

# GOLD AND DIAMOND MINING IN CENTRAL AFRICAN REPUBLIC AN AMS PROJECT



❖ **AMS, MAY 2012**

❖ 2DG SARL

❖ MACKLENSKY SARL

## Business plan on Gold and Diamond exploration in: **CENTRAL AFRICAN REPUBLIC**

### ▪ **1. INTRODUCTION**

When planning an exploration and mining operation in Central Republic of Africa, it is important that everybody involved understands every step that we are going to take to make the project a success. This will take a team effort, from 2DG S.A.R.L, Maclensky S.A.R.L, AMS, to the diver cleaning the bedrock, eight meters below surface or the buying house that we need to setup.

We have seen and heard about many mining projects in Africa and South America that fails because the explorers have great expectations about finding massive gold and diamond deposits in the first or second month of operations.

The major pitfall is to “go too big” on a continent where it is expensive to mine due to a lack of infrastructure, non-availability of support equipment and the poor quality of equipment that is available. So, planning this project properly and buying the right equipment is crucial.

There are still massive undiscovered mineral deposits in Africa – no argument - but the art is in discovering them. Experience has taught us that the best results can be achieved with several low cost units, capable of proper exploration and the discovery of feasible grades where bigger mining operations can be based upon.

Procurement in Africa is too expensive to go big, especially in a country like CAR with poor infrastructure, but this can be made to work in our favor. Many companies would rather choose easier countries to work in, like Ghana and Zimbabwe, leaving us to explore the virgin areas.

Planning of this project and employing the right group of people to execute the plan is crucial to its success. Companies that have been previous mining in CAR (like PANGEA; in the person of Helen Pain, confirms this. She told our mining engineer that her company which invested millions of dollars on a mining project in CAR (excavators, bulldozers, dump trucks etc.) also made the mistake of using unreliable jigs, and in the end it cost them massively in down time.

Helen says; the diamonds are there, but a low budget approach is required to achieve results. So, even if we were offered 40 million Euros to undertake this project, we would still take the “small steps” approach.

To achieve success over time, one has to plan properly, acquire reliable equipment, use experienced, multi-skilled expatriates, build an effective procurement and logistics network and apply a low cost exploration plan.

The goal is to set up several low cost mobile mining units across our concessions in the first phase. The purpose of that is to do the exploration not on a highly money consuming method but on a low cost operation method whereby the exploration can be done profitable instead, (having the result higher than the running costs). In addition this exploration method will tell us what we need; accurate readings of the gravel. Based on these results we will make the report showing the projected numbers, the grades and the results of the type of gravel we found which shall be used to prepare the follow up investment plan, knowing exactly what is in the ground and therefore tells us what investment needs to be made to enter into the second phase of the mining operation.

## ▪ **2. PROCUREMENT, LOGISTIC**

Time, planning and organizing recourses will be critical to our success.

### **2.1 Labor**

- Starting to formulate contracts to employ the right people so that they have guidelines on how to do their jobs.
- Head of the mining site need to have a meeting every morning at 7am to discuss the goals of the day, week, month, three months and six months. Every person needs to know exactly what to do.
- Head of the mining operation need to have a meeting with the site managers to discuss the goals, challenges and operation every day by phone and every week physically and consider how these integrate and influence each other.
- Allocating phones and phone cards.
- Allocating food

### **2.2 Housing**

- We need to get proper accommodation, not only to save money but also to have a home, and to make sure it is properly secure. Do not pay a year in advance.
- Electricity: We must have a back-up generator.

### 2.3 Medical

- We need to set-up a medical response facility to deal with serious malaria or accidents and discuss what we have to do. Identify all the medical services available to us, including the best local doctors. Get their contact details and home addresses.
- Getting insurances arranged for expatriates or visit the UN or UNICEF and see what medical services they offer for their own people and others.

### 2.4 Import

- We will import a lot of equipment and supplies over the next couple of years. Dealing with the import of machines into African countries is a nightmare. We have to allocate a person responsible for importing. Setting up the process and procedures so that once the container is in Cameroun and/or CAR we don't struggle. We will get names, numbers and positions of senior people who deal with imports.

### 2.5 Government incentives

- It is important for us to compose and complete a file describing our activities and our intentions in Central African Republic showing a forecast of our investment plan expressing our intention to invest a sum that exceeds US\$ 4'000'000.00 to benefit from the incentives that has been in place to support foreign investment projects. For investment above US\$ 4'000'000.00 there are benefits that includes a reduction of taxes for a period of 2 to 5 years and in addition it qualifies the investor to benefit from an exemption of import duties. ***For our situation it is highly important that this file needs to be prepared and submit prior to the start of our import activities***

### 2.6 Mechanical

- It is important that we identify and allocate the right people to look after our vehicles. Trial and error is only going to cost us money. We also need to know the availability of spare parts and identify where we can buy them.

### 2.7 Immigration

- Write a document listing all the things we need to get invitation letters, residency and driver's licenses. We need to assign one person responsible for dealing with the immigration people.

### ▪ 3.METHODS OF EXPLORATION



#### ▪ 3.1. Dredging for gold and diamonds.

Rivers have been carrying material to the sea for millions of years. From a mining exploration point of view, a river is actually a big sluice in which heavy minerals like gold, silver and iron remain behind in the catchment areas while the lighter materials like silica are washed further downstream.

The purpose of a dredge is to mine the pockets of concentrated minerals in the river at low cost. Eco sounders will be used to survey the river to discover the prime catchment spots, like rapids, deep pools, rock beds and walls. Once discovered, either a pump on the riverbank or a motorized barge with a dredge and a classifier (which splits the gold-bearing gravel from the diamond-bearing gravel) will be used to extract the material.

Two companies manufacture these barges in South Africa;

- PCF engineering([www.pcfengineering.co.za](http://www.pcfengineering.co.za))
- Rapid Mining ([www.rapidmining.com](http://www.rapidmining.com))

Our mining engineer has worked with equipment from both companies in mining operations in Sierra Leone and Congo.

Cheaper barges can be obtained locally or from China, but we recommend that we use one or both of the South African companies. They are extremely reliable and their dredge technology has been tested over many years in Africa.

Our mining sites and activities will take place a day's travel from Bangui, so we need low maintenance equipment which requires only diesel, oil filters and V-belts and will work for months on end without breaking down.

Our need for reliable equipment to start this project is no better illustrated by this example: If we pump two grams of gold per ton at eight tons an hour, we will lose an ounce of gold (about \$1700) every two hours of downtime.

▪ **3.2. Hydraulic mining (Gold and diamonds)**

In hydraulic mining, water is used to excavate areas like low terraces and flood plains close to rivers. Water jetted at high pressure breaks down the gravel and washes it to a lower pit, from where the dredge will move the material to a classifier and the diamond and gold plant. This method was developed in countries like Surinam, Guyana and Brazil and remains the cheapest way to mine on land.

**Please look at the following link:**

<http://www.youtube.com/watch?v=zE-pHdqMFIs> Once again, cheap units can be obtained from China, but they don't last long in Africa. Most companies that use hydraulic units order them from Crown mining in Guyana.

▪ **3.3. Extrac-Tec (gold)**



Extrac-Tec manufactures high particle concentrators (HPC), which separate light materials from heavy materials - the ideal gold exploration machines for Africa. They are extremely accurate and mobile for African conditions. Please look at the website: [www.extrac-tec.com](http://www.extrac-tec.com)

The goal is to start a pit mining exploration program with locals by allocating a network of pits that they can dig or can be excavated with a Backactor/JCB. After we extract the gravel, we can use any of a number of separation machines on the market, like Nelsons, Gecco internal pressure jigs etc.

