughout the Project area, children are often enrolled in primary school courses however not many children proceed to secondary school. This is especially the case when there is no public secondary school close to the village or if the household requires the active participation of children in family livelihood strategies (e.g., working in the fields). There are five primary schools and no secondary schools in the Project area.

Field surveys show that most of the communities in the Project area practice traditional or animist religions (59%). The presence of Christian (30%) and Muslim (10%) communities in the Project area is significant.

The great majority of individuals in the communities of the Project area belong to the Akan ethno-cultural family. They represent 42% of the national population and are concentrated in the east-central and south-eastern portions of the country. No population group that would be defined as indigenous peoples as described in IFC Performance Standard 7 are present in the Project area.

Artisanal gold mining in the project area commenced approximately 150 years ago. Artisanal activities in the Yaouré area are carried out through various methods from simple panning to using explosives, diesel driven crushers, extensive washing and use of chemicals such as mercury and reportedly also cyanide. Periodically, mainly foreign artisanal miners have been evicted by the government from their workings and some of their camps and other temporary infrastructure were destroyed.

Vulnerable groups in the Project area include women, illegal workers, minority groups and the retired, elderly and disabled. These groups may have minimal or interrupted incomes, may be unable to partake in communal decision-making processes, may face marginalisation within local traditional communities and suffer reduced access to healthcare, education, civil rights, credit, and other services.

The Project may also lead to the destruction or relocation of sacred sites within the footprint (e.g. the relocation of grave sites). A Cultural Heritage and Archaeological Assessment was conducted as part of the Project ESIA. In addition, Perseus has undertaken a consultative process to identify all sacred sites (graves and forests) with the assistance of the community. The consultants undertaking this recent survey will liaise with the community and provide recommendations for each identified site.

There are several sacred grave and forest sites present within the immediate Project area. According to the Cultural Heritage and Archaeological Assessment, there is currently no legislation that guides removal or the moving of these sites. This is done through negotiation with communities and the relevant leaders.

A Cultural Heritage Management Plan including a Chance Find Procedure has been prepared and will be implemented prior to the commencement of pre-development activities.

A stakeholder engagement and social assessment process, as part of the ESIA process for the Project, has been ongoing since June 2014, with a Community Consultative Committee (CCC) established. In addition, a Grievance Management system has been developed and will be carried into the construction and operational phases of the Project. It provides a tool through which the general population can raise their concerns about the Project.

A Community Development Fund will also be established at the commencement of operations, as required by law. This Fund will be managed by a Committee of government, community and Perseus representatives. A corresponding Community Development Plan will also be developed to guide the Committee in their decision-making.

20.3 Waste Management

A waste management plan was developed as part of the ESIA in line with international best practice to ensure that waste is handled and managed to avoid or minimise impacts. The wastes expected to be generated by the Yaouré Gold Project include general, non-hazardous wastes, hazardous wastes, recyclables, medical wastes, timber, batteries, tyres, sewage and other waste water, waste rock and tailings.

The Company aims to reduce wastes, re-use wastes where feasible, recycle if possible and otherwise dispose of wastes correctly to prevent pollution of soil or water.

20.4 Mine Rehabilitation and Closure

A preliminary mine closure and rehabilitation plan was developed by AMEC Foster Wheeler for the ESIA, and based on the infrastructure design at that time and with consideration of legal requirements of Côte d'Ivoire and international best practice, the current closure provision is estimated at US$20,650,000. This amount is expected to be significantly reduced however as the infrastructure layout as a result of the DFS has a much smaller footprint than the layout used for the ESIA.

The Ministry of Environment and the Ministry of Mines indicated that the Closure Plan in the ESIA must take into consideration the provisions included in the previous 2012 plan for Cluff Gold's Angovia Mine. Subsequently, all current disturbed areas and infrastructure from previous Yaouré mining operations will be decommissioned and rehabilitated as part of the final mine closure. The final decommissioning and closure plan will be determined following consultation with key stakeholders, including the government and local communities. Infrastructure will be dismantled and removed from site if required, and some of the main areas that will be progressively rehabilitated include the mine pits, tailings storage facility, site roads, waste rock dumps and ROM Pad and the Process Plant site.

Rehabilitation will be monitored and maintained for an agreed period of time post-closure, until the site is handed back to the government.

20.5 Additional Studies for the DFS

Additional studies were conducted in 2017 for the DFS

20.5.1 Geochemistry

Knight Piésold (KP) was engaged by Perseus to conduct a geochemistry study for the Yaouré Gold Project (Knight Piésold, 2017b). They reviewed the previous geochemical characterisation study conducted by AMEC Foster Wheeler (AMEC Foster Wheeler & 2D Consulting Afrique, 2015) as part of the ESIA baseline study which looked at waste rock and tailings characterisation.

Waste Rock

Testing included acid base accounting (ABA) and net acid generation (NAG), with most samples found to be acid consuming or non-acid forming. Only one sample of transitional material was classed as low capacity PAF. As such, the risk of significant acid generation from the waste rock and construction materials is low and hence there are no perceived requirements for management controls with respect to acid generation during operations or on closure, subject to further testing. There is also a low perceived risk of metal leaching from the waste rock, subject to further testing, and at this stage it is envisaged that there will be no requirements for seepage controls to manage the risk from the waste rock dumps, other than scarifying and re-compacting the footprint of the dumps. Waste Rock Dumps will be designed to certain heights and slope angles to minimise erosion and progressive rehabilitation will be undertaken to further reduce this risk.

Tailings

Slurry samples were sent to Intertek Genalysis for geochemical analysis of the solid and liquid fractions. The tailings samples analysed were classified as non-acid forming or acid consuming. If these samples are representative of the tailings to be produced during the life of the project, there are no specific controls required with respect to acid generation during operations or on closure.

The supernatant was found to be of a poor quality with elevated metals and cyanide and so the tailings facility will be designed to limit seepage. The tailings storage facility (TSF) design will comply with local and international standards and will have a low permeability liner and underdrainage system. Ongoing independent monitoring shall occur during operations and the detailed site Closure Plan will ensure the long-term stability of the structure, with a store and release cover system recommended for closure to limit long term infiltration and ongoing seepage. Tailings will be discharged to the TSF via a pipeline that has secondary containment and a TSF Operations Manual will be developed to guide the ongoing management of the facility

20.5.2 Water Management

A water management (hydrology and hydrogeology) study was completed for the Yaouré Project DFS by RPS Aquaterra (RPS Aquaterra, 2017). The key potential project risks associated with water management include mine dewatering impact on nearby village water supply wells, groundwater/surface water contamination from TSF seepage or overflow, inadequate site water management leading to off-site discharge of contaminated water, flooding of the mine site and pits, pit inundation during and/or after large storm events or interception of high transmissivity zones, and pit wall instability due to elevated pore water pressures in the pit walls.

Adoption of appropriate management measures/mitigation will reduce all these to low risk, with the exception of TSF seepage/overflow (high) and inadequate site water management (medium), due to the fact that both of these items have potentially major consequences. A TSF Operations Manual will be implemented which will address the TSF risks and some of the water management issues, as water from the TSF will be returned to the Process Plant for re-use. Some additional bores may also need to be constructed in Angovia and Allahou-Bazi, away from the mine pit, to ensure year-long access to water is guaranteed.

20.6 Permits and Bonds

The two main government departments responsible for the approval of mining activities in Côte d'Ivoire are the Ministry of Mines and Industry and the Ministry of Environment.

Mining activities fall under the jurisdiction of the Ministry of Mines and Industry. Applications for exploitation and exploration permits have to be approved by the Ministry of Mines and Industry. However, an exploitation permit can only be issued once the ESIA for a mining project has been approved by the Ministry of Environment in collaboration with an inter-ministerial committee consisting of representatives of the main Ministries and the National Agency of Environment (ANDE).

In addition, the Ministry of Mines and Industry together with the Ministry of Agriculture oversee land compensation as well as approval for the transportation and storage of cyanide and explosives.

The Company has applied for a water abstraction permit from the Department of Water and Forests to take water from the Bandama River and a series of groundwater bores. This water will supply the Camp and provide the raw water for the Process Plant. Government specialists are currently reviewing the data and consultant's findings prior to issuing the Permit.

Other permits that will be required for the Yaouré Project include:

- Permits for road construction, diversions and major upgrades;

- Building Permits for the construction of buildings and other structures;
- Radiation Permit for the radiation density gauges in the Process Plant;
- Permits for the transport and storage of explosives; and
- Permits for the transport and storage of hazardous chemicals, specifically cyanide.

