Adaptive Environmental Consulting

Mokau River – Annual River Monitoring Summary - 2024

Catchment monitoring by King Country River Care, commenced in 2021. Across the entire Mokau River catchment the monitoring programme covers up to 16 monitoring sites across 6 sub-catchments sampled on a quarterly basis. Waikato Regional Council (WRC) has 5 monitoring sites in 4 of these 6 sub-catchments, which are monitored monthly. A water quality baseline was calculated from the time the catchment group was formed using five years (Jan 2015 – Dec 2019) of monthly monitoring data, collected at the WRC sites. The location of the monitoring sites for each sub-catchment are shown on Maps 1 through to 6, below.

2024 represents the fourth consecutive year of catchment monitoring. Water samples were collected on 14 Feb, 13 May, 22 August and 18 November, during stable weather to avoid any significant rainfall events. River flow strongly influences water quality and the river flow hydrograph for Mokau River at Totoro Road is provided on page 18.

The Lower Mokau River Sub-catchment

Key Resources Being Lost from the Land

Monitoring across five sites in 2024 shows that the key resources lost from the Lower Mokau sub-catchment were *E. coli* and Sediment (reflected by low water clarity). Both were elevated at all five monitoring sites.

- Loss of Sediment represents a loss of soil and nutrients.
- Elevated *E. coli* represents a loss of organic matter and nutrients as it is largely associated with animal manure in rural catchments.

Catchment Hotspots

- ***E. coli*:** Elevated at all sites - none met national health guidelines for swimming. Concentrations were highest at Mangaotaki River and Mokauitit Stream, Aria, and lowest at Mokau River at Wairere Dam.
- **Sediment:** Suspended sediment was high across all sites. The highest levels were at Awakau Road and Mokauitit Stream; the lowest levels were at Mokau river – Wairere Dam and Mangaotaki River – State Highway 3 Bridge.

The water quality dials on the following page summarise the results collected from the sites in the Lower Mokau catchment. The dial on the left shows the baseline for the catchment, covering 5 years of regional council monitoring at the five WRC monitoring sites (Awakau Road, Mokauiti Stream at 3-way Point Aria, Mangaotaki River-SH3 bridge, Totoro Road and Mangaokewa Road off SH30). The dial on the right combines all data collected at 5 sites in 2024, 52 samples in total. Arrows indicate either an increase or decrease in values compared to the sub-catchment baseline. An increase in water clarity is positive for river health while an increase in all other indicators may impair river health.

In 2024, nutrient indicators met national water quality limits, while water clarity/suspended sediment and *E. coli* did not. Compared to the baseline – Water clarity was lower and *E. coli* was greater. Conversely, dissolved reactive phosphorus and nitrogen were less than baseline levels (see Figure 1).

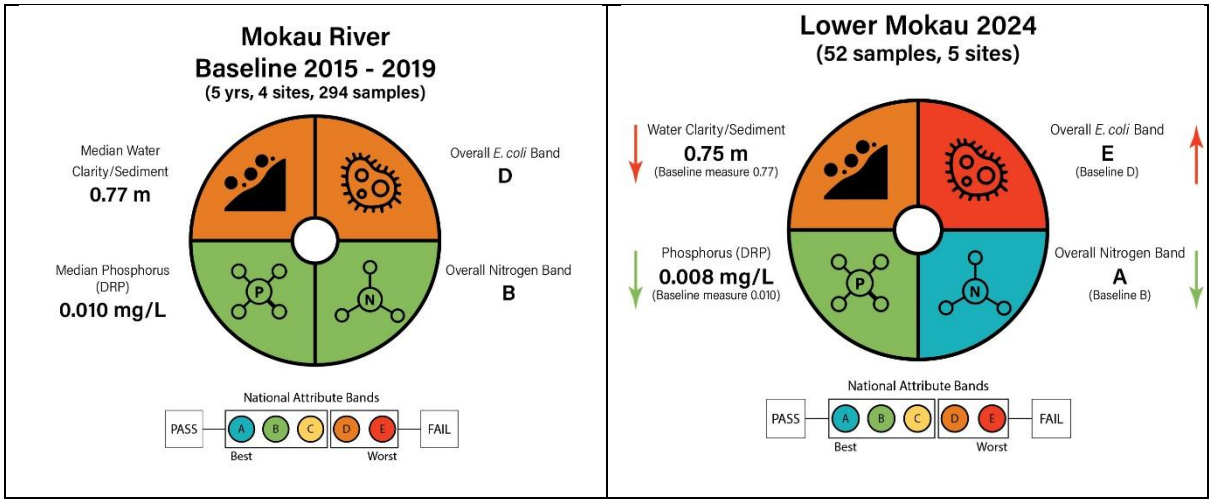


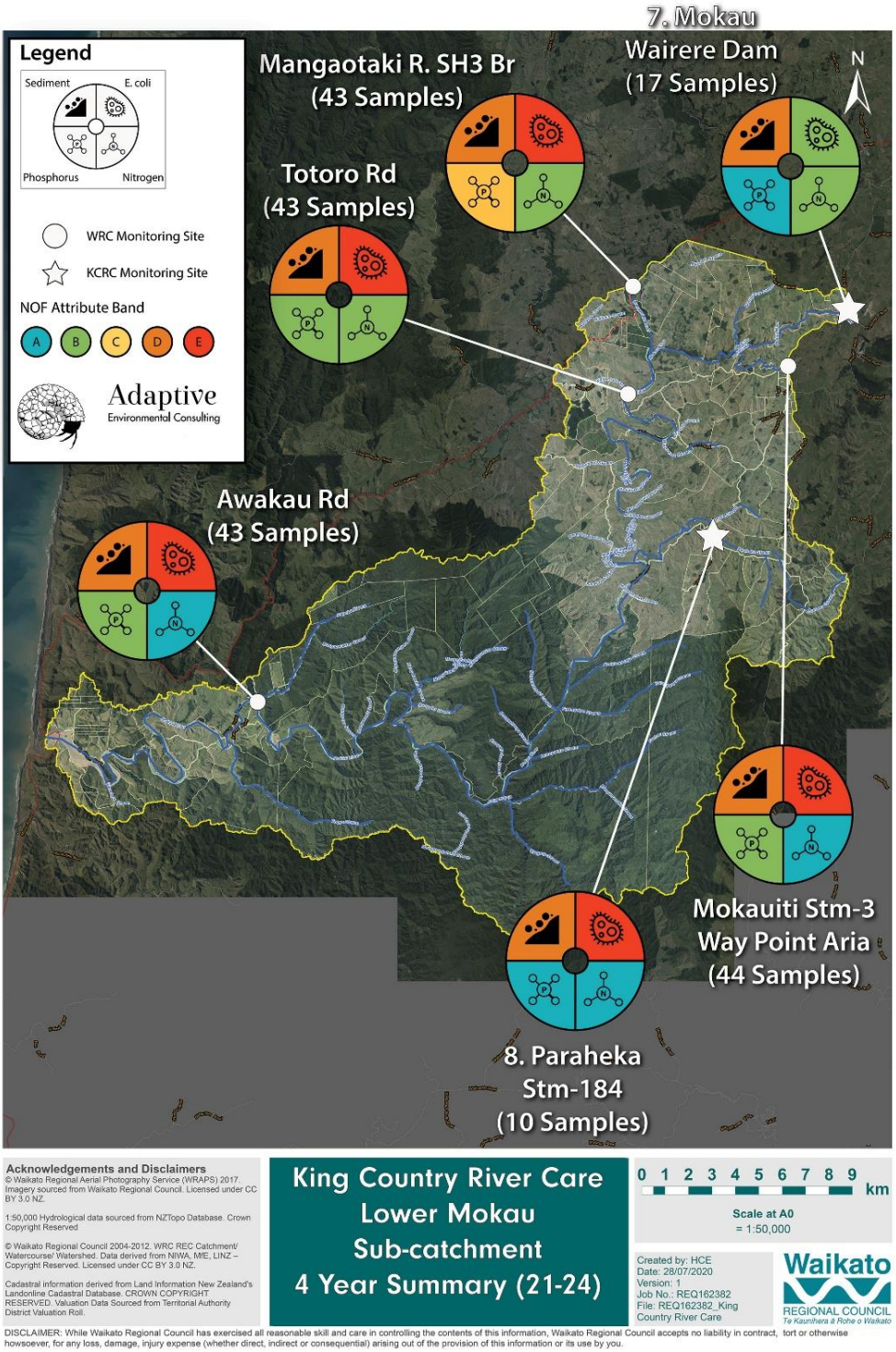
Figure 1. Water quality dials for the six sites in the Lower Mokau catchment. The dial on the left shows the sub-catchment baseline (2015-2019) and the dial on the right combines results collected in the 2024 monitoring period.

The above results have been assessed against the national freshwater attribute bands under the national policy statement for freshwater (NPS-FM 2020).