Our mining engineer has worked with most of them and has found that the HPC system produces the best results. It minimizes the colloidal factor by extracting gold up to between 50 and 200 microns. The HPC 15 can do between two to three tons per hour, so when mining good grades one can extract enough gold to cover some of the running costs.

Once we discover good grades, we can look at bigger mining units.

**4.METHODOLOGY**

	Land Mining			River Mining		
	Action	Comodity	Description	Action	Comodity	Description
Start	Procurement	Gold - Diamond	Planning project / employing the right people / ordering equipment / hire or renting facilities	Procurement	Gold - Diamond	Planning project / Employing the right group of people/ ordering the equipment / hire or renting facilities
	Setup working camps	Gold - Diamond	Store working tools, spare parts, to do maintenance , establish process and procedures	Setup working Camps	Gold - Diamond	Store working tools, spare parts, to do maintenance , establish process and procedures
Exploration	Diggers dream /Bushman Jigs	Diamond	Establish grade : dig a network of pits across concession and setup low cost mining units	Eco Sounder	Gold - Diamond	To survey the river to discover prome catchment spots
	Small HPC 15	Gold	Establish grade : Separation/concentration of the gravel we extract to calculate gram /ton	Dredging	Gold - Diamond	To mine the discovered pockets of concentrated minerals
Mining : Phase One	Large HPC 30 with FC 30	Gold	Separation/concentration of the gravel we extract	Multiple Dredges	Gold - Diamonds	once the grades are very good we can decide to use larger dredges
	150 Ton Wash plants	Gold	Washing the gravel extracting the gold dust			
	Hydraulic Mining units	Gold - Diamond	Low cost gold and diamond mining and processing unit			
	Excavators	Gold - Diamond	Create pits, close pits /Excavate land/ feed the washing plant or classifier			
	Dump trucks	Gold - Diamond	Transport the gravel and the overburden			
Mining : Phase Two	WF 100 with multiple HPC 30	Gold	Gold separation of the gravel we extract	16'' Cutter head dredges that work 24 hours a day	Gold - Diamonds	once the grades are very good we can decide to use larger dredges
	Multiple Wash plants	Gold	Washing the gravel extracting the gold dust	Cofferdam or River diversions	Gold - Diamonds	Another option when we find good grades to mine the river.
	50 Ton a hour DMS	Diamond	50 Ton a hour diamond processing plant			
	MB 70 Wash plant	Gold - Diamond	Wash gravel for DMS plant			
	Flow Sort and X ray machines	Diamond	Final recovery for processing plant			
	Earthmoving equipment		Create pits, close pits /Excavate land/ feed the processing plant			

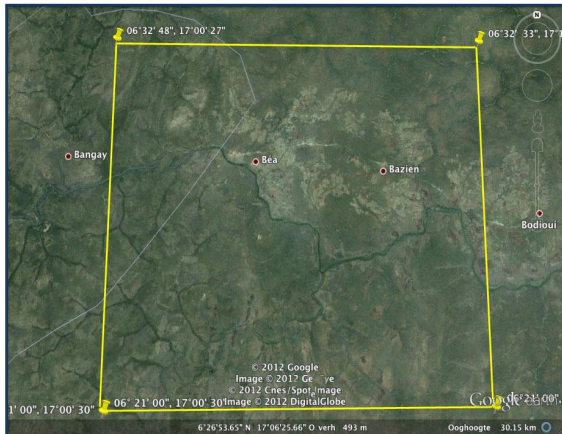
**5. OUR TWO POTENTIAL MINING AREAS**

**5.1. In general**

The two areas identified as the available mining concessions are chosen based on local information and information from the government geological survey office. We are intending a visit for our mining engineer to these sites to get a better idea and understanding on the geological characteristics of the sites and how to proceed. We will explore this area and test a number of sites to see which one is truly productive. The word is that it's all virgin land, but once we start exploring we will easily see if it's virgin or "travel gravel". Most African chiefs and local governments will do and say anything to get foreign companies to explore their land, so the proof is in the testing - gravel does not lie.

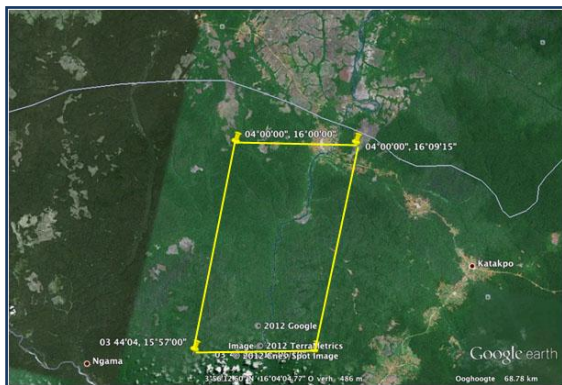
**5.2. Map & coordinates**

**GOLD SITE IN THE REGION OF BOSANGOUA**



Points	Long_E	Lat_N
A	17°00'27"	06°32'48"
B	17°13'15"	06°32'33"
C	17°13'1,44"	06°21'00"
D	17°00'30"	06°21'00"
Superficie : 500 km <sup>2</sup>		

**DIAMOND SITE IN THE REGION OF NOLA**





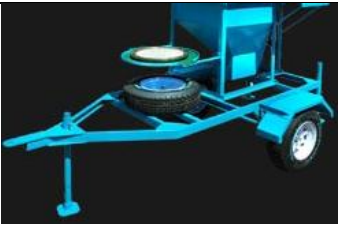
Points	Long_E	Lat_N
A	16°00'00"	04°00'00"
B	16°09'15"	04°00'00"
C	16°06'10"	03°44'04"
D	15°57'00"	03°44'00"
Superficies : 500 km <sup>2</sup>		



▪ **5.3. Site 1, gold (GOLD SITE IN THE REGION OF BOSANGOUA)**

This site was identified by the government geological survey office of being a site that is getting above average gold grades.

Our plan is to explore this site by taking only the equipment required to do a three to four weeks exploration to get our own accurate readings on the grade. Once we have done the bulk sampling and if we have a clear picture on the grades, we will discuss best options to mine this area, like going big; using excavators, high capacity washing plants, dump trucks etc. or to remain small operation; using pumps and hydraulic mining equipment. Another option to think of; is subcontracting local miners providing small equipment like bushman jigs whereby we will still control the recovery process and final product.

