

Title of Article: Mud Rotary Drilling in Southern Nigeria: Potential Adverse Effects of its By-Products on the Environment.

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Abstract: Boreholes are the major sources of potable water for households, communities, institutions and industries in Nigeria and the number of these boreholes continues to rise and does not show any sign of abatement. Among the current methods used for drilling boreholes, mud rotary drilling has been consistently chosen due to its low cost and efficient operation. However, no attempt has been made to assess the effects of the drilling process and the potential impact of its by-products on the environment. This work assesses the concentrations of heavy metal constituents of mud effluent collected from five well sites made of mud rotary drilling (Oraeri community in Anambra State, Yenegoa in Bayelsa State, Forcados Island in Delta State, Ohaji Egbema in Imo State, and Ndoni LGA in Rivers State) in Southern Nigeria and the impact of its by-products where they are indiscriminately disposed during and after drilling activities. The Mud effluent collected from all the sites were analyzed for metals (Manganese, copper, lead, nickel, zinc, chromium, arsenic, mercury, and iron) using atomic absorption Spectrophotometry (AAS) method. The mud effluents from the wells in all the sites have concentrations in the range of Manganese (114 to 314 mg/kg), Copper (73 to 96 mg/kg), Lead (16 to 36 mg/kg), Nickel (36 to 70 mg/kg), Zinc (4 to 79.51 mg/kg), Chromium (320 to 423 mg/kg), Arsenic (2 to 3.2 mg/kg), Mercury (Trace to 2.93 mg/kg) and Iron (14 to 229.3 mg/kg) in that order. The study also highlights the possible methods of managing the drilling mud effluent and the best practices for disposing the waste materials.