The overall *E. coli* band is based on the following four measures, the percentage of samples exceeding 540 (CFU/100ml), the percentage of samples exceeding 260 (CFU/100ml), the median value and the 95th percentile (or upper 5% of *E. coli* concentrations).

The overall nitrogen band is based on the following six measures, Nitrate Toxicity (median and 95th percentile), Ammonia Toxicity (median and maximum annual value) and Dissolved Inorganic Nitrogen (median and 95th percentile).

The dials on the map below show water quality data from seven monitoring sites in the Lower Mokau River catchment. Each dial reflects all data collected at the site since the KCRC monitoring programme in 2021, see Map 1 below. Detailed results for 2024 at each site are presented in Table 1 on page 15.



Map 1. Water quality monitoring results for 4 years of data at the six monitoring sites in Lower Mokau (four WRC Sites & two KCRC sites).

The Mangaotaki – Mairoa Sub-catchment

Key Resources Being Lost from the Land

Monitoring across four sites in 2024 shows that the key resources lost from the Mangaotaki – Mairoa sub-catchment were *E. coli* and Sediment (reflected by low water clarity).

- Loss of Sediment represents a loss of soil and nutrients.
- Elevated *E. coli* represents a loss of organic matter and nutrients as it is largely associated with animal manure in rural catchments.

Catchment Hotspots

- ***E. coli***: Elevated at all sites - none met national health guidelines for swimming. Concentrations were highest at Mangaotaki River – SH3 Bridge and 11-Mangaotaki stream, and were lowest at Waitanguru stream.
- **Sediment:** Suspended sediment was high at three out of four sites. The highest levels were at Kihikihi Stream and Mangaotaki River-SH3; the lowest levels were at Waitanguru Stream.

The below water quality dials summarise the results collected from the sites in the Mangaotaki – Mairoa sub-catchment and the Mokau River water quality Baseline. The dial on the left shows the baseline for Mokau River, covering 5 years of regional council monitoring at the five WRC monitoring sites (Awakau Road, Mokauiti Stream at 3-way Point Aria, Mangaotaki River-SH3 bridge, Totoro Road and Mangaokewa Road off SH30). The dial on the right combines all data collected at four sites in 2024, 24 samples in total. Arrows indicate either an increase or decrease in values compared to the sub-catchment baseline. An increase in water clarity is positive for river health while an increase in all other indicators may impair river health.

In 2024, nutrient indicators and water clarity/suspended sediment met national water quality limits, while *E. coli* did not. Compared to the baseline – Water clarity was higher and *E. coli* was lower. There was no difference in dissolved reactive phosphorus and nitrogen compared to baseline levels (see Figure 2).

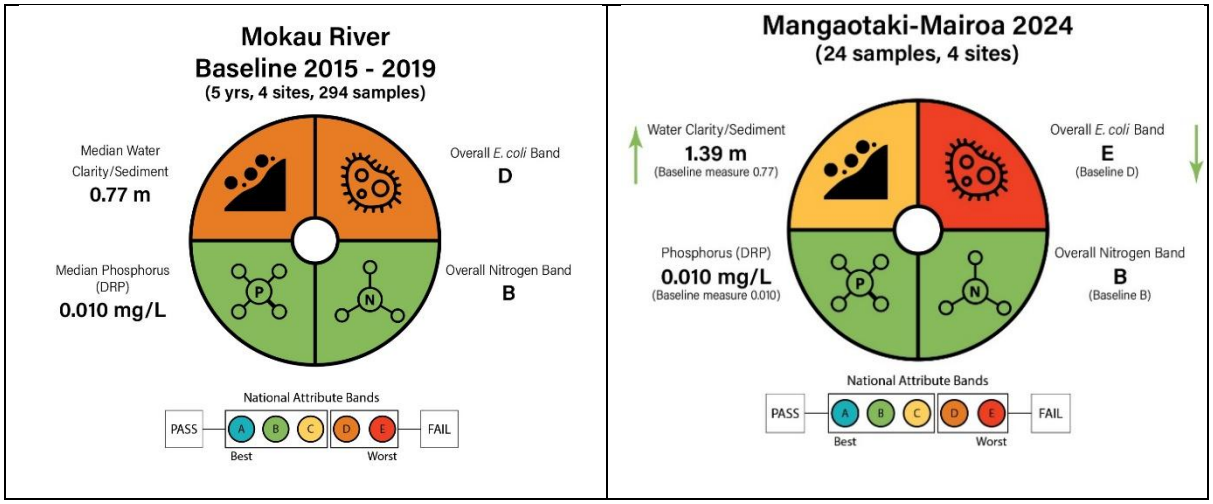


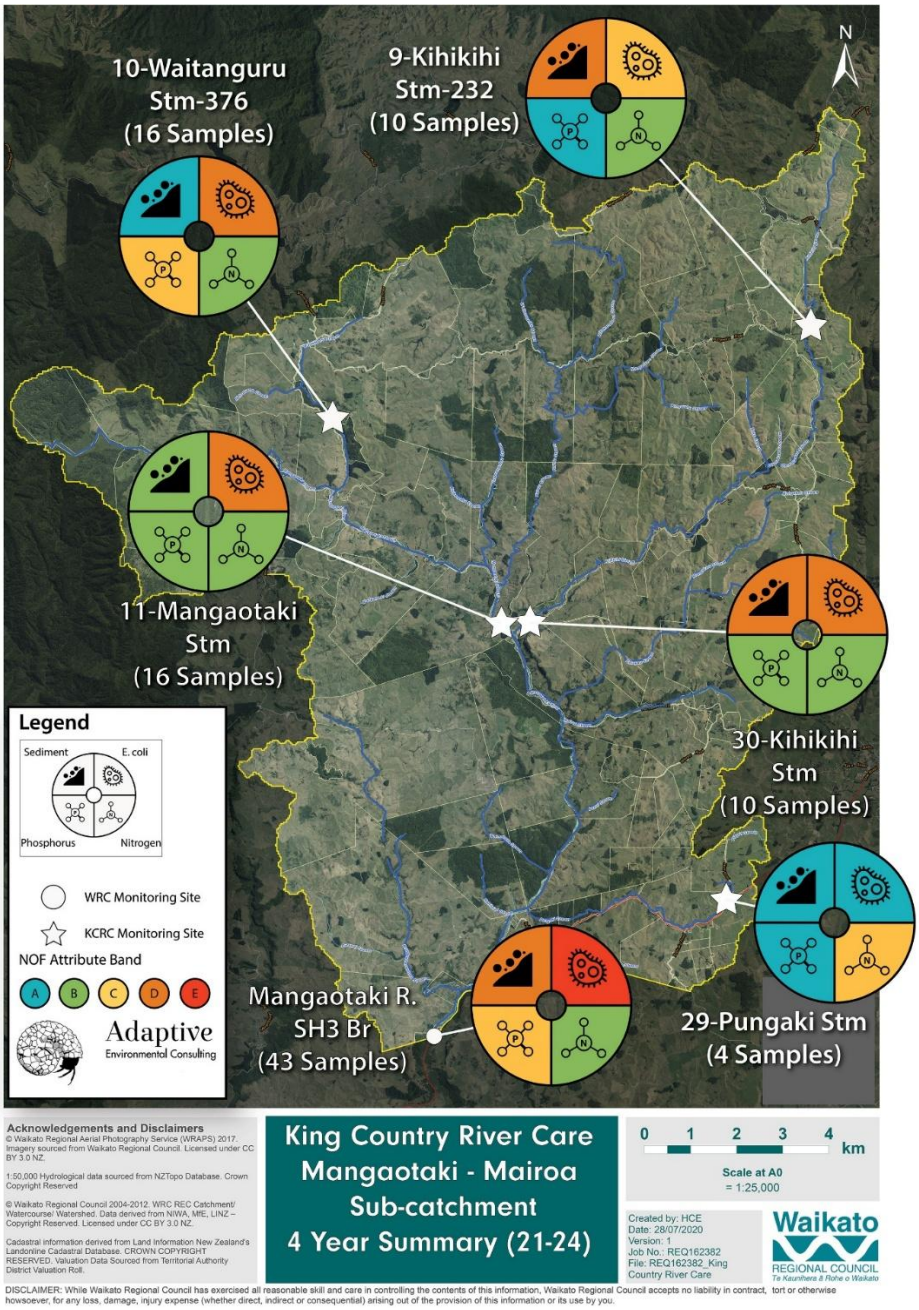
Figure 2. Water quality dials for the six sites in the Mangaotaki-Mairoa catchment. The dial on the left shows the sub-catchment baseline (2015-2019) and the dial on the right combines results collected in the 2024 monitoring period.

The above results have been assessed against the national freshwater attribute bands under the national policy statement for freshwater (NPS-FM 2020).

The overall *E. coli* band is based on the following four measures, the percentage of samples exceeding 540 (CFU/100ml), the percentage of samples exceeding 260 (CFU/100ml), the median value and the 95th percentile (or upper 5% of *E. coli* concentrations).