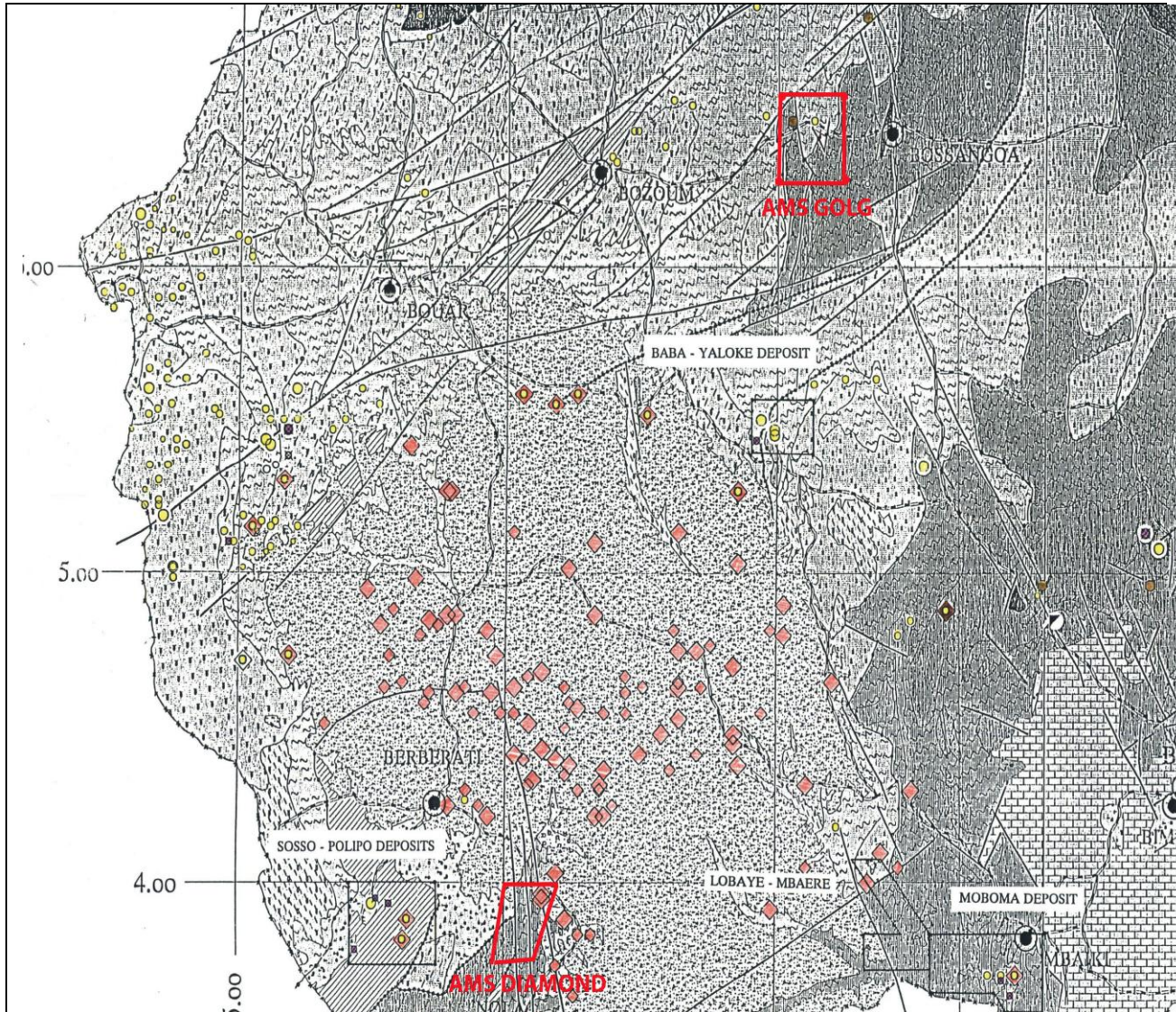
DIFFERENT TYPE OF BUSHMAN JIG WE ARE GOING TO NEED 10 OF THOSE		
NA	CAPACITY 2 TONES/HOUR	CAPACITY 1 TONES/HOUR
		 MOBILE UNIT
<p>The jig works with water, and pulsates continuously, there are two bellows on the machine, the up and down movement-on the 1 side it pushes the gravel up, while on the other side it pulls down the material. There is a continuous flow of water being pumped into the machine, as well as a flow of water flowing with the gravel, which helps the gravel to move forward and eventually out of the machine. The top of the machine is covered with a screen to keep any hands out of the concentrate. The machine is fitted with a winch to empty the concentrate twice daily, depending on the production. The machine is also fitted with two stainless steel security containers which when removed lock automatically, and can only be opened by the person with the key(security containers).</p>		

▪ **5.4. Site 2, diamonds (DIAMOND SITE IN THE REGION OF NOLA)**

This site was identified as well by the government geological survey office, known for -10crt stones with E-F color.

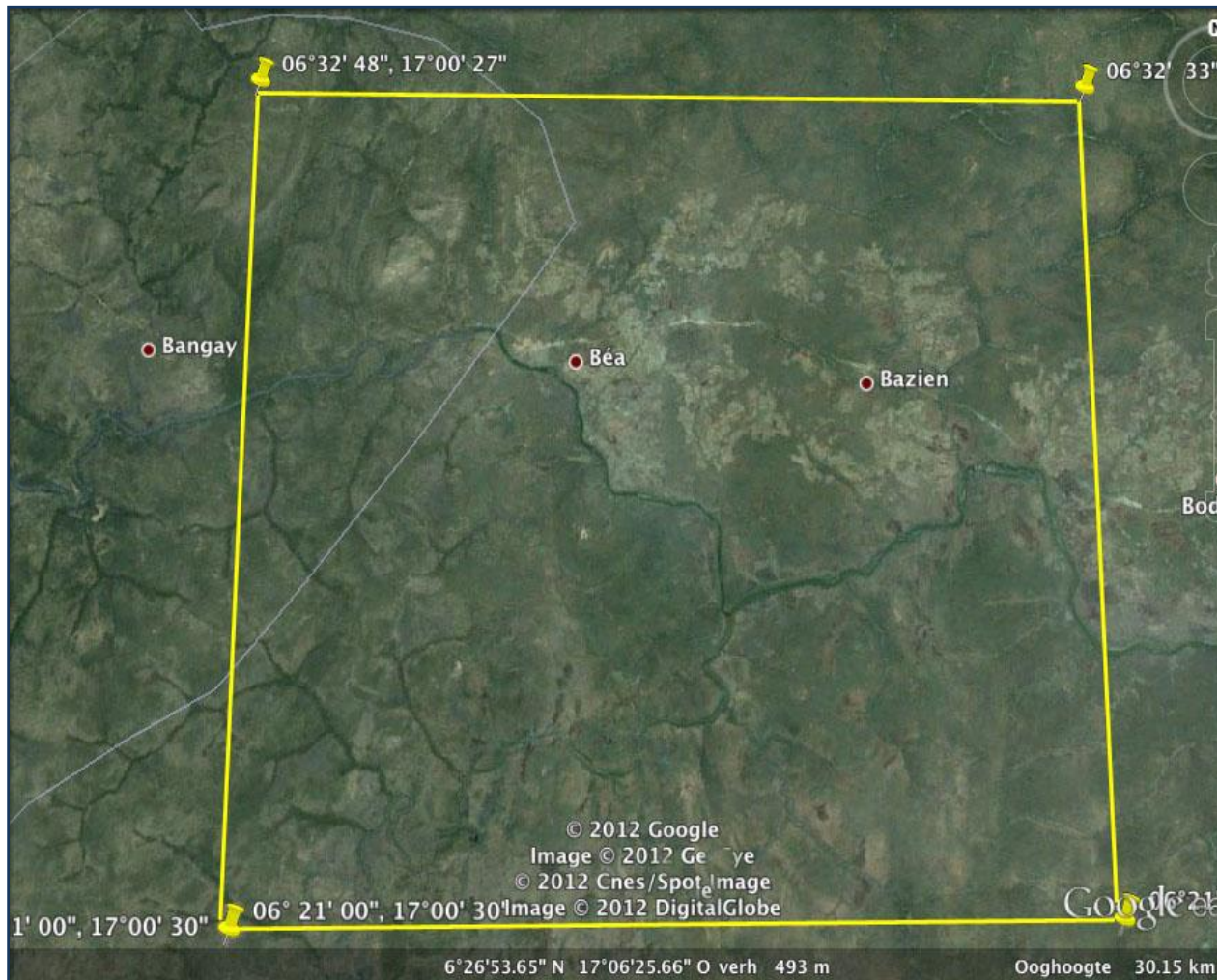
Our plan is to explore this site first by using Eco sounders to survey the river to discover the prime catchment spots, once discovered; we will discuss the best options (see earlier explanation on river/land mining for diamonds).

