

# Massawa Gold Project

## ...Senegal

January 2017



# Kedougou Kenieba Inlier...Randgold footprint



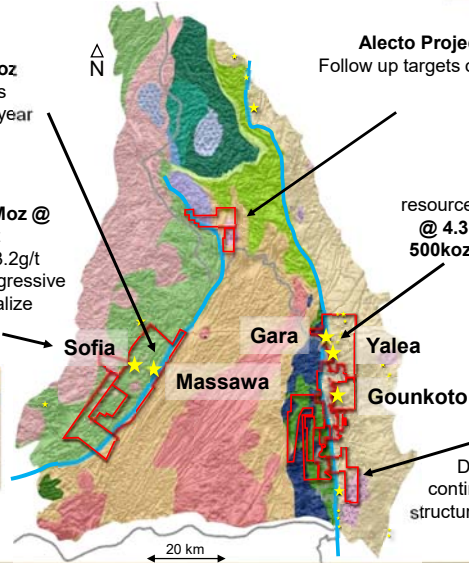
**Massawa Project**  
**Total resource: 3.9Moz**  
 Study guides towards prefeasibility update by year end

**Alecto Project**  
 Follow up targets on MTZ

**Sofia**  
 resource upgraded to **+1Moz @ 2.5g/t** incl 158kz @ 3.5g/t indicated and 416koz @ 3.2g/t inferred at Sofia Main. Aggressive Exploration strategy to realize potential.

**Gara South**  
 resource drilling adds **540koz @ 4.3g/t** to indicated and **500koz @ 4.4g/t** to inferred

Permits	Surface (Km <sup>2</sup> )
Kanoumba	606
Dalema	224
Bambadji	236
<b>Total</b>	<b>1066</b>



RRL permits

**Bakolobi**  
 Drilling confirms continuous mineralised structure over 5km at Dioula



# Senegal...Mako Belt prospectivity



## Bambayara

**21koz @ 1.2g/t** inferred resource  
Mineralisation associated with quartz-tourmaline veins.  
Structurally complex – area folded and faulted

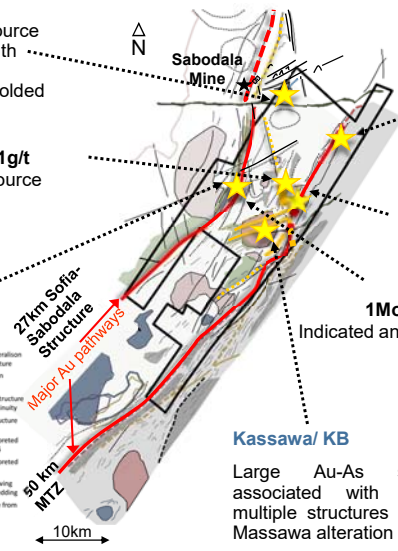
**Tina**  
**50koz @ 1.1g/t** inferred resource

## Sofia North

Au soil anomaly over 2.5km strike. **158koz @ 3.5g/t** indicated and **416koz @ 3.2g/t** inferred resource

- Highly conductive
- Rocks – Shaly carbonaceous Rich mesosediments
- Moderate to strongly conductive Rocks
- Volcanic and volcanic-clastic rocks and Andesites, 2160 Ma
- Highly magnetic rocks of mafic origin: Gabbros, basalts and Ultrabasic
- Mafic to intermediate intrusives
- Plutonic rocks
- Plutonic – hypabyssal rocks
- Late Diabrite intrusives – Dykes and Sills

- Known Au mineralisation On Major structure
- Major fault basin Contact Au
- Projected Au structure and for discontinuity
- Inferred Au structure
- Structure interpreted From IVD MAG
- Structure interpreted From EM
- Form lines showing the strike of bedding
- Circular feature from MAG