These Permits will be applied for prior to the commencement of the relevant activity.

In accordance with the provisions of Article 144 of the Mining Code, a reclamation bond equal to an agreed percentage of the estimated total cost of the rehabilitation and closure work for the site will be paid into an environmental rehabilitation escrow account upon first commercial production. The amount can be reviewed every three years to capture any changes to the mine plan or completed rehabilitation. The actual percentage to be paid will be determined during the Mining Convention negotiations and will be captured in the Convention. An annual Rehabilitation Plan and associated budget will also be communicated to the government.

20.7 Monitoring Programme

The environment and social monitoring programme for Yaouré construction, operations and closure phases will include:

- Climate – temperature, rainfall, evapotranspiration, humidity and wind;
- Water - groundwater levels, stream flows, surface and groundwater quality, and water use;
- Noise;
- Vibration (i.e. blasting during operations);
- Air quality – dust deposition and particulate matter;
- Waste rock – acid base accounting;
- Biodiversity - visual fauna sightings, rehabilitation monitoring, aquatic monitoring; and
- Social – community grievances, community health studies and socio-economic studies.

The National Anti-Pollution Centre (CIAPOL) will also issue an ordinance in which air, noise, soil and water quality limits will be stipulated for the Project. This will be followed by annual audits to ensure that the Project meets these requirements.

20.8 Conclusions

Perseus will develop environmental and social management systems to effectively and transparently manage these functions and to encourage continual improvement in performance. Regular consultation and communication with key stakeholders, including government and community representatives, will be a key objective of the Company to ensure they remain informed and appropriately involved.

There are currently no significant negative environmental or social impacts identified for the development of the Yaouré Project, and the potential minor negative impacts identified will be managed as a priority. There are a number of positive impacts expected, mainly related to community development and opportunities for local people.

21. Capital and Operating Costs

21.1 Capital Cost Estimate

21.1.1 Introduction

The capital cost estimate for the Yaouré Gold Project has been compiled by Lycopodium Minerals Pty Ltd (Lycopodium, 2017) with input from Knight Piésold on water infrastructure and the tailings storage facility, and Perseus Mining Limited on project specific portions of Mining and Owners costs.

The estimate is based on the Project being implemented using an EPCM approach for the Process Plant, whereby the EPCM Engineer will provide design, procurement and construction management services on behalf of the Owner, based on a project schedule. The Owner will self-perform the majority of works outside the Process Plant.

21.1.2 Estimate Currency and Base Date

The estimate is expressed in US dollars based on prices and market conditions current at third quarter 2017 (3Q17).

The following exchange rates have been used in the compilation of the estimate:

- • US$1.00 = A$1.25 (Australian Dollar);
- • US$1.00 = €0.84 EUR (Euro);
- • US$1.00 = £0.74 GBP (British Pound);
- • US$1.00 = $1.22 CAD (Canadian Dollar); and
- • US$1.00 = R13.21 ZAR (South African Rand).

The estimated capital cost accuracy is ±15% for both plant and infrastructure capital costs.

21.1.3 Inclusions / Exclusions

Inclusions - Owner Costs

The capital cost estimate includes allowances for the following Owner costs:

- Owner's project expenses (provided by Perseus);
- Mining and pre-stripping costs (provided by Perseus);
- Pre-production costs;
- First fills (grinding media, lubricants, fuel, and reagents);
- Opening stocks;
- Owner’s plant mobile equipment (provided by Perseus);
- Project spares (provided by Perseus);
- Vendor representative and training costs for the process plant;
- Fit-out of buildings (provided by Perseus);
- Information technology and communications (provided by Perseus);
- Project spares.

Exclusions

The capital cost estimate excludes costs associated with:

- Government taxes and duties other than import duty and land tax;
- Escalation;
- Working capital (included directly in the financial model);
- Permits and licences;
- Project sunk costs;
- Bulk fuel facility (apart from earthworks);
- Upgrade of the public road from Toumbokro turn-off to Kossou.

Contingency

An amount of contingency has been provided in the estimate to cover anticipated variances between the specific items allowed in the estimate and the final total installed project cost. The contingency does not cover scope changes, design growth, etc. or certain defined qualifications and exclusions (Lycopodium, 2017).

Contingency has been applied to the estimate as a deterministic assessment by assessing the level of confidence in each of the defining inputs to the item cost being engineering, estimate basis and vendor or contractor information. It should be noted that contingency is not a function of the specified estimate accuracy and should be measured against the project total that includes contingency.

A contingency analysis has been applied to the estimate that considers scope definition, materials / equipment pricing and installation costs. Contingencies applicable to various Owners' inputs have been specified by Perseus.

The resultant contingency allowance for the project is 10.3%.

21.1.4 Capital Estimate Summary

Table 21-1 Capital Estimate Summary (US$, 3Q17, ±15%)

Area	US$'000
Construction distributables	26,191
Treatment plant costs	65,670
Reagents and plant services	9,947
Infrastructure	49,163
Mining	17,880
Management costs	17,665
Owner's project costs	45,881
Owner's operation costs (working capital)	Excl.
Subtotal	**232,397**
Contingency	23,865
Taxes & duties (import duty & land tax only)	2,463
Escalation	Excl.
Estimated total	**258,725**

Provisional Cost Items

Detoxification plant	4,000
Project total	**262,725**

21.2 Operating Costs Estimates

21.2.1 Mining Costs

The mine operating cost estimate assumes a contractor mining model. It has been developed by Perseus with input from the following sources:

- manning levels and pay rates by Perseus;
- averaged rates derived from quotes received from three mining contractors;
- drill and blast costs by George Boucher Consulting; and
- estimates based on operating data from Perseus's Edikan Gold Mine in Ghana.

Battery limits for the costs are:

- placement of ore onto the ROM pad and ore delivered to the ROM bin; and
- placement of waste on the waste rock dump.

Excluded from these costs are:

- mining contractor establishment, mobilisation and de-mobilisation costs which have been capitalised; and
- clearing, grubbing and top soil removal costs which have capitalised.

Estimates of owner's costs have been built up from a labour schedule and labour rates and on-costs based on Perseus's Sissingué Gold Mine in Côte d'Ivoire.

The fuel credit is an offset to the mine operating cost to account for the difference in fuel price quoted in the tender documentation and the final fuel price selected by Perseus for the feasibility study, inclusive of rebate.

Table 21-2 Mine Operating Costs Including Owner's Management and Supervision

Cost Centre	LOM		
	$M	**$/t ore**	**$/t mined**
Excavate, load & haul	276.030	10.31	1.68
Drill & blast	135.227	5.05	0.82
Day works	9.541	0.36	0.06
Presplit	6.963	0.26	0.04
Fixed contractor costs	63.605	2.35	0.39
Rehabilitation	1.59	0.06	0.01
Dewatering	0.636	0.02	0.00
Grade control	21.531	0.80	0.13
Rehandle	18.509	0.69	0.11
Fuel credit	-27.540	-1.03	-0.17
Contractor Subtotal	**506.09**	**18.91**	**3.09**
Owner's labour	12.603	0.47	0.08
Owner's vehicles	0.086	0.00	0.00
Owner's consumables	8.315	0.31	0.05
Owner Subtotal	**21.005**	**0.78**	**0.13**
Total	**527.095**	**19.70**	**3.21**

21.2.2 Processing and G&A Costs

Estimates of unit costs for processing and General and Administration costs (G&A) are presented in Section 15 of the report.

Estimates of process plant operating costs were developed from information sourced by Lycopodium and Perseus:

- Manning levels and pay rates advised by Perseus;
- Consumable prices from Perseus's in country operations, supplier budget quotations, or the Lycopodium database;
- Cyanide and lime consumption and gold recovery based on laboratory testwork results;
- Modelling by Orway Mineral Consultants (OMC) for crushing and grinding energy and comminution consumables, using ore characteristics measured during the testwork;
- General and administration costs based on advice from Perseus and typical allowances; and
- First principle estimates based on typical operating data / standard industry practice.

The following exchange rates, as advised by Perseus, have been used for the preparation of the operating cost estimate:

- US$1.00 = A$1.25 (Australian Dollar);
- US$1.00 = 560 XAF (CFA Franc);
- US$1.00 = 13.2 ZAR (South African Rand);
- US$1.00 = 0.84 € (Euro).

