

OP-16

**Selection of nitrate as an anthropogenic indicator for natural background level estimation**

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The Natural Background Level (NBL) assessment can be done to identify contamination status of groundwater. In this study, a methodology based on hydrogeochemistry and statistical methods was proposed to derive NBL of nitrate. Nitrates are frequently used as markers of anthropogenic contamination, along with other more definite pollutants. Defining background concentrations of nitrate in ground water from natural sources is probably challenging in most environments. Anthropogenic activities are the major source of nitrate in the ground water; disruption of soils and oxidation of organic matter, and atmospheric inputs from products of combustion and evaporation of ammonia from fertilizer and livestock waste. In this study, we will compare the natural background level derived for nitrate in Netiyagama village (X-181018, Y-347127), Anuradhapura district using geochemical and statistical methods. Thirty-six groundwater samples were collected from existing well locations in Netiyagama village using random sampling techniques. The geochemical controls on natural concentrations are discussed and an approach to defining baseline concentrations using geochemical and statistical tools will be proposed. The statistical distribution of nitrate concentrations will be analysed and the outliers will be identified using statistical methods. After identifying outliers, baseline value of nitrate will be calculated. The objective of this study is to determine a NBL value for nitrate as an anthropogenic indicator. This method then can be used for determine NBL values for other chemical parameters; Na<sup>+</sup>, Mg<sup>2+</sup>, K<sup>+</sup>, Ca<sup>2+</sup>, Cl<sup>-</sup>, F<sup>-</sup>, SO<sub>4</sub><sup>2-</sup> and HCO<sub>3</sub><sup>-</sup>. The outcomes of this study will be advantageous to the sustainable management of groundwater resources in the study area.

**Keywords:** *NBL, Nitrate, Geochemical, Statistical*