CARTES DES 2 ZONES MINIERES DE L'AMS SUR LA SECTION OUEST DE LA CARTE GEOLOGIQUE DE LA R.C.A

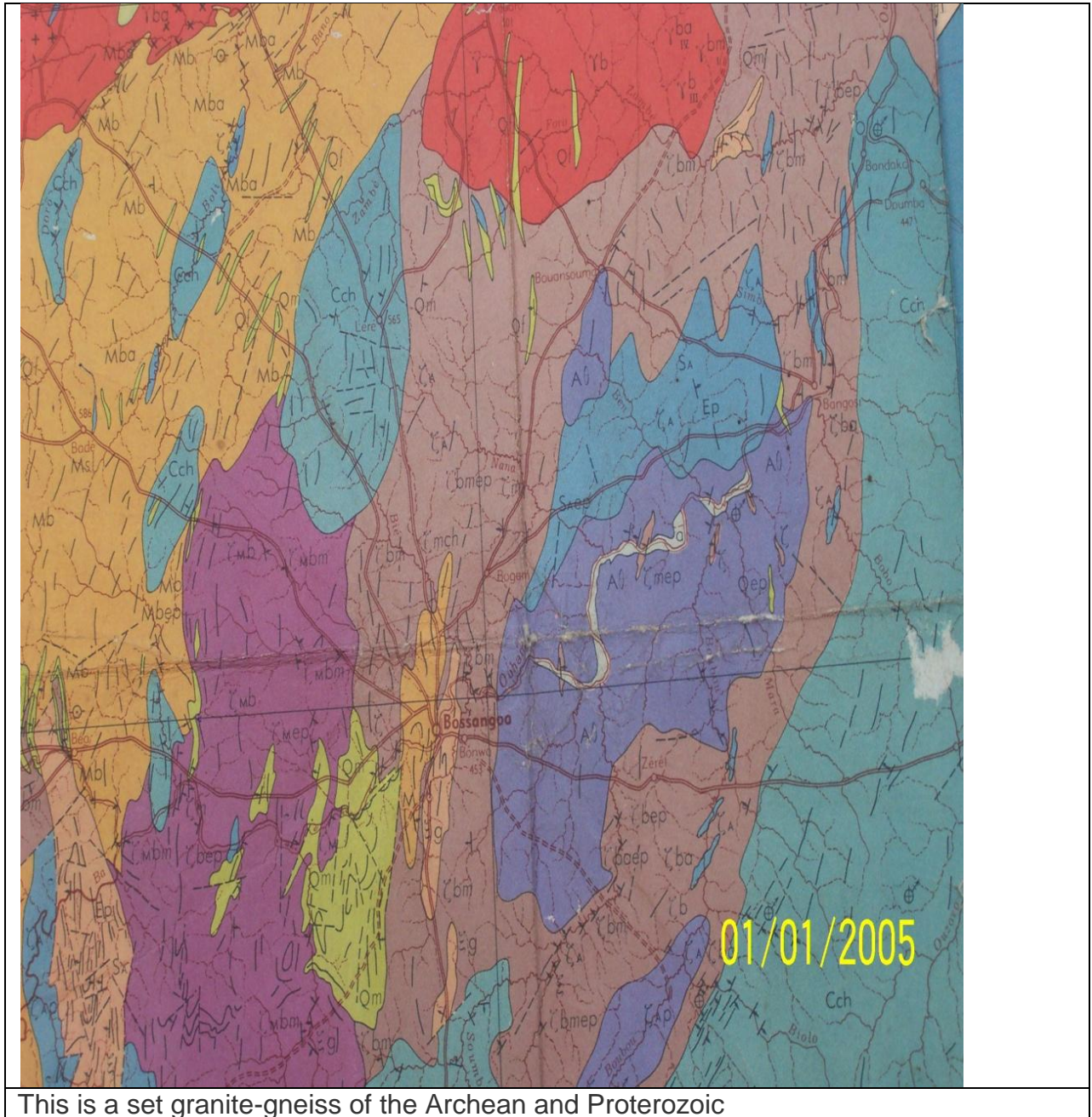


**GOLD SITE IN THE REGION OF BOSANGOUA**

Points	Long_E	Lat_N
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Superficies : 500 km <sup>2</sup>		



Geology:

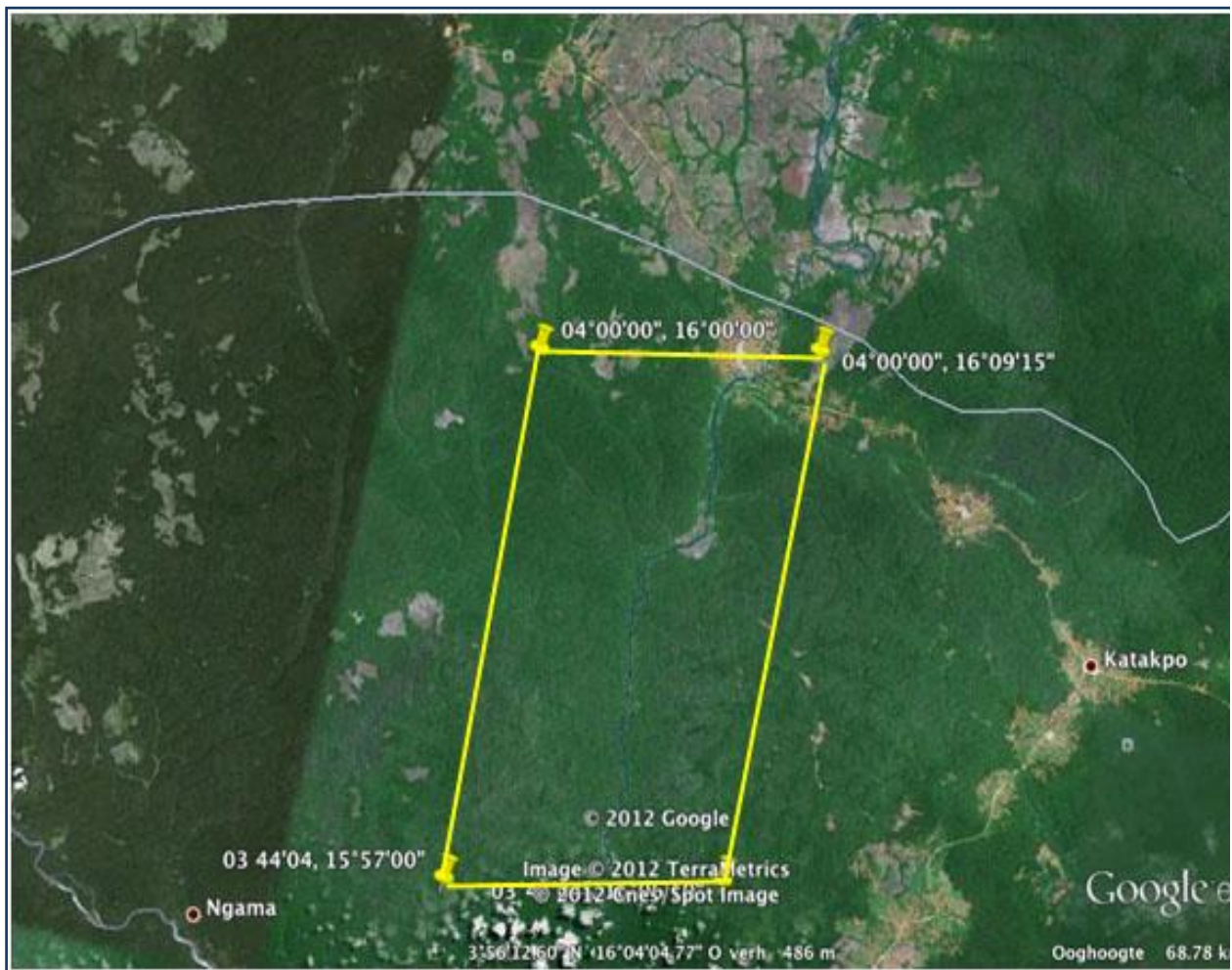


With many septa of banded ferruginous quartzites generally elongated northeast-southwest associated with metabasites, amphibolites, and pyroxenites shales andesitic, rhyolitic. The whole is covered with quartzite and training of low metamorphic slate kouki.

