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Spatial and temporal variations in total iron concentration in the Kalatuwawa reservoir: a comparative analysis of different depths

K. G. E. Harshana^{1*}, T. M. A. L. M. Thennakoon ¹

¹National Water Supply & Drainage Board, Sri Lanka
kgeharshana@yahoo.com*

The aim of this study is to investigate the distribution of total iron concentration at different depths of the reservoir (near intake well) and its implications for water treatment at the Kalatuwawa Water Treatment Plant. Two sampling rounds were conducted using a depth sampler to collect water samples from six specific depths below the spillway: 10 ft, 15 ft, 20 ft, 25 ft, 30 ft, and 35 ft. The total iron concentration was determined using the APHA 3500 Fe-B test method. The results obtained on June 27, 2023, revealed varying total iron concentrations across the different depths. The concentration increased progressively with depth, ranging from 0.4 ppm at 10 ft to 1.26 ppm at 35 ft. On July 6, 2023, during the subsequent sampling round, the total iron concentrations exhibited slight fluctuations compared to the previous round, ranging from 0.36 ppm at 10 ft to 1.52 ppm at 35 ft. These findings highlight the spatial variation in total iron concentration within the Kalatuwawa reservoir, with higher concentrations observed at greater depths. The study emphasizes the importance of tailored treatment strategies to effectively remove or mitigate iron-related issues faced by the Kalatuwawa Water Treatment Plant. The identified variations in total iron concentration underscore the challenges in maintaining water quality and treatment efficiency. Further investigation is warranted to determine the sources and mechanisms influencing total iron concentration in the reservoir. The knowledge gained from this study will aid in the development of targeted treatment approaches to ensure the production of safe and high-quality drinking water for the surrounding communities.

Keywords: Kalatuwawa Reservoir, Spatial Variation, Total Iron Concentration, Temporal Variation, Water Treatment, Water Quality.