Processing plant and administration operating costs were developed based on annual throughput rates of 3,336,000 t/y for oxide, transition and primary CMA basalt, 2,464,000 t/y primary Yaouré basalt and 2,528,000 t/y for primary Yaouré granodiorite. The primary ore throughput rates are based on grinding circuit specific energies calculated by OMC and the mills selected for the feasibility study. Throughput on the softer transition and oxide ore is limited to that of the primary CMA basalt ore.

Operating costs were developed for the five defined ore types and Life of Mine (LOM) costs estimated based on the mining schedule provided by Perseus.

The estimates are considered to have an accuracy of ±15%, are presented in US dollars (US$) and are based on prices obtained during the third quarter of 2017 (3Q17).

Table 21-3 LOM Processing and G&A Costs

Cost Centre	LOM	
	US$M	US$/t
Process & maintenance labour	66.271	2.48
Power	121.725	4.55
Maintenance materials	32.823	1.23
Reagents & consumables	92.446	3.45
Laboratory	7.061	0.26
Total Processing	**320.326**	**11.97**
Administration Labour	28.961	1.08
General & Administration Costs	62.967	2.36
Total G&A	**91.928**	**3.44**

The operating cost estimates in Table 21-3 are exclusive of:

- Mining costs;
- All ore handling costs;
- All head office (off-shore) costs, including head office labour;
- Any impact of foreign exchange rate fluctuations;
- Any escalation from the date of the estimate;
- Any contingency allowance;
- All withholding taxes and other taxes (Import duties on consumables allowed);
- Tailings storage facility future lifts and site rehabilitation (sustaining capital);
- Cyanide detoxification costs. A 2016 Scoping Study addressing a Yaouré detoxification circuit on site estimated additional operating costs of $1.50 per tonne of ore.
- Government monitoring / compliance costs except where noted;
- Gold refining and bullion transport and in-transit security of gold from site; and
- Ongoing land / community compensation costs.

The operating cost estimates include:

- Import duties on consumable unit costs (in the consumables unit costs); and
- Costs for the preparation and assaying of 100 mine grade control samples per day and routine laboratory tests on the site water samples (in the laboratory cost) in addition to routine plant monitoring and accounting assay costs.

21.3 Bullion Transport and Refining Costs

The LOM bullion transport and refining costs are $3.063 million dollars, or $0.11/t. The costs are based a refining charge of $2.24/oz.

21.4 Royalties

The LOM royalties payable are $57.426 million dollars or $2.15/t.

The royalties are calculated as 3.5% of gross revenue.

22. Economic Analysis

22.1 Valuation Methodology

The Yaouré Gold Project has been evaluated using the discounted cashflow method, by taking into account yearly milled tonnages, grades and associated recoveries for the ore, gold price, operating costs, bullion transport, refining charges, royalties and capital (both initial and sustaining). Construction capital is expended in 1.5 years with operations commencing thereafter.

The project has been evaluated as stand-alone and 100% equity financed with no debt financing considered.

22.2 Key Assumptions

The key assumptions in assessing the financial viability of the Yaouré Project are as follows:

- **Construction capital expenditure**: Yaouré construction capital expenditure payments are assumed to have been paid in the first 1.5 years of the project.
- **Sustaining capital expenditure**: Yaouré sustaining capital investment is to occur throughout the 8.4-year project life.
- **Royalties:** The State of Côte d'Ivoire is entitled to production royalties as follows in Table 22-1. The royalty is based on gross revenue from gold sales after deduction of transportation and refining costs.

Table 22-1 Production Royalties

Royalty	Gold price
3%	Up to US$1,000
3.5%	US$1,000 – US$1,300
4%	US$1,300 – US$1,600
5%	US$1,600 – US$2,000
6%	Over US$2,000

- **Income Tax:** There is a five-year tax holiday on revenue from the date of first production. After that period the corporate tax rate is 25%. Income tax losses may be carried forward for a maximum of five years. Sunk costs have been taken into account when calculating deductible capital allowance for tax purposes.
- **Marketing:** The gold bullion bars produced may be sent to any of the active gold refiners in the world for refining. Perseus will already be operating two other gold mines in West Africa when Yaouré begins gold production and it is likely that the gold produced at the Project will be shipped to the same refiners.
- The refining process is completed within five working days after receiving the bullion. The refiner will charge costs to cover transport, smelting, assaying and refining. For the purpose of this study 99.95% of the gold contained in the bullion will be returned to Perseus for sale on the open market.
- Bullion transport, insurance and refining costs were assumed to be $2.24/oz.
- **Closure/Rehabilitation Costs:** Both closure and rehabilitation costs have been included in the sustaining capital costs.
- **Currency:** Costs are presented in United States Dollars (US$).

22.3 Annual Cash Flow Forecast and Production Schedule

The forecast of annual costs and production shown below is a long-range forecast based upon a US$1,250/oz gold price. The results, on a 100 per cent equity basis, are shown in Table 22-2.

Table 22-2 Annual Cash Flow Forecast and Production Schedule Yaouré Project, 100% equity basis

	Unit	-1.5	-1	1	2	3	4	5	6	7	8	9	LOMP
Ore mined	Mt	-	-	2.75	4.38	4.37	3.35	6.64	3.83	-	-	-	25.3
Waste Mined	M	-	-	29.08	23.84	24.33	25.49	22.01	8.93	-	-	-	133.7
Total mined	Mt	-	-	31.84	28.22	28.71	28.84	28.65	12.77	-	-	-	159.0
Strip ratio	t:t	-	-	10.56	5.45	5.56	7.61	3.31	2.33	-	-	-	5.28
Mining cost	US$/t mined	-	-	2.65	3.13	3.30	3.30	3.81	3.86	-	-	-	3.31
Head grade	g/t	-	-	1.73	2.50	2.29	2.10	2.71	1.58	0.71	0.71	0.71	1.76
Ore milled	Mt	-	-	3.06	3.32	3.32	3.32	3.32	3.07	3.12	3.12	1.13	26.8
Processing cost	US$/t milled	-	-	10.66	11.95	11.89	11.74	11.99	12.61	12.36	12.31	12.66	11.97
G&A cost	US$/t milled	-	-	3.60	3.49	3.45	3.41	3.53	3.57	3.23	3.23	3.69	3.45
Recovery	%	0.0%	0.0%	88.3%	90.5%	90.4%	90.4%	90.5%	90.1%	89.4%	89.4%	89.4%	90.1%
Gold produced	**koz**	**-**	**-**	**150**	**241**	**220**	**202**	**262**	**140**	**64**	**64**	**23**	**1,367**

	Unit	-1.5	-1	1	2	3	4	5	6	7	8	9	LOMP
Production Cost	US$/oz	-	-	856	580	663	720	616	709	802	799	839	690
Royalties	US$/oz	-	-	44	44	44	44	44	44	44	44	44	44
Sustaining Capital	US$/oz	-	-	11	19	29	21	16	31	83	14	125	25
All-in-site cost	**US$/oz**	**-**	**-**	**911**	**642**	**736**	**785**	**676**	**783**	**928**	**857**	**1,008**	**759**
Cashflow after tax	**US$M**	**- 87.6**	**- 175.2**	**50.7**	**146.5**	**113.2**	**94.1**	**150.2**	**49.0**	**15.3**	**19.5**	**5.3**	**381.1**

22.4 Financial Analysis / Sensitivity

Table 22-3 shows the key LOM performance measures, on a 100 per cent equity basis, for the Yaouré Gold Project at varying gold prices.

Table 22-3 Financial Analysis Yaouré Project, 100% equity basis

Gold price	Unit	US$1,200/oz	US$1,250/oz	U$S1,300/oz
Waste + Ore Mined	'000 tonnes	159,012	159,012	159,012
Ore processed	'000 oz	26,761	26,761	26,761
Head Grade	g/t gold	1.76	1.76	1.76
Weighted Average Recovery	%	90.1	90.1	90.1
Gold Produced	Au Oz	1,367,297	1,367,297	1,367,297
Development Capital	$'000	262,725	262,725	262,725
Sustaining Capital	$'000	34,675	34,675	34,675
Mining Costs	$'000	527,095	527,095	527,095
Processing Costs	$'000	320,326	$320,326	320,326
Administration Costs	$'000	91,928	92,270	92,612
LOM Cash Operating Cost (C1)	$/oz	690	690	690
Year 1 & 2 Cash Operating Cost (C1)	$/oz	856	856	856
All In Site Cost	$/oz	757	759	767
Free cash	$'000	342,833	408,431	465,160
IRR	%	23.3	26.9	29.9
NPV 5%	$'000	209,793	259,158	301,849
NPV 10%	$'000	130,341	170,299	204,855
Payback period	months	35	32	30
Tax paid	$'000	23,815	27,284	30,284
Royalties paid (Govt)	$'000	57,291	59,682	70,941

Applying a long-term gold price of US$1,250/oz on a flat line basis from the commencement of production, estimated pre-tax cashflows generated are US$408.4 million and the payback of the Yaouré Gold Project is 2.67 years. The mine life is estimated at 8.4 years.