## KANOUMBA PERMIT 606 km<sup>2</sup>

**Delya**  
**123koz @ 1.4g/t** inferred resource

**Massawa**  
**3.7Moz @ 2.7g/t** indicated and inferred resource

**Sofia**  
**1Moz @ 2.5g/t** indicated and inferred resource

## Kassawa/ KB

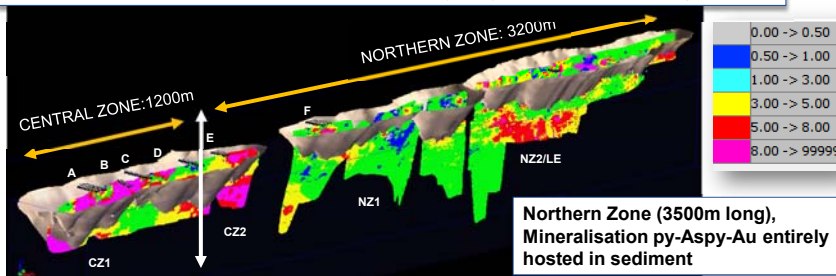
Large Au-As soil anomaly associated with interaction of multiple structures – linked to the Massawa alteration system



# Massawa Deposit...resource



Central Zone: (885m long) mineralization is located in volcanoclastics, in sediment as well as in altered and deformed mafic and felsic intrusives. Py-Aspy-Au and Qz-Sb-Au stages



**Northern Zone (3500m long), Mineralisation py-Aspy-Au entirely hosted in sediment**

\*2015 bloc model \$1500 pit at 0.5g/t cutoff

Total Massawa Deposit Resource			
	Mt	g/t	Moz
Measured	0.2	5.1	0.003
Indicated	35	2.6	2.9
Inferred	7.2	3	0.76
<b>Total</b>	<b>43</b>	<b>2.7</b>	<b>3.7</b>

- Drilled blocks B-D, Q1/Q2 at 15 x10 ( Total A-D 14638m). Higher resolution into the geologic model and for Met work.
- Results showed that the Block model significantly underestimated the deposit resource (A-D) (~69%) and grade (~16%). Infill drilling of Block C confirmed the findings.
- New block model to be delivered Q1 2017.



# Senegal...Massawa deposit



## Central Zone resource

- Orientation drilling confirms continuity and 2 styles of mineralisation
- 80% of gold within Phase 2

## Central Zone metallurgy – Phase 2

- Good gravity and floatation recovery from metallurgy tests - 70 to 75% leach recovery
- Metallurgical modelling advancing northwards to Northern Zone

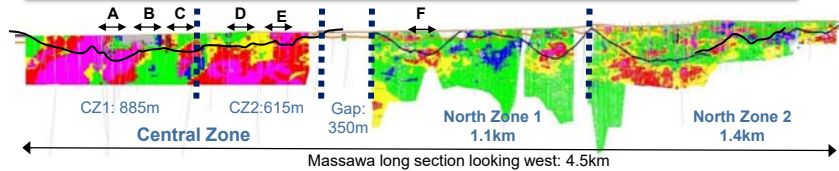
## Northern Zone 2

- Orientation drilling confirms current resource model

## North Zone 2 metallurgy

- Overall Biox testwork recovery of 89% on refractory sulphide

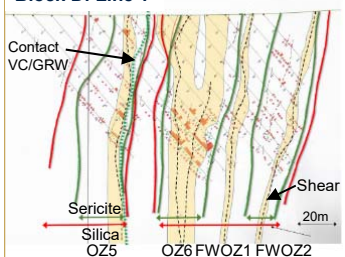
Block (Phase 1 and 2) leach recovery %	A		B		C		D	
	Ph1	Ph2	Ph1	Ph2	Ph1	Ph2	Ph1	Ph2
Gravity + float conc leach	na	na	48	77	63	75	p	p
Gravity + float + tails leach	51	77	58	81	76	79	p	p



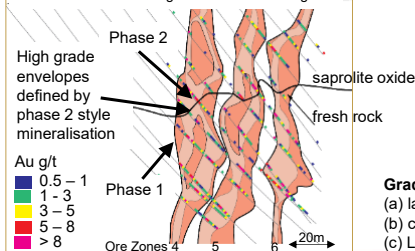
# Massawa feasibility project... a geology driven resource



