

Regional rivers water quality monitoring programme data report 2022

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1 Introduction

1.1 Background

To effectively manage water quality, the regional rivers monitoring programme addresses the following questions:

1. What is the quality of the water now?
2. Why is the water of the observed level of quality?
3. Is water quality getting better or worse? If so – what makes it change?
4. How can we improve the quality, ecological health, and integrity of the region's rivers and streams?

The monitoring information allows Waikato Regional Council to:

- Determine compliance with classification standards.
- Assess the suitability of the resource for various beneficial uses and values of the water.
- Monitor the impact of major discrete point source discharges on water quality.
- Monitor the impacts of diffuse discharges on water quality.
- Provide a basis for evaluating the effectiveness of resource management measures.

This dataset is invaluable for the evaluation of the region's rivers: their state, the pressures on them, and our response to these pressures. We need to continue to gather comprehensive, reliable, and good quality data on the regions' rivers to protect and enhance their values into the future.

This report is the 27th since the implementation of the regional rivers monitoring programme (ReRiMP) in 1993¹. A major redesign of the programme was implemented in 2018 to incorporate 10 new sites from the Healthy Rivers Plan Change. The programme currently consists of 110 sites and the ReRiMP report series remains the same.

This report follows the format of the previous data report (Salu 2022). Copies of reports as described in the list of references (page 44) can be obtained by contacting Waikato Regional Council (the Library) on 0800 800 401, or filling out the request for service form at www.waikatoregion.govt.nz/request or in electronic format from the publications page of the Waikato Regional Council website: www.waikatoregion.govt.nz/publications.

¹ Waikato River reported separately

1.2 Report Content

The report provides information on the routine monthly monitoring of water quality at 110 locations across the Waikato region, and includes:

- 2022 summary statistics tabulated by parameter and reported together.
- Summary tables identifying the number of samples meeting 'satisfactory' and 'excellent' water quality guidelines and standards.

1.3 Water Quality Guidelines and Standards

Table 1 lists the physical, chemical (physio-chemical), and microbiological water quality guidelines and standards used to assess the condition of the region's rivers in 2022. The standards relate to either the protection of the ecological health of rivers and streams or to the suitability for direct-contact water based recreation (for example, swimming).

Table 1: Guidelines and standards for physiochemical water quality for ecological health and for human use of water

Water quality measure	Relevance ¹	Satisfactory	Excellent
Ecological health			
Dissolved Oxygen (% sat.)	aquatic life (breathing)	>80	>90
pH	aquatic life (acidity)	6.5-9	7-8
Turbidity (NTU)	plant growth (clarity)	<5	<2
Ammoniacal Nitrogen (g/m ³)		<0.88	<0.1
Water Temperature (°C)(May-Sep)	fish spawning,	<12	<10
Water Temperature (°C)(Oct-Apr)		<20	<16
Total Phosphorus (g/m ³)	nuisance plant growth	<0.04	<0.01
Total Nitrogen (g/m ³)	nuisance plant growth	<0.5	<0.1
Human uses - recreation			
Black Disk (m)	visibility	>1.6	>4
<i>Escherichia coli</i> (/100ml)	human health	<550	<55
Median <i>Escherichia coli</i> (/100ml)	human health	<126	<23
Enterococci (/100ml)	human health	<77	n/a

¹Refer to Appendix I for description of guideline and standards values used. These guidelines and standards are also defined on the Waikato Regional Council Internet site; www.waikatoregion.govt.nz