The overall nitrogen band is based on the following six measures, Nitrate Toxicity (median and 95th percentile), Ammonia Toxicity (median and maximum annual value) and Dissolved Inorganic Nitrogen (median and 95th percentile).

The dials on the map below show water quality data from six monitoring sites in the Mangaotaki - Mairoa River sub-catchment. Each dial reflects all data collected at the site since the KCRC monitoring programme in 2021, see Map 2 below. Detailed results for 2024 at each site are presented in Table 2 on page 15.



Map 2. Water quality monitoring results for 4 years of data at the six monitoring sites in Mangaotaki-Mairoa catchment (one WRC Site & five KCRC sites).

The Mapiu-Mapara Sub-catchment

Key Resources Being Lost from the Land

Monitoring across four sites in 2024 shows that the key resources lost from the Mapiu-Mapara sub-catchment were *E. coli* and Sediment (reflected by low water clarity).

- Loss of Sediment represents a loss of soil and nutrients.
- Elevated *E. coli* represents a loss of organic matter and nutrients as it is largely associated with animal manure in rural catchments.

Catchment Hotspots

- ***E. coli*:** Elevated at all sites - none met national health guidelines for swimming. Concentrations were highest at Mangaiti Stream, and were lowest at Mapara Stream.
- **Sediment:** Suspended sediment was high at all sites. The highest levels were at Mapiu Stream and the lowest levels were at Puputaha Stream.

The below water quality dials summarise the results collected from the sites in the Mapiu-Mapara sub-catchment and the Mokau River water quality Baseline. The dial on the left shows the baseline for Mokau River, covering 5 years of regional council monitoring at the five WRC monitoring sites (Awakau Road, Mokauiti Stream at 3-way Point Aria, Mangaotaki River-SH3 bridge, Totoro Road and Mangaokewa Road off SH30). The dial on the right combines all data collected at four sites in 2024, 16 samples in total. Arrows indicate either an increase or decrease in values compared to the sub-catchment baseline. An increase in water clarity is positive for river health while an increase in all other indicators may impair river health.

In 2024, nutrient indicators met national water quality limits, while water clarity/suspended sediment and *E. coli* did not. Compared to the baseline – Water clarity was higher and dissolved reactive phosphorus and nitrogen were lower. There was no difference in *E. coli* compared to baseline levels (see Figure 3).

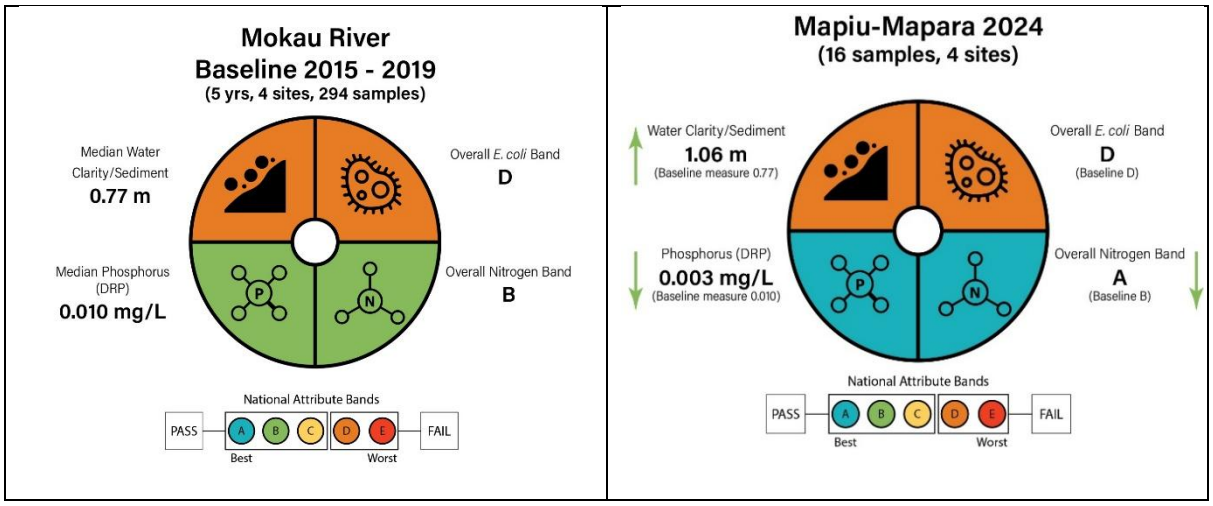


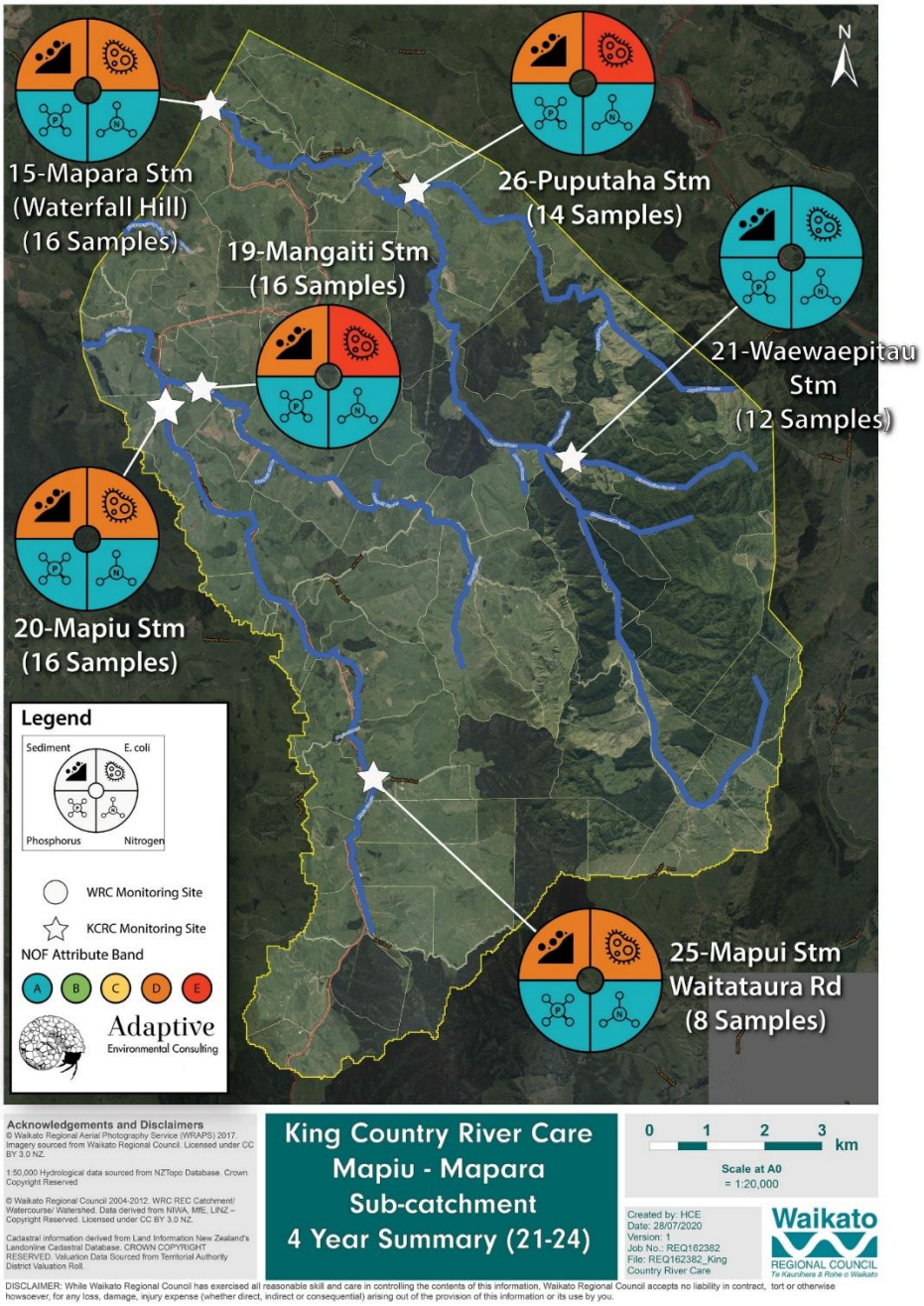
Figure 3. Water quality dials for the Mapiu-Mapara catchment. The dial on the left shows the sub-catchment baseline (2015-2019) and the dial on the right combines results collected in the 2024 monitoring period.

The above results have been assessed against the national freshwater attribute bands under the national policy statement for freshwater (NPS-FM 2020).

The overall *E. coli* band is based on the following four measures, the percentage of samples exceeding 540 (CFU/100ml), the percentage of samples exceeding 260 (CFU/100ml), the median value and the 95th percentile (or upper 5% of *E. coli* concentrations).