The Yaouré Gold Project internal rate of return (IRR) is 26.9% and the net present value (NPV) is US$170.3 million (based upon real, post-tax cash flows, calculated using a 10% discount rate). Life of mine average cash costs of production are US$690/oz while all-in sustaining costs (AISC) are US$759/oz.

22.5 Sensitivity Analysis

A sensitivity analysis was performed on the post-tax NPV of the Project by varying the key variables of gold price, grade, recovery, operating costs and initial capital by 10%. Each assessment was done independent of the others. The results are shown in Figure 22-1.

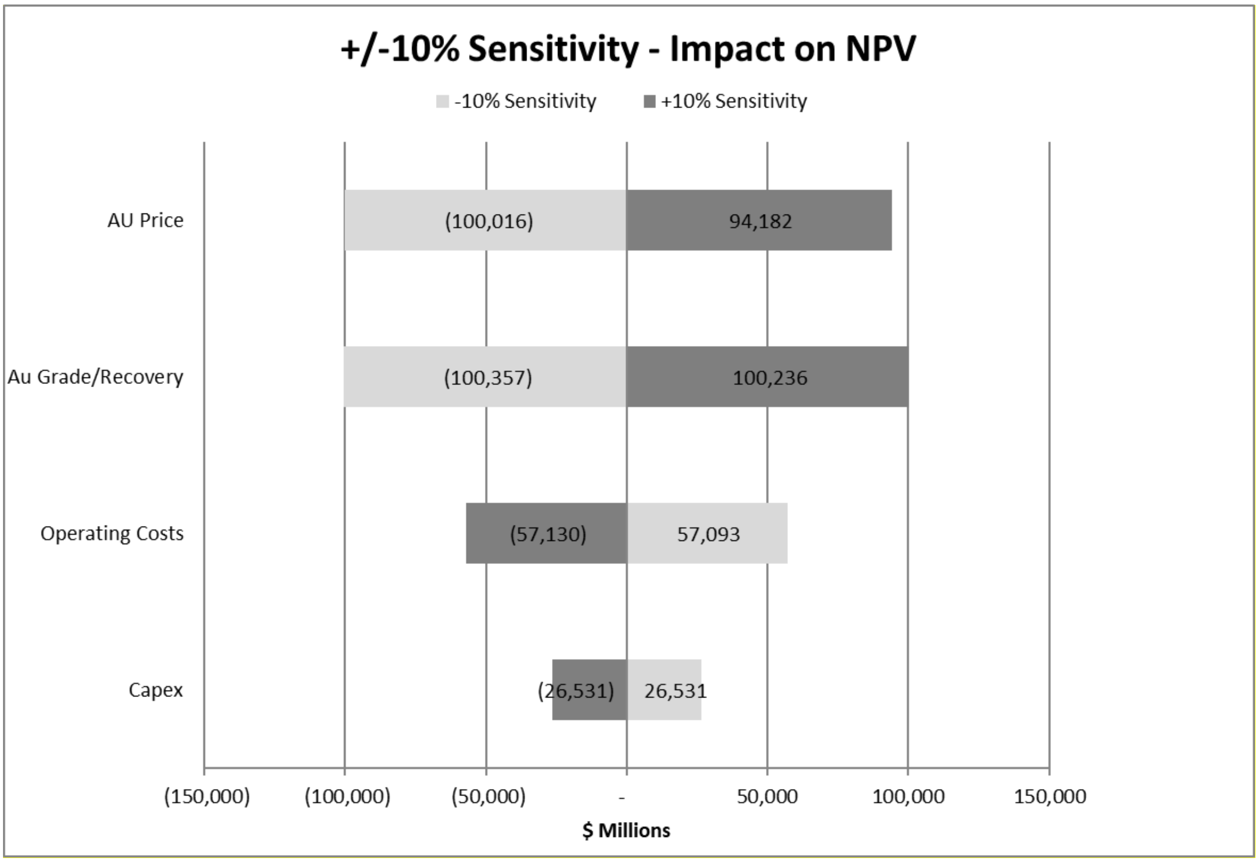


Figure 22-1 Sensitivity Analysis Yaouré Project

23. Adjacent Properties

The most recent information concerning nearby properties obtained by Perseus from the Ministry of Mines is dated 17th July 2017 (Figure 23-1).

There are two applications for exploration permits directly adjacent to the west of Perseus Yaouré SARL PR 615. Perseus knows of no significant mineral exploration or appraisal works on those properties. Kobo Resources has lodged an application for an exploration permit located just east of the Bandama River. Perseus knows of no significant mineral exploration or appraisal works in that area.

The area immediately south of PR 615 is reserved for artisanal mining; corporate-scale exploration and mining are not permitted in the area.

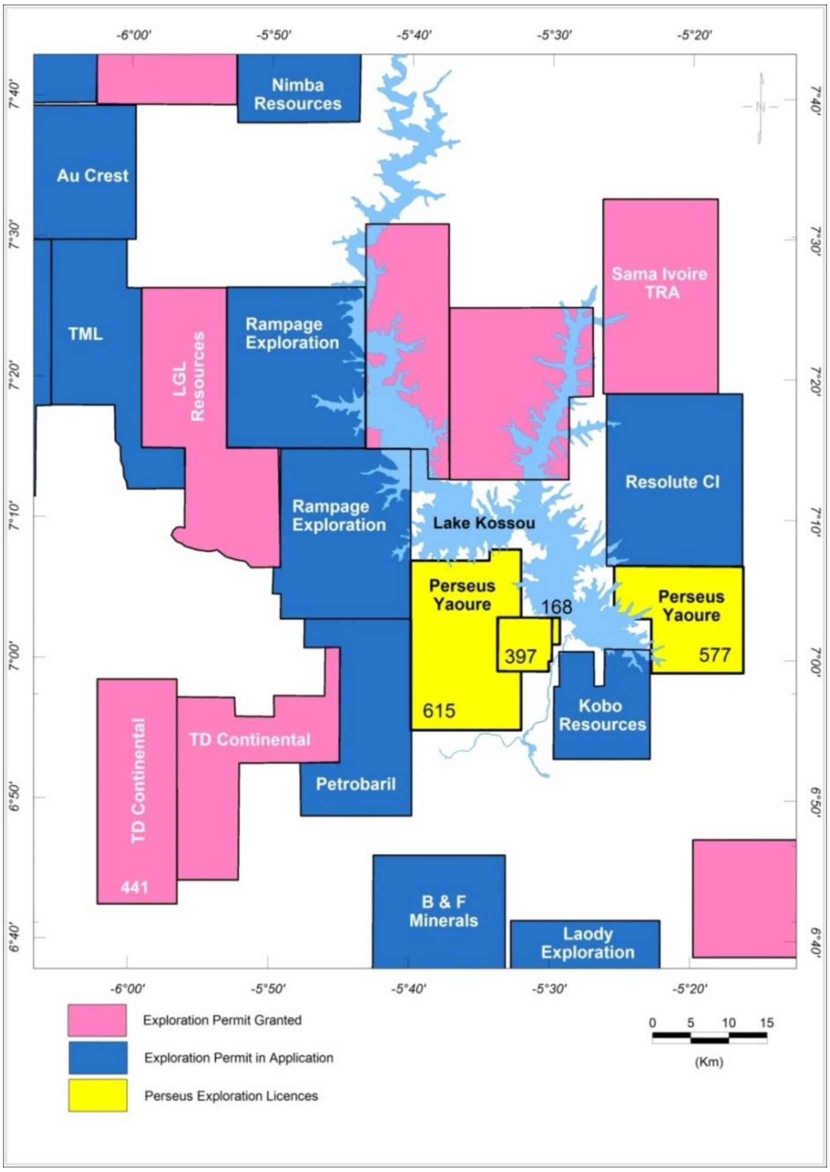


Figure 23-1 Licences adjacent to Perseus Yaouré Gold Properties

24. Other Relevant Data and Information

The information presented in this report is necessarily a summary of more detailed information contained in the supporting reports and documents listed as references in Section 27 of the report.