2 Regional Rivers Monitoring Design

2.1 Sampling Locations

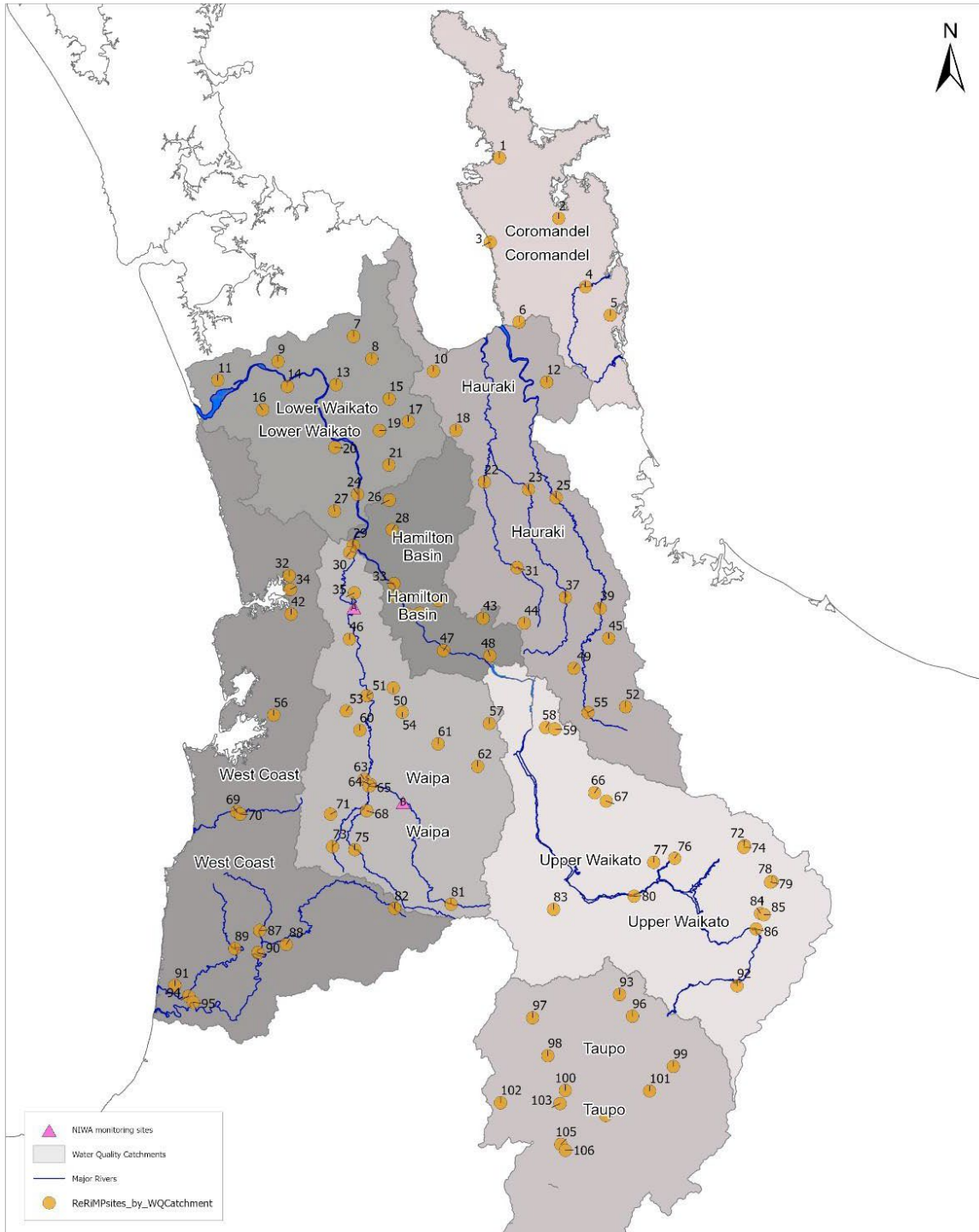
Routine water quality monitoring locations of the ReRiMP are summarised in Table 2 and illustrated in Figure 1. Waikato Regional Council sampled 110 sites on a monthly schedule. A further five locations form part of NIWA's National Rivers Water Quality Network, whose data can be found on the NIWA website (www.niwa.co.nz).