Bossangoa has outside indices of iron ores exploited artisan alluvial gold in the Ouham River and auriferous quartz veins associated with shear oriented N80 corridor and from Dibono (Bocaranga) in the west to Nana Bakassa through northern Bossangoa (Bea). This corridor is related to shear a greenstone belt that is parallel. It also gives a gold mineralization Dibono and Nana-Bakassa.

**DIAMOND SITE IN THE REGION OF NOLA**

Points	Long_E	Lat_N
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Superficies : 500 km <sup>2</sup>		



Geology:

For gold, we take a well-studied mining site around Sosso Polipo-west of the town of Nola.

The geology of the license is summarized here and other data are provided from interpretations of radiometric and magnetic data collected during the air campaign conducted by Aurafrique in 2006.

The permit is based on a succession of Proterozoic sedimentary rocks Meta. These include quartzites, schists and quartz sericite, and a series of cross beds of chlorite schists, sericite, and carbonates. The chloritic schists and carbonate as a single unit continues between units of quartzite and quartz sericite schists, complete stratigraphy forms a slight dome just north of the village of Sosso (west of Nola). All qualified prospects lie along the margins of this dome structure to NNE-SSW trend where chloritic schists and carbonate outcrop at the surface.

Gold mineralization is found in a series of quartz veins oriented sub-parallel to the axis of the dome. Historically, the French geologists have identified four of these vein systems south of the river Kadei. The work undertaken on the permit is located only two of these systems, in which, a series of veins and vein lets orientation approximately NS and EW are visible, these veins often contain sulfide minerals, gold and can be carbonate minerals. They vary in size up to 3m and hang both low (20 °) that strongly (sub-vertical), their extension in depth is not known. The drill holes have revealed graphitic schists, chloritic schists, and quartz-sericite schists and quartzites. The presence of quartz veins with a thickness varying from some cm was also noted.

Geophysics: The map (Figure 2) show a large fold belt in the shape of a horseshoe, fractures NW direction, and a large fault management SW-NE (fault Mbakiri).

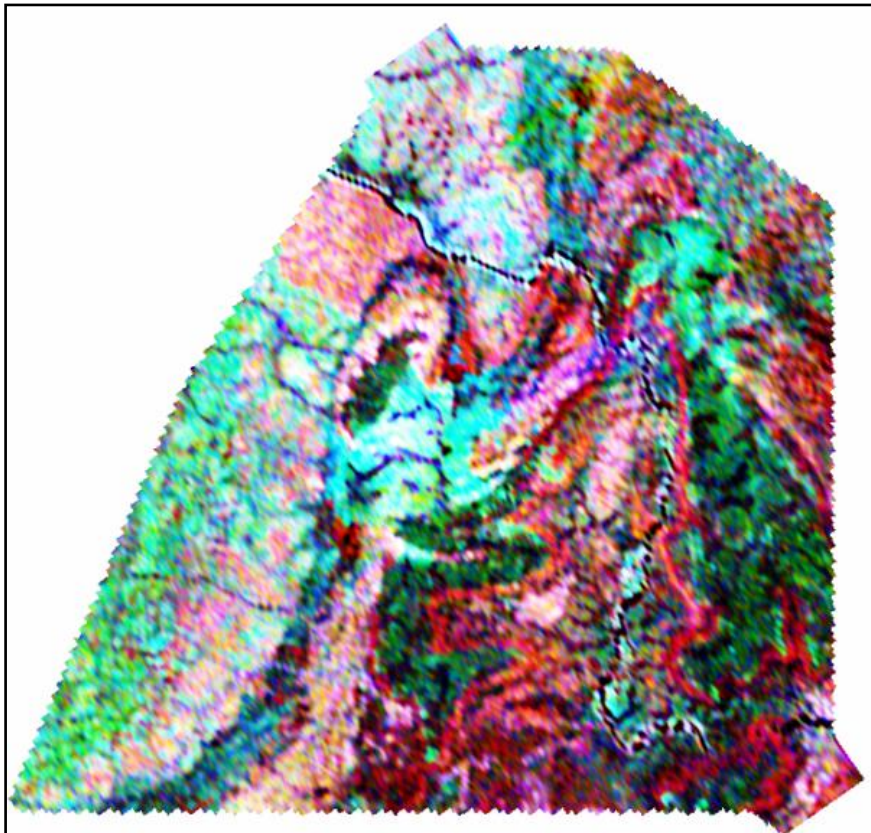


Figure 2: Ternary radioelement map license Sosso Polipo

Geochemistry: The results of the geochemical soil plotted on the map gave a gold soil anomaly (> 25 ppb) (Figure 3, Figure 4 and Figure 5) (Appendix 2)The burrow area is covered by an abnormality of 450m long and 400m wide. These anomalies appear to be in a corridor SW-NE direction.