In addition to the work described in the report, the Yaouré Gold Project Definitive Feasibility Study includes:

- A Project Execution Plan;
- An Operational Readiness Plan; and
- A Risk Management Study.

Detailed discussion of each of those items is considered beyond the scope of this report.

Perseus proposes that the Project will progress to a Front End Engineering and Design (FEED) Study in 2018. That study will result in further refinement of estimates of capital and operating costs and, potentially, updated estimates of Mineral Resources and Mineral Reserves.

25. Interpretation and Conclusions

25.1 Mineral Resources

Data that inform the resource estimate are considered to be representative and free of any biases or other factors that may materially impact the reliability of the sampling or significantly affect confidence in estimated resources. Checks to confirm the validity of the drilling database indicate that it forms a sufficiently reliable basis for resource estimation.

There are a number of mineralisation targets that offer opportunities to extend the mine life at Yaouré, ranging from early stage drill targets to extensively drilled mineralisation with historic resource estimates.

25.2 Mineral Reserves

Estimates of Mineral Reserves at Yaouré Gold Project are considered sufficiently reliable to support a decision to proceed to mine development.

The limits of the open pits that define Mineral Reserves at US$1,200/oz gold price are, in places, constrained by drill coverage. An optimal pit shell that includes Inferred material in the resource model reports additional mineralisation compared to the optimal pit shell generated using only Indicated resources. It appears likely that a significant proportion of that material could convert to Mineral Reserves were it sufficiently drilled to be included in Indicated Mineral Resources. The southern extension of the Y2 structure, immediately west of the existing Yaouré open pit, is an example of an area that has obvious potential to add a modest tonnage to Mineral Reserves in a shallow extension of the open pit.

Drill and blast costs are a significant component of total mining costs and optimisation of blasting will be an important aspect of managing the mining process at Yaouré.

Pit optimisations at gold prices up to US$1,800/oz indicate that at higher gold prices significant tonnages of additional mineralisation would report to Mineral Reserves, particularly from expansion of the Yaouré pit to depth.

25.3 Mining Methods

The combination of high UCS (217 MPa at the 80th percentile of available data), large in situ block size (50% passing block volume of 27 cubic metres) and a primary crusher topsize (specified by Perseus) has resulted in very high estimated powder factors. Drill and blast costs are a significant component of total mining costs and optimisation of blasting will be an important aspect of managing mining at Yaouré.

The proximity of Angovia/Allahou Bazi village means careful blasting practices will need to be adopted to avoid excessive blast vibration, over-pressure and noise.

Pit slope stability is not expected to be a major risk. In the regolith material, 40 to 60 metres thick, slope stability will be highly sensitive to groundwater pore pressures. Material strengths are low and rotational failure may be expected to be the controlling failure mechanism. A mining sequence that quickly mines into the more broken transition material below would improve the rate at which slopes within the regolith drain and potentially result in less stability issues.

The transition zone (weathered and fractured material) is approximately 20 metres thick. Slope stability in the transition zone is most likely to be controlled by planar sliding and wedge sliding failures from jointing.

The fresh rock domain comprises rock with a very strong to extremely strong UCS and is classified as a good to very good rock mass. Instability issues are expected to be governed by jointing within the rock mass leading to planar sliding and edge-sliding failures. Pre-split and trim blasting will assist in reducing blast damage and reduce potential instability issues caused by blasting.

25.4 Metallurgy and Mineral Processing

The results of comminution and metallurgical testwork commissioned by Perseus and, previously, by Amara have been consistent and are considered sufficiently reliable to support a decision to proceed to mine development.

The Yaouré sulphide ores are hard and require fine grinding (P_{80} 75 µm) to optimise cyanide leach recoveries. Power consumption in the crushing and grinding circuits is a major component of processing costs. The SABC grinding configuration selected as the basis of the DFS permits optimisation of mill energy consumptions.

Yaouré gold ores contain no minerals that are deleterious to recovery of gold in a standard Carbon-in-Leach process. Testwork indicates an average gravity gold recovery of 38% for the dominant CMA fresh ore. Cyanide consumption is relatively low, slurry density has little impact on overall gold recovery and oxygen sparging improves the initial leach kinetics but gold extraction is essentially complete after 24 to 30 hours when either air or oxygen was used.

25.5 Project Infrastructure

Perseus intends to progress Yaouré to a further stage of optimisation of the feasibility study that will include detailed Front End Engineering and Design (FEED). That work will permit more accurate estimates of capital costs and may permit optimisation of some infrastructure components.

Final infrastructure placement may be affected by discovery of additional economic or potentially economic gold mineralisation. The proposed site for the processing plant was moved late in the DFS. The adequacy of sterilisation drilling over the site now proposed for the process plant and associated infrastructure requires assessment. Additional geotechnical testwork is also required to investigate the foundation conditions of the proposed plant site.

25.6 Environment, Social Impact and Permitting

The Yaouré Gold Project is in a brownfield area which has been historically subject to various gold mining activities. Artisanal mining can be traced back to the 19th century and is still ongoing, in addition to industrial open pit mining, which has been intermittently undertaken since the 1980s. Other human activities within PR 397 include villages, agricultural practices, hunting and gathering. These, together with the various mining activities, have caused disturbance to various levels of significance within the Project area of influence. The extents and effects of that disturbance have been established by the Environmental and Social Impact Assessment (ESIA) and the baseline studies that underlie it.

The ESIA includes plans for water management, waste management, and mine closure and rehabilitation.

The permits required for approval of mining activities are known and their requirements understood. Also, the system pertaining to the reclamation bond required to permit mining operations is known and understood.

There are currently no significant negative environmental or social impacts identified for the development of the Yaouré Project and the potential minor negative impacts identified will be managed as a priority. There are a number of positive impacts expected, mainly related to community development and opportunities for local people.

25.7 Economic Analysis

Applying a long-term gold price of US$1,250/oz on a flat line basis from the commencement of production, estimated pre-tax cashflows generated are US$408.4 million and the payback of the Yaouré Gold Project is 2.67 years. The mine life is estimated at 8.4 years.

The Yaouré Gold Project internal rate of return (IRR) is 26.9% and the net present value (NPV) is US$170.3 million (based upon real, post-tax cash flows, calculated using a 10% discount rate). Estimated life of mine average cash costs of production are US$690/oz while all-in sustaining costs (AISC) are US$759/oz.

The project is most sensitive to gold price, grade and metallurgical recovery and relatively insensitive to capital cost.

26. Recommendations

26.1 Drill Hole Database

As described in sections 11 and 12 of the report, the drill hole database contains a number of minor errors and inconsistencies such as apparent misallocations of blanks as standards and vice versa, and apparent misallocations of standard names for some records. It is recommended that these be rectified.

Compilation of quality control data for the Cluff drilling is incomplete at the time of reporting. Those data should be imported into the database.

26.2 Exploration Targets

Several known mineral occurrences within 2 to 5 km of the proposed Yaouré mine are attractive exploration targets.

Filon de Akakro

Gold mineralisation at Filon de Akakro is controlled by an east-west striking, steeply dipping structure exposed in artisanal workings over at least 200 metres strike length. The true width and tenor of mineralisation are not known. A traverse of RAB drill holes by Cluff paralleled the structure and the westernmost hole, YRB1912, intersected 5 metres @ 7.46g/t Au in what was possibly a partial intersection of the structure.

Govisou

Govisou prospect is located about 1.3 kilometres due west of Yaouré open pit.

Govisou was discovered by RAB drilling undertaken by Cluff in 2012 and confirmed by RC drilling in 2015. Four sequential RAB drill holes drilled on an east-west line (777,415mN, holes at approximately 25 metre spacing and angled -45 degrees to the west) intersected mineralisation commencing at about 10 metres depth. Each of the holes ended in mineralisation. Intercepts are summarised in Table 2-1. RAB holes on lines located 100 metres to the north and to the south intersected only low gold grades in transported overburden.

A bulldozer trench was excavated by Amara in about 2014. Despite being excavated to about 9 metres depth, sampling of the trench floor returned no significant gold grades and it is likely that it bottomed in transported overburden.

Three RC holes were drilled by Amara in 2015 specifically targeted at Govisou (YRC0800, 833 and 834). The first two holes returned encouraging intercepts (Table 2-1); YRC0834 intersected only low grade (circa 0.5g/t) mineralisation.

The prospect is nearly coincident with the historic north-trending soil gold anomaly delineated by BRGM's early exploration work but given that drilling has demonstrated the area is covered by up to 15 metres of transported overburden, it appears unlikely that the soil anomaly is directly related to underlying mineralisation. There are no artisanal workings in the area that penetrate to bedrock.

