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Regulations and methods for disposal of waste drilling fluid

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Abstract. With the emphasis on environmental protection, drilling process in the disposal of waste drilling fluid is also more and more attention by drilling people in recent years. Based on the current development status of waste drilling fluid disposal method in home and start from waste drilling fluids of the China, this paper discussed respectively of the processing method of based waste drilling fluid in the disposal of waste drilling fluids, and the field application situation. It is more convenient to choose the disposal method of abandoned drilling fluid which is suitable for a certain area, and it will be helpful to the field work.

Key words: Waste drilling fluids; disposal method; harmless treatment.

1. Introduction

With the rapid development of China's petroleum industry, more and more waste drilling fluids are produced at drilling wellsites. The production of a large amount of waste drilling fluids undoubtedly causes a heavy burden on the marine and terrestrial environment. Therefore, the treatment of waste drilling fluid and how to turn waste into treasure and realize harmless treatment will be of great significance to the ecological environment.

2. Composition and harm of waste drilling fluid

The main components of the waste drilling fluid are: clay, weighting materials, chemical additives, oil and drill cuttings, etc. Although the components and types of waste drilling fluid produced by different drilling processes are different, the salts, heavy metals, Oils, etc., will have a serious impact on the environment.

The main performance is as follows: (1) pollution of surface water and groundwater; (2) retention of heavy metals in soil, affecting plant growth and microbial reproduction, and at the same time due to plant absorption and enrichment, endangering human and animal health; (3) salt and alkali in waste drilling fluid are very harmful to plant growth, even unable to grow, resulting in soil waste.



3. Relevant regulations on disposal of waste oil-based drilling fluids in China

3.1. “Marine Environmental Protection Law of the People's Republic of China”

China issued the "Marine Environmental Protection Law of the People's Republic of China" on August 23, 1982. It provides basis for the exploration and development of offshore oil. It has been amended on December 25, 1999 and put into force officially on April 4, 2000. Article 51 has a specific requirement for the drilling and exploitation in terms of offshore oil, that is the oily sewage and oiliness compounds can only be discharged after meet the requirement that the oil content do not exceed the state specified standard.

3.2. GB18599-2001 “Criteria for the general industrial solid waste storage and pollution control of disposal sites”

This criterion stipulated the general industrial solid waste storage, and the selection, design, operation management, shut and close, pollution control and monitor of disposal sites. Disposed solid waste must meet the requirement of this criterion after the waste drilling fluids are disposed in environmentally insensitive areas.

3.3. “Biotoxicity Admissible Value of Drilling Fluids in China”

China issued the limitations of contaminant content in 2001, and moreover, it also stipulated the inspecting frequency of drilling fluids and the biotoxicity admissible value of water-based drilling fluids and oil-based drilling fluids, as in table 1.

Table 1. Biotoxicity admissible value of drilling fluids in China

categories	Sea level	Biotoxicity tolerance (mg.L ⁻¹)
Water-based drilling fluid (cuttings)	First level	30000
	Second level	20000
Oil-based drilling fluid (cuttings)	First level	10000
	Second level	8000

3.4. Punishments of optionally discharging of the waste drilling fluids

The management of oily waste produced in the exploration and development process is very strict in China, the State Supreme Procuratorate and the Supreme Court have already interpreted the sentence of the environmental crime: discharging, dumping, disposing the hazardous waste (such as oil sludge) three tons or more, will be identified as “heavily polluted environment”, and sentenced to three years of imprisonment or detention with a fine; if the consequences are particularly serious, will be sentenced to fixed-term imprisonment of not less than three years and not more than seven years and with fines.

The new amended “Marine Environmental Protection Law of the People's Republic of China” has been implemented on January 1, 2015 in China. Some new stipulations have been added into the legal liability of the Chapter Six in the law, such as a daily penalty, seizure and administrative detention. The amended law stipulates that enterprises and institutions and production operators who are disposing waste illegally, they will be punished by public security detention, and they will be prosecuted criminal responsibility according to law if their behavior can be considered as a crime.

4. The disposal status of waste oil-based drilling fluids in China

There are many disposal methods of waste oil-based drilling fluids in China before 1990s, including incineration, seal and landfill, solidification, etc. Recently, more environmentally friendly methods such as emulsification, biodegradation, cuttings reinjection are gradually applied as more attention to the environment protection and the introduction of environmental protection law in China.

Curing method

5. Conclusion

As China pays more and more attention to environmental protection, the treatment methods of waste fluid generated during drilling are also constantly improving, from the original landfill method, incineration method and other methods to more environmentally friendly and harmless solid-liquid Separation method, demulsification method and other methods better protect the ecological environment of the ocean and land, and enable energy to be recycled and reused. However, no matter which kind of treatment method has a certain range of application, it should be selected reasonably. At the same time, in order to more effectively control the environmental pollution of waste drilling fluid, we should strengthen the source, control the process, and continue to develop more adaptable New technology.

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