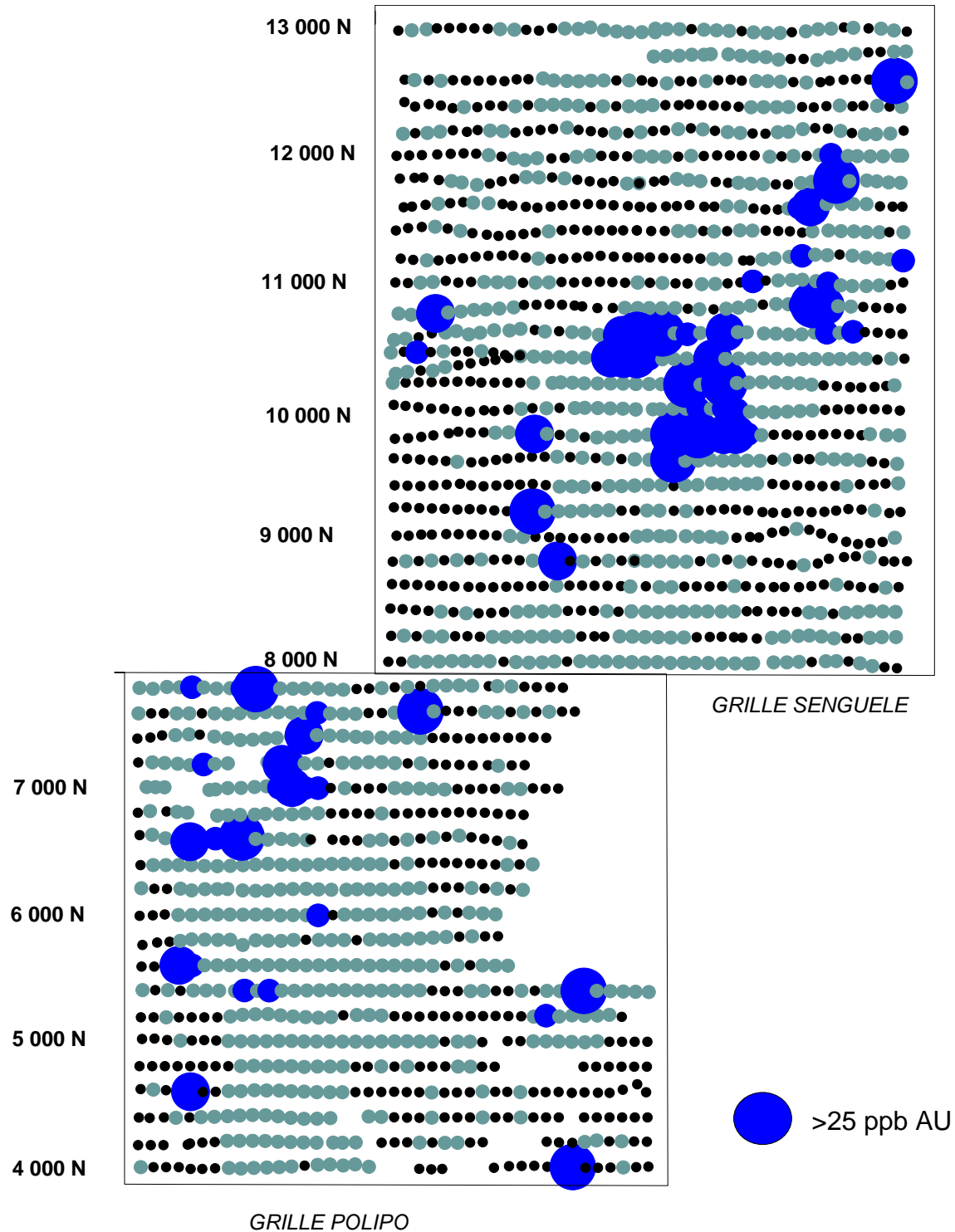


Figure 3: Location of Zones in Sol Gold Anomalies on grids and Senguélé Polipo in Local Coordinates.

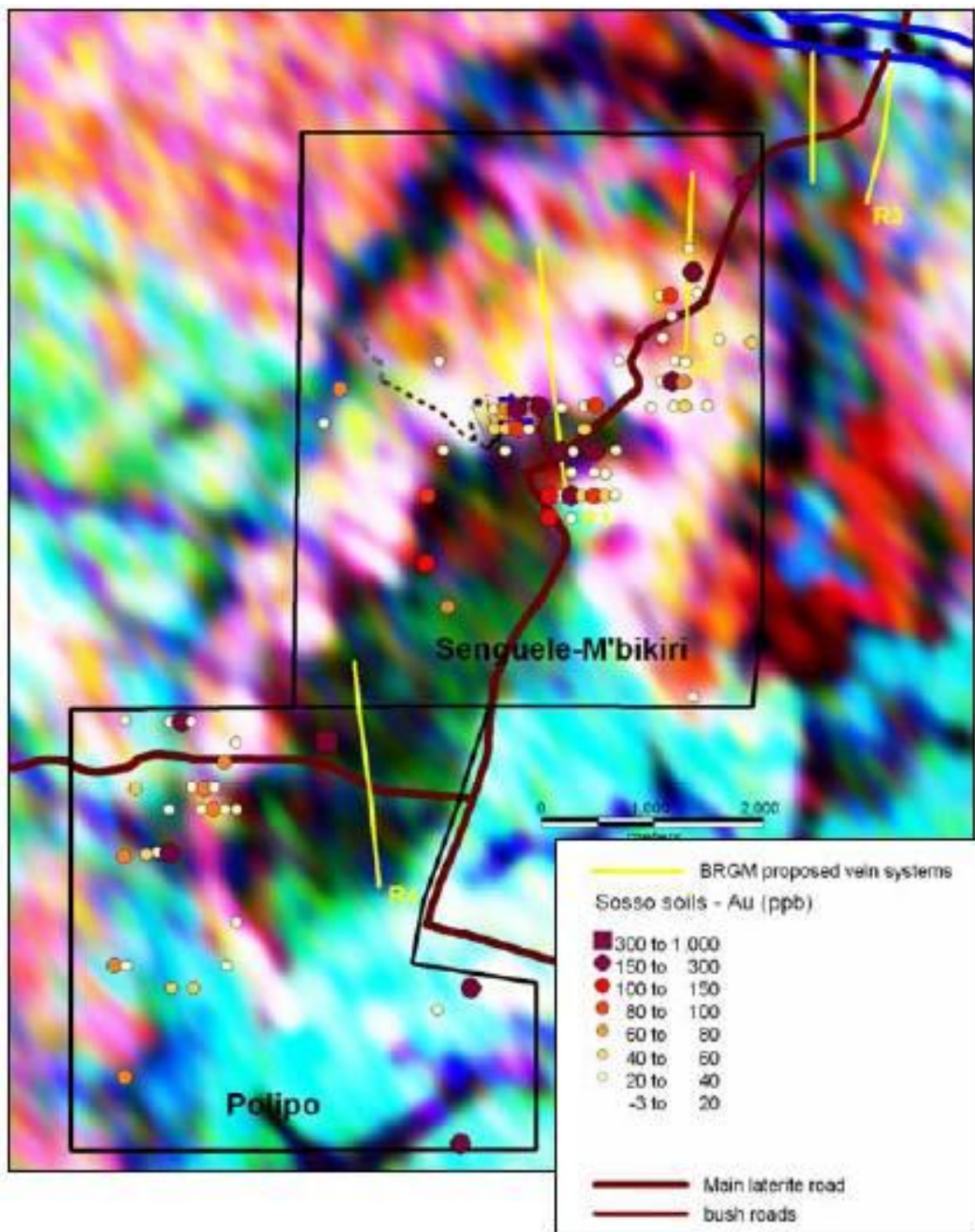
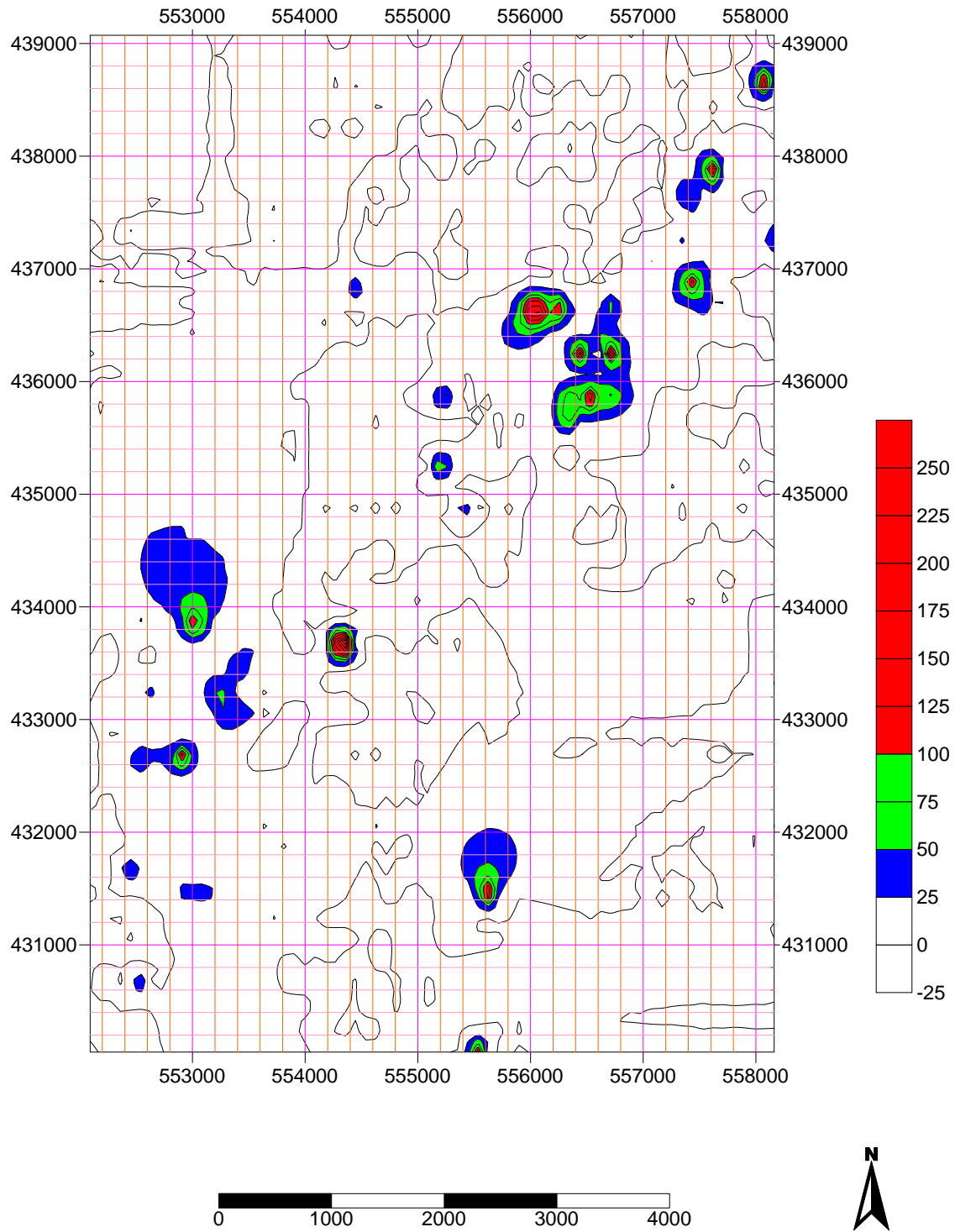


