



#### CORPORATE INFORMATION

Bassari Resources Limited is an Australian listed company focused on discovering multimillion ounce gold deposits in the Birimian Gold Belt, Senegal, West Africa.

#### FAST FACTS

ASX Code	BSR
Issued Capital	771,319,369
Unlisted options	2,500,000
No of shareholders	1,679
Top 20	50%

#### **INVESTMENT HIGHLIGHTS**

Exploration permits cover approx. 850 km<sup>2</sup> over prospective Birimian Gold Belt, Senegal, West Africa.

- Makabingui Gold Project, Mineral Resource (December 2012) 1.0 million ounces in 11.9 Mt at 2.6 g/t gold at a 0.5 g/t cut-off, comprising:
  - Indicated: 336,000 ozs in 2.6Mt at 4.0g/t
     Inferred: 669,000 ozs in 9.3Mt at 2.2g/t
- Senegal, stable democracy since 1960.
- Quality ground holding in a 50M ounce
- gold region which hosts a number of world class deposits.
- 13 prospects identified along 80km strike length within Kedougou-Kenieba Inlier.
- Strategic and dominant exploration package.
- Gold intersected over a wide interval at Konkouto Prospect.

#### **BOARD AND MANAGEMENT**

Alex Mackenzie Executive Chairman Jozsef Patarica Managing Director/CEO Chris Young Non Executive Director Philip Bruce Non Executive Director Ian Riley Company Secretary/Chief Financial Officer

#### CONTACT US

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#### 31 October 2013

# POSITIVE PRELIMINARY PIT OPTIMISATION AND METALLURGY RESULTS FOR MAKABINGUI GOLD PROJECT, SENEGAL

Bassari Resources Limited (The Company) is pleased to announce positive pre-development results for the Makabingui Gold Project, in Senegal, West Africa.

The positive results are based on independent preliminary open pit optimisation studies and metallurgical test work for the development of the Makabingui Deposit. The deposit has a Mineral Resource of **1** million ounces of gold in **11.9** million tonnes at **2.6** g/t gold. The positive results are key milestones to unlocking value for shareholders.

## **Highlights**

- Preliminary Whittle open pit optimisation studies were conducted on the Makabingui Gold Project Mineral Resource
- Results of the preliminary optimisation using selective mining at 300ktpa, show a robust operation:
  - Ore grade to the mill > **5.5g/t** Gold
  - Mine life of >3 years at ~50,000 ounces per year
  - Indicative average operating cost of US\$700/oz
  - Opportunity to upgrade the Company's existing gravity plant and associated infrastructure to reduce capital costs
  - Very high gold recovery indicated by metallurgical test work
    - Gold recovered from gravity and leaching of the gravity tails was:
      - 97.6% at 106 micron
      - 96.6% at 150 micron
    - Gold recovery from gravity and flotation of the gravity tails was:
      - 98.6% at 106 micron
      - **98%** at 150 micron
    - Gold recovered by gravity was approximately 80% for all grind sizes from 106 to 425 micron. A gravity gold circuit would be essential in a processing plant

"The combined outcomes of both the preliminary pit optimisations and additional metallurgy are very significant and provide important information to justify the next steps along the development path for the Makabingui Project.

There are significant amounts of free gold evident leading to a simple processing method incorporating a gravity circuit which we already have. With a lower rate, selective mining option we can keep capital costs low while maximising grade. The results clearly justify further feasibility work." Bassari Resources' Managing Director, Jozsef Patarica said.

# **Preliminary Pit Optimisation**

The Makabingui Gold Project Mineral Resource of **1 million ounces** of gold in **11.9 million tonnes at 2.6 g/t gold**, at a cut-off grade of 0.5 g/t gold, was announced in December 2012 following estimation by AMC Consultants Pty Ltd (AMC). This includes an Indicated Resource of **336,000 ounces** of gold in **2.6 million tonnes at 4.0 g/t gold**.