The sampling locations are reasonably evenly distributed across the Waikato region (Figure 1). To assist assessment of water quality, sites in the region were divided into seven water quality zones. This division is based on expert opinion, and reflects river catchments and some broad ecological features, including geology, altitude, winter temperatures, vegetation cover and land use. Sampling locations within each water quality zone are shown in *Table 2*.

Table 2: Waikato Regional Council's sampling locations

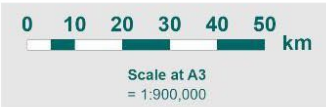
Map No.	Location name	Location number	Location coordinate
Coromandel			
1	Waiau River at E309 Rd Ford	1105-3	1825236, 5925022
24	Waitekauri River at U/S Ohinemuri Confluence	1239-32	1846306, 5855261
2	Waiwawa River at SH25 Coroglen	1257-3	1839816, 5910119
5	Wharekawa River at SH25	1312-3	1852498, 5886250
12	Hikutaia River at Old Maratoto Rd	169-2	1836841, 5869743
6	Kauaeranga River at Smiths Cableway/Recorder	234-11	1830040, 5884528
22	Ohinemuri River at Karangahake	619-16	1840337, 5855574
23	Ohinemuri River at Queens Head	619-19	1847342, 5855482
19	Ohinemuri River at SH25 Bridge	619-20	1853847, 5859843
3	Tapu River at Tapu-Coroglen Rd	954-5	1822967, 5904237
4	Tairua River at Morrisons Bridge Hikutia	940-10	1846396, 5893251
Hauraki			
51	Waihou River at Okauia	1122-18	1850033, 5813970
33	Waihou River at Te Aroha	1122-34	1839179, 5841242
73	Waihou River at Whites Rd	1122-41	1847029, 5788310
69	Waiohotu Stm at Waiohotu Rd (Off SH5)	1173-2	1856291, 5789715
60	Waiomou Stm at Matamata-Tauranga Rd	1174-4	1852108, 5806591
10	Waitakaruru River (Hauraki Plains) at Coxhead Rd Bridge	1230-1	1808982, 5872419
48	Waitoa River at Landsdowne Rd Bridge	1249-15	1841455, 5816681
31	Waitoa River at Mellon Rd Recorder	1249-18	1832368, 5843261
20	Mangawhero Stm (Kaihere) at Mangawara Rd	489-2	1814506, 5857854
65	Oraka Stm at Lake Rd	669-6	1843532, 5799203
39	Piako River at Kiwitahi	749-10	1829552, 5824019
