

Mid Mokau-Piopio – Quarterly River Monitoring May

Sample Collection Day: 15th May 2025

Water quality was **Good** in Mokau River-above Wairere Dam (Site 7), Mokau River-HWY 4 (Site 13) and Mangapehi river-HWY 4 (Site 14), and **Fair** in Mapara stream (Site 15).

E. coli concentrations were low in Mokau river (sites 7 and 13) and Mapara stream (≤ 220 cells per 100 mL) and slightly elevated in Mangapehi river (440 cells per 100 mL). All sites fell within recommended health guidelines for swimming (540 cells per 100 mL), and Mokau river-above Wairere Dam met guidelines for livestock drinking water (< 100 cells per 100 mL).

Nitrogen: Nitrate concentrations were low at three sites (≤ 0.45 mg/L) and moderate in Mokau river-above Wairere Dam (0.65 mg/L). All sites were well below ecological toxicity levels (2.4 mg/L). **Ammonia** concentrations were low across all sites (≤ 0.02 mg/L). **Dissolved inorganic nitrogen (DIN)** was low in three sites (≤ 0.45 mg/L) and slightly elevated in Mokau river-above Wairere Dam (0.65 mg/L), exceeding the ecological impact threshold (0.5 mg/L).

Phosphorus: Dissolved reactive phosphorus (DRP) concentrations were low across all sites (≤ 0.009 mg/L).

Suspended sediment/Water Clarity: Water clarity was **Good** in Mokau river-above Wairere Dam (1.69 m) and Mangapehi river-HWY 4 (1.56 m), **Fair** in Mokau river-HWY 4 (1.39 m) and **Poor** in Mapara stream (1.15 m), relative to the national bottom line (1.34 m).

The results in the table below have been graded according to the National Policy Statement for Freshwater Management (NPS-FM, 2020).

Mid Mokau-Piopio	Human Contact	Ecosystem Health					
		Water Quality				Sediment	
		Nitrates Toxicity (mg N/L)	Ammonia Toxicity (mg N/L)	Dissolved Inorganic Nitrogen (mg N/L) ²	Dissolved Reactive Phosphorus (mg/L)	Water Clarity (m) ¹	National Bottom Line
Sample Date: 15-May-25 Lab: Analytica	E. coli/100 ml						
7-Mokau R, above Wairere Dam	78	0.65	0.02	0.65	0.008	1.69	1.34
13-Mokau R. HWY 4	220	0.28	0.02	0.28	0.005	1.39	1.34
14-Mangapehi R. HWY 4	440	0.45	0.01	0.45	0.009	1.56	1.34
15-Mapara Stm	210	0.38	<0.005	0.38	0.006	1.15	1.34

¹Water clarity has been converted from measured turbidity using the formula $\ln(\text{CLAR}) = 1.21 - 0.72 \ln(\text{TURB})$ (Franklin, Booker & Stoffels, 2020).

²Guideline values to assess ecological impacts of nitrogen on freshwater life. Attribute band limits are from the NPS-FM consultation draft (2019)

Attribute Band	
A	Ecosystem Health
B	
C	
D	
E	Human Contact only

Mokau River – Summary of water quality collected from 15 sites across the Mokau River catchment on 15th May 2025

Water quality was Fair across the Mokau River Catchment. While most sites had low to moderate levels of *E. coli*, nitrogen, and phosphorus, and water clarity was good at over half the locations, a few sites exceeded ecological thresholds for nutrients and water clarity.

***E. coli* (Microbial Contamination):**

- ◆ Most sites (60%) had low concentrations (≤ 230 cells per 100 mL) low risk for swimming.
- ◆ Two sites (13%) had very low concentrations (< 100), considered safe for livestock drinking water¹.
- ◆ A third of sites (33%) had slightly elevated concentrations (370 - 490 cells per 100 mL).
- ◆ One site (Puputaha stream) had high levels (690 cells per 100 mL) which could pose a health risk, especially when swimming.

Nitrogen

Nitrate:

- ◆ All 15 sites had low to moderate concentrations (0.06 - 0.80 mg/L), falling well below ecological toxicity thresholds (2.4 mg/L) for native fish and invertebrates.
- ◆ However, 4 sites exceeded ecological impact thresholds (0.5 mg/L), which can affect stream health.

Ammonia:

- ◆ All sites had very low concentrations ($< 0.005 - 0.08$ mg/L), little concern for aquatic life.

Dissolved Inorganic Nitrogen (DIN):

- ◆ Most sites (73%) had low concentrations (≤ 0.46 mg/L).
- ◆ Four sites (27%) were slightly elevated (0.63 - 0.80 mg/L), exceeding the ecological impact threshold of (0.5 mg/L).

