

MALI GOLD PROJECT

INTRODUCTION

According to order of mission N° 0174/MMEE/SG of 25 April 2000, a mission of the program for the development of the mineral resources (PDRM) visited Boutoungoussi district of Aourou area of Kayes republic of Mali.

The project aims to fulfil the geochemical mapping of the prospect area. On the legal level this work is carried out within the framework of the prospecting permit of Boutoungoussi area of 239 Km² granted to the SOCAF. This licence is located at the West of Mali (see fig 1).

The contract envisaged a program of geochemistry ground of taking away of 500 samples to the mesh of 100 x 50m.

I - GEOGRAPHICAL FRAMEWORK

1-1 Location of the Project

The concession of SOCAF is located at 100 km in the North of Kayes into 1 area, to 10 km in the south of Boutoungoussi. An extract of the sheet to the 1/200.000 of Kankossa (Fig 2) gives an outline of the licence.

1-2 Climate, flora & fauna

The whole of the area is characterized by a climate dominated by the one-season alternation dries long (November at June) and one season of rain. In the area the climate is of type will be arid with precipitations of about 600 mm per annum. In January, the temperatures are of approximately of i0 with 15°C with 7 H of the morning and of 25 with 30°C with 14 H, in May they reach and exceed 45°C with 14 H and do not go down under the 30° C the night.

The areas vegetation is typical semi-arid with namely a cover the graminaceous ones and a sparse shrubby population with baobab trees.

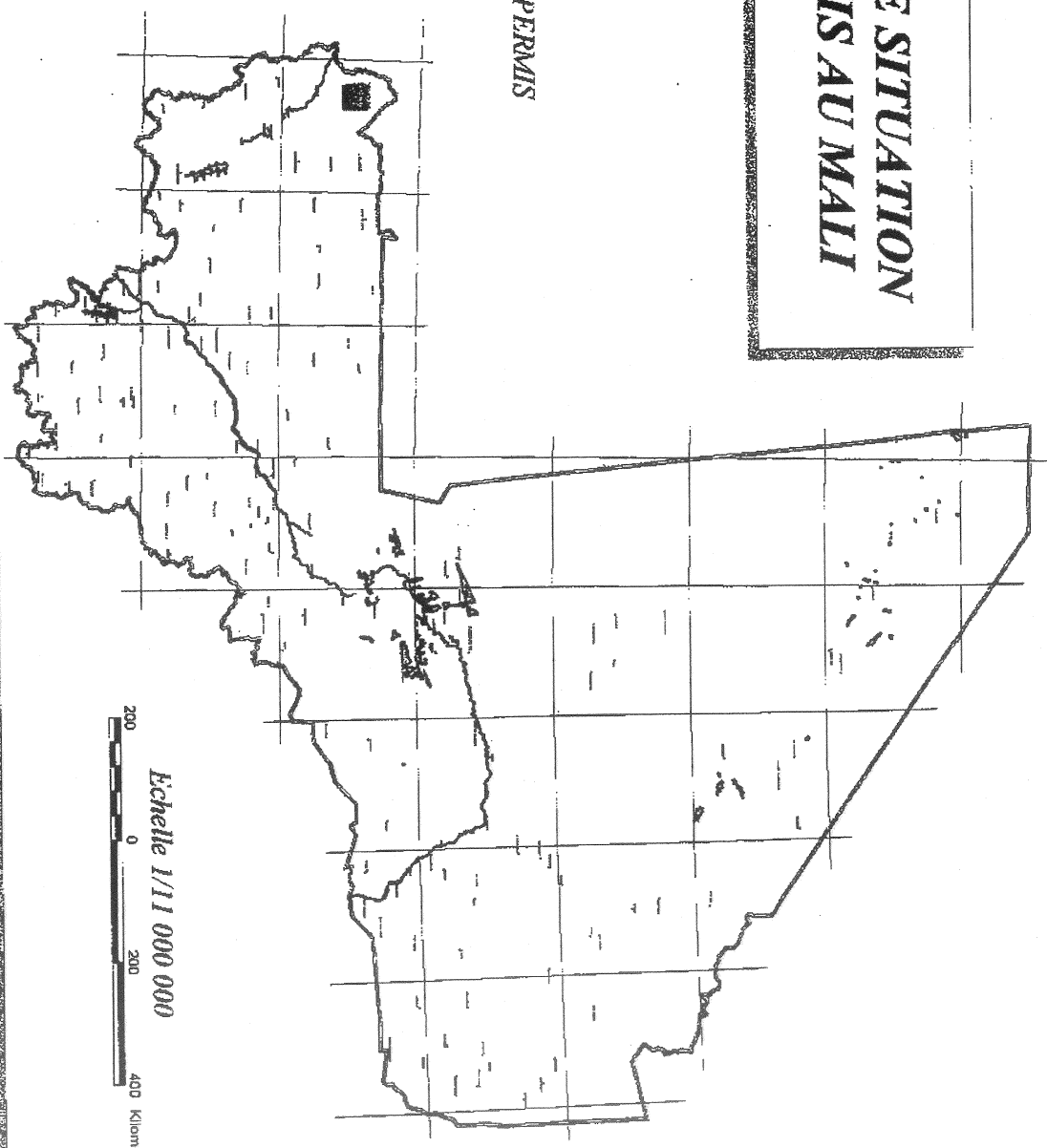
Apart from the domestic breeding, bovines, sheep, caprine, the area is populated of a wild fauna relatively not very significant: phacochères, monkeys, antelopes and various species of birds.