30	Piako River at Paeroa-Tahuna Rd Bridge	749-15	1821502, 5845142
59	Piakonui Stm at Piakonui Rd	753-4	1831309, 5810336
Tributaries to the lower Waikato River			
18	Waerenga Stm at Taniwha Rd	1098-1	1802756, 5860005
46	Waitawhiriwhiri Stm at Edgecumbe Street	1236-2	1799902, 5816915
9	Whakapipi Stm at SH22 Bridge	1282-8	1770704, 5874826
87	Whakauru Stm at U/S SH1 Bridge	1287-7	1851510, 5766456
13	Whangamarino River at Island Block Rd	1293-7	1784968, 5869103
16	Whangamarino River at Jefferies Rd Bridge	1293-9	1798066, 5865561
26	Whangape Stm at Rangiriri-Glen Murray Rd	1302-1	1784703, 5853683
64	Karapiro Stm at Hickey Rd Bridge	230-5	1822883, 5802300
42	Kirikiroa Stm at Tauhara Drive	253-4	1799248, 5820070
36	Komakorau Stm at Henry Rd	258-4	1798800, 5833361
76	Little Waipa Stm at Arapuni – Putaruru Rd	335-1	1836614, 5784613
35	Awaroa Stm (Rotowaro) at Sansons Bridge–Rotowaro-Huntly	39-11	17846617, 5837950
53	Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	398-1	1802506, 5812573
86	Mangamingi Stm (Tokoroa) at Paraonui Rd Bridge	407-1	1848650, 5768522
52	Mangaone Stm at Annebrooke Rd Bridge	417-7	1805661, 5812778
11	Awaroa River (Waiuku) at Otaua Rd Bridge opp Moseley Rd	41-9	1755860, 5870203
49	Mangaonua Stm at Hoeka Rd	421-10	1810244, 5815925
57	Mangaonua Stm (a.k.a Waitakaruru Stm) at Te Miro Rd	421-16	1821181, 5811525
8	Mangatangi River at SH2 Maramarua	453-6	1793779, 5875482
7	Mangatawhiri River at Lyons Rd at Buckingsham Bridge	459-6	1789293, 5881001
34	Mangawara Stm at Rutherford Rd Bridge	481-7	1798115, 5840673
62	Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	488-1	1811449, 5803595
27	Matahuru Stm at Waiterimu Rd Br	516-5	1798000, 5849274
15	Ohaeroa Stm at SH22 Bridge	612-9	1773012, 5868668
17	Opuatia Stm at Ponganui Rd	665-5	1766922, 5862941
77	Pokaiwhenua Stm at Arapuni-Putaruru Rd	786-2	1838866, 5784259
32	Lake Waahi Outlet at Te Ohaaki Bridge	1097-1	1790273, 5842096
21	Northern Outlet Canal at Downstream of Control Gate	3021-3	1795678, 5857803