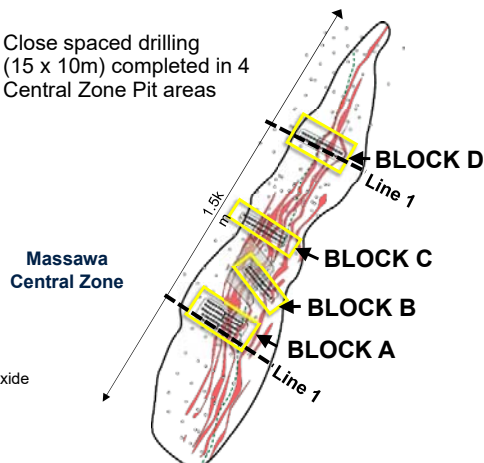
## Block D: Line 1



## Block A: Line 1 eg cross section looking NE



- Close spaced drilling (15 x 10m) completed in 4 Central Zone Pit areas

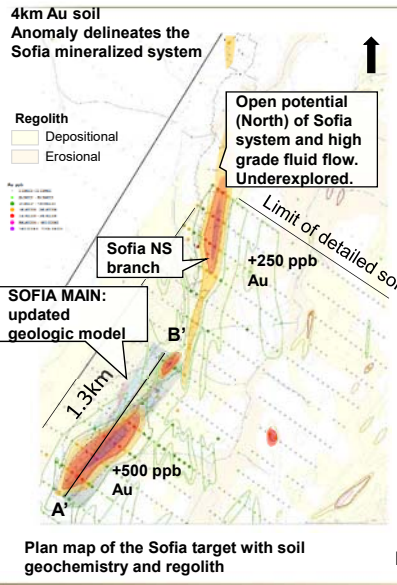


## Grade + tonnage increase the result of:

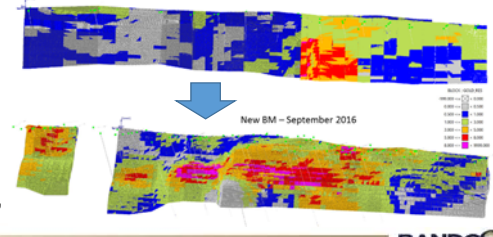
- larger RC samples being more representative
- close-spaced drill – higher resolution on high grade phase 2
- Leachwell + FA tail assay more representative than fire assay



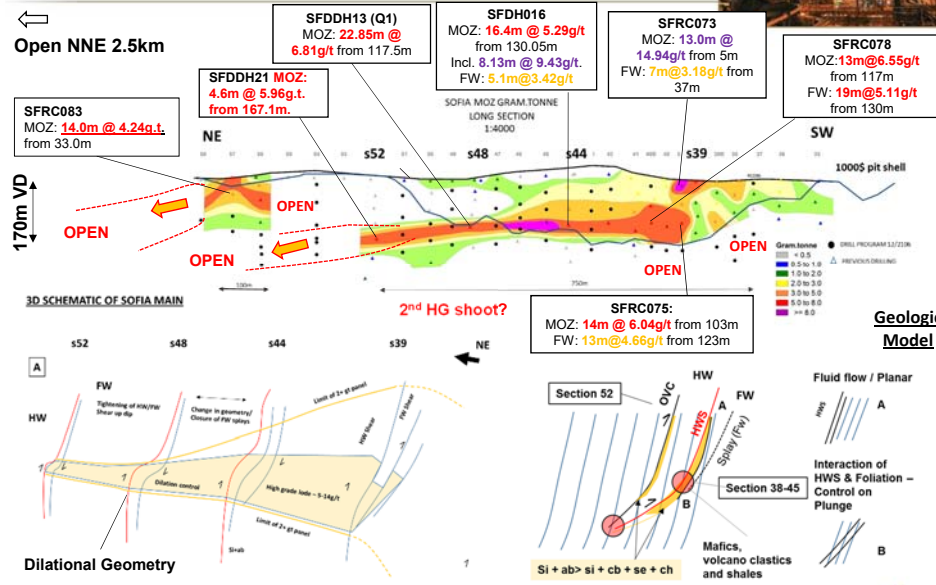
# Senegal...Sofia Gold deposit



- Updated model has open pit potential
  - In situ resource material within a \$1000/oz pit 660koz @ 3g/t
  - Metallurgical recovery 89% direct leach
  - Potential to increase the resource by testing the North
  - Busy with prefeasibility drilling and testwork
- Updated resource model (1500/oz shell)**  
 Indicated resource:  
**1.4Mt @ 3.5g/t for 158koz**  
 Inferred resource:  
**11.5Mt @ 2.4g/t for 871koz**



