

Water Quality Assessment of Deep Wells in Western Misamis Oriental, Philippines

Authors : Girlie D. Leopoldo, Myrna S. Ceniza, Ronnie L. Besagas, Antonio Y. Asoy, Noel T. Dael, Romeo M. Del Rosario

Abstract : The quality of groundwater from main deep well sources of seven (7) municipalities in Western Misamis Oriental, Philippines was examined. The study looks at the well waters' physicochemical properties (temperature, pH, turbidity, conductivity, TDS, salinity, chlorides, TOC, and total hardness), the heavy metals and other metals (Pb, Cd, Al, As, Hg, Sb, Zn, Cu, Fe) and their microbiological (total coliform and E. coli) characteristics. The physicochemical properties of groundwater samples were found to be within the Philippine National Standards for Drinking Water (PNSDW)/US-EPA except for the TDS, chlorides, and hardness of some sources. Well waters from both Initao and Gitagum municipalities have TDS values of 643.2 mg/L and 578.4 mg/L, respectively, as compared to PNSDW/US-EPA standard limit of 500 mg/L. These same two municipalities Initao and Gitagum as well as the municipality of Libertad also have chloride levels beyond the 250 mg/L limit of PNSDW/US-EPA/EU with values at 360, 318 and 277 mg/L respectively. The Libertad sample also registered a total hardness of 407.5 mg/L CaCO₃ as compared to the 300 mg/L PNSDW limit. These mentioned three (3) municipalities are noticed to have similar geologic structures. Although metal analyses revealed the presence of Zn, Cu and Fe in almost all well water sources, their concentrations are below allowable limit. All well waters from the seven municipalities failed in total coliform count. Escherichia coli were also found in well waters from four (4) municipalities including Laguindingan, Lugait, Gitagum, and Libertad. The presence of these pathogens in the well waters needs to be addressed to make the waters suitable for human consumption.

Keywords : groundwater, deep well, physico-chemical, heavy metal, microbiological

Conference Title : ICNAS 2015 : International Conference on Natural and Applied Sciences

Conference Location : Montreal, Canada

Conference Dates : May 11-12, 2015