Analysis of Oilfield Reserve Pit Toxicity

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Abstract

Drilling waste management is currently one of the major concerns of the Oil & Gas industry, due to the strict regulations imposed by various regulatory bodies. This leads to the technological development in these industries leading to a Clean and Green Environment. Drilling processes generates a large volume of spent mud which are being directly dumped into pits in the vicinity of the operational site. This project is aimed to discuss the Drilling mud toxicity and their disposal techniques to fulfil pro-active Waste Management techniques across various operational sites in Upper Assam. It also addresses the various environmental impacts as a result of drilling mud and cuttings disposal, and emphasises on identification of the toxic elements, proper chemical treatment as integral part of waste management process.

World is also suffering from the issues of pollution due to industrial activities. The lands near oilfields are getting barren. The ineffective disposal of drilling mud is causing a great complication for the people living near the oil rigs. There fields and farms are getting contaminated from the constituents of drilling mud, which makes up the complex chemistry of drilling mud. Heavy metal is one of the most feared contaminants in the nearby areas, whose effects are still not known by the science community. This toxin drains our health without even knowing. And by the time we realize, it is too late.

Drilling fluids are currently excluded from hazardous waste regulations under the Resource Conservation and Recovery Act (RCRA). However, the United States Environmental Protection Agency (EPA) has been researching reserve pit coutents since 1986 to evaluate if oilfield wastes should continue to be excluded under this exemption. Concerns over reserve pit contents and disposal procedures have resulted in state and municipal government restrictions limiting traditional methods of reserve pit development, closure, and disposal of sludge and water. Drilling fluids that end up in reserve pits have received a lot of interest and research.

Oil and gas drilling activities generate trash that must be disposed of in a cost-effective and environmentally friendly manner. The typical method of disposal has been to dump garbage into a reserve pit at the drill site. After the well is completed, the pit trash can be dewatered and then filled, solidified, or processed in a variety of ways on-site, or it can be taken for off-site disposal. 1 Backfilling the hole on-site is the most cost-effective option. However, state and federal agencies have recently called this practice into doubt.

With this in mind, we started to look into reserve pit elements that contained waste from water-based drilling processes. Shortly after drilling operations were completed, chemical studies were performed on reserve pits. The results were collected and compiled to determine the range of inorganic elements present, and metals and ions concentrations were compared to other water-quality indicators to evaluate whether these levels would be regarded a hazard to the environment or to humans.

The presence of technologically enhanced naturally occurring radioactive substances in soil and water (sludge) recovered from reserve pits used in unconventional natural gas mining was investigated (TENORM). Total gamma, alpha, and beta radiation, as well as specific radionuclides, were measured in the samples: beryllium, potassium, scandium, cobalt, cesium, thallium, lead-210 and -214, bismuth-212 and -214, radium-226 and -228, thorium, uranium, and strontium-89 and -90. Laboratory testing verified the high beta levels of 1329 311 pCi/g.

Land disposal of oilfield waste, commonly known as "pit closure via land treatment," can be accomplished through land spreading or land farming. Lanspreading is the process of spreading garbage over the land and tilling it into the soil. No further activity is required after the initial tilling. After the initial application of waste, the soil is usually handled for multiple seasons in land farming. This additional processing may include applying fertilizers and repeatedly tilling the soil to promote oxygen intake.

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