In 2017 previous drill results were reassessed and it was concluded that mineralisation probably strikes east-northeast and dips vertically or steeply to the northwest. Two diamond core holes were drilled (YDD0503 and 504), collared 80 metres apart and dipping -55 degrees toward the southeast. The first hole encountered a quartz-rich intrusive rock (granodiorite/tonalite) throughout almost its entire length. The second hole intersected basaltic rocks and granodiorite/tonalite. Intercepts are listed in Table 26-1.

Table 26-1 Govisou Drill Intercepts

Hole ID	From m	To m	Length m	g/t Au
YRB1807	10	27	17	2.34
YRB1808	11	18	7	2.49
YRB1809	12	33	21	2.11
YRB1810	12	33	21	1.91
YRC0800	52	87	35	2.31
YRC0833	46	72	26	2.46
YRC0834	38	46	8	0.49
YDD0503	90	108	18	1.79
YDD504	80	93	13	0.58

The intersection of granodiorite in the diamond core holes was not expected but subsequent re-logging of previous RC holes indicated that there is probably a large granodiorite body at Govisou and, given the association of gold mineralisation with such intrusive rocks in other deposits in the Birimian terrane of West Africa, this is regarded as encouraging. Similar to the granodiorite body in Yaouré open pit, the Govisou granodiorite has no discernible magnetic signature in images of aeromagnetic data.

The mineralised intercepts in YDD0503 and 0504 are not associated with any obvious zone of veining or deformation. Gold appears to be associated with a relatively low concentration of disseminated pyrite associated with silicification and weak haematite alteration.

A program of air core drilling with 20m spaced holes on 80 metre spaced line, with holes drilled toward the southeast, is recommended to confirm the strike trend and extent of potentially economic mineralisation. Contingent on encouraging results from that program, a staged program of RC and diamond core drilling should then be implemented with holes drilled on 40 metre spaced lines to define an inferred resource to approximately 100 metres below surface.

Other Exploration Targets

Exploration throughout Yaouré district has relied substantially on surface geochemical sampling. The method works well in areas of residual regolith but substantial areas around Yaouré are covered by transported colluvium and alluvium and one or more inversions of the weathering profile have created a complicated geomorphological regime.

The spatial extent of bedrock drill intercepts in drilling peripheral to the Yaouré deposits indicates potential for discovery of additional deposits. Effective exploration will increasingly rely on auger, RAB or air core drilling to evaluate covered areas.

26.3 Additional Mineral Resources

There are clear targets within 1-2 km of the proposed Yaouré mine that may add to Mineral Resources and potentially to Mineral Reserves, including Y2 South, CMA Hangingwall, Angovia 2 and CMA South (Figure 26-1). Each of those targets is discussed in detail below and a summary of recommended drilling and estimated costs to define Indicated resources at each is presented in Table 26-2.

Table 26-2 Drilling recommended to define additional resources

Target	Drill Program	Drill cost US$'000*
Y2 South	2,500 m RC	200
CMA Hangingwall Lode	3,500 m RC	265
Angovia 2	4600 m RC	350
	1,600 m core	375
CMA South	2,800 m RC	215

** Estimated total drilling, assay, manning & support costs excluding site admin standstill costs.*

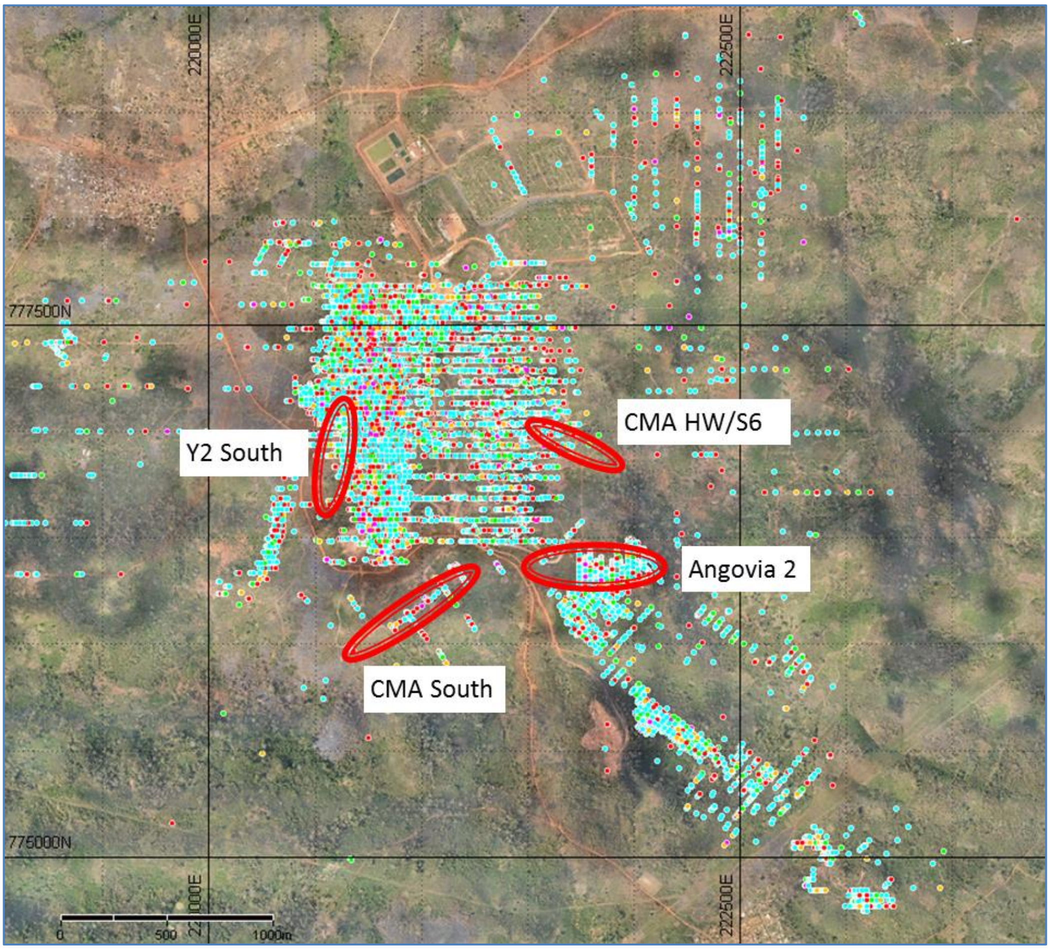


Figure 26-1 Targets for additional Mineral Resources

Y2 South

Previous drilling has indicated potential for a southerly extension of the Y2 structure to the southwest of the existing pit. Hole YDD0447 contains an isolated intercept of 9m @ 14.5g/t Au from 48m depth. A program of infill drilling at 25mE x 25mN spacing to delineate resources in that area could result in an extension of the open pit

CMA Hanging Wall Lode

Drilling has located a steeply dipping, WNW striking lode in the hanging wall of CMA at around 777,085N. Hole YDD0081 contains an intercept of 68.3m @ 1.52g/t Au from 35.7m depth and adjacent hole YRC0688 contains an intercept of 43m @ 5.19g/t Au from 48m depth. These oblique intercepts probably represent mineralisation with a true width of about 10 metres. Present drill coverage is insufficient to define this mineralisation to greater than Inferred category but it has potential to modify the limits of an economic open pit in its immediate vicinity; mineralisation appears to extend approximately 200 metres east of the CMA optimum pit. A drilling program to infill the area to 25mN x 25mE spacing is recommended prior to mining to a final pit design, with holes drilled toward the southwest. Certainly the lode should be specifically targeted by grade control drilling during mining.

Angovia 2

Mineralisation at Angovia 2 appears to comprise a complex series of east-west striking structures. Mineralisation is interpreted to dip to the south at about 35 degrees, subparallel to the hill slope in the area, but some steeper lodes may be present. The mineralisation has been extensively exploited by artisanal miners.

RC drilling by Cluff in 2011-2012 covered approximately 300 metres strike length with angled holes at 25mN x 25mE spacing. There are some substantial gaps in up-dip and down-dip coverage, presumably because of access difficulties. Drilling appears to have closed off mineralisation to the east but to the west it remains open.

A program of drilling is recommended to confirm selected previous RC drill intercepts (diamond core twins), infill gaps in drill coverage and extend drill coverage to the west. It is recommended that the core drilling be conducted prior to additional RC drilling so that ore geometry and structural controls can be confirmed.

