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Analysis of heavy metals in ground water of Kanpur Metro, U.P.

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ABSTRACT - This paper presents the distribution of heavy metals profile in ground water system during rainy season. In this study, five residential areas (Higher Income Group I-V, Minimum Income Group I-V, Lower Income Group I-V, Juggi Jhopari I-V, and Industrial Area I-V) were chosen and ground water samples were collected to determine the concentrations of heavy metals such as iron (Fe), copper (Cu), zinc (Zn), chromium (Cr), lead (Pb), manganese (Mn) and nickel (Ni). In this study, most of the heavy metals concentrations were exceeded to the maximum permissible concentration (MPC) as specified in the WHO standard for drinking water. These results played an important role in order to determine and visualize the location. Hence, these results can help the local authorities to take an action in terms of remediation purpose.

Key words - Heavy metals, Ground water, Pollution, Polluted water

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Ground water pollution is manmade problem which needs urgent attention of those concerned with pollution, pollution control and the consumer. However before we go into the realm of the specific problem of ground water in a city like Kanpur metro, it would be worthwhile to have a holistic picture of environmental pollution to get the right perspective. Investigations throughout the country, both in rural and urban areas have indicated the rise of various pollutants such as heavy metals (Cu, Cd, Zn, Pb, Ni, and Cr etc.) pesticides, nitrate, fluoride and bacteria in groundwater leading to various health hazards. Heavy metals are the constituents of large numbers of industrial, domestic and agricultural discharges. The toxicity of metal and its rate of uptake from solution depend on oxidation state of metal, (Pelligrini *et al*., 1999). So it is important to analyze them and study their speciation which has become an important tool in assessing environmental contamination. Bhand and Chaturvedi (1995) carried out speciation studies in the Khan River and reported distribution and variation in dissolved particulate concentrations of P, Zn and Cd.

EXPERIMENTAL METHODOLOGY

Area under study:

The present study covers the entire urban (residential) area of Kanpur metro.

Selection of sampling points:

After a survey of the city, five types of locations were chosen for collecting groundwater samples. Each type of location has have had five sampling stations which included mostly the hand pumps, and some dug wells. The sampling points were classified occupation wise using stratified Random Sampling techniques as HIG (I-IV), MIG (I-V), LIG (I-V), JJ (I-V) and IA (I-V).

Sample collection:

Samples from various groundwater sources were collected for the analysis of heavy metals.