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A CRITICAL REVIEW OF DRILLING WASTE MANAGEMENT TOWARDS SUSTAINABLE SOLUTIONS

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Abstract

Drilling waste management for oil and gas industry involves collection, transportation, processing, recycling, disposal, and monitoring of waste materials in order to reduce their effects on health and environment. In the Exploration and Production industry, environmental concerns have made effective management of drilling waste at well sites a great priority. Effective waste management is thus a key element in a successful drilling project. The industry therefore relies on effective expertise and newer technologies to maintain a balanced trade-off between healthy business activities and environmental effects. Over several decades, the industry has recorded remarkable progress in reducing the effects of drilling activities on the environment. The progressive development and adoption of sustainable drilling waste management protocols by operating and servicing companies have been partly responsible for this success. However, new challenges are emerging due to advances in drilling techniques such as extended reach wells, deep water drilling, multi-lateral drilling, and high-pressure wells. Recently, advanced drill waste treatment methods such as nanotechnology based approach, supercritical fluid extraction, and microwave treatment process have been explored and tested in the laboratory and on pilot scale to see if they can help overcome these challenges and increasingly stringent regulations. This paper reviews the shortcomings of the conventional approaches, their treatment technologies, advantages, and applications. This article enhances understanding of waste management and its treatment process based on sustainability concept. Researchers can find this review useful as an update on the state of drill waste management in the oil and gas industry. It can also serve as a useful guide to develop new rigorous sustainable models, protocols, and techniques to manage drilling waste using the noble concept.

Keywords: drill cuttings, oil-based mud, sustainability, toxicity, waste management, waste treatment methods

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