It is possible that an open pit at Angovia 2 may connect with a cut-back of the CMA South pit.

CMA South

There are no drill hole data available for CMA South that precede mining of the pit. Drilling by Amara between 2013 and 2015 included RC and diamond core holes targeted specifically at depth extensions of CMA South lode in holes spaced at approximately 100 metre intervals along strike. Several holes intersected mineralisation representing down-dip extensions of the lode but most are more than 100 metres down-dip of the bottom of the existing pit. Perseus's 2017 drilling campaign included 10 vertical RC holes, on 25 metre spacings, drilled from an access ramp established in the southern pit wall and designed to intersect the lode nearer the base of the existing pit. Drill intercepts (at approximately 0.6g/t cut-off) are summarised in Table 26-3. True widths of mineralisation are approximately 85 per cent of down-hole intercept lengths.

Table 26-3 CMA South 2017 Drill Intercepts

Hole ID	From m	To m	Length m	g/t Au	Depth below pit base (down-dip) m
YRC1175	17	31	14	3.18	30
YRC1176	22	39	17	1.01	44
YRC1177	30	36	6	2.45	45
YRC1178	30	42	12	0.98	44
YRC1179	31	36	5	1.72	36
YRC1180	4	11	7	2.02	12
and	17	27	10	1.26	37
and	34	42	8	3.11	66
YRC1181	20	22	2	3.97	28
YRC1182	40	55	15	1.92	44
YRC1183	48	54	6	1.53	55
YRC1184	52	58	6	2.35	50

The tenor and width of intercepts indicates potential to define a modest resource that might be economically exploitable by a cut-back of the existing pit. Additional drilling is recommended to infill the drill coverage to a 25m x 25m (along strike x down-dip) pattern to 60-80 metres (down-dip) below the base of the existing pit and including holes targeted to intersect the lode as close to the bottom of the existing pit as is practicable.

26.4 Targets that May Affect Infrastructure Placement

Final infrastructure placement may be affected by discovery of additional economic or potentially economic gold mineralisation. The proposed site for the processing plant was moved late in the DFS. The adequacy of sterilisation drilling over the site now proposed for the process plant and associated infrastructure requires assessment. Additional geotechnical testwork is also required to investigate the foundation conditions of the proposed plant site.

Drilling has located numerous mineralised intercepts in bedrock beneath transported cover. Follow up drilling has the potential to locate mineralisation that may influence the placement of mine infrastructure. Examples include the area immediately east of the proposed plant site (Magazine South), the north-westerly extension of the Y2 lode and the Y3 structure, east of Yaouré pit (

Figure 26-2). Each of those targets is discussed in detail below and a summary of recommended drilling and estimated costs to define Indicated resources at each is presented in Table 26-4.

Pit optimisations at gold prices up to US$1,800/oz indicate that at higher gold prices significant tonnages of additional mineralisation could report to Mineral Reserves, particularly from expansion of the Yaouré pit to depth. The potential for future cut-backs of both Yaouré and CMA pits should be considered when planning infrastructure.

Table 26-4 Drilling to test targets that may affect infrastructure placement

Target	Drill Program	Drill cost US$'000*
Magazine South	5,000 m AC	185
	4,500 m RC	340
Y2 North	3,000 m AC	110
Y3	4,000 m AC	150
Plant site geotech	300 m core	75

** Estimated total drilling, assay, manning & support costs excluding site admin standstill costs.*

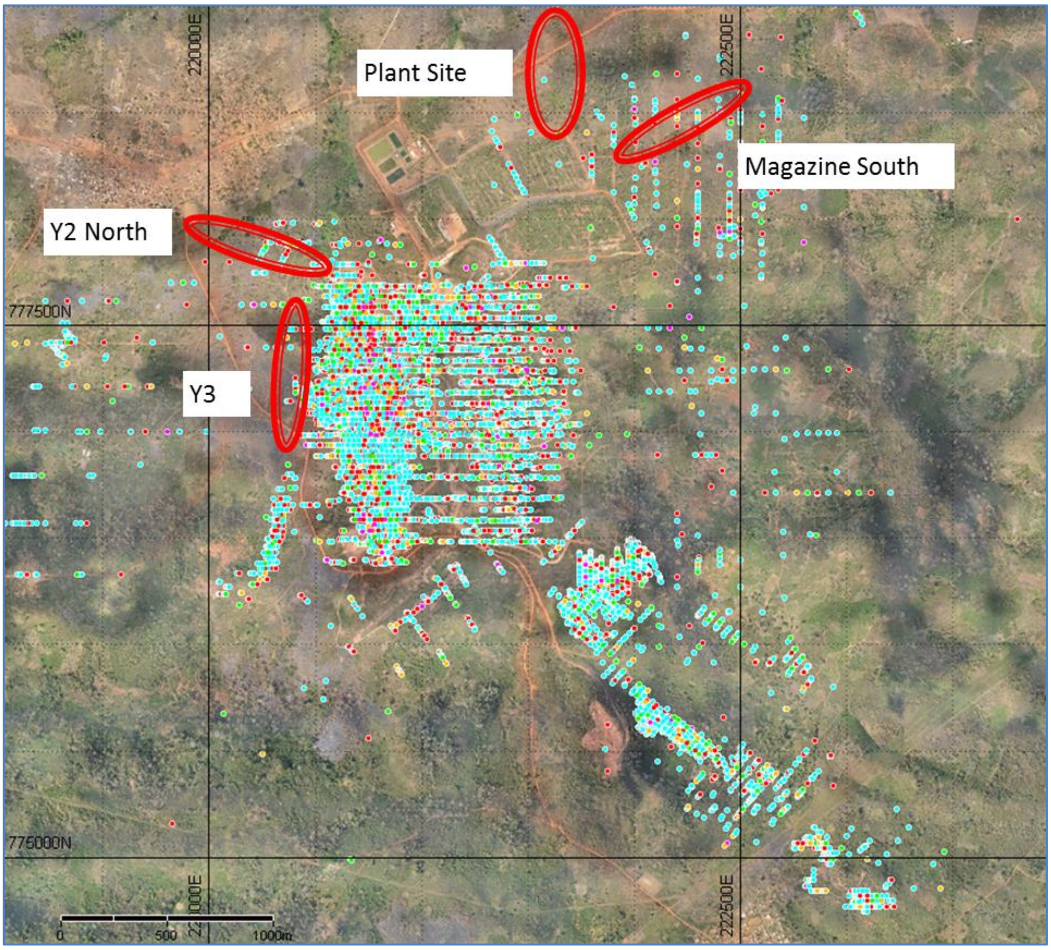


Figure 26-2 Targets that may affect infrastructure placement

Magazine South

Condemnation drilling completed by Perseus in 2017 included air core drilling on 100 metre spaced lines to the east and northeast of the heap leach pads and south of the area previously referred to as the Magazine Prospect. The area straddles the faulted contact between the basaltic sequence that hosts Yaouré and CMA gold mineralisation and volcanoclastic rocks of the Birimian sub-basin to the north. Reactivation of the structures bounding that basin, and in particular the basin "corner" located at the northern end of CMA, is thought to be important in the mineralising process at Yaouré.

The area drilled is devoid of outcrop, being covered by 5 to 20 metres of transported clay and lateritic gravel. Artisanal workings in the area appear to exploit alluvial gold contained within the transported overburden. Drilling located sporadic gold in the transported overburden (best intercept 4m @ 8.99g/t from surface in YAC0199) but also a scattering of bedrock intercepts, generally hosted by basalts and within 100-150 metres south of the volcanoclastic contact (Table 26-5).

Table 26-5 Magazine South area drill intercepts

HoleID	From m	To m	Length m	g/t Au
YAC0104	8	23*	15	0.87
YAC0105	20	31*	11	1.04
YAC0180	60	66*	6	0.84
YAC0194	40	52	12	1.02
YAC0228	20	32	12	1.99
and	52	56	4	1.02
YAC0279	40	59*	19	0.76
YAC0283	20	36	16	2.02
YAC0319	64	72*	8	1.71
YAC0340	32	48	16	1.11
YRC0612	17	30	13	1.29
YRC0814	93	103	10	1.98
YRC1193	45	56	11	1.29
YRC1195	72	75*	3	1.75
YRC1198	90	98	8	3.86

**hole ends in mineralisation*

A series of RC holes, specifically targeting the basalt-volcanoclastic contact, was drilled immediately following the air core drilling with generally one angled hole on each 100 metre spaced line. Those holes demonstrated that the contact itself is possibly not the principal target for mineralisation but subsidiary structures that splay from it into the basalt sequence may host significant mineralisation. It is possible that the north-south orientation of the drill traverses may not be optimum for locating and defining mineralisation.