1-3 Populations

The area consists of soninkés and maures. It is sparse with less than 10 inhabitants in 1Km².

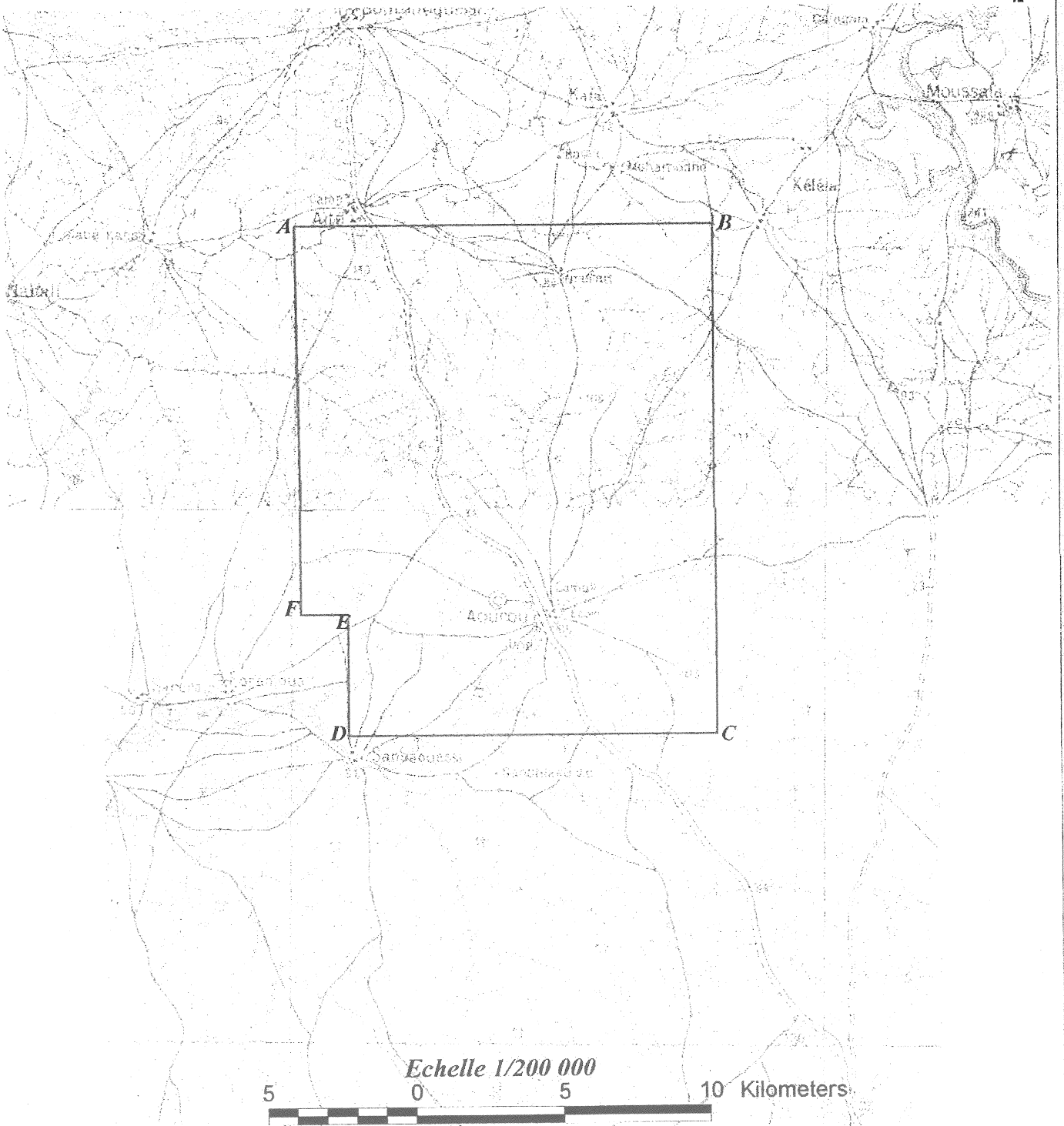
CARTE DE SITUATION DU PERMIS AU MALI

■ SITUATION DU PERMIS



Echelle 1/1 000 000
400 Kilomètres

PERMIS DE BOUTOUNGUISSI - SUD



EXTRAIT 1/200 000 (feuilles de Kayes et Kankossa)

1-4 Transportation routes

The principal axis of transportation is the railroad Dakar-Niger. The area is only accessible via track. These tracks are regularly practicable only during the dry season.

II - PREVIOUS WORK

The sector of Bouteunguissi was covered by Western the Mali project I, which had as principal goals:

- The geological survey of 27.000 Km² which correspond to the topographic sheets on scale 1:1200.000 of Kankossa in North), Kayes (in the center) and Kossanto (in the South)
- Geochemical prospecting of 9.000 Km² of grounds birrimiens for and other elements, covering the totality of the fénêtre of Kayes and the part in north of the parallel 13°00 'N of the fénêtre of Kékiéba.

During this work the anomalies were identified in the sector of Boutoungouissi in particular with Nreilatt.

In 1991 work of the project of Western Mali II and concerned the sector of Boutoungouissi.

Work on the ground started in 1991 and continued until 1993. They were carried out in three shifts.

a) The campaigning year 1991

For the study of the anomalies, the anomalous threshold retained in the sector of Boutoungouissi was 20 ppb.

Work consisted of a sampling ground to the mesh of 100 m x 50 m of termitiere; and rock for the litho-geochemistry. These taking away are accompanied by a geological survey on the 1/1.000 scale. This various work was useful for the control of the anomalies of the project Mali-West I.

b) The second and third years 1992 and 1993 During these campaigns, following work were carried out:

