

# **GEO-HIKLAS**

**GEO-SERVICES & ENGINEERING LIMITED**

**BOREHOLE DRILLING & GENERAL ENGINEERING SERVICES**

**09031167739**

**PRE-DRILLING FEASIBILITY/GEOPHYSICAL  
INVESTIGATION FOR GROUNDWATER  
EXPLOITATION & DEVELOPMENT POTENTIAL  
THROUGH DRILLING OF ONE BOREHOLE AT  
ADABATA ILORIN KWARA STATE.**

**COMPILED BY:**

**BUSARI ABDULRASAQ OLAWALE (B.Sc, MSc, P.hd in view,NMGS)**

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## **INTRODUCTION**

### **PREAMBLE**

Water is life. There is no gain saying that without water there would be no life of any kind on earth. Apart from air, it is the most important. It sustains human life and constitutes about 70% of its weight. Its tremendous use and advantage is worth of note in domestic, industrial, agriculture, navigational and recreation sectors as well as energy in form of hydro-power generation.

Although water is about 70% (by volume) of potable water supply is through underground water exploitation (wells, boreholes, tube wells wash bore). This is so because the unit cost of providing and sustaining water through well is less. In addition to this, the underground water is pure, natural and free from contamination. It does not require treatments (addition of additive such as chlorine, potassium, alum and others) which have been proved to have their cumulative effect on the body chemistry. This will be done through drilling of one borehole and it is our hope that this borehole will serve the people for its present and future needs of the water necessary for domestic use.

## **LOCATION**

The location of the borehole is located **AT ADABATA ILE KARATU ILORIN KWARA STATE.**

The access roads are motorable all the year round, so there is no problem of accessibility for the drilling rig and the supporting vehicles during raining season.

**The geophysical survey determines the following:**

- 1.The spot to be drilled
- 2.The depth to drill to
- 3.The method of drilling: MUD (sedimentary)or Air/DTH (Basement)
- 4.Anticipated water yield (low, moderate or high)

## **GEOLOGY AND HYDROGEOLOGY**

ILORIN, where the survey was done is underlain by rocks of the crystalline Nigeria Basement Complex, Principal among which are granites and gneiss. These rocks were emplaced in Precambrian times and have over time been subjected to tectonic activities characterized by large changes in temperature and pressure resulting in features like joints, faults and fractures within the Basement Complex rocks. Such fractures are those that influence the groundwater in crystalline rocks especially if they exist at depth and are overlaid by a thick superficial cover (overburden).

Although there is no visible outcrop in the area worked upon, this is clear index to the fact that on a regional projection such rocks exist at depth beneath the thick superficial cover that is predominant in the area.

## **GEO-PHYSICAL INVESTIGATION**

The geophysical investigation was carried out using surface electrical resistivity method with ADMT 200AX and other Accessories. The ADMT series instruments use natural Electromagnetic field of the earth as the working field source to study the electrical structure inside the earth. According to the principle that different frequencies of electromagnetic wave have different skin depths in the conductive coal, the surface is measured from high to the low frequency Earth electromagnetic response sequence studies the difference in electrical variation of geological bodies at different depth in the subsurface and determines the occurrence of underground geological bodies.

## **INTERPRETATION OF RESULTS**

The purple colour represents very low resistivity (Aquifer), blue colour stands for low resistivity (Aquifer), green colour represents intermediate resistivity value and red colour represent high resistivity value. In addition, the Scale on the Y axis represents the depth at sub surface. Other interpretation techniques are

- (i) Visual isoline graph Inspection.
- (ii) Comparison with previous borehole that was dug in that area.