Sydney based Australian Mine Design & Development Pty Ltd (AMDAD) was commissioned to undertake Whittle pit optimisations to test open-cut mining scenarios on the combined Resource block model. Two cases were examined at US\$1,300 gold price:

- Low rate mining to deliver 300 ktpa of mill feed
- High rate mining to deliver 1.5 Mtpa of mill feed

The 300 ktpa case delivers ~1.0Mt of mill feed at over 5.5 g/t Gold for a mine life of >3 years. Staged mining was assumed with starter pits followed by a push back to the final wall (Figures 1 & 2). The 300 ktpa mining rate is considered the base case to advance further feasibility work.

The 1.5 Mtpa case resulted in a mine life of less than 2 years with approximately 3Mt of mill feed delivered and would require significantly more shallow resources to improve the economics.

Based on the assumptions used for this preliminary study, the indicative average operating cost is US\$700 per ounce.

Note:

- This is a preliminary study to assess project potential with most of the key inputs assumed rather than based on real data
- The pit optimisation uses Indicated and Inferred Resource blocks estimated by AMC
- Whittle shells have been used rather than practical pit designs based on these shells
- The reliability of the results is commensurate with the preliminary nature of the input assumptions
- Tonnes, grade and values reported do not represent an ore reserve



Figure 1 - 300 ktpa First and Final Stage Pit Design - Preliminary Plan



Figure 2 - 300 ktpa First and Final Stage Pit Design - 3D View

## **Pit Optimisation Inputs**

Makabingui is at an early stage of economic evaluation. There is only limited information to guide some of the inputs for the Whittle pit optimisation conducted for this study. Where analyses have been conducted, such as metallurgical test work, the most representative values for the project as a whole were used. In other areas where little or no work has been done, such as pit slope and mining and processing costs, AMDAD discussed options with Bassari to select values. The main inputs selected were:

- Loss / Dilution. The high rate bulk mining scenario used the average grades of a re-blocked model using 2.5m cubes to provide adequate allowance for loss and dilution without further adjustment. The low rate selective mining scenario applied fixed dilution of 10% and fixed loss of 5% to the partial block grades and tonnes.
- **Pit Wall Overall Slopes**. An average slope of 45° was used in all directions at all depths.
- **Process Recoveries**. Based on metallurgical test work on a combination of gravity and sulphide flotation which indicates gold recovery of 95% for both oxide and sulphide mineralisation.
- **Mining Costs**. Bassari assumption of a fixed cost of \$US3.50 per tonne for ore and waste.
- **Process Costs**. The 1.50 Mtpa case was initially run at a processing cost of \$US18.00/t based on a review of US costs for similar size flotation plants. The 300 ktpa case was run at \$US30.00/t to allow for both a higher cost generally and the increase caused by inefficiencies of running at a lower rate.
- Site Fixed Costs. Nominal values of US\$5.00/t (US\$7.5M per year) for the 1.5 Mtpa case and US\$10.00/t (US\$3.0M per year) for the 300 ktpa case were selected.
- Gold Price. US\$1,300/oz.

Applying these inputs gives undiluted resource COGs of 0.6 g/t Gold for the 1.5 Mtpa case and 1.15 g/t Gold for the 300 ktpa case.

## The next steps:

- Undertake geotechnical studies to establish pit wall slopes to be used in pit designs
- Further refine mining dilution, ore loss and operating cost assumptions
- Confirm the presence of the high grade blocks which drive the larger open pits
- Plan the next phase of infill and/or exploration drilling focused on the optimised pits and growth of the resource inventory

## **Metallurgical Test Work Results**

Sydney based ALS Metallurgy was commissioned to conduct a series of metallurgical tests to determine the gravity recoverable gold over a range of grind sizes. The test work amalgamated a gravity concentrate at primary grind sizes of 425, 300, 212, 150 and 106 microns to determine the amount of free gold recoverable. Cyanide leaching and flotation were also carried out on the gravity tails for the 150 and 106 microns grind sizes. Previous metallurgical test work (See ASX release dated 30 January 2012) carried out at a primary grind of 75 microns produced very high leaching recoveries >96%.

