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Estimation of Optimal Sampling Frequency in Groundwater Monitoring Programs

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Water sampling and analysis is costly time-consuming task. Therefore, careful designing of sampling program is an important step for sustainable monitoring programs. It has tasks to be accomplished; determination of the background values and time bound variations of water quality in a location selected as a production source of groundwater for the community. In this work we examined the variation of the water quality in groundwater production location for 3 months. Our study focusses on calculating sampling frequency using statistical approach for the source water well. One source water well was selected in Mihintale. Sampling was done every day continuously for three months on same time, and samples were analysed for basic water parameters (pH, EC, TDS, Turbidity). Sampling frequency was calculated according to approach provided by Dunnette (1980) and others (National Water Quality Hand book) (NWQH, 2003). Sampling frequency was calculated in three confidence levels at 90%, 95%, and 99%. Turbidity range was observed 0.03 to 0.48 NTU, and TDS ranged in 308 to 383 ppm. In all confidence level turbidity monitoring needs sampling in high frequency (66 samples/90 days) and TDS needs samples low frequency (1 sample/ 90 days). Rather than three months long period of data will give the good picture for this study, Monitoring is continuing. Our future directions will be on calculating sampling frequency for every separate source water and predict the changes.

Keywords: Groundwater, Monitoring, Sampling frequency, variations

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