

## Evolution of Nettlespurge Oil Mud for Drilling Mud System: A Comparative Study of Diesel Oil and Nettlespurge Oil as Oil-Based Drilling Mud

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**Abstract :** Recently the low prices of Crude oil and increase in strict environmental regulations limit limits the use of diesel based muds as these muds are relatively costlier and toxic, as a result disposal of cuttings into the eco-system is a major issue faced by the drilling industries. To overcome these issues faced by the Oil Industry, an attempt has been made to develop oil-in-water emulsion mud system using nettlespurge oil. Nettlespurge oil could be easily available and its cost is around ₹30/litre which is about half the price of diesel in India. Oil-based mud (OBM) was formulated with Nettlespurge oil extracted from Nettlespurge seeds using the Soxhlet extraction method. The formulated nettlespurge oil mud properties were analysed with diesel oil mud properties. The compared properties were rheological properties, yield point and gel strength, and mud density and filtration loss properties, fluid loss and filter cake. The mud density measurement showed that nettlespurge OBM was slightly higher than diesel OBM with mud density values of 9.175 lb/gal and 8.5 lb/gal, respectively, at barite content of 70 g. Thus it has a higher lubricating property. Additionally, the filtration loss test results showed that nettlespurge mud fluid loss volumes, oil was 11 ml, compared to diesel oil mud volume of 15 ml. The filtration loss test indicated that the nettlespurge oil mud with filter cake thickness of 2.2 mm had a cake characteristic of thin and squashy while the diesel oil mud resulted in filter cake thickness of 2.7 mm with cake characteristic of tenacious, rubbery and resilient. The filtration loss test results showed that nettlespurge oil mud fluid loss volumes was much less than the diesel based oil mud. The filtration loss test indicated that the nettlespurge oil mud filter cake thickness less than the diesel oil mud filter cake thickness. So Low formation damage and the emulsion stability effect was analysed with this experiment. The nettlespurge oil-in-water mud system had lower coefficient of friction than the diesel oil based mud system. All the rheological properties have shown better results relative to the diesel based oil mud. Therefore, with all the above mentioned factors and with the data of the conducted experiment we could conclude that the Nettlespurge oil based mud is economically and well as eco-logically much more feasible than the worn out and shabby diesel-based oil mud in the Drilling Industry.

**Keywords :** economical feasible, ecological feasible, emulsion stability, nettle spurge oil, rheological properties, soxhlet extraction method

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