- The mesh of the geochemistry-ground was tightened (50 m x 50 m or 25 m x 25m) inside the anomalous zones, on the other hand their extensions were studied with the mesh of 100 m x 50 m.
- Work of subsurface (well and sliced were introduced, to study the rooting and the immediate geological context of the anomalies. Sampling was metric and/or by facies; vertical for the wells and horizontal for the trenches.

- The methods geophysics; Magnetometry, Eieetromagnetism. VLF, max/min, Trainees electric was used to leave the extension the known structures and those under cover.
- The tests of jams were carried out on certain cuts of well to test the presence of coarse gold.

The purpose of all this work was a better study of the proven anomalies and to therefore interest the private investors.

The sector of Nreilat

The anomalous zone of Nreilat east is located 3 Km East of the village of Nreilat.

The results of geochemistry ground made it possible to gather the three isolated anomalies and the two gathered anomalies of Western Mali L, the anomalous zone of Nreilat East is the largest from the point of view dimensions (5 Km²). It was divided into six anomalous sub-fields.

The anomalies are in a schisto-greywacke context silicified with sulphides. Quartz seams of various directions cross this unit: North/South, East/West, N 150°.

Tectonics crossed the whole of the rocks according to directions 50° N, 175° N, 50°N and Is - Western; it is what explains the aspect disaggregated of the quartz seams and the local crushing of the schisto-greywacke series observed on the ground.

Mineralisation in the anomalous zone of Nreilat East is related as well to the seams of quarter to the schisto-greywacke series. For the majority the mineral-bearing zones are rather broad May: with rather low contents.

The zone southern part, trench TR2 15 m long gave a value of 0,90 ppm Au and in the central part, trench 10 m length TR5 gave an average content of 0,80 ppm Au.