Map No.	Location name	Location number	Location coordinate
Waipa River and tributaries			
84	Waipa River at SH3 Otorohanga	1191-12	1793417, 5770550
67	Waipa River at Pukehoua Bridge on Baffin Road	1191-2	1792588, 5792454
106	Waipa River at Mangaokewa Rd	1191-5	1813330, 5741060
83	Waitomo Stm at SH31 Otorohanga	1253-5	1791948, 5771850
92	Waitomo Stm at Tumutumu Rd	1253-7	1783624, 5763236
61	Kaniwhaniwha Stm at Wright Rd	222-16	1788300, 5806382
75	Mangaohoi Stm at South Branch Maru Rd	411-9	1822734, 5785595
98	Mangaokewa Stm at Lawrence St Bridge	414-6	1789612, 5754501
66	Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	438-3	1799086, 5794363
85	Mangapu River at Otorohanga	443-3	1793118, 5770149
81	Mangatutu Stm (Waikeria) at Walker Rd Bridge	476-7	1810109, 5780575
71	Mangauika Stm at Te Awamutu Borough Water Supply Intake	477-10	1787494, 5788722
44	Ohote Stm at Whatawhata/Horotiu Rd	624-5	1789493, 5817795
72	Puniu River at Bartons Corner Rd Bridge	818-2	1801295, 5788365
38	Firewood Creek at Waingaro Road Bridge	124-8	1788353, 5827726
96	Mangarama Stm at Gadsby Road Bridge	1391-1	1784134, 5755235
89	Mangarapa Stm at Old Te Kuiti Rd Bridge	444-1	1792544, 5764098
78	Moakururua River at Warratah Farm Bridge	553-12	1790853, 5783949
82	Punui River at Wharepapa Sth Road Bridge	818-40	1819868, 5775028
37	Waipa River at Ngaruawahia Br	1191-6	1789220, 5829466
Tributaries to the upper Waikato River			
111	Torepatutahi Stm at Vaile Rd Bridge	1057-6	1888409, 5734946
102	Waiotapu Stm at Campbell Rd Bridge	1186-2	1892343, 5746710
110	Waiotapu Stm at Homestead Rd Bridge	1186-4	1890373, 5738454
105	Waipapa Stm (Mokai) at Tirohanga Rd Bridge	1202-7	1858355, 5743037
95	Whirinaki Stm at Corbett Rd	1323-1	1885524, 5755511
104	Kawaunui Stm at SH5 Bridge	240-5	1891976, 5746482
101	Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	359-1	1863201, 5751371
109	Mangakara Stm (Reporoa) at SH5	380-2	1889506, 5738783
108	Mangakino River (Whakamaru) at Sandel Rd	388-1	1838547, 5739797
97	Otamakokore Stm at Hossack Rd	683-4	1885383, 5755059
117	Pueto Stm at Broadlands Rd Bridge	802-1	1883743, 5720920
100	Tahunaatara Stm at Ohakuri Rd	934-1	1868367, 5752370
West coast			
41	Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	1167-4	1773441, 5822030
54	Waitetuna River at Te Uku-Waingaro Rd	1247-2	1773923, 5812566
114	Awakino River at Gribbon Rd	33-6	1760059, 5730104
120	Awakino River at SH3 Awakau Rd Junction	33-9	1748705, 5718389
116	Manganui River at Off Manganui Rd	410-4	1745321, 5721017
112	Mangaotaki River at SH3 Bridge	428-3	1766193, 5734587
90	Marokopa River at Speedies Rd (Off Te Anga Rd)	513-3	1760521, 5763807
121	Mokau River at Awakau Rd	556-2	1749850, 5716869
107	Mokau River at Mangaokewa Rd (Off SH30)	556-5	1799420, 5740045
115	Mokau River at Totoro Rd Recorder	556-9	1765756, 5729127
113	Mokauiti Stm at Three Way Point – Aria	557-5	1772711, 5731165
43	Ohautira River at Waingaro - Te Uku Rd	616-1	1773746, 5818631
74	Oparau River at Langdon Rd (Off Okupata Rd)	658-1	1769651, 5787687
91	Tawarau River at Off Speedies Rd	976-1	1761387, 5763275
Inflows to Lake Taupo			
135	Tokaanu Stm at Off SH41 Turangi	1045-3	1841470, 5680399
123	Waihaha River at SH32	1106-4	1833389, 5713044
125	Waitahanui River at Blake Rd	1226-1	1868051, 5701057
119	Whangamata Stm (Kinloch) at Whangamata Rd	1300-1	1854803, 5718799
124	Whanganui Stream at Lakeside Lake Taupo	1301-1	1837143, 5703708
128	Whareroa Stream at Lakeside Lake Taupo	1318-4	1841456, 5695161
134	Tokaanu Power Station Tailrace Canal at SH41 Bridge	1491-1	1840329, 5681866
129	Hinemaiaia River at SH1	171-5	1862185, 5695020
130	Kuratau River at SH41 Moerangi	282-4	1825502, 5692096
131	Kuratau River at Te Rae Street	282-5	1840133, 5691927
122	Mapara Stm at Off Mapara Rd (Whakaipo Reserve)	504-2	1857975, 5713452
132	Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	971-5	1851416, 5688991