The overall nitrogen band is based on the following six measures, Nitrate Toxicity (median and 95th percentile), Ammonia Toxicity (median and maximum annual value) and Dissolved Inorganic Nitrogen (median and 95th percentile).

The dials on the map below show water quality data from six monitoring sites in the Mapiu - Mapara River sub-catchment. Each dial reflects all data collected at the site since the KCRC monitoring programme in 2021, see Map 3 below. Detailed results for 2024 at each site are presented in Table 3 on page 16.



Map 3. Water quality monitoring results for 4 years of data at the six monitoring sites in Mapiu-Mapara catchment.

The Mid Mokau - Piopio Sub-catchment

Key Resources Being Lost from the Land

Monitoring across four sites in 2024 shows that the key resources lost from the Mapiu-Mapara sub-catchment were Sediment and *E. coli* (reflected by low water clarity).

- Loss of Sediment represents a loss of soil and nutrients.
- Elevated *E. coli* represents a loss of organic matter and nutrients as it is largely associated with animal manure in rural catchments.

Catchment Hotspots

- **Sediment:** Suspended sediment was high at three out of four sites. The highest levels were at Mapara Stream and the lowest levels were at Mokau River-HWY 4.
- ***E. coli*:** Elevated at all sites, one site (Mokau River-Wairere Dam) did not met national health guidelines for swimming. Concentrations were highest at Mokau River above the Wairere Dam, and were comparably less at all other sites.

The below water quality dials summarise the results collected from the sites in the Mid Mokau-Piopio sub-catchment and the Mokau River water quality Baseline. The dial on the left shows the baseline for Mokau River, covering 5 years of regional council monitoring at the five WRC monitoring sites (Awakau Road, Mokauiti Stream at 3-way Point Aria, Mangaotaki River-SH3 bridge, Totoro Road and Mangaokewa Road off SH30). The dial on the right combines all data collected at four sites in 2024, 16 samples in total. Arrows indicate either an increase or decrease in values compared to the sub-catchment baseline. An increase in water clarity is positive for river health while an increase in all other indicators may impair river health.

In 2024, nutrient and *E. coli* indicators met national water quality limits, while water clarity/suspended sediment did not. Compared to the baseline – Water clarity was higher and all other parameters were lower (see Figure 4).

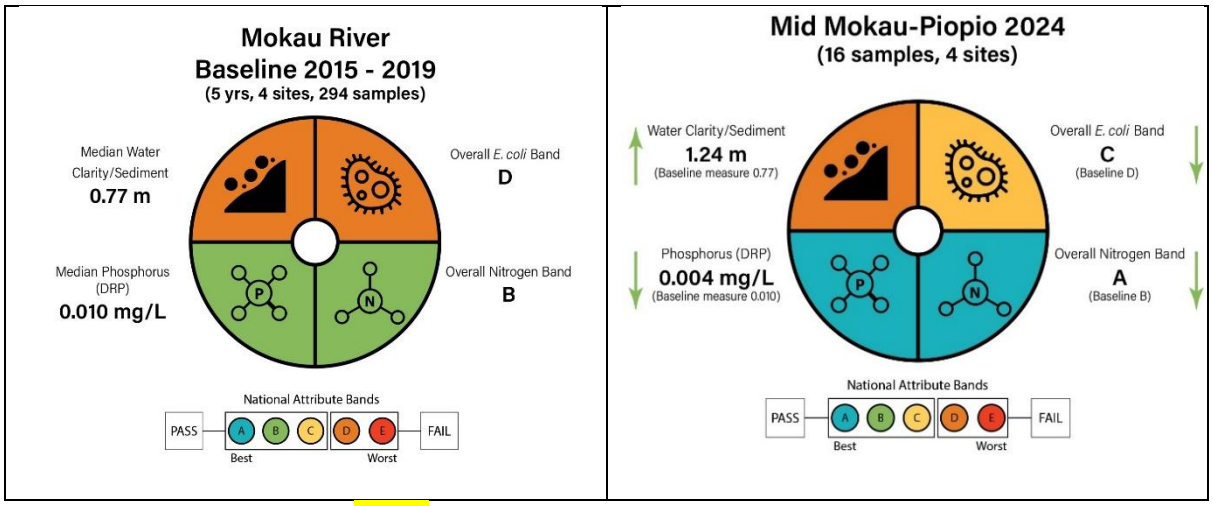


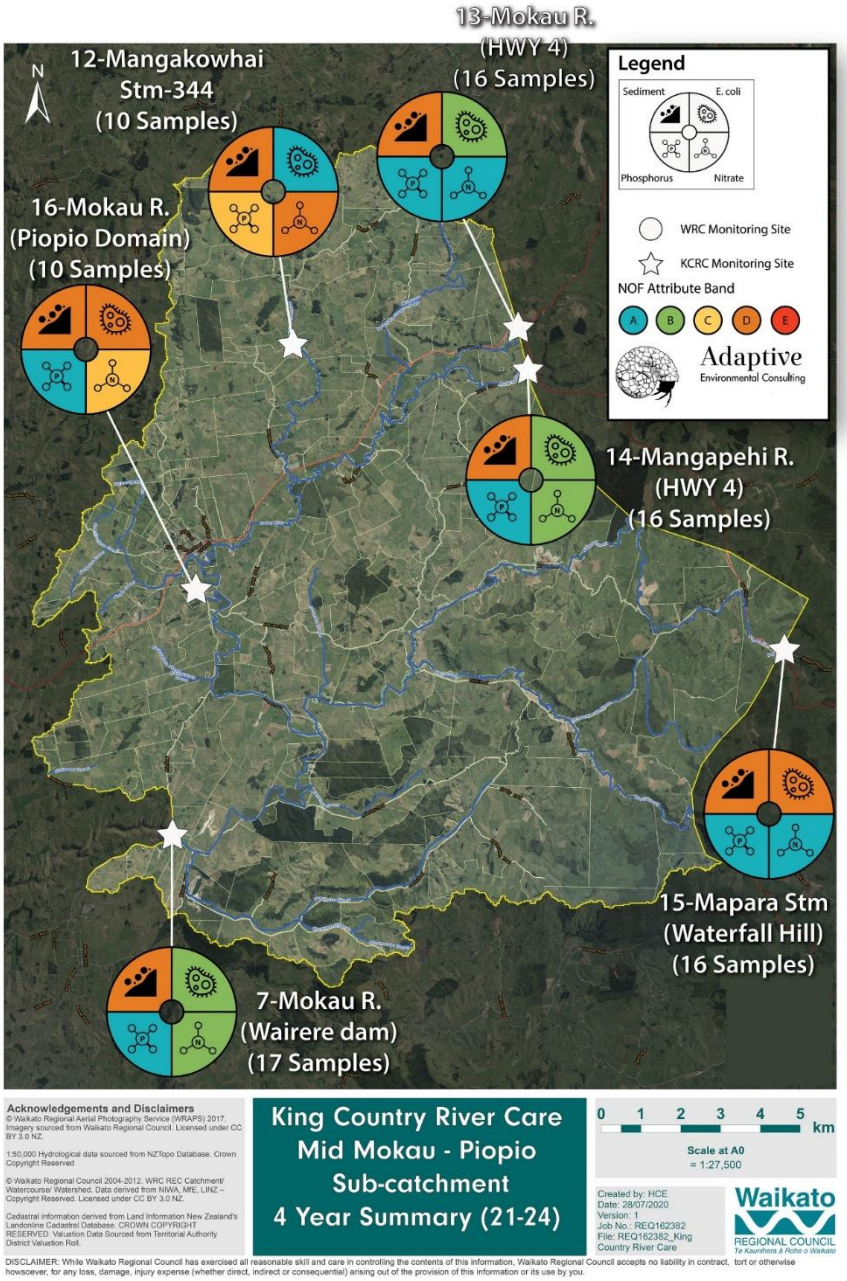
Figure 4. Water quality dials for the six sites in the Mid-Mokau-Piopio catchment. The dial on the left shows the sub-catchment baseline (2015-2019) and the dial on the right combines results collected in the 2024 monitoring period.

The above results have been assessed against the national freshwater attribute bands under the national policy statement for freshwater (NPS-FM 2020).

The overall *E. coli* band is based on the following four measures, the percentage of samples exceeding 540 (CFU/100ml), the percentage of samples exceeding 260 (CFU/100ml), the median value and the 95th percentile (or upper 5% of *E. coli* concentrations).

The overall nitrogen band is based on the following six measures, Nitrate Toxicity (median and 95th percentile), Ammonia Toxicity (median and maximum annual value) and Dissolved Inorganic Nitrogen (median and 95th percentile).

The dials on the map below show water quality data from six monitoring sites in the Mid-Mokau -Piopio sub-catchment. Each dial reflects all data collected at the site since the KCRC monitoring programme in 2021, see Map 4 below. Detailed results for 2024 at each site are presented in Table 4 on page 16.