- From 18/2/93 to the 22/6/93 the P.D.R.M (Program for the Development of the Resource Mineral) carried out work of geophysical prospecting on the sectors of yateh Boutoungoussi, Dag-Dag, within the framework of the contract signed between the Project Western Mali II and I P.D.R.M. The methods employed were: magnetometry, the VLF-EM, max/min (HLEM) and the trailed electric ones.

The objective of this geophysical prospecting was to determine a possible correlation between the signatures geophysics of at least one of the above-mentioned methods and the zone of gold bearing mineralisation.

The geophysics results thus being able to contribute to elaborate the program of work of sub-surface such as the wells, distinct surveys, and with étué of the structural geology of the various zones covered by geophysics. Geology arises penny forms intrusive meta-sediments and rocks.

Geologist

Baker Khudeira
baker@ashgill.com.au

- The Nreilat Au Zone

Anomalies were detected there. Geophysics covered the diagonal part of C surface 2100 m x 1320 m.

The first remark is that the covered surface is very narrow for determine with certainty of the magnetic anomalies or VLF-EM. Nevertheless some axis C discontinuities magnetic MG1 with MG4 appear on the magnetic card.

Axis MG2 with MG4 are directed 60°N the axis MG 1 corresponded to a fault die located by the geologists.

On the chart of the VLF1-EM (Fraser UP) several axis of driver (VLF-1 with VLF-7) directed appear North-South. There are not a correlation between the anomaly magnetic and those of the VLF-EM.

The geochemical anomalies seem to be related to the quartz veining of which some have been studied by the geologists.

The chart of interpretation of Nreilat presents the following characteristics:

- Delimitation of the zone of study not very suitable for a geophysical study.
- The axis of drivers VLF-EM also compared to weak are directed North-South in accordance with the direction of emission of the station used.

Thus the magnetic anomalies will not marry those of the VLF-EM with the GB1 station the use of another transmitting station in the East-West direction could confirm the existence of the magnetic anomalies. Geologists have comprehended the link between the quartz veining and gold bearing mineralisation. It would be desirable to use the manners of resistive to detect other quartz veins and to continue those having the end levelling and this especially in the southern part of the zone.

III - GEOLOGICAL FRAMEWORK

The concession is located in major part in the sedimentary formation of Kafa, which are primarily volcanic sediments.

3-1. The Kafa Formation

This unit occupies a panel coarsely quadrangular between the latitudes 15°N 14°N and longitudes 11° 28 W and 11° 38 W.

In its western part this formation with sedimentary predominance then is characterized by passed conglomeratic the rather remarkable ones whereas, towards the east, repetitiveness of greso-pelitic successions is stopped only by some intercalations to volcanic origin. Let us announce moreover the presence, in the extreme north of the window (area of Ah• Falouté) of a small panel of meta- sediments where lithology is comparable with that of the greso-pelitic series.

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baker@ashgill.com.au

The formation was subjected to major deformations, which have rectified the entire series in driving position or sub-vertical conferring an average direction N to them on NNE. In northern part of the panel, this direction inflects, the foliation of the rocks intensities is directed parallel to an accident N 55°. With the regional scale, the minimal degree C metamorphism corresponds to the facies green schist with sericite, chlorite and epidote.

3-1-1 Facies passed conglomeratic

This facies consists of passed conglomeratic interlarded in conglomeratic series of meta-silt or meta-greywacke. They level in position sub-vertical, formed lengthened hills of 30° N direction in 35°N. The whole of the facies is observed on you thickness of approximately 1200 m, last the conglomeratic themselves ones being, as they, the thicknesses of about 30 to 50 m. The meta-conglomerate is a massive rock made up to 70 % of black rollers centimétriqu héréro granular, well-rounded, not very jointed, bathing in a matrix fine grained, gray-greenish, relatively homogeneous.

3-2 The intrusive rocks

These rocks are structurally of two types:

- in lengthened solid masses, with often directed texture.
- In solid masses of circumscribed pace, to texture generally équante the chemical compositions go from granitic terms to definitely basic terms, with a total prevalence of granodioritic composition. With this description succinte of the major intrusive phenomena, it is appropriate, of course, of additions the slickenside rocks, broad lithological variety.