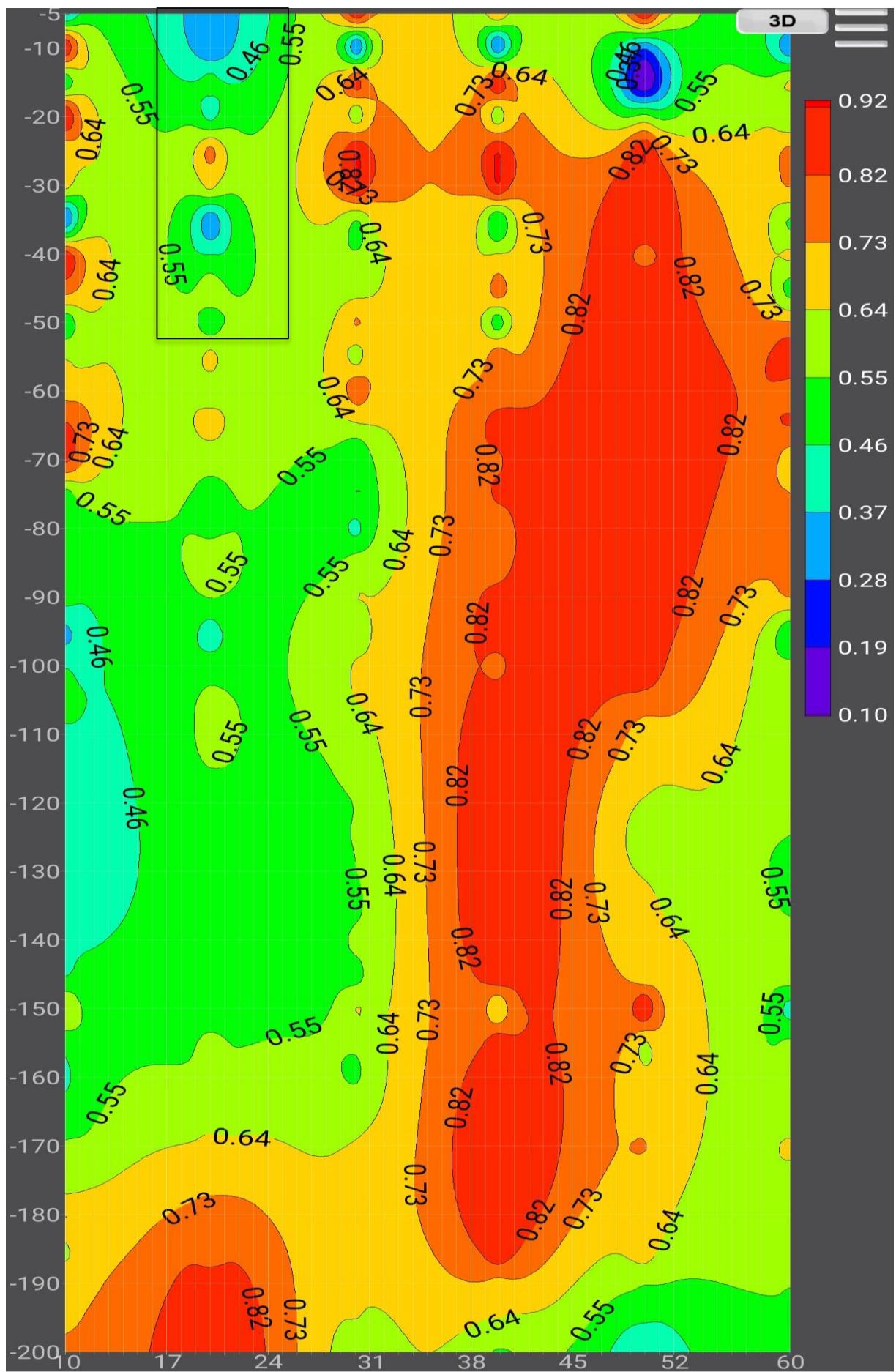
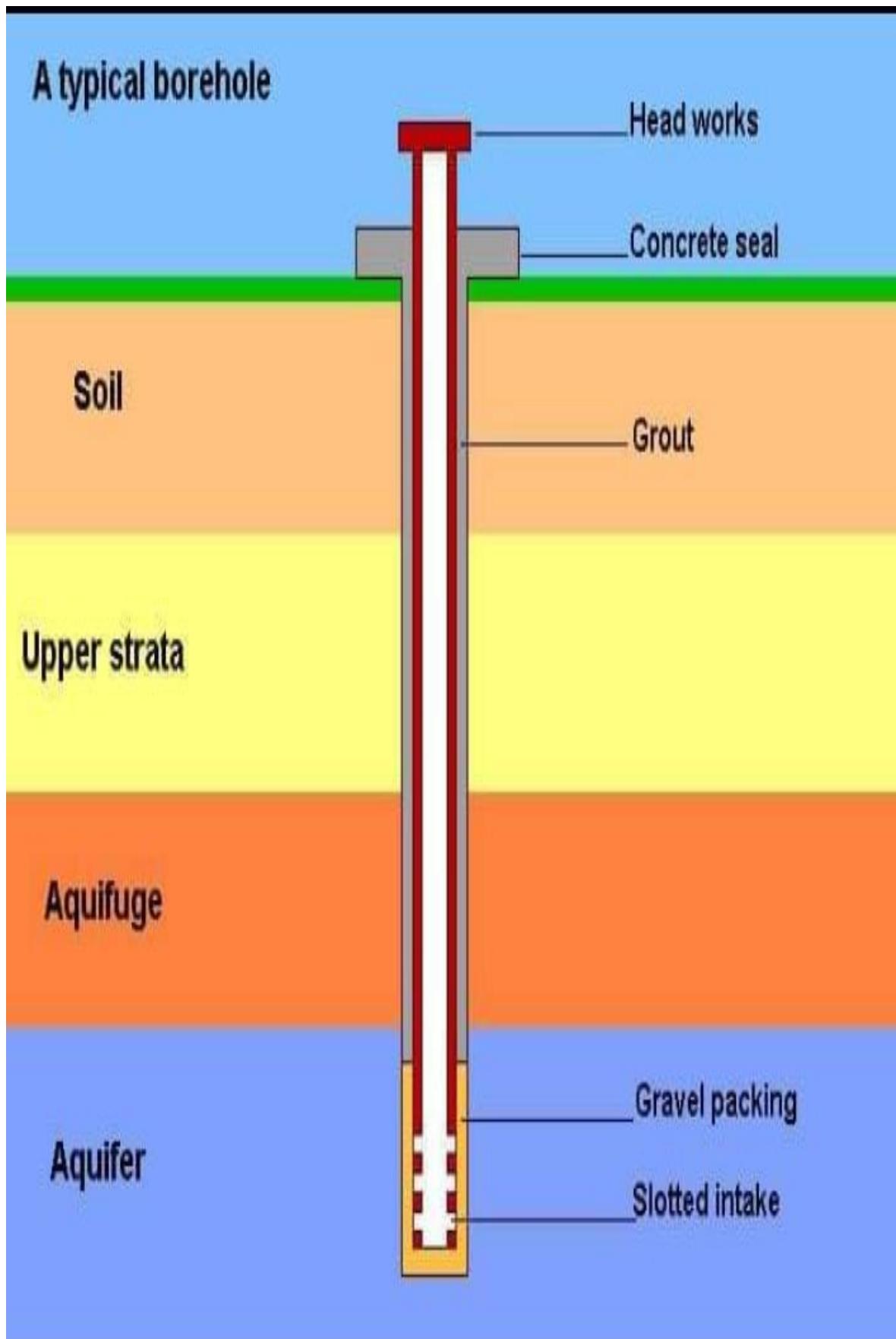


Figure 1- isoline graph of the study area



**FIGURE 2- SCHEMATIC DIAGRAM OF THE BOREHOLE DESIGN**

## **INTERPRETATION AND RECOMMENDATIONS**

1. The borehole should be drill to the depth of **40-50 meters** for drilling.
2. The fracture zones are **25, 35 meters above**.
3. **18-20** meters overburden.
4. **MUD DRILLING METHOD** should be used to drill the borehole.
5. **POINT 2** is recommended for drilling.

## **TERMS AND CONDITIONS**

- (a) The geophysical survey does not show geologist water at the sub-surface but depicts geophysical structures like fractures or weathered basements that could be dry.
- (b) The survey does not determine the actual water yield of the borehole. The volume of water in a borehole can only be determined during pump testing.
- (c) The borehole should be cased to competent rock formation to avoid collapse
- (d) Geophysical logging of the borehole should be done before the insertion of screens and casing which should be supervised by an experienced Hydrogeologist.

Geologist- Busari Abdulrasaq

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