Map 4. Water quality monitoring results for 4 years of data at the six monitoring sites in Mid-Mokau-Piopio catchment.

The Mokauiti-Aria Sub-catchment

Key Resources Being Lost from the Land

Monitoring across five sites in 2024 shows that the key resources lost from the Mokauiti-Aria sub-catchment were *E. coli* and Sediment (reflected by low water clarity).

- Loss of Sediment represents a loss of soil and nutrients.
- Elevated *E. coli* represents a loss of organic matter and nutrients as it is largely associated with animal manure in rural catchments.

Catchment Hotspots

- ***E. coli*:** Elevated at four out of five sites - three sites (Mokauiti Stream-Aria, Huioteko Stream and 28-Mokauiti Stream) did not meet national health guidelines for swimming. Concentrations were highest at Mokauitit Stream-Aria and Huioteko Stream, and were lowest at Whareroa Stream followed by Ramaroa Stream.
- **Sediment:** Suspended sediment was high at two sites. The highest levels were at Mokauitit Stream-Aria and the lowest levels were at Ramaroa Stream and Whareroa Stream.

The below water quality dials summarise the results collected from the sites in the Mokauiti-Aria sub-catchment and the Mokau River water quality Baseline. The dial on the left shows the baseline for Mokau River, covering 5 years of regional council monitoring at the five WRC monitoring sites (Awakau Road, Mokauiti Stream at 3-way Point Aria, Mangaotaki River-SH3 bridge, Totoro Road and Mangaokewa Road off SH30). The dial on the right combines all data collected at five sites in 2024, 28 samples in total. Arrows indicate either an increase or decrease in values compared to the sub-catchment baseline. An increase in water clarity is positive for river health while an increase in all other indicators may impair river health.

In 2024, indicators for nutrients met national water quality limits, while water clarity/suspended sediment and *E. coli* did not. Compared to the baseline – Water clarity was higher and nutrients were lower. Conversely, *E. coli* was greater than baseline levels (see Figure 5).

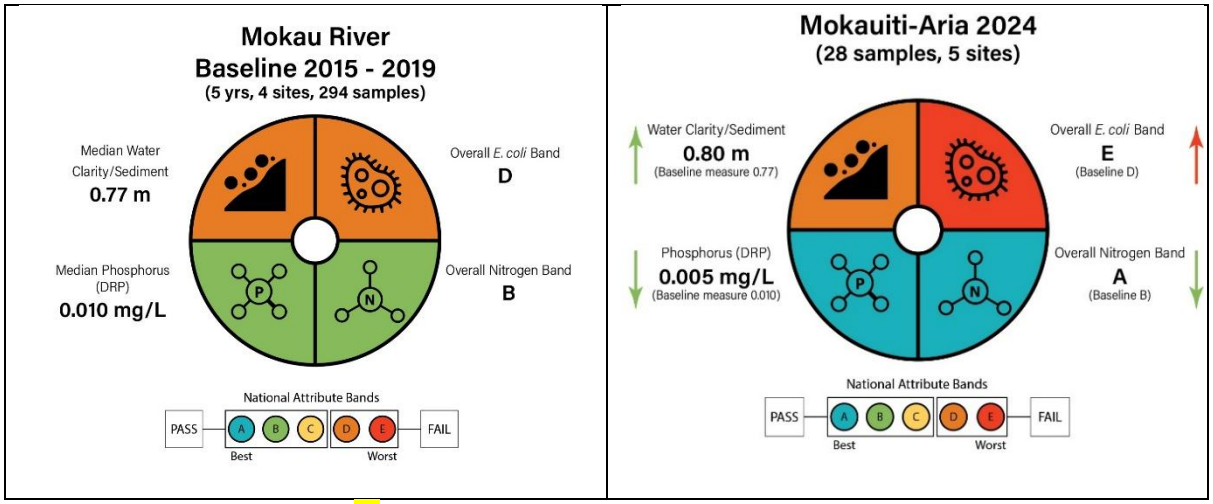


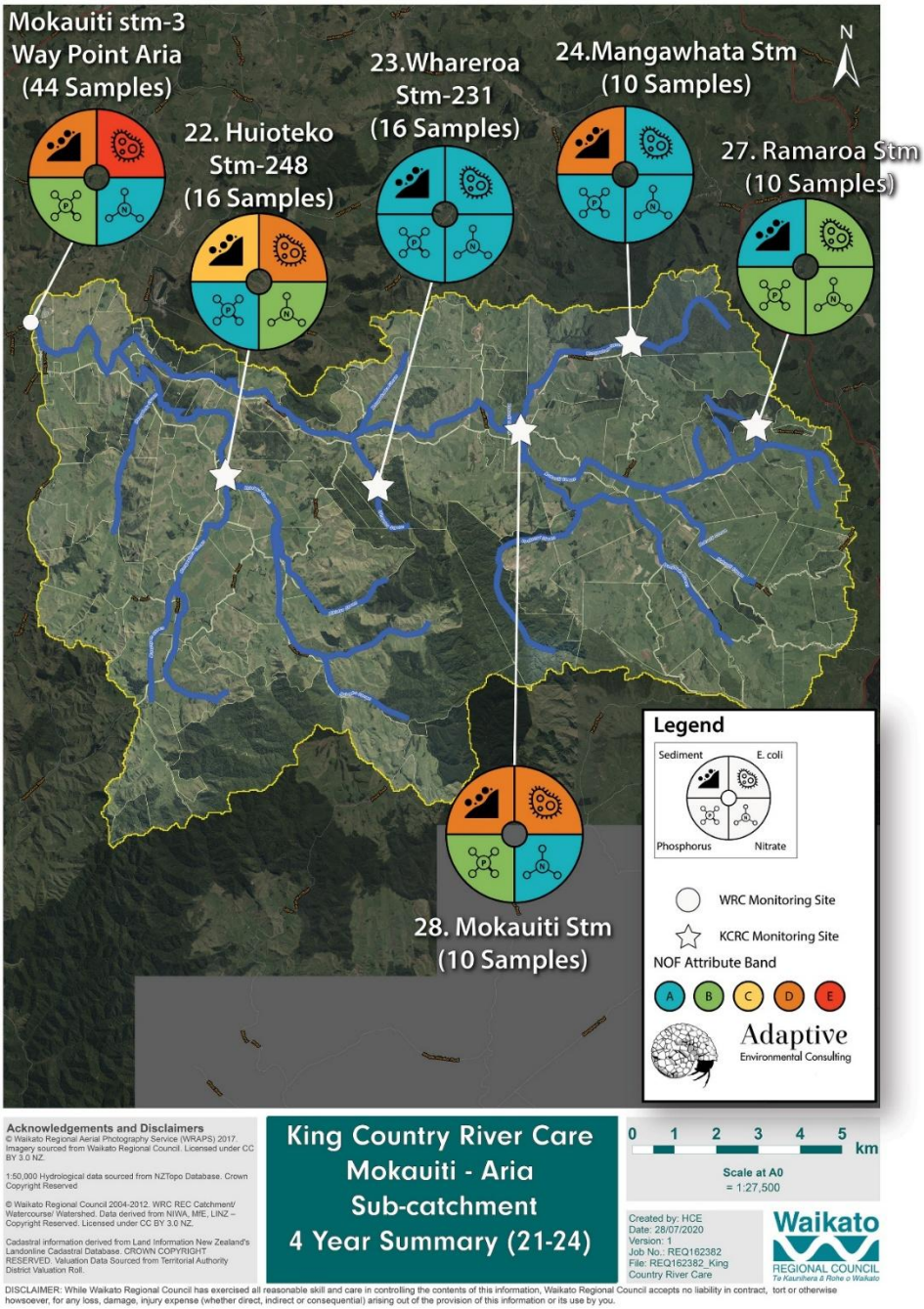
Figure 5. Water quality dials for the six sites in the Makauiti-Aria catchment. The dial on the left shows the sub-catchment baseline (2015-2019) and the dial on the right combines results collected in the 2024 monitoring period.

The above results have been assessed against the national freshwater attribute bands under the national policy statement for freshwater (NPS-FM 2020).

The overall *E. coli* band is based on the following four measures, the percentage of samples exceeding 540 (CFU/100ml), the percentage of samples exceeding 260 (CFU/100ml), the median value and the 95th percentile (or upper 5% of *E. coli* concentrations).

The overall nitrogen band is based on the following six measures, Nitrate Toxicity (median and 95th percentile), Ammonia Toxicity (median and maximum annual value) and Dissolved Inorganic Nitrogen (median and 95th percentile).

The dials on the map below show water quality data from six monitoring sites in the Mokauiti - Aria sub-catchment. Each dial reflects all data collected at the site since the KCRC monitoring programme in 2021, see Map 5 below. Detailed results for 2024 at each site are presented in Table 5 on page 17.



Map 5. Water quality monitoring results for 4 years of data at the six monitoring sites in Mokauiti-Aria catchment (five WRC Sites & one KCRC site).