Phosphorus

Dissolved Reactive Phosphorus (DRP):

- ◆ Two-thirds of sites (67%) had low levels ($< 0.002 - 0.009$ mg/L).
- ◆ Five sites (33%) were slightly elevated (0.011 – 0.014 mg/L) which can contribute to problematic plant and algae growth if levels stay high.

Suspended Sediment / Water Clarity:

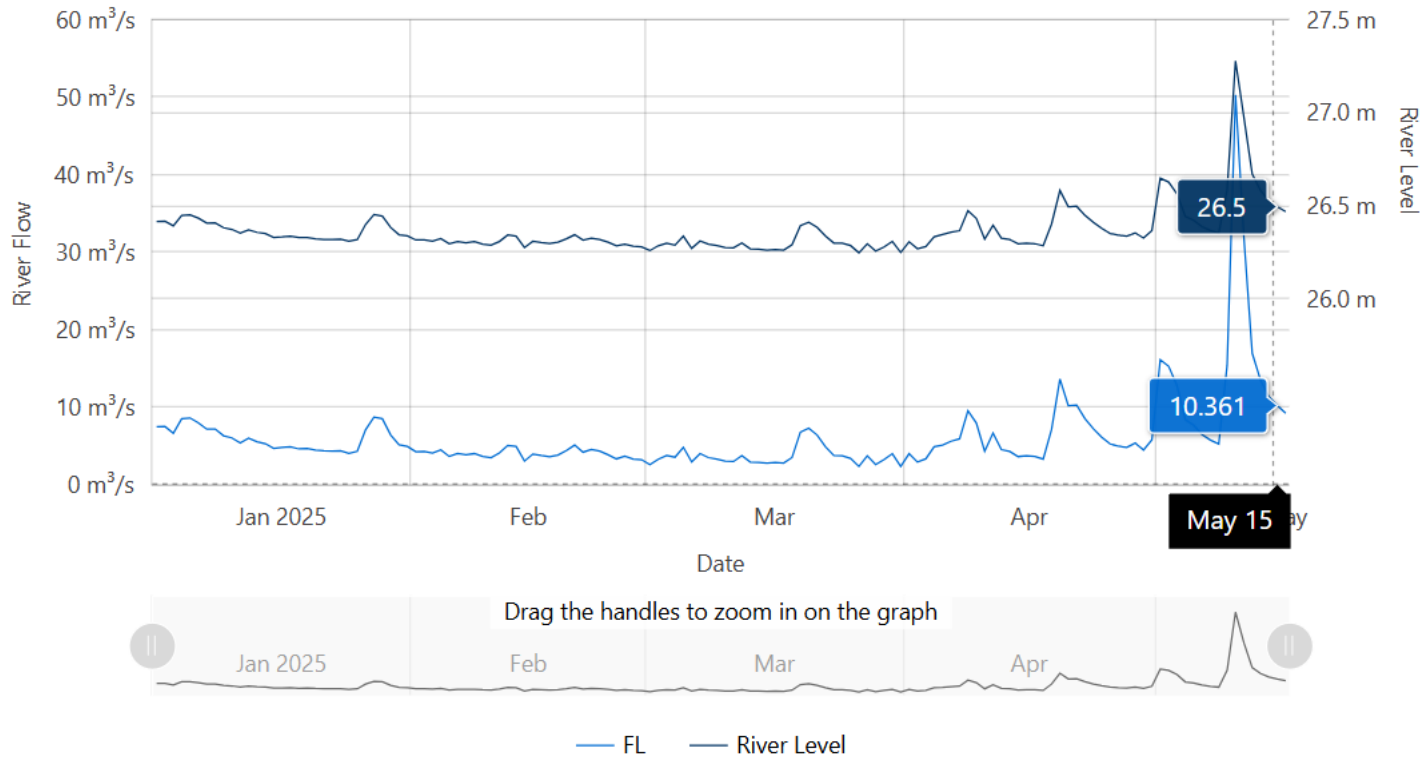
- ◆ Over half of sites (53%) had *Good* water clarity (A or B band).
- ◆ Two sites (13%) had *Fair* water clarity (C band).
- ◆ A third of sites (33%) had *Poor* water clarity (D band).

Water clarity bands for each site are based on the National Bottom Line (NBL), which varies depending on local landscape characteristics (e.g. geology, climate, and elevation). For Mokau River sites, the NBL is either 1.34 m or 0.61 m, depending on location.

¹ Drinking water for livestock should contain < 100 cfu/100 mL (median value) of *E. coli*. Livestock Drinking Water Guidelines (2023), Australian & New Zealand Guidelines for Fresh & Marine Water Quality.

River Level and Flow Rate – Mokau River, Totoro Road

The below chart presents continuous data collected by the Waikato Regional Council for Mokau River between 1st January and 16th May 2025. River Level and Flow Rate on the day of sampling (15-May) are highlighted.



Data source: Waikato Regional Council [envirohub website](https://www.waikato.govt.nz/environ) for environmental data.