INVESTIGATING THE PRESENCE OF HEAVY METALS IN CHUNNAKAM AND AREAS AROUND DUE TO THE CONTAMINATION OF OIL LEAKED FROM CHUNNAKAM POWER PLANT

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Abstract

The Jaffna Peninsula, is situated within the dry zone in Sri Lanka,and it is underlain by miocene limestone that is considered to have appropriate aquifer properties for groundwater storage and discharge. Among the four aquifer systems in Jaffna, chunnakam consists of high capacity and acceptable quality for drinking, agriculture and also being supplied for other water scarcity areas.The consequences of contaminated ground water or degraded surface water are often serious.During the period of 2009 improper disposal of oil directly to the ground was observed which threatened the quality of water and environment. Disposed waste oil in landfills or dumped on the ground had the possibility of seeping into groundwater contaminating wells or surface waters.

The objective of the research was to identify the levels of contamination of toxic chemicals in well as a follow up to the research conducted in 2016.Waste oil contamination data were collected through questionnaires and a sample of 46 wells were selected for analysis. The water quality of these wells was analyzed for pH, EC,Oil & Grease and heavy metals in water and soil samples.

According to the study of wells in this area 52.17% are having the oil contamination where the concentration values are greater than maximum permissible level of oil and grease in the drinking water (SLS 614, 2013) with higher oil level than the standard while no wells were not contaminated by oil or grease. As per the heavy metal analysis done in water samples, results showed contamination present in Cd^{2+}, Pb^{2+} .With reference to the SLS 614 (2013) standards for drinking water from wells, these results have shown the presence of heavy metals more than maximum permissible level, and also Cu^{2+} ,Zn^{2+} ,Fe^{2+} contamination results were under the permissible level.Pb and Cd are the causative ions for the water pollution and Zn,Fe,Cu does not cause any pollution to the water according to the study. As per the heavy metal analysis done in soil samples, results showed contamination present in Cd^{2+}, Pb^{2+} ,Fe^{2+} with reference to the SLS 614 (2013) standards for drinking water from wells, these results have shown the presence of heavy metals more than maximum permissible level, and also Cu^{2+} ,Zn^{2+} contamination results were under the permissible level. Most of the heavy metals cause for the pollution in the study area.