The Upper Mokau – Mangapehi Sub-catchment

Key Resources Being Lost from the Land

Monitoring across four sites in 2024 shows that the key resources lost from the Upper Mokau – Mangapehi sub-catchment were Sediment and *E. coli* (reflected by low water clarity).

- Loss of Sediment represents a loss of soil and nutrients.
- Elevated *E. coli* represents a loss of organic matter and nutrients as it is largely associated with animal manure in rural catchments.

Catchment Hotspots

- ***E. coli*:** Elevated at two out of four sites (18-Mangapehi River and Mangaokewa Road-off SH30) – neither site met national health guidelines for swimming. Concentrations were highest at Mangaokewa Road-off SH30, and were lowest at 13-Mokau River-HWY4 and 14-Mangapehi River-HWY4.
- **Sediment:** Suspended sediment was elevated at three sites. The highest levels were at 14-Mangapehi River-HWY4 and the lowest levels were at 13-Mokau River-HWY4.

The below water quality dials summarise the results collected from the sites in the Upper Mokau - Mangapehi sub-catchment and the Mokau River water quality Baseline. The dial on the left shows the baseline for Mokau River, covering 5 years of regional council monitoring at the five WRC monitoring sites (Awakau Road, Mokauiti Stream at 3-way Point Aria, Mangaotaki River-SH3 bridge, Totoro Road and Mangaokewa Road off SH30). The dial on the right combines all data collected at four sites in 2024, 24 samples in total. Arrows indicate either an increase or decrease in values compared to the sub-catchment baseline. An increase in water clarity is positive for river health while an increase in all other indicators may impair river health.

In 2024, indicators for nutrients and water clarity/suspended sediment met national water quality limits, while *E. coli* did not. Compared to the baseline – Water clarity was higher and nutrients were lower. Conversely, *E. coli* was no different from baseline levels (see Figure 6).

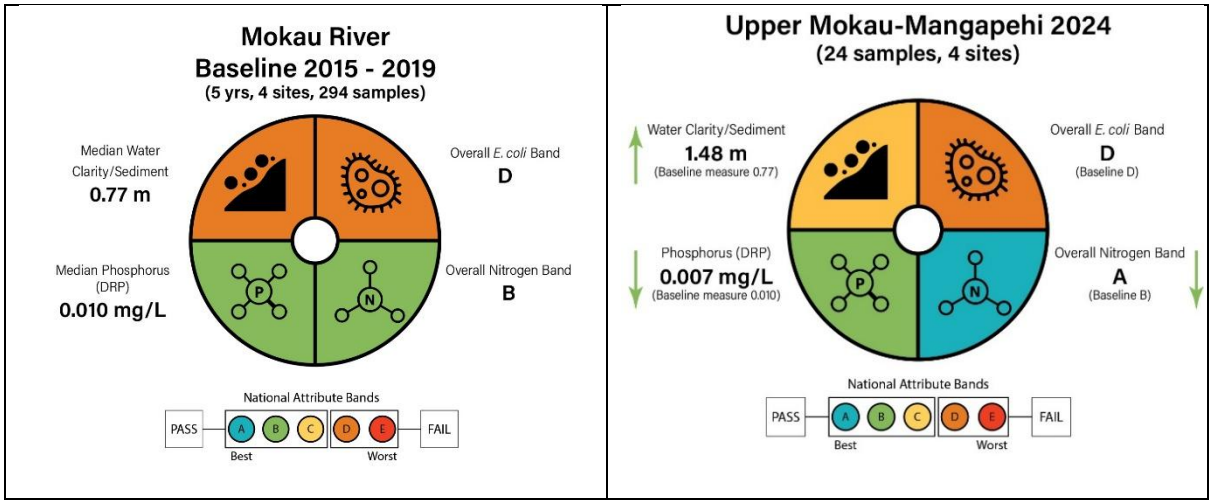


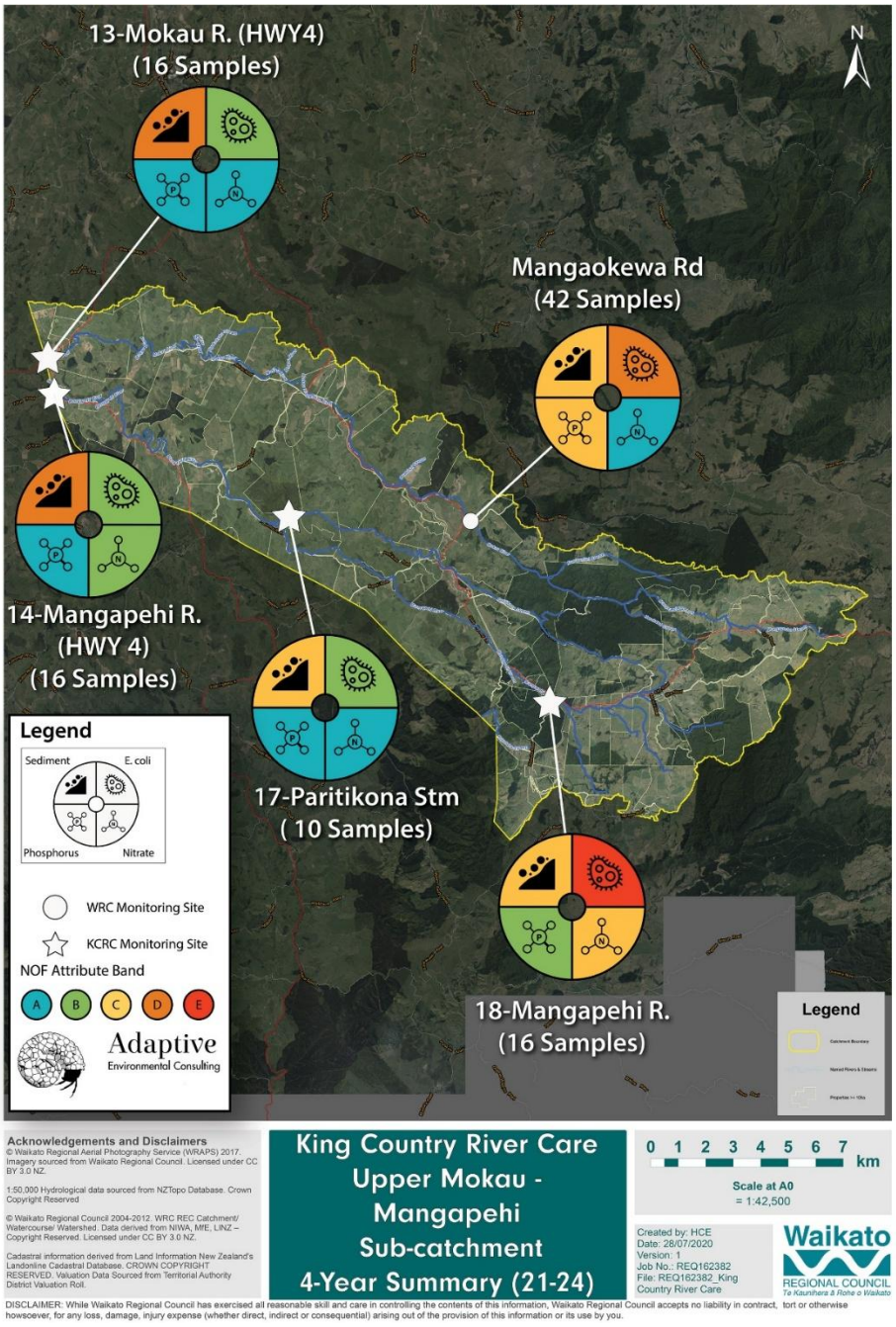
Figure 6. Water quality dials for the Upper Mokau-Mangapehi catchment. The dial on the left shows the sub-catchment baseline (2015-2019) and the dial on the right combines results collected in the 2024 monitoring period.

The above results have been assessed against the national freshwater attribute bands under the national policy statement for freshwater (NPS-FM 2020).

The overall *E. coli* band is based on the following four measures, the percentage of samples exceeding 540 (CFU/100ml), the percentage of samples exceeding 260 (CFU/100ml), the median value and the 95th percentile (or upper 5% of *E. coli* concentrations).

The overall nitrogen band is based on the following six measures, Nitrate Toxicity (median and 95th percentile), Ammonia Toxicity (median and maximum annual value) and Dissolved Inorganic Nitrogen (median and 95th percentile).

The dials on the map below show water quality data from five monitoring sites in the Upper Mokau - Mangapehi sub-catchment. Each dial reflects all data collected at the site since the KCRC monitoring programme in 2021, see Map 6 below. Detailed results for 2024 at each site are presented in Table 6 on page 17.



Map 6. Water quality monitoring results for 4 years of data at the five monitoring sites in the Upper Mokau-Mangapehi catchment (one WRC Site & four KCRC sites).