A staged program of further drilling is recommended for the area, commencing with infill air core drilling to better define mineralisation geometries and, contingent on success, RC drilling to delineate resources to 60-80 metres depth.

Y2 North

Drilling during 2017 has demonstrated that at the north end of Yaouré pit the Y2 structure deflects to a west-north-westerly strike, merging with the faulted unconformity that bounds the volcanoclastic metasediments with the underlying basalt sequence. Previous RC drilling has indicated that the contact structure and adjacent basaltic and volcanoclastic rocks are mineralised.

Four traverses of air core holes angled toward the southwest were drilled to specifically target the contact over approximately 450 metres strike length. The two traverses nearest the pit appear to have intersected the contact but the western two traverses were entirely within volcanoclastic rocks, the contact being farther south than was anticipated. The prospective structural corridor thus remains poorly tested by drilling. Further work is recommended although assessment of what comprises a viable resource target must include consideration of the proximity of Angovia village.

Y3 Structure

Y3 is a north striking, east dipping mineralised structure located approximately 200 metres west of the existing Yaoure pit. It does not outcrop, the area being covered in up to 15 metres of transported colluvium and alluvium.

The structure has been sporadically intersected in RAB and air core drill holes and RC drilling by Amara on 50 metre spaced lines tested it to about 50 metres depth over 400 metres strike length between 776,285N and 776,685N. That drilling demonstrated that the structure is consistently mineralised but grades are generally too low to support mining over that strike interval.

North of 776,835N the structure is poorly tested by drilling but scattered drill intersections indicate that it continues northward for at least 900 metres to the faulted contact with volcanoclastic rocks. An intercept of 12m @ 8.83g/t from 12m depth in YAC0043, a hole drilled as part of Perseus's 2017 sterilisation drilling campaign, indicates potential for economic gold grades at shallow depths. The tenor of mineralisation may be enhanced in areas where Y3 intersects other structures

It is recommended that the structure be tested by air core or RC drilling on 50 metre spaced traverses to about 50 metres below surface prior to placement of any mine infrastructure (e.g. waste dumps).

Plant Site Geotechnical Drilling

Geotechnical characteristics of the proposed plant site area require investigation by diamond core drilling. Ten diamond core holes each 30 m deep are likely to be adequate to test the foundation conditions at locations proposed for major plant components.

26.5 Mineral Reserves

Open Pit Extensions

The limits of the open pits that define Mineral Reserves at US$1,200/oz gold price are, in places, constrained by drill coverage. An optimal pit shell that includes Inferred material in the resource model reports additional mineralisation compared to the optimal pit shell generated using only Indicated resources. It is likely that a significant proportion of that material would convert to Mineral Reserves were it sufficiently drilled to be included in Indicated Mineral Resources.

A program comprising approximately 4,000 m of RC drilling and 5,200 m of diamond core drilling, costing approximately $310,000 and $1.22 million respectively, are recommended to convert peripheral Inferred resources to Indicated category and thence potentially to Mineral Reserves.

Underground Potential

A number of high-grade drill intercepts below the likely limits of an economic open pit indicate potential to define resources that may be economic to exploit by underground mining. Targets may include:

- CMA lode
- S1 and S2 lodes (Yaouré deposit)
- Conceptual structural targets such as the down-dip continuation of the Y3 structure where it intersects the granodiorite intrusive body.

Testing such potential ore positions would require staged diamond core drilling programs totalling in the order of $3M. Additional expenditure would then be required to delineate inferred resources by core drilling from surface. Definition of indicated resources would likely require drilling from underground platforms.

26.6 Grade Control

It is anticipated that mining at Yaouré will utilise medium-sized truck and shovel equipment. Drill hole assay data indicate that many of the mineralised structures do not have "hard" ore-waste contacts and that mining will require delineation of ore contacts at one or more cut-off grades, a situation typical of modern open pit gold mining. Reliable separation of ore and waste will thus require good quality sampling and assaying and an ore delineation methodology that permits ore selection at block support rather than sample support, i.e. a technique that sufficiently accounts for the volume-variance effect.

To obtain quality samples ahead of mining, it is recommended that grade control sampling be by drilling of dedicated reverse circulation holes. Optimum sample spacing is probably in the order of 5mE x 8mN x 1.25mRL in the complex mineralisation within Yaouré pit and in the order of 6mE x 10mN x 1.25mRL in CMA pit. Holes should be angled and sample intervals specified so as to take two samples per 2.5m flitch.

Grade control quality assurance should include recording of sample recoveries, on a campaign basis as a minimum, inclusion of blanks and CRMs in the sample stream, routine checks of sample preparation procedures (e.g. pulp grind size) and routine inter-laboratory check assays.

The unit cost of a suitable grade control approach is likely to be in the order of USD0.85 per ore tonne (excluding manning and overheads).

26.7 Mining Methods

Drill and Blast

Estimates of drill and blast costs are based on a relatively small database of UCS tests. Should additional core drilling be undertaken during further refinement of the feasibility study, it is recommended that additional UCS tests be undertaken, particularly on mineralised samples.

Drill and blast costs will be a significant component of total mining costs and optimisation of blasting will be an important aspect of managing mining at Yaouré. A Mine-to-Mill optimisation study is recommended as soon as practicable after commencement of mining to assess trade-offs between blasting and comminution costs.

The proximity of Angovia/Allahou Bazi village means that careful controls on blasting practices will be required to avoid excessive blast vibration, over-pressure and noise. Optimisation of blasting practices may require a dedicated program of training the Mining Contractor’s local employees.

Pit Slope Stability

Appropriate effort should be directed toward control of surface water and ground water inflows in order to maximise the stability of pit slopes in regolith and transition materials.

Stability assessment during mining will require ongoing mapping to confirm structural information and thus confirm stability assumptions. This also potentially provides an opportunity to mine steeper slopes if more favourable structural conditions are determined. The largest potential for steeper slopes may be in the southern walls, as these have been flattened significantly as part of the current study due to unfavourable orientation of structures.

26.8 Metallurgy and Mineral Processing

Optimisation of Feed Blends

Viscosity testing of various blends of oxide ores, heap leach material and fresh ores is recommended to define safe operating ranges and optimal slurry density and viscosity conditions.

There may be an opportunity to refine the mine and plant feed blend to reduce operating costs and increase plant efficiency. For example, supplementing the oxide ore with Yaouré primary ore will better utilise the mill power whilst maintaining nameplate throughput capacity.

26.9 Project Infrastructure

Raw Water Supply

The overall site water balance indicates that a significant source of clean water is required for the raw water plant and for the process water dam make-up.

The DFS assumes that raw water will be predominantly sourced from the Bandama River. Approval for water abstraction and clarification of the conditions pertaining to it is required in order to finalise the planning of water supply infrastructure.

FEED Study

Perseus intends to progress Yaouré to a further stage of optimisation of the feasibility study that will include detailed Front End Engineering and Design (FEED). That work will permit more accurate estimates of capital costs and may permit optimisation of some infrastructure components.

In some areas, the ore exhibits extreme hardness which leads to very high blasting costs and could present difficulties with secondary rock breakage at the ROM pad and crusher. There is an opportunity to reduce these costs by installing a larger crusher and the associated ancillaries.

26.10 Environment, Social Impact and Permitting

The ESIA commissioned by Amara and lodged in 2015 requires updating or amending to reflect changes to the proposed mining and processing operations that have arisen out of the DFS.

Mine development and operations require a number of permits from regulatory agencies and government departments. Maintaining a schedule of permit applications and their progress toward issue would assist in ensuring that the various permits are achieved in a timely manner.

Resolution of the permit for water abstraction from the Bandama River prior to conclusion of the FEED study will allow certainty around requirements for pipeline and water storage infrastructure and costs.

It is intended that the environment and social monitoring programme for Yaoure construction, operations and closure phases will include:

- Climate – temperature, rainfall, evapotranspiration, humidity and wind;
- Water - groundwater levels, stream flows, surface and groundwater quality, and water use;
- Noise;
- Vibration (i.e. blasting during operations);
- Air quality – dust deposition and particulate matter;
- Waste rock – acid base accounting;
- Biodiversity - visual fauna sightings, rehabilitation monitoring, aquatic monitoring; and
- Social – community grievances, community health studies and socio-economic studies.

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