Figure 4: Map of Radiometric Ternary Permits Sosso Polipo with the Presentation of Results of Soil Sampling





**Anomalie géochimique de sosso-Polipo (Au ppb)**

Figure 5: Curves Geochemical Isoteneurs Gold (ppb) on grids Sosso Polipo in UTM coordinates (WGS34 33N)

Several quartz veins are observed with various orientations, contained in the graphitic schist foliation having a NE-SW and dips 20-30 ° NW in the area galleries. Graphitic schist is overlain by sericite schist, exposed in the roof of the gallery 2 by a fall of ground. The sericite schist seems to continue upward in the direction of sericite quartzite, exposed on the surface beside the main road to Berberati Sosso. In all cases, the sericite schist and quartzite with sericite form a single unit or formation of layered rocks with changing the initial composition. The nature and extent of graphitic shale in the area are not known for lack of vegetation cover and the scarcity of outcrops.

Many small folds were observed in the graphitic schist within a few galleries. The fold axes are generally not inclined, but these can be changed in detailed mapping.

The sampling was carried out in channels along the side galleries. A sample is taken from each 5m horizontally, and amid a second sample is taken vertically from the roof to the gallery wall.

Thus, 102 rock samples were collected in 2 galleries, 5 and 6. All samples were prepared and sent for analysis. The best results (Figure 6) are found in the gallery with grades 5 to 45 g / t of rock samples (grab sample) and 2.9 g / t over 50 meters (chip channel sample).

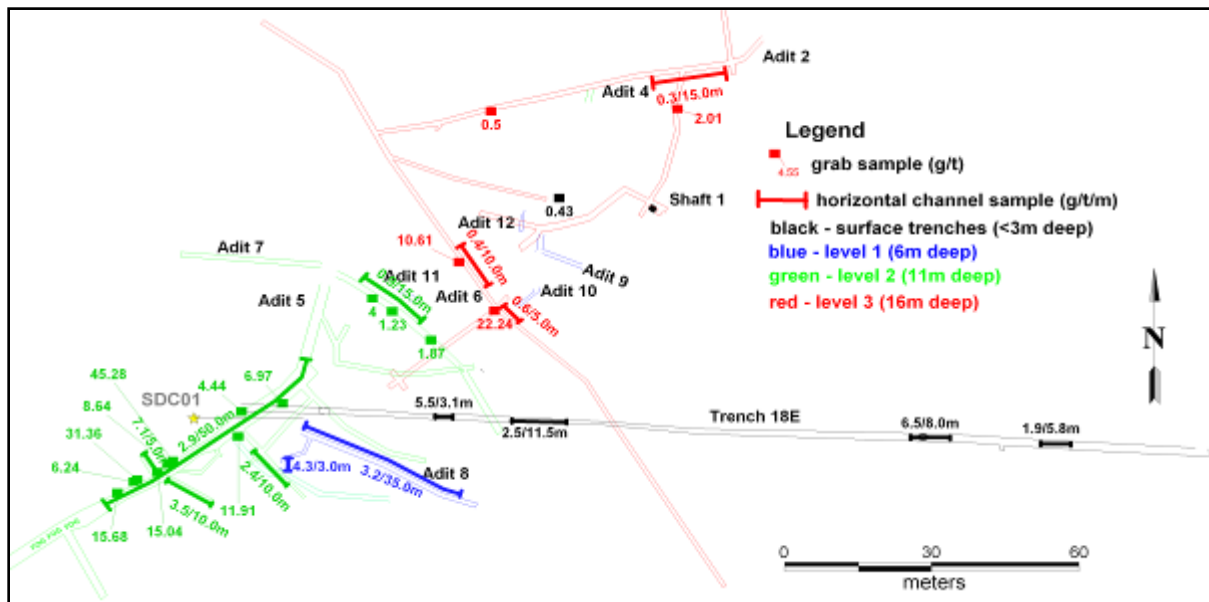


Figure 6: Summary of Results of Sampling of Galleries

The results of the geochemical samples galleries plotted on the map (Figure 6) shows a mineralization SW-NE direction. Up sampling was conducted in October in view of delineating the mineralized zone, a total of 1900 samples galleries

### Works of the Trench

Three trenches were positioned to allow a better understanding of the geology and mineralization. A total of 21 samples were collected for analysis (Appendix 4).

Two of the three trenches intersected the third system:

The STR001 trench intersected a vein with a sub-vertical dip, and the trench STR003 intercepted a brecciated quartz vein which gave the breaching visible gold.

### Cored boreholes

the drilling program, begun in the first quarter of 2007 ended in June 2007 for a total of 13 boreholes (Table 5). Drilling, completed with a small drill (man portable), are located on two lines of EW direction distant from the other of 50m above the old French galleries and zone of quartz veins identified in the trenches (Figure 7).

The geology intersected graphitic schist includes the top, the chlorite schist, sericite schist and quartzite more or less sericite at the base. These lithologies are cut by quartz veins and vein lets a few millimeters to several meters thick. Shales generally show significant deformity. Sulfides (pyrite and arsenopyrite) are present in all lithologies.

The pan carrot cut fragments indicates some mineralization related to quartz veins. The analytical results are available (Appendix 5). They show some mineralization in quartz veins only in the graphitic schist.

