# Mokau River - Water Quality Summary 2022

Sampling occurred between January and December 2022

**All sub-catchments**

* ***E. coli*** was low in 28% of all sites (A & B band, ≤ 246) and 24% had moderate (C band, concentrations between 295 - 512), 48% of all sites exceed health recommendations for human contact (D & E band, >550). Across all sub-catchments Mangaotaki-Mairoa had the highest proportion of sites (67%) with low concentrations (147 - 227) and the Lower Mokau had the highest proportion of sites (100%) with elevated concentrations (352 – 10,050).
* **Nitrate** concentrations were below toxicity levels at 100% of all sites (A & B band, median ≤ 1.88 mg/L; 95th percentile ≤ 2 mg/L).
* **Ammonia** concentrations were below toxicity levels at 100% of all sites (A & B band, median ≤ 0.070 mg/L; 95th percentile ≤ 0.262 mg/L).
* **The combined concentration of Nitrate and Ammonia** exceeded 0.5 mg/L at 52% of all sites. Ecological impacts, including problematic growth of algae and/or aquatic plants and loss of sensitive aquatic species are likely when the combined concentration of nitrate and ammonia regularly exceed 0.5 mg/L. Across all sub-catchments Mokauiti-Aria and Mapiu-Mapara had the most sites (83%) with low concentrations (< 0.002 – 0.010 mg/L) and Lower Mokau had more sites (100%) with elevated concentrations (0.54 – 1 mg/L).
* **Median dissolved reactive phosphorus (DRP)** was low in 83% of sites (A & B band, ≤ 0.010 mg/L) and 17% of sites had elevated concentrations (C band, between 0.012 - 0.017 mg/L). 95th percentile DRP concentrations were low in 97% sites (A & B band, ≤ 0.026 mg/L) and one site had elevated concentrations (D band, 0.153 mg/L). Across all sub-catchments Mokauiti-Aria and Mapiu-Mapara had the highest proportion of sites (83%) with low concentrations (0.1 – 0.4 mg/L) while Mangaotaki-Mairoa and Upper Mokau-Mangapehi each had two sites with elevated concentrations (0.012 – 0.017 mg/L).
* **Water clarity** was good in 24% of sites (A or B band), 3% had moderate clarity (C band) and 72% of sites had poor clarity (D band). Bands for each site relate to the national bottom line for water clarity, which is either 1.34 m or 0.61 m, and is dependent on the local geology, climate and elevation. Across all sub-catchments Mangaotaki-Mairoa had the most sites (67%) with good water clarity (165 – 3.21 m) while Lower Mokau and Mid Mokau-Pio Pio had 100% of sites with poor water clarity (≤ 0.98).

**Upper Mokau-Mangapehi**

Water quality over 2022 was generally moderate across sites. Results indicate that *E. coli* and sediment are the main contaminants to be aware of. Nitrate, in relation to its potential ecological effects, was also elevated at 2 sites. Analysis of samples collected over 2021 and 2022 indicate that *E. coli* concentrations were higher in spring and summer lower in autumn and winter. Nitrate concentrations peaked in winter and were lower in summer and autumn. Suspended sediment (as indicated by water clarity) was higher in winter and lower in summer in autumn.

* ***E. coli*** was elevated at all sites (≥ 538). The lowest concentration was recorded at 18-Mangapehi R. (538). The highest value was recorded at Mangaokewa Rd (14,865), the only site with a concentration greater than the sub-catchment (SC) baseline (5yr baseline = 5,000). No sites had values greater than the sub-catchment (SC) baseline (5yr baseline = 5,000). Concentrations peaked in spring and summer were lower in winter.
* **Nitrate** concentrations were below toxicity levels at all sites. Concentrations were lowest at 13-Mokau R. HWY 4 (median 0.39 mg/L; 95th percentile ≤ 0.73 mg/L) and highest at 18-Mangapehi R. (median 0.74 mg/L; 95th percentile 1.35 mg/L), the only site that had median and 95th percentile values greater than the SC baseline (5yr baseline = median 0.54 mg/L; 95th percentile ≤ 1.00 mg/L). Concentrations were higher in winter and spring and lower in summer and autumn.
* **Ammonia** concentrations were below toxicity levels at all sites and was exceptionally low at Mangaokewa Rd (median < 0.01 mg/L; 95th percentile ≤ 0.01 mg/L). The highest concentration was calculated for 18-Mangapehi R. (median 0.025 mg/L; 95th percentile 0.149 mg/L). Three sites (13-Mokau R. HWY 4, 14-Mangapehi R. HWY 4 and 18-Mangapehi R.) had median values greater than the SC baseline and two sites (14-Mangapehi R. HWY 4 and 18-Mangapehi R.) had a 95th percentile value above the SC baseline (5yr baseline = median 0.009 mg/L; 95th percentile ≤ 0.047 mg/L).
* **The combined concentration of nitrate and ammonia** exceeded 0.5 mg/L at two sites (18-Mangapehi R. and 14-Mangapehi R. HWY 4). Ecological impacts, including problematic growth of algae and/or aquatic plants and loss of sensitive aquatic species are likely when the combined concentration of nitrate and ammonia regularly exceed 0.5 mg/L.
* **Dissolved reactive phosphorus (DRP)** concentrations were exceptionally low at 3 out of 5 sites (median ≤ 0.005 mg/L; 95th percentile ≤ 0.010 mg/L). Concentrations were elevated at 18-Mangapehi R. and Mangaokewa Rd (Off SH30) (median ≥ 0.012 mg/L; 95th percentile ≥ 0.023 mg/L), both sites had median and 95th percentile values greater than the SC baseline (5yr SC baseline = median 0.009 mg/L; 95th percentile ≤ 0.022 mg/L). Concentrations were consistently high at 18-Mangapehi R. and Mangaokewa Rd across all seasons with an exceptional measurement recorded in Mangapehi R. in August 2022 (0.178 mg/L). DRP was otherwise variable across the remaining sites, showing no discernible seasonal pattern.
* **Water clarity** was poor at 5 out of 6 sites (≤ 1.12 m) and good at Mangaokewa Rd (Off SH30) (1.36 m) relative to the national bottom line (1.34 m). One site (14-Mangapehi R. HWY 4) had a median annual water clarity value less than the SC baseline (5yr SC baseline 0.79 m). Water clarity was higher in summer and autumn and lower in winter indicating a higher suspended sediment load in winter and a lower suspended sediment load in summer and autumn.







