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Physicochemical Characterisation and Heavy Metal Assessment of Groundwater Quality at Two Communities Housing Cement Industries in Ogun State, Nigeria

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Mining activities have been identified to impact negatively on groundwater quality. Forty samples of groundwater from were collected from two industrial communities in Ewekoro and Yewa North, Ogun State and analysed for: lead, zinc, chromium, nickel, strontium, pH, electrical conductivity (EC), temperature, total dissolved solid (TDS), dissolved oxygen, biochemical oxygen demand (BOD), total hardness, chloride, calcium, magnesium, alkalinity, potassium, sulphate and alkalinity using standard methods. The results showed the ranges of the investigated parameters in the samples as follows: temperature; 27.2±0.25^{o}C — 27.9±0.36^{o}C, pH; 5.38±0.10 — 7.75±0.03, electrical conductivity (EC); 0.06±0.020 — 1.82±0.03 µS/cm, TDS; 0.04±0.02 — 1.01±0.02 mg/L, total hardness; 23±3.00 — 1040±3.51 mg/L, dissolved oxygen; 6.55±0.03 — 12.55±0.90 mg/l, BOD; 0.10±0.02 — 16.60±0.15 mg/L, calcium; 12±2.00 — 618±7.93 mg/L, magnesium; 16±2.00 —770±5.56 mg/L, potassium; 0.50±1.00 — 3.50±0.35 mg/L, chloride; 45.5±5.25 — 283.50±0.80 mg/L, sulphate; 1.02±0.10 — 46.28±0.33 mg/L, phosphate; 0.043±0.00 — 13.10±0.28 mg/L, alkalinity; 0.70±0.20 — 4.20±0.25 mg/L, Pb; 0.421 — 0.632 mg/L, Zn; 0.01 — 0.96 mg/L, Cr; 0.000 — 0.006 mg/L, Ni; 0.043 — 0.093 mg/L and Sr; 20.119 — 32.321 mg/L. The concentrations of some of the investigated parameters such as pH, electrical conductivity (EC), temperature, total dissolved solid (TDS), dissolved oxygen, chloride, alkalinity, potassium, sulphate in the groundwater samples from were within the permissible limits of the World Health Organization standard except total hardness, calcium and magnesium levels in Papalanto and also BOD levels were found to exceed the WHO permissible limit, also lead, nickel, strontium and chromium concentration in the locations exceeded WHO permissible limit. All the above results confirmed the high pollution of the ground water sources and hence, they are not suitable for consumption without treatment.