Water Quality Tables

Tables 1 to 6 on pages (15-17) present detailed results for each site in the six Mokau River sub-catchments.

Water quality results have been assessed under national (NPS-FM) water quality targets and have been colour coded as shown the adjacent key, Figure 4.

The overall *E. coli* band is based on the following four measures, the percentage of samples exceeding 540 and 260 (CFU/100ml), the median value and the 95th percentile (or upper 5% of *E. coli* concentrations).

The overall nitrogen band is based on the following six measures, Nitrate Toxicity (median and 95th percentile), Ammonia Toxicity (median and maximum annual value) and Dissolved Inorganic Nitrogen (median and 95th percentile).

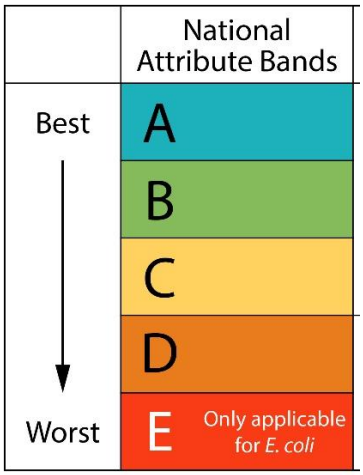


Figure 3 Key for grading shown in Tables 1 to 3

Table 1) Water quality indicators for individual sites in the Lower Mokau catchment recorded over the 2024 monitoring period. Measured values have been assessed against the National Attribute Bands (NPS-FM, 2020).

Lower Mokau	Number of Samples	Human Health					Ecosystem Health										
							Water Quality									Sediment	
Annual Summary 2024		*E. coli* /100 ml					Nitrate Toxicity (mg N/L)		Ammonia Toxicity (mg N/L)		Dissolved Inorganic Nitrogen-DIN (mg N/L)		Overall Nitrogen Band	Dissolved Reactive Phosphorus (mg/L)		Water Clarity Value[1]	National Bottom Line
KCRC SITES Lab: Analytica		% Exc. > 540	% Exc. > 260	Median	95th Percentile	Overall Band	Median	95th Percentile	Median	Annual Maximum	Median	95th Percentile		Median	95th Percentile	Median	
7-Mokau R, above Wairere Dam*	4	25%	50%	225	643	D	0.44	0.62	0.020	0.030	0.45	0.64	A	0.005	0.006	1.19	1.34
WRC SITES Lab: Hills																	
Awakau Rd	12	25%	33%	205	3,130	E	0.42	0.67	0.007	0.018	0.42	0.68	A	0.007	0.018	0.44	0.61
Mokauiti Stm-3 Way Point Aria	12	25%	75%	325	3,215	E	0.31	0.51	0.009	0.020	0.32	0.54	A	0.006	0.014	0.57	1.34
Mangaotaki River-SH3 Br	12	42%	75%	340	3,260	E	0.68	0.91	0.004	0.011	0.69	0.91	B	0.012	0.018	1.16	1.34
Totoro Rd	12	8%	42%	200	3,043	E	0.55	0.80	0.004	0.017	0.56	0.81	B	0.010	0.019	0.75	1.34
Mokau R. Baseline (Jan-2015 to Dec-2019)	**294**	**27%**	**43%**	**210**	**6,000**	**D**	**0.55**	**1.00**	**0.009**	**0.164**	**0.559**	**1.014**	**B**	**0.010**	**0.021**	**0.77**	**1.34**

[1]*Water clarity has been converted from measured turbidity using the formular ln(CLAR) = 1.21 – 0.72 ln(TURB) (Franklin, Booker & Stoffels, 2020).*

Table 2) Water quality indicators for individual sites in the Mangaotaki-Mairoa catchment, recorded over the 2024 monitoring period. Measured values have been assessed against the National Attribute Bands (NPS-FM, 2020).

Mangaotaki-Mairoa	Number of Samples	Human Health					Ecosystem Health										
							Water Quality									Sediment	
Annual Summary 2024		*E. coli* /100 ml					Nitrate Toxicity (mg N/L)		Ammonia Toxicity (mg N/L)		Dissolved Inorganic Nitrogen-DIN (mg N/L)		Overall Nitrogen Band	Dissolved Reactive Phosphorus (mg/L)		Water Clarity Value[1]	National Bottom Line
KCRC SITES Lab: Analytica		% Exc. > 540	% Exc. > 260	Median	95th Percentile	Overall Band	Median	95th Percentile	Median	Annual Maximum	Median	95th Percentile		Median	95th Percentile	Median	
10-Waitanguru Stm-376	4	25%	25%	170	549	D	0.80	0.89	0.005	0.006	0.80	0.90	B	0.011	0.057	2.27	1.34
11-Mangaotaki R.	4	25%	75%	425	916	E	0.62	0.69	0.007	0.008	0.63	0.70	B	0.008	0.018	1.46	1.34
30-Kihikihi Stm	4	25%	50%	295	843	D	0.78	0.90	0.007	0.010	0.79	0.91	B	0.008	0.009	1.15	1.34
WRC SITES Lab: Hills																	
Mangaotaki River-SH3 Br	12	42%	75%	340	3,260	E	0.68	0.91	0.004	0.011	0.69	0.91	B	0.012	0.018	1.16	1.34
Mokau R. Baseline (Jan-2015 to Dec-2019)	**294**	**27%**	**43%**	**210**	**6,000**	**D**	**0.55**	**1.00**	**0.009**	**0.164**	**0.559**	**1.014**	**B**	**0.010**	**0.021**	**0.77**	**1.34**

[1]*Water clarity has been converted from measured turbidity using the formular ln(CLAR) = 1.21 – 0.72 ln(TURB) (Franklin, Booker & Stoffels, 2020).*

Table 3) Water quality indicators for individual sites in the Mapiu-Mapara catchment, recorded over the 2024 monitoring period. Measured values have been assessed against the National Attribute Bands (NPS-FM, 2020).

Mapiu-Mapara	Number of Samples	Human Health					Ecosystem Health										
							Water Quality									Sediment	
Annual Summary 2024		*E. coli* /100 ml					Nitrate Toxicity (mg N/L)		Ammonia Toxicity (mg N/L)		Dissolved Inorganic Nitrogen-DIN (mg N/L)		Overall Nitrogen Band	Dissolved Reactive Phosphorus (mg/L)		Water Clarity Value[1]	National Bottom Line
KCRC SITES Lab: Analytica		% Exc. > 540	% Exc. > 260	Median	95th Percentile	Overall Band	Median	95th Percentile	Median	Annual Maximum	Median	95th Percentile		Median	95th Percentile	Median	
15-Mapara Stm	4	0%	25%	160	425	D	0.30	0.42	0.005	0.008	0.31	0.42	A	0.004	0.015	1.14	1.34
19-Mangaiti Stm	4	25%	75%	310	1,323	E	0.20	0.30	0.010	0.020	0.21	0.32	A	0.002	0.002	1.06	1.34
20-Mapiu Stm	4	25%	25%	160	846	D	0.29	0.43	0.007	0.010	0.30	0.44	A	0.002	0.003	0.83	1.34
26-Puputaha Stream	4	25%	50%	295	918	D	0.41	0.47	0.005	0.009	0.42	0.47	A	0.006	0.021	1.43	1.34
Mokau R. Baseline (Jan-2015 to Dec-2019)	**294**	**27%**	**43%**	**210**	**6,000**	**D**	**0.55**	**1.00**	**0.009**	**0.164**	**0.559**	**1.014**	**B**	**0.010**	**0.021**	**0.77**	**1.34**

[1]*Water clarity has been converted from measured turbidity using the formular ln(CLAR) = 1.21 – 0.72 ln(TURB) (Franklin, Booker & Stoffels, 2020).*

Table 4) Water quality indicators for individual sites in the Mid-Mokau-Piopio catchment, recorded over the 2024 monitoring period. Measured values have been assessed against the National Attribute Bands (NPS-FM, 2020).