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 Major Rivers data sourced from NZTopo Database.
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ReRiMP and NIWA monitoring sites by Water Quality Catchment



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Figure 1: ReRiMP and NIWA monitoring sites by water quality catchment.

2.2 Sample Collection

Sample collection occurs monthly. The 110 locations sampled by WRC staff were divided between 9 sampling runs up to November 2020. The runs are sampled in the same order each month, and by the same group of field staff. Sampling is assigned to either the first, second, third or fourth week of each month. A similar time of sampling (± 1 hour) is maintained for subsequent visits to a location to minimise the effect of any diurnal variation on water quality parameters, thereby increasing long term trend detection power. On occasion, sampling is prevented by logistical aspects (e.g., site access, COVID-19).

From⁺ December 2020 twelve sites in the Taupo catchment were transferred to Tūwharetoa Māori Trust board (TMTB), under section 33 of the Resource Management Act 1991 (RMA) which enables a local authority to transfer any one or more of its functions, powers or duties under the RMA to another public authority, except the power of transfer.

2.3 Water Quality Parameters

Water quality of the region's rivers is assessed by measuring up to 32 parameters (19 routinely). Some parameters are measured in the field, but most are analysed by laboratories using standard analytical methods. Details of field measurements and analytical methods are outlined in *Appendix II*.

2.4 Quality Control, Data Storage, and Analysis

Quality control measures are undertaken in accordance with WRC standards including procedures for the collection, transport and storage of samples, and methods for data verification and quality assurance to ensure the consistency of data across the programme. Samples are sent to IANZ registered laboratories for analysis. Back-up samples are held for two weeks until results have been verified by routine quality assurance procedures. All data from field measurements and laboratory analyses are stored in Waikato Regional Council's database called WISKI.

Data analysis was performed using WQStats program. For the purpose of data analysis, non-detect results (i.e. results with "less than" values) were assumed to be equal to half the corresponding limit of detection (i.e. $<x = x/2$), and results greater than the value reported were taken as equal to the value reported (i.e. $>x = x$).

2.5 Reports

A report on Regional Water Quality Trends (Vant, 2018) summarises the trends and patterns in regional water quality during 1993 to 2017.

The data contained in these regional rivers reports is updated to the LAWA and Waikato Regional Council website, which also provides a link to details of the water quality guidelines and standards used to assess the condition of the region's rivers, as well as other information relating to lakes, rivers and wetlands. View this information at <http://www.waikatoregion.govt.nz/fresh-water-quality> and [Land, Air, Water Aotearoa \(LAWA\) - River Quality](#)

3 Results

The results are divided into two sections. Section 3.1 has a statistical summary of routine monitoring of the region's rivers in 2022 based on median values for the last five years. Summaries of these additional tests are included in this report. Section 3.2 compares the results with water quality guidelines and standards for compliance.

3.1 Regional Rivers Monitoring Programme

3.1.1 Summary Statistic

Table 3: Absorbance (340nm) sample statistics for 2022 with 2018-2022 five-year median.

Location	Absorbance (340nm) (µ/cm)							18-22 median
	Count	Mean	Median	Min	Max	IQR	Skew	
Coromandel								
Hikutaia River at Old Maratoto Rd	12	0.025	0.018	0.01	0.062	0.021	1.38	0.017
Kauaeranga River at Smiths Cableway Recorder	11	0.026	0.01	0.01	0.091	0.016	1.77	0.013
Ohinemuri River at Karangahake	12	0.019	0.015	0.01	0.055	0.007	2.15	0.016
Ohinemuri River at Queens Head	12	0.016	0.014	0.01	0.032	0.005	1.66	0.014
Ohinemuri River at SH25 Br	12	0.016	0.011	0.01	0.038	0.015	1.22	0.012
Tairua River at Morrisons Br Hikuai	11	0.027	0.018	0.01	0.064	0.028	1.19	0.017
Tapu River at Tapu-Coroglen Rd	12	0.021	0.014	0.01	0.072	0.017	2.27	0.01
Waiau River at E309 Rd Ford	11	0.029	0.018	0.01	0.073	0.026	1.37	0.018
Waitekauri River at U/S Ohinemuri Conflu	12	0.016	0.01	0.01	0.045	0.009	1.87	0.011
Waiwawa River at SH25 Coroglen	12	0.034	0.02	0.01	0.109	0.029	1.64	0.021
Wharekawa River at SH25	12	0.027	0.02	0.01	0.067	0.018	1.42	0.018
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	0.035	0.027	0.02	0.073	0.023	1.2	0.022
Oraka Stm at Lake Rd	12	0.02	0.015	0.01	0.046	0.02	1.13	0.013
Piako River at Kiwitahi	12	0.051	0.051	0.03	0.079	0.019	0.24	0.046
Piako River at Paeroa-Tahuna Rd Br	12	0.087	0.089	0.06	0.112	0.031	-0.08	0.076
Piakonui Stm at Piakonui Rd	12	0.