Composite samples were made up from material used as part of the January 2013 metallurgical test work program. The samples are a composite of the Metagabbro (primary focus for 2012 resource drilling program) and Metasediments. The samples were taken from multiple sections and varying depths focused on primary (unoxidised) ore. Tables 1, 2 and 3 summarise the results for the various stages of the test work program.

#### Table 1 – Summary of Gold Recovery by Gravity Separation

Primary grind p80 micron	106	150	212	300	425
Calculated Head g/t Au	7.38	6.14	8.08	5.37	6.91
% free gold recovered	77.8	80	82.3	82.9	78.6

#### Table 2 – Summary of Gold Recovery by Flotation and Leaching on the Gravity Tails

Process	Flotation	Leaching	Flotation	Leaching
Primary grind p80 micron	106	106	150	150
Calculated Head g/t Au	1.61	1.66	1.27	1.19
% gold recovered	93.7	89.1	89.8	83.2

## Table 3 – Summary of Total Gold Recovery

	% Gold Recovery	
	106	150
Process	micron	micron
Gravity	77.8	80
Gravity + Leaching	97.6	96.6
Gravity + Flotation	98.6	98

## **Gravity Gold**

The initial stage of the program focused on the quantity of free gold able to be recovered by gravity methods at various primary grind sizes of 425, 300, 212, 150 and 106 microns. This was determined by grinding 2 kg samples to the required size and passing them through a 75 mm Knelson concentrator, taking one bed volume of concentrate. This concentrate was examined by panning dish for the occurrence of gold flakes and then amalgamated with mercury to remove the free gold.

Figure 3 shows the free gold seen from panning the Knelson concentrate for the 106 micron primary grind test. Flakes of gold similar to those seen in this photo (Figure 3) were seen at all the grind sizes tested with some flakes over 1 mm in size.



Figure 3 - Gold Flakes in Pan Concentrate for 106 micron Primary Grind

The gold recoveries at each grind size resulted in around 80% of the gold being liberated and amenable to gravity recovery at all the grind sizes tested.

## **Cyanide Leach on Gravity Tails**

The Knelson tailings and the Knelson concentrate minus the removed free gold for the 150 and 106 micron tests were recombined and each was divided into two portions, one for cyanide leaching of gold and the other for a flotation test.

The cyanide leach test work indicated that there is a drop in leach efficiency at the 150 micron grind size compared to the 106 micron test but the results were still reasonably good at both grind sizes. Figure 4 shows the rate of gold dissolution at each grind size which is rapid and almost complete within the first 10 hours.

The total gold recovery by gravity concentration, amalgamation and then cyanide leaching of the gravity tailings was calculated to be 98% at 106 microns and 97% at 150 microns.



Figure 4 - Rate of Gold Dissolution

## Flotation on Gravity Tails

The other half of the 106 and 150 micron gravity tails that was not used in the leach tests was subjected to a flotation test to see if the remaining gold could be recovered by flotation.

As with the leach results there was a slight decrease in gold recovery at the 150 microns grind size compared to the 106 micron grind size.

With recoveries at 94% and 90% for the 106 and 150 micron tests respectively flotation could be used as a possible upgrading step prior to leaching. Further flotation test work could be considered to see if the concentrate could be cleaned sufficiently to produce a saleable grade.

# The total gold recovery by gravity and then flotation was calculated to be 99% at 106 microns and 98% at 150 micron.

## The next steps:

- Undertake additional test work at grind sizes greater than 425 microns
- Develop a process flow sheet based on 300 ktpa base case and metallurgical results
- Review options to utilise existing gravity plant
- Review plant location options (remain at Douta and truck ore ~10 km from Makabingui or relocate to Makabingui)
- Establish capital cost estimate

# Makabingui Gold Project – Location & Geology

Makabingui is located within the Kedougou-Kenieba Inlier, Eastern Senegal, where multimillion ounce gold deposits are being mined and developed (Figure 5).



Figure 5 – Project Location Map

## **Regional Geology**

The resource is located in the Palaeoproterozic Birimian volcano-sedimentary sequence and the intrusives of the Diale Formation. The Diale Formation lithologies commonly comprise chlorite-sericite schists and phyllites derived from the metamorphism of greywackes and argillaceous sediments.

