ANALYSIS OF PHYSICO-CHEMICAL PARAMETERS OF UNDERGROUND DRINKING WATER

[1]Pankaj Kumar Singh, [2]Gauarv Kumar Rastogi,

1. Department of Civil engineering, R.D. Engineering College, Ghaziabad-201001, India
2. Department of Applied Science, R.D. Engineering College, Ghaziabad-201001, India

ABSTRACT

Water is one of the precious natural resources that exist on our planet Earth.   Without water, survival is not possible. In rural areas, water is an integral part of human life specially in agricultural field. Potable safe water is totally essential for healthy living. Adequate supply of fresh and clean water may be a basic requirement for all person on the planet. Due to over exploitation and poor management, the matter of beverage pollution and water quality management has assumed an awfully advanced form. Attention on pollution and its management has become a requirement of

hour due to way reaching impact of it on human health. Moradabad is an industrial town, globally identified for its brass business. due to completely different varieties of human activities and speedy industry, the underground water quality is additionally badly affected. Underground beverage samples at IM2 hand pumps at fourteen completely different sites at Moradabad were collected and analyzed quantitatively following commonplace strategies and procedure to estimate the extent of contamination. Water quality physico-chemical parameters were elite as per the rules of W.H.O. Underground beverage was found to be contaminated with references to most of the parameters studied, whereas it absolutely was moderately contaminated for alternative water quality parameters studied. The studies recommend that individuals hooked in to this water are liable to health hazards of contaminated beverage and a few effective measures are desperately required for water quality management.

Kew words: Water pollution, physico-chemical parameter, chemical contamination

Introduction

Water is completely essential for healthy living. It plays an essential role within the lifetime of each species that survive during this world and is needed by all living organisms for his or her existence. Improper management and reckless use of water system area unit inflicting serious threats to the supply and quality of water 1-3. This study is aimed to assess the groundwater quality of IM2 hand pumps of district Moradabad.

Experimental

Underground water samples of fourteen India Mark-II(IM2) hand pump were collected and analysed quantitatively following standard methodology of sampling and estimation[4-6]. Three samples of each site were collected, estimated and the arithmetic mean of three values is reported. A blank was also run for all volumetric titration. All the chemicals of anal R grade were used. The specification of used instruments are– Century CP 901 pH meter, RI Conductivity meter and Hach 2010 (version 6.4) spectrophotometer. The estimated water quality physico-chemical parameters are- pH, conductivity, turbidity, total solids, total dissolved solids alkalinity, dissolved oxygen, biological oxygen demand, chemical oxygen demand, hardness, calcium, magnesium,   chloride, sulphate and zinc A brief description of sampling site is given in Table 1.

Results and Discussion

Site-wise estimated values of different physico-chemical parameters with their prescribed W.H.O.[7] standards are listed in Table 2. A critical analysis of the data revealed following facts regarding ground water quality at Moradabad.

Groundwater is found to be alkaline with higher values of pH and very high values of alkalinity. The observed range of conductivity is 0.44 -1.5 µS/cm and it is much higher than the desirable limit. The estimated range of hardness is140 - 408 mg/lit and the water of all the sites of study is very hard and unfit for usage. The concentration of calcium at all the sites is higher than that of magnesium, therefore, it may be suggested that hardness of water is mainly due to salts of calcium.

The amount of dissolved oxygen in groundwater is irrelevant for the assessment of water quality, however, water samples are found to be deficient of dissolved oxygen. The observed range of biological

oxygen demand and chemical oxygen demand are 0.2-2.8 mg/lit and 20-100 mg/lit respectively. These values suggested high concentration of organic matter and presence of high amount of oxidizable inorganic chemical pollutants in groundwater of study area.

The concentration of chloride in water samples at all the sites is with in desirable limit except at site no. II where it is 101 mg/lit. The observed range of sulphate is 25-110 and zinc is 0.2-2 mg/lit and it is with in desirable limit.

Conclusion

On the basis of above discussion it may be concluded that underground water at Moradabad is alkaline, very hard and highly polluted with reference to almost all the physici-chemical parameters studied. Hardness of water is mainly due to salts of calcium and is unfit for drinking and other domestic purposes. The water is enriched with calcium and magnesium as essential micro-nutrient. The presence of high concentration of organic matter and high amount of oxidizable inorganic chemical pollutants suggests the high level of pollution of groundwater The present study suggests that people exposed to water of source of study area are prone to health hazards of polluted water and quality management is needed in the study area.

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