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Extended Abstracts

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INTRODUCTION

Lagos is the industrial and commercial nerve center of Nigeria and home to over 70% of the industrial and commercial activities in the country. Metropolitan Lagos covers an area of approximately 3,577 km² in the southwestern corner of Nigeria, with its landmass lying between longitudes 2°42' E, west of Badagry and 4°22' E east of Ode-Omi and latitudes 6° 22' N along the Bight of Benin Coastline and 6°41' N (Fig. 1) Owing to inadequate supply of pipe-borne water from the water corporation, inhabitants and industries have resorted to devising means for private water supply system by sinking of boreholes and hand-dug wells. The sinking of these boreholes and had dug wells is done without any form of control or monitoring with huge volume of water extracted on a daily basis from these aquifers without any record. This work highlights the groundwater potential of the metropolis using geophysical and geochemical and geological data.

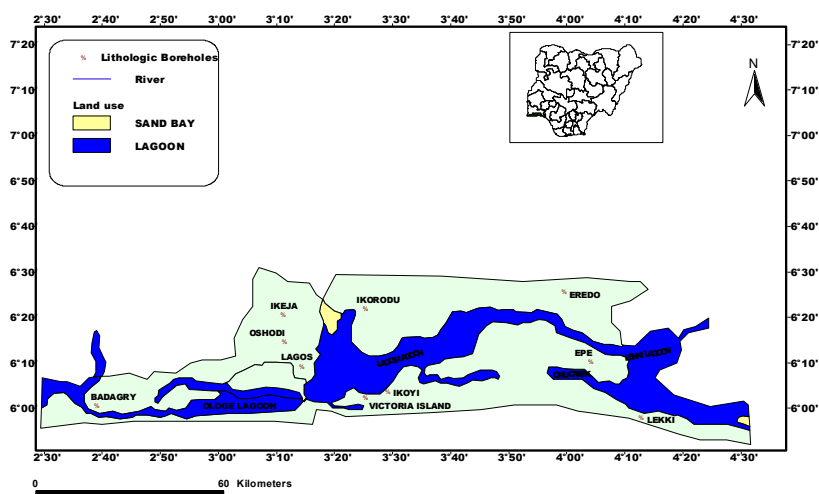


Figure 1. Location map of study area.

GEOLOGY OF LAGOS

Regionally, Lagos Metropolis is underlain by the rocks of the eastern Dahomey basin (Fig. 2).

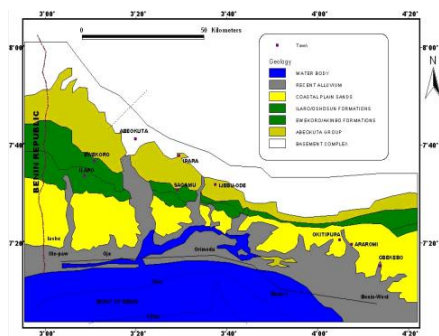


Figure 2. Geological map of Eastern Dahomey Basin (modified after Agagu, 1985).

The geology of the Lagos area is dominated by a continuous and monotonous repetition of clayey and sandy horizons. These horizons show some discernable lateral continuation and are made up of successions of sandy-clay, sands, clayey sands and gravely sands sequences. The sandy layers which are fine silty-sands to very coarse gravely sands range from reddish-brown to pinkish in colour while the clay units vary from whitish through pinkish, reddish to brown and dark-brown in colour. The sands and clay sequences are intercalated with isolated and sometimes discontinuous bands of dark-brown to black peat and lignite. An east-west traverse along the coastline from the Badagry end to Akodo showed that sands are found at the top of the section in all the boreholes along the coastline (Figs 3a & 3b).

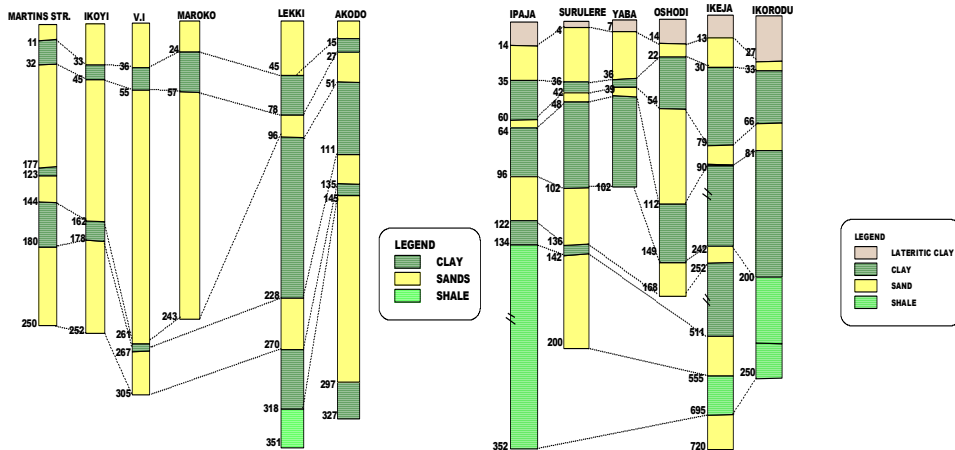


Figure 3. Stratigraphic sequence: a) from Martins Street to Akodo (E-W); b) from Ipaia to Ikorodu (E-W).

HYDROGEOLOGY, HYDROGEOPHYSICS AND HYDROGEOCHEMISTRY OF LAGOS

Borehole data revealed that most of the domestic boreholes and hand-dug wells have depths ranging from 20m to 60m while industries and the water corporation have boreholes with depths ranging from 100m to 300m with some having a depth of 700m (Olatunji, 2006). Geophysical results obtained from the metropolis revealed a plethora of apparent resistivity curves. These include the Q, K, QH, QQHA, KQHA, HKQQ, QQQ, HKQHK, HAKHK, HQKHK, KHKQK and the KHKHA types depending on the depth of penetration of the soundings. However the multi-layered curves are more dominant an indication of the chaotic depositional sequences that were responsible for the lithology. Groundwater chemistry revealed that the water samples are generally potable in terms of water quality except for some of the shallow boreholes that have been impacted by surface run-offs, saline water influence from the lagoons as well as iron contamination. The water types in the area are mainly Na-HCO₃ and Ca-(Na)-HCO₃ water types (Olatunji et al., 2005; Tijani et al., 2005).

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