

Mudlogging, a Key Tool in Effective Well Delivery: A Case Study of Bisas Field Niger Delta, Nigeria

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Abstract : Mudlogging is the continuous analysis of rock cuttings and drilling fluids to ascertain the presence or absence of oil and gas from the formation penetrated by the drilling bit. This research highlighted a case study of Well BSS-99ST from 'Bisas Field', Niger Delta, with depth extending from 1950m to 3640m (Measured Depth). It was focused on identifying the lithologies encountered at specified depth intervals and to accurately delineate the targeted potential reservoir on the field and prepare the lithology and Master log. Equipment such as the Microscope, Fluoroscope, spin drier, oven, and chemicals, which includes: hydrochloric acid, chloroethene, and phenolphthalein, were used to check the cuttings for their calcareous nature, for oil show and for the presence of Cement respectively. Gas analysis was done using the gas chromatograph and the Flame Ionization Detector, which was connected to the Total Hydrocarbon Analyzer (THA). Drilling Parameters and Gas concentration logs were used alongside the lithology log to predict and accurately delineate the targeted reservoir on the field. The result showed continuous intercalation of sand and shale, with the presence of small quantities of siltstone at a depth of 2300m. The lithology log was generated using Log Plot software. The targeted reservoir was identified between 3478m to 3510m after inspection of the gas analysis, lithology log, electric logs, and the drilling parameters. Total gas of about 345 units and five Alkane Gas components were identified in the specific depth range. A comparative check with the Gamma ray log from the well further confirmed the lithologic sequence and the accurate delineation of the targeted potential reservoir using mudlogging.

Keywords : mudlogging, chromatograph, drilling fluids, calcareous

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