The Makabingui deposit is located near the southern margin of a syntectonic granite (Sambarabougou Granite). The deposit comprises a large number of generally shallow east dipping lodes and quartz veins ranging in thickness from 8 metres down to less than 1 metre width and hosted by a gabbroic intrusive and contact metasediments. Mineralised structures have been identified over an area of some 1.7 kilometres by 1.2 kilometres to date. The Sambarabougou Granite and host gabbro lie within the east-west trending crustal fracture zone identified by the presence of a major diorite dyke which extends from the Makana area to the west through to the Loulo-Gounkoto project area in nearby Mali, eastwards to Sitakil; a newly discovered "porphyry" gold deposit.

## Local Geology

The project is focused on the contact zone between metasediments and an oval shaped metagabbroic intrusive. Gold mineralisation, commonly as free gold, is associated with quartz veins and stockworks with silica, sericite, biotite and carbonate alteration together with variable amounts of pyrite, arsenopyrite and pyrrhotite.

## **Strategic Exploration Package**

The Company's exploration permits cover an area of approximately 850 km<sup>2</sup> over the highly prospective Birimian Gold Belt. The Makabingui Gold Project area is centrally located within the three contiguous permits and is approximately 25 kilometres from the Sabodala Gold Operation (Figure 6).

Artisanal activity established within the Makabingui Project area south of the existing resource (see ASX announcement 11 October 2012) has identified potential for new lodes within a significant NE trending shear zone, and further highlights the prospectivity of Makabingui. Additional artisanal sites have since been established further south along strike within the well-defined gold mineralised structural corridor.



Figure 6 – Exploration Permits – Moura, Sambarabougou & Bounsankoba

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#### About Bassari

Melbourne - based West African gold explorer Bassari Resources Limited (ASX:BSR) has a strategic portfolio of exploration permits focused on the Birimian Gold Belt in Senegal. The permits cover an area of 850 km<sup>2</sup> with 80 km of strike along the combined three contiguous permits. The permits are located within the Kenieba Inlier which is a 50M ounce gold region. Bassari's vision is to discover and delineate gold resources which can be developed into profitable operations.

#### Forward Looking Statement

This release may include forward-looking statements which are based on assumptions and judgements of management regarding future events and results. Statements regarding Bassari Resources Limited plans with respect to future exploration and drilling are forward-looking statements. Forward-looking statements are necessarily subject to risks, uncertainties and other factors, many of which are outside the control of Bassari Resources Limited that could cause actual results to differ materially from such statements. Bassari Resources Limited makes no undertaking to subsequently update or revise the forward-looking statements made in this release to reflect events or circumstances after the date of this release.

#### Competent Persons Statement

The technical information in this report related to preliminary pit optimisation has been sourced from Australian Mine Design and Development Pty Ltd (AMDAD) Report REP1723\_131025 and reviewed by Mr John Wyche (author of the report).

The technical information in this report related to metallurgical test work and comminution test work has been sourced from ALS Metallurgy (New South Wales – Sydney) Report M2867 and reviewed by Mr T Baily (author of the report).

The technical information in this report has been reviewed and approved by Mr Chris Young who is a Member of the Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists. Mr Young has over 40 years' experience in the industry and has more than five years' experience which is relevant to the style of mineralisation being reported upon to qualify as a Competent Person as defined in the 2004 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Young consents to the inclusion in the report of the matters based on the information in the form and context in which it appears.

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g/t	grams per tonne
Mt	Million tonnes
Mtpa	Million tonnes per annum
ktpa	Thousand tonnes per annum
RAB Drilling	Rotary Air Blast drilling.
RC Drilling	Reverse Circulation drilling
DD Drilling	Diamond drilling
ppb	parts per billion, e.g. 1000 ppb gold is 1 g/t gold
ррт	parts per million
<b>km</b> ²	square kilometres
km	kilometres
mm	millimetres
Au	Chemical symbol for gold
3D	Three dimensional
COG	Cut-off grade
kg	kilogram
NE	North East
ASX	Australian Securities Exchange

#### Technical Terms