Surface and Ground Water Quality Status in and Around Vedanta Alumina Ltd. Lanjigarh, Odisha, India

Somya Surovita Pradhan
PhD. Scholar, School of Life Sciences, Sambalpur University, Sambalpur, Odisha, India

Dr. Aliva Pattnaik
Assistant Professor, School of Life Sciences, Sambalpur University, Sambalpur, Odisha, India

Aliva Anindita Pradhan
PhD. Scholar, Department of Environmental Sciences, Sambalpur University, Sambalpur, Odisha, India

Abstract

Background: Vedanta's Alumina Refinery at Lanjigarh is having zero discharge system i.e. no water or effluent is discharged to any outside water bodies from the refinery. The effluent is recycled within the plant which helps to reduce external water by more than 60%. There is sustainable in every stage of operation starting from design, technologies, construction, and monitoring and management. The industry meet its water requirements from Tel River at Kesinga, Odisha. However development has both positive and negative aspect; it is unlikely that the plant would be able to consume all the wastewater even if they use it for dust suppression, gardening or some other activities. Therefore, there is a high possibility that some amount of wastewater may find its way into the surface and ground water. There is high risk of groundwater and surface water contamination from the red mud and fly ash disposal site.

Aim: to investigate the physicochemical qualities of surface and groundwater from the periphery of VAL at Lanjigarh, Odisha due to flyash and red mud disposal. And to determine its suitability for drinking and domestic use from Water Quality Index.

Methods: Water samples is collected during monsoon, pre and post monsoon. Sampling is carried out at different sites of Vedanta Alumina Lanjigarh Plant. Total 5 sites are selected for the study i.e 2 surface water sites and 3 tube well. Sampling bottles were rinsed at least three times before sampling was done. At surface water sites sampling bottles were immersed about 10 cm below the water surface. For ground water; samples were collected from hand pump which are used for domestic and drinking purpose. All the samples are acidified with 10% HN03, and brought to the laboratory in an closed ice box for analysis of physicochemical characteristics and heavy metal concentrations. The analysis of the sample is carried on the basis of standard methods by the American Public Health Association American Public Health Association (APHA, 2005).

Conclusion: In the present study to evaluate the pollution status, the samples were analysed and its results were compared with the standard values of Indian water quality Standards.

From the present research study, it was concluded that although the Physico chemical parameters of ground water samples and surface water samples in and around Vedanta Aluminium Company at Lanjigarh, Odisha are within safe limits of Indian standard for drinking water quality (IS: 10500) but the toxic level of harmful materials can mix up with the ground water if no precautionary measures were taken for effective treatment of the industrial effluents.

Keywords

Surface and ground water quality.