

Impact of Industrial Activity on Ground Water Quality— A Case Study from Orissa

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ABSTRACT

Ground water has an advantage of being less contaminated than the surface water due to its mode of occurrence. However the geological conditions such as porosity, permeability, fracture pattern of the overlying rock formation and the industrial activities around determine the proneness of ground water to pollution. The present paper deals with a case study of point source ground water pollution due to industrial activity at Kalma area, Balasore district, Orissa. The chemical industry generates huge amounts of solid waste that has affected the quality of both surface water and ground water to some extent.

At Kalma, phreatic aquifer up to 12.5 m depth was characterized by Na-Cl facies type of ground water with a general alkaline pH. Colour is greenish yellow to yellow, a characteristic of contamination due to untreated waste of chrome sulphate producing industry. Values of Cl, TH and Ca were found as high as 553 mg/l, 440 mg/l and 100 mg/l respectively. High concentration of heavy metals such as Mn, Cr, Cd, Ni, Zn and Fe up to 0.642 mg/l, 0.322 mg/l, 0.023 mg/l, 0.098 mg/l, 0.405 mg/l and 0.898 mg/l were found in the phreatic aquifer. Ground water in deeper aquifer tapped by hand pump up to 60 m depth was characterized by pH ranging within 6.59-8.62 and heavy metals such as Mn, Cd, Zn and Fe ranged up to the maximum extent of 1.292, 0.003, 1.304 and 4.658 mg/l respectively. Contamination of ground water from both phreatic and deeper aquifers near the effluent channel of the chemical industry has affected the water quality for drinking purposes.