Mid Mokau-Piopio	Number of Samples	Human Health					Ecosystem Health										
							Water Quality									Sediment	
Annual Summary 2024		*E. coli* /100 ml					Nitrate Toxicity (mg N/L)		Ammonia Toxicity (mg N/L)		Dissolved Inorganic Nitrogen-DIN (mg N/L)		Overall Nitrogen Band	Dissolved Reactive Phosphorus (mg/L)		Water Clarity Value[1]	National Bottom Line
KCRC SITES Lab: Analytica		% Exc. > 540	% Exc. > 260	Median	95th Percentile	Overall Band	Median	95th Percentile	Median	Annual Maximum	Median	95th Percentile		Median	95th Percentile	Median	
7-Mokau R, above Wairere Dam	4	25%	50%	225	643	D	0.44	0.62	0.020	0.030	0.45	0.64	A	0.005	0.006	1.19	1.34
13-Mokau R. HWY 4	4	0%	25%	174	354	C	0.29	0.40	0.006	0.010	0.29	0.41	A	0.003	0.004	1.56	1.34
14-Mangapehi R. HWY 4	4	0%	25%	195	427	C	0.40	0.54	0.007	0.010	0.40	0.55	A	0.005	0.006	1.15	1.34
15-Mapara Stm	4	0%	25%	160	425	C	0.30	0.42	0.005	0.008	0.31	0.42	A	0.004	0.015	1.14	1.34
Mokau R. Baseline (Jan-2015 to Dec-2019)	**294**	**27%**	**43%**	**210**	**6,000**	**D**	**0.55**	**1.00**	**0.009**	**0.164**	**0.559**	**1.014**	**B**	**0.010**	**0.021**	**0.77**	**1.34**

[1]*Water clarity has been converted from measured turbidity using the formular ln(CLAR) = 1.21 – 0.72 ln(TURB) (Franklin, Booker & Stoffels, 2020).*

Table 5) Water quality indicators for individual sites in the Mokauiti-Aria catchment, recorded over the 2024 monitoring period. Measured values have been assessed against the National Attribute Bands (NPS-FM, 2020).

Mokauiti-Aria	Number of Samples	Human Health					Ecosystem Health										
							Water Quality									Sediment	
Annual Summary 2024		*E. coli* /100 ml					Nitrate Toxicity (mg N/L)		Ammonia Toxicity (mg N/L)		Dissolved Inorganic Nitrogen-DIN (mg N/L)		Overall Nitrogen Band	Dissolved Reactive Phosphorus (mg/L)		Water Clarity Value[1]	National Bottom Line
KCRC SITES Lab: Analytica		% Exc. > 540	% Exc. > 260	Median	95th Percentile	Overall Band	Median	95th Percentile	Median	Annual Maximum	Median	95th Percentile		Median	95th Percentile	Median	
22-Huioteko Stm-248	4	25%	100%	425	791	E	0.22	0.40	0.025	0.050	0.25	0.42	A	0.003	0.006	0.79	0.61
23-Whareroa Stm-231	4	0%	0%	33	99	A	0.14	0.19	0.007	0.009	0.15	0.20	A	0.002	0.002	1.39	0.61
27-Ramaroa stream	4	25%	25%	116	723	C	0.37	0.55	0.005	0.007	0.37	0.56	A	0.008	0.010	1.52	0.61
28-Mokauiti stream	4	25%	25%	160	659	D	0.15	0.26	0.014	0.030	0.16	0.28	A	0.004	0.005	0.68	1.34
WRC SITES Lab: Hills																	
Mokauiti Stm-3 Way Point Aria	12	25%	75%	325	3,215	E	0.31	0.51	0.009	0.020	0.32	0.54	A	0.006	0.014	0.57	1.34
Mokau R. Baseline (Jan-2015 to Dec-2019)	**294**	**27%**	**43%**	**210**	**6,000**	**D**	**0.55**	**1.00**	**0.009**	**0.164**	**0.559**	**1.014**	**B**	**0.010**	**0.021**	**0.77**	**1.34**

[1]*Water clarity has been converted from measured turbidity using the formular ln(CLAR) = 1.21 – 0.72 ln(TURB) (Franklin, Booker & Stoffels, 2020).*

Table 6) Water quality indicators for individual sites in the Upper Mokau-Mangapehi catchment, recorded over the 2024 monitoring period. Measured values have been assessed against the National Attribute Bands (NPS-FM, 2020).

Upper Mokau-Mangapehi	Number of Samples	Human Health					Ecosystem Health										
							Water Quality									Sediment	
Annual Summary 2024		*E. coli* /100 ml					Nitrate Toxicity (mg N/L)		Ammonia Toxicity (mg N/L)		Dissolved Inorganic Nitrogen-DIN (mg N/L)		Overall Nitrogen Band	Dissolved Reactive Phosphorus (mg/L)		Water Clarity Value[1]	National Bottom Line
KCRC SITES Lab: Analytica		% Exc. > 540	% Exc. > 260	Median	95th Percentile	Overall Band	Median	95th Percentile	Median	Annual Maximum	Median	95th Percentile		Median	95th Percentile	Median	
13-Mokau R. HWY 4	4	0%	25%	174	354	B	0.29	0.40	0.006	0.010	0.29	0.41	A	0.003	0.004	1.56	1.34
14-Mangapehi R. HWY 4	4	0%	25%	195	427	B	0.40	0.54	0.007	0.010	0.40	0.55	A	0.005	0.006	1.15	1.34
18-Mangapehi R.	4	25%	50%	270	616	D	0.61	0.77	0.020	0.030	0.63	0.80	B	0.006	0.009	1.53	1.34
WRC SITES Lab: Hills																	
Mangaokewa Rd (Off SH30)	12	17%	42%	250	1,562	D	0.37	0.62	0.00	0.01	0.38	0.62	A	0.012	0.019	1.49	1.34
Mokau R. Baseline (Jan-2015 to Dec-2019)	**294**	**27%**	**43%**	**210**	**6,000**	**D**	**0.55**	**1.00**	**0.009**	**0.164**	**0.559**	**1.014**	**B**	**0.010**	**0.021**	**0.77**	**1.34**

[1]*Water clarity has been converted from measured turbidity using the formular ln(CLAR) = 1.21 – 0.72 ln(TURB) (Franklin, Booker & Stoffels, 2020).*

River Flow Graph

The graph below shows river flow recorded by Waikato Regional Council at Mokau River between 1 Jan 2023 and 31 Dec 2024. The black arrows indicate quarterly sampling days (Figure 5).

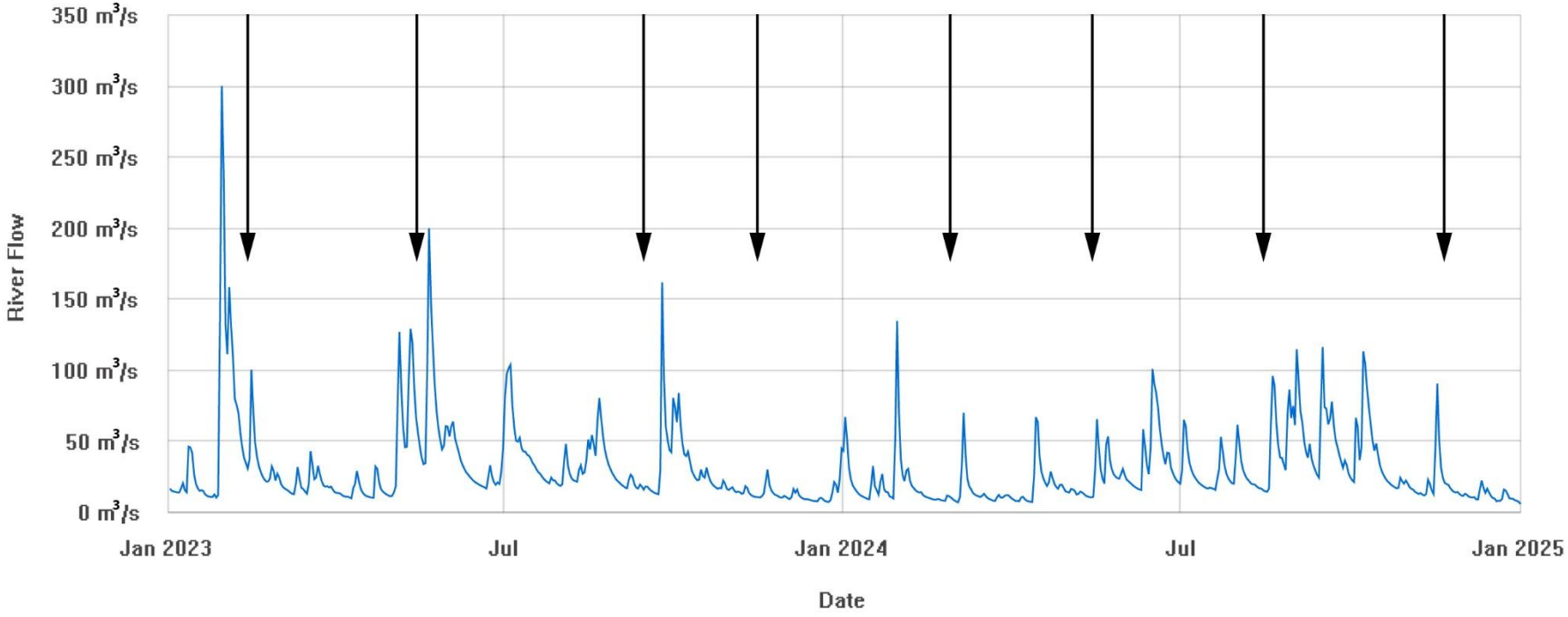


Figure 7. River flow recorded by Waikato Regional Council at Mokau River from 1 January 2023 to 1 January 2025. The black arrows indicate catchment monitoring days.