# An Examination of Selected Physicochemical Water Quality Parameters of the Rivers near Kaieteur National Park

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Studies have indicated that gold mining operations increased within the vicinity of Kaieteur National Park, yet its impacts on freshwater systems could not have been assessed due to an absence of baseline data for water and sediment quality in the area. This study examined the total mercury and non-metallic physiochemical water quality parameters at four sampling sites: Echerak River, Muri-Muri River, Potaro River before Kaieteur Falls, and Potaro River after Kaieteur Falls. The physicochemical parameters (pH, turbidity, total dissolved solids, electrical conductivity and water temperature) were measured in-situ for both sub-surface and depth samples near the sediment. The mercury concentration in sediment and water sampled from Echerak and Potaro (after Kaieteur Falls) rivers were determined during the laboratory analyses. One-way ANOVA, Pearson product moment correlation, and t-test were employed to comparatively analyse the data from the sample sites. The turbidity range (0.64 - 42.30NTU) for all the samples was above the World Health Organisation (WHO) guidelines for healthy drinking water, except at Muri-Muri. However, the other physicochemical parameters of the river system were below the WHO guidelines: mean pH (3.4 – 7.7), total dissolved solids (0.00 – 12.64 mg/L), and conductivity (0.00 – 25.20 µS/cm). Mercury concentrations in water and sediment samples from Echerak River (0.082 µg/L & 0.021mg/kg) were higher than that of Potaro River (after Kaieteur Falls) (0.065 µg/L & 0.008mg/kg). At both areas, total mercury in water and sediments were below the guidelines set by WHO (0.6 µg/L); thus are safe for humans and aquatic life. These results can serve as the baseline for physicochemical and mercury evaluation of the area. To extend knowledge on the rivers near this important landmark, an investigation can be conducted on the impacts of the physiochemical parameters and mercury concentrations on the fish population.

**Keywords:** Kaieteur National Park; total mercury; river