• The rocks of intermediate composition

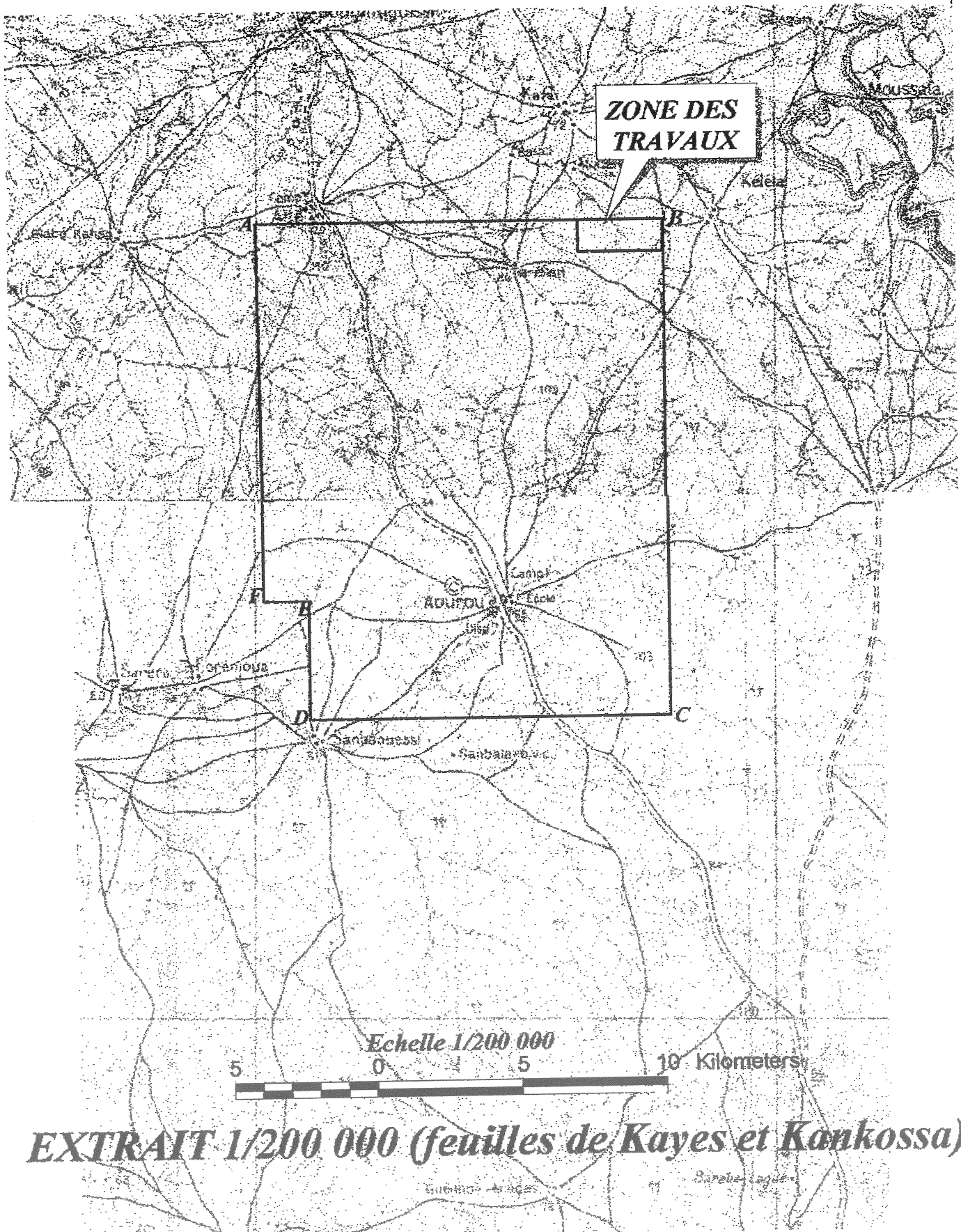
They are the granodiorites until granitic terms. These granodiorites show sometimes a directed texture. This orientation is expressed, on the other hand, very clearly in the vicinity, contacts with the boxing volcanic one in the South East of Boutoungouissi.

- The rocks of basic composition pyroxenes they are solid masses of basic composition. They are made up only of pyroxenes el of amphiboles. Typically the pyroxenes of Aité is made up with nearly pyroxene 60% (augite) to approximately 30% to hornblende, quartz, plagioclases, and K-feldspars appearing in definitely small quantity.
- The surface formations the surface formations are wind. They are essentially fixed deposits dunaires made up of fine sand and classified well, yellowish-reddish. These dunes are covered with vegetation the graminaceous ones with arbussive population clairsemée. Also finds in the area of sharp wind platings, of size much more reduced consisted of fine, yellow sand clearly.

