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## Memo Report for Resistivity Survey at Koffiefontein Mine

### Introduction

The methods and results are given herewith of a resistivity survey carried out at the Koffiefontein Mine. The purpose of the survey is to supply information on ground conductivity that is to be used to identify and delineate zones of interest for the purpose of hydro-geological studies.

Data collection was carried out over three days during April and consisted of five lines which traversed the area of interest.

Table 1: Traverse coordinates (WGS 84)			
1A-0	S29 26 20.7 E24 59 00.0	3-400	S29 25 52.0 E24 58 58.0
1A-200	S29 26 19.8 E24 59 07.5	3-600	S29 25 47.6 E24 59 03.3
1A-400	S29 26 19.0 E24 59 14.9	4-0	S29 25 49.9 E24 59 01.5
1A-570	S29 26 18.3 E24 59 20.6	4-200	S29 25 53.8 E24 59 07.2
2A-0	S29 26 00.5 E24 58 47.2	4-400	S29 25 57.6 E24 59 13.5
2-200	S29 26 06.5 E24 58 50.3	5-0	S29 25 51.4 E24 59 07.8
2-400	S29 26 12.4 E24 58 53.3	5-200	S29 25 57.9 E24 59 08.5
2-600	S29 26 18.3 E24 58 56.4	5-400	S29 26 04.5 E24 59 09.4
2-700	S29 26 20.9 E24 58 57.8	5-600	S29 26 10.9 E24 59 10.1
3-0	S29 26 01.0 E24 58 47.4	5-800	S29 26 17.4 E24 59 10.8
3-200	S29 25 56.6 E24 58 52.6	5-860	S29 26 19.3 E24 59 10.9

### Instrumentation, data collection and reduction procedure

An Abem Lund LS resistivity meter was used to collect continuous vertical electrical sounding data. Resistivity measurements are obtained by injecting a current into the ground through two electrodes and measuring the resulting potential between another electrode pair. By systematically increasing the electrode separation in a fashion otherwise known as a vertical electrical sounding a picture is obtained of resistance variations with depth, whilst a set of adjacent soundings provides a resistivity image or cross section of the ground.

A Wenner configuration (equally spaced electrodes set in a line) was used for the resistivity imaging. Five traverses were conducted using an electrode separation of 10m, allowing for an exploratory depth of 75-80 meters, also depending on the conductivity of the ground.

Traverses were tagged at start and end points and every 200m, also recorded on a GPS for reference which can be found in table 1.

Figures accompanying this memo-report:

- Figure 1: Resistivity model W-E traverse
- Figure 2: Resistivity model N-S traverse West side
- Figure 3: Resistivity model W-E traverse West side
- Figure 4: Resistivity model NW-SE traverse West side
- Figure 5: Resistivity model N-S traverse West side

## Results

As a general overview figures 1 through 5 show resistivity models which display uniform homogenous horizontal layering with minimal variations in the resistivity across the site. The first 25m of subsurface is very conductive leading to layers of soft and or weathered rock. There are no apparent geological structures vertically intrusive to the survey area, except that of figure 5 at 130m. There is variable weathering throughout the site, with visible channels in some of the N-S orientated lines.

Material	Resistivity ohm/m
Alluvium	10-800
Sandstone	>1000
Shale	>1000
Quartzite	>1000-8000
Ground Water	3.62
Saline	0.2
Fresh Water	10-100

Profiles:

- Figure 1: First 25m material is conductive overburden and or very weathered rock. Surface also shows resistive bands or sill like features, possibly leached mineral deposits reworked and forming hard calcrete formations. Below a depth of 30m uniform horizontal layering which appears to be well weathered.
- Figure 2: Consistent with fig 1 conductive subsurface increasing to the South (down slope) and also uniform layering with some channels.
- Figure 3: Increased depth of conductor to the East (down slope) at the base of tailings. First 300m is a resistive sill and generally uniform layering at depth.
- Figure 4: Runs parallel to tailings and shows no change in homogeneity.
- Figure 5: **130m** small contact zone which may have potential to target for drilling as it may be a fracture or softer composite rock. This profile does illustrate variable weathering of the basement with several channels and or pathways.  
360m-860m Resistive sill.

**Respectfully Submitted**



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