# Sofia...realising the potential



## Sofia-Sabodala Structure...2017



### OPPORTUNITY:

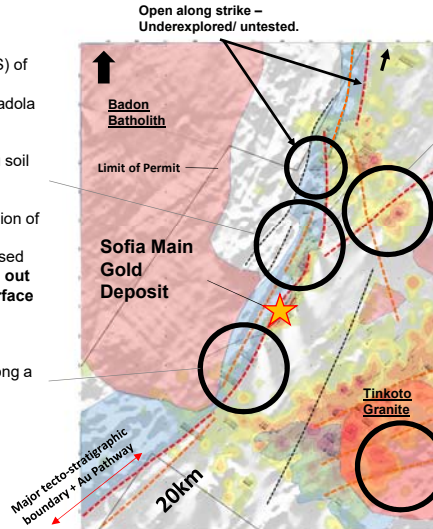
#### SOFIA NORTH

- Change in strike (NNE-NS) of known gold bearing mineralisation (Sofia-Sabadala structure).
- Associated with strong Au soil anomalism (250+ppb).
- Structural setting: Truncation of stratigraphy to the east, historical exploration focused in the Hanging wall – **Step out and test new model; surface validation.**

#### SOFIA SOUTH

- Open potential at depth along a South Westerly strike from Sofia.

- Known Au mineralisation On Major structure
- Projected Au structure and /or discontinuity
- Inferred Au structure



#### MAKANA-1

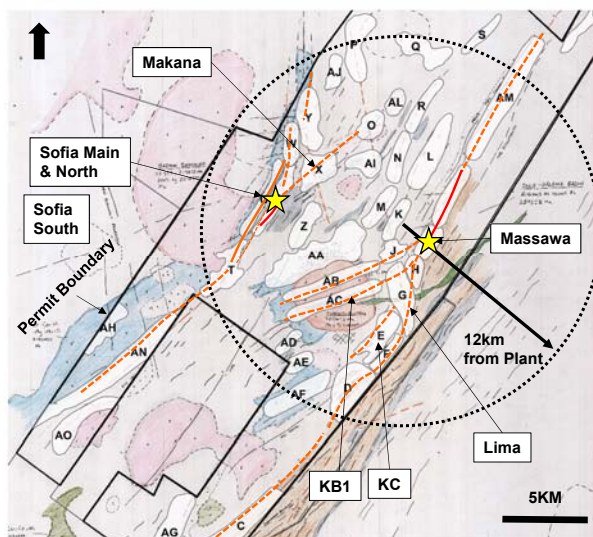
- Prospective and undereexplored ENE splay off the Sofia-Sabadala structure/
- Intersection model

#### KB-1, KB2, KB3

- High and extensive Au soil anomalism (32 km<sup>2</sup>) associated with interpreted ENE structures
- Enrichment of Ti-Mo-K (alteration halo): alteration system implicated with Massawa
- Modelled Splay of the MTZ

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## Kanoumba Permit...2016/2017



KANOUMBA PERMIT: INTEGRATED GEOLOGY & AOI

- Regional Area of Interest (AOI) generated using qualitative and quantitative approach: 41 AOI generated.

- Key Geologic criteria: Structure, connectivity, geochemistry & lithology
- Weight applied to structural sites and major gold bearing fluid pathways

#### Key focus:

- Target the Sofia-Sabadala structure along strike and splays – 27km of potential.
- Explore open near strike extensions of Sofia
- Identify Satellite deposits to add to the portfolio



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## Massawa Project...



- Extensive pre-feasibility work being carried out is showing that a combined Massawa-Sofia project is edging closer to meeting Randgold's filters for development, principally the requirement for a reserve of 3Moz with an IRR of 20% at \$1000/oz gold price. Updating prefeasibility for Q4 2016
- Complete Greenfields review and grassroots approach to exploration to achieve the 3 in 5. Massive potential in two major regional scale structures with proven high grade fluid flow.
- Actions being taken to move the project up the value chain
  - Find additional non-refractory satellite open pit resources
  - Identification of opportunities across the Mako belt and within Senegal
  - Understand the metallurgical domain impacting on Massawa and associated processing routes
  - Optimisation based on a simple process route comprising gravity and CIL recovery for Central zone
  - Assessing alternatives for refractory ores vs. non-refractory ores
  - Advance Sofia, a non-refractory target

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