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baker@ashgill.com.au

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3-3 Structural Outline

The dominant structural directions characterizing by volcanic grounds which, at Senegal and in the window of Kayes, have an orientation 20°N with 40°N , take in fi window of Kéniéba, to N of the latitude 13°N and in the East of Falémé a meridian orientation with 160°N .

That prints with the regional structure a vast flexure of shape. Field of Boutoungoussi on the basis of their structural pace one can subdivide this field as a plusior compartments. In the part Eastern the volcanic sequences, whose dips vary generally between 40° and 60° , towards the NW, are directed mainly according to a directioi 50°N - 60° , locally drawing light virgations or bendings (structures crimped ellipsoidales). On the other hand the Western compartment is marked by a bent structure; concavity is.

These two compartments are separated by a zone, broad of some kilometric, dominated by several faults of decakilometric extension and orientation 10° to 20° .

Once at the camp the samples passed by the following phases: Crushing dries sifting in a sieve of 80 meshes. The passer by then is quarté and put in envelopes.

4-2-2 the analysis of laboratory

The samples were analysed for with by atomic absorption in the laboratories of the PDRM in Bamako with a threshold of detection of 5ppb.

V- RESULTS OF WORK

Work of ground made it possible to take 500 samples ground. On the plan geomorphologic, share the height consisted the meta-greywacke coarsely directed Northern South has, the relief and is dominated by the blow sands, hiding below a saprolitic clay.

The laboratory results, which appear as an annexed presents in the following way:

- Maximum content: 3460 ppb
- Content Minimum: 5 ppb
- Average Content: 42, 6 ppb
- Standard deviation: 195 ppb

These results are valid for the entire two campaigns i.e. that May - June 1998. When one gets rid of the exceptional contents, one has the following data:

- Average content: 31 ppb
- Standard deviation: 84 ppb

It is released on the two charts from the contents and isoteneurs gold annexed to the report/ratio two zones anomalous:

- First is located between the meridian lines 224500 E and 225700 E consisted two coarsely directed parallel corridors NW-SE having their termination on the level of the parallel 1668800 N.
- The second is between the meridian lines 226300 E and 226800 E and would correspond probably an anomaly related to a jet of faults.

VI - CONCLUSIONS & RECOMMENDATIONS

The second geochemistry campaign of the PDRM on the anomaly of Nreilat showed all the interest of this anomalous zone already identified during work of Western Mali (1 & 11). The contents with are rather eloquent in this respect. The anomalies are dependent apparently on larded meta-greywacke and quartz veins.

The anomalous zones are worthy of interest. Nevertheless it will be necessary in order to show all the interest of the sector to carry out geochemical prospecting complementary to the mesh of 100 x 50 mm because one is already in a known anomalous zone (5 km² western Mali work commencing year 1992 -1993, but 3 Km² starting from work of 1998 and 2000 of the PDRM) in order to increase the anomalous surfaces.

Meanwhile, the tools of geological research evolved and the civil GPS are more precise since April 2000. The co-ordinates of ground of western the Mali project are today difficult to identify without the same authors them. I will wish in priority a prolongation of the geochemical prospecting to the mesh of 100 x 50 m out of 1000 m in the south starting from the latitude 1668500 N of which one pared made in April 2000 (object of this report/ ratio) are 600 samples to be taken.

A prolongation of the geochemical prospecting is moreover desirable in the West on 500m with the same mesh i.e. of the meridian line 224500 E to the meridian line 224000 E and of the parallel 169500 N to the parallel 1667500 N are 700 samples.

These two operations if they are carried out will make it possible to include the old anomaly of 5km² Western I and II and to consider work geophysics and subsurface well and sliced Mali. It would be necessary to avoid making geophysics on a narrow tape like that was the case in 1993. Currently the identified anomalies are easy to find using GPS. It would be necessary to devote

ASHGILL AUSTRALIA Pty. Ltd
P.O. Box 700 Brentford Square VIC 3131
AUSTRALIA

for the continuation of work a suitable time for the comprehension of former work.

Geologist
Baker Khudeira
baker@ashgill.com.au