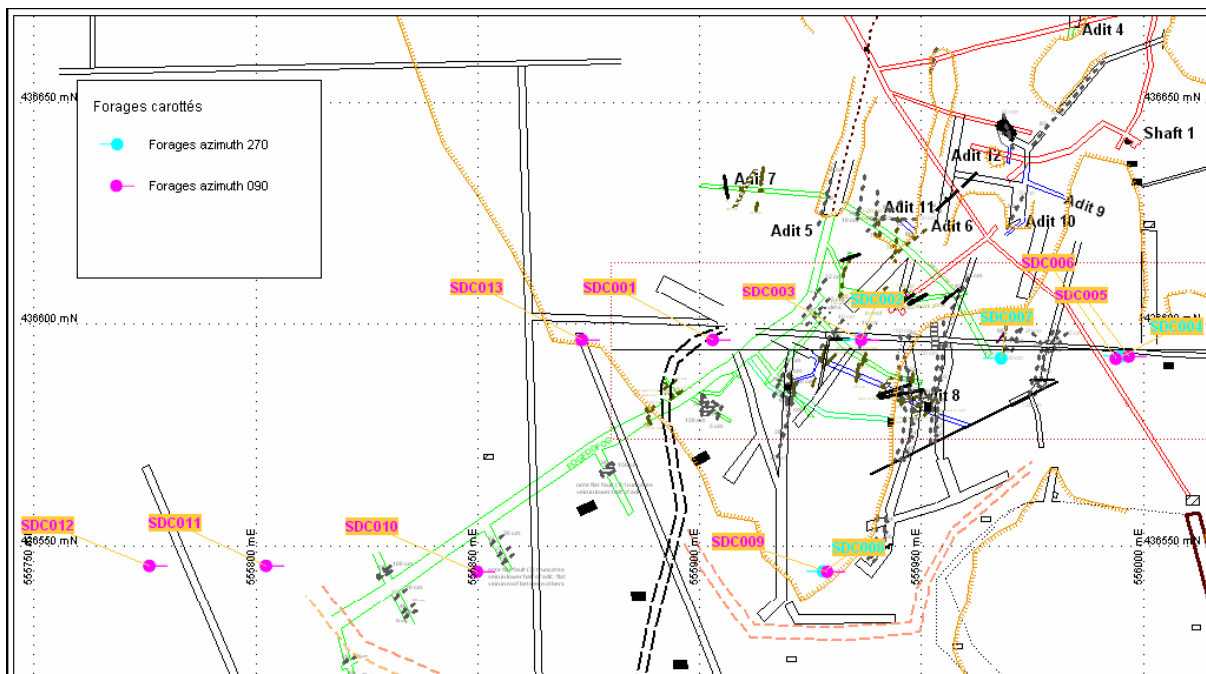


Figure 7: Location of Boreholes Carrots Sosso Polipo.

### ▪ 5.5. Buying house

We also advise the establishing of a buying office (or several small ones) in the mining area, so most of the special stones found in CAR can move through these buying offices. We will construct or obtain existing properties that might function as a buying and operational office for our project. The buying offices will also identify the areas where the diamonds come from and point us in the right direction for future operations and/or joint venture deals with owners of the specific concessions. We have a specialist on that field within our organization (Tracy), she will control the buying and selling of diamonds in CAR .She will be responsible for helping us to understand the strategy to follow to achieve our goals, which is to become the preferred mining company and a main player in this line of business in this region.

### ▪ 6. TEAM & STAFF

Name	Function	Number	Title / description
<b>Expatriates</b>			
Albert Matthew	Mining engineer	1	Head of Mining Operation
engineer 1	Mining engineer	1	Site manager gold mine
engineer 2	Mining engineer	1	Site manager Diamond mine
Project manager	Project manager	1	Procurement/facility/reporter/Assistant to the head of mining and board members
Diving manager	Diver	1	Diving and training local divers
Tracy Myburgh	Valuator	1	Valuation/buying/selling diamond
<b>Locals</b>			
local divers	Divers	6	Report to Diving manager and site manager
local runners	allrounder	2	Report to Project manager and facility manager
local workers	Miners	25	report to site managers
Nicaise Bonza	Military / chief adjudant	1	Head of Security
local Security	militaries	10	Secure the premises/buying & collecting offices
Operator machines		2	Operate the mini excavators & bushman jigs
Facility manager	allrounder	1	Facilitating Import & Imigration activities. Reports to Project manager
Mechanic	Technician	1	Responsible for the daily check up of vehicles. Reports to Project manager
<b>Board members</b>			
Patrick Dote	Executive	1	Country Director
Brian Olensky	Executive	1	Operation Director
AMS	Executive	1	Financial Director





## ▪ 7. COST MINE EQUIPMENT

### ▪ 7.1 River exploration equipment with processing plant (diamond & gold)

3 x 8" Gravel pump 4 cyl. Hatz diesel trailer mounted engine with piab prime system...	\$ 90K
3 x 8" Classifier -Yanmar diesel /trailer mounted 3 X Classification.....	\$ 45K
3 x 60 L Air compressor, air filter, 3 port manifold.....	\$ 21K
3 x Double Pleitz jig -Yanmar diesel.....	\$ 45K
3 x 3" Honda water pump.....	\$ 8K
3 x Generator 6 KWA Yanmar L100 diesel engine.....	\$ 12K
3 x Gold sluice 8"Classifier.....	\$ 11K
3 x Barge.....	\$ 150K
6 x Gravel boat - Quintrex explorer 390 gravel boat.....	\$ 21K
6 x 40 Yamaha enduro.....	\$ 30K
Diving equipment, accessories & spares.....	\$ 50K
<b>Total River exploration equipment with processing plant (diamond &amp; gold)</b>	<b>\$ 483K</b>

### ▪ 7.2 Land exploration (Diamond)

10 x Bushman Jig & bushman Jig access.....	\$ 150K
6 x 3" Honda water pump.....	\$ 15K
<b>Total land exploration (diamond)</b>	<b>\$ 165K</b>

### ▪ 7.3 Land Exploration (Gold)

3 x Hpc 15 & access.....	\$ 120K
3 x Generator.....	\$ 15K
3 x 3" Pump diesel.....	\$ 10K
Accessories.....	\$ 9K
<b>Total land exploration gold</b>	<b>\$ 154K</b>

#### ▪ 7.4 Other

Working camp: tents, generator, medical kit, tables, and mattress

Workshop: grinders, toolbox, welders, Drill, chain block EST

Trailer for gravel with 240 l diesel tank.

Sorting table

Workbench

Security screen for container

Doors for container

Steel spare

Total of above..... \$ 58K

3 x Backhoe 426 (good second hand) ..... \$ 135K

2 x Excavator 320 CAT (good second hand)..... \$ 300K

3 x Pickups 4x4..... \$ 60K

3 x Vehicles ..... \$ 150K

Working capital including salaries (4months)..... \$ 265K

Operational costs (4months)..... \$ 52K

**Total other** **\$ 1'020K**

#### ▪ 7.5 Costs for starting & exploration phase

Total of sub.: **7.1 + 7.2 + 7.3 + 7.4 = US\$ 1'822'000.00**

Miscellaneous & unforeseen costs = **US\$ 182'000.00**

Total cost for starting and exploration phase including working and operational capital for the first 4 months is: **US\$ 2'004'000.00 (Two million and four thousand dollars)**

#### ▪ 7.6 Manufacture & delivery time.

Most equipment will have to be manufactured from the moment of ordering (50% down payment) which will take between 4 -6 weeks. The shipping (after the second and total payment) will take approximately 4 weeks. We need to consider a timeframe of 8 – 10 weeks from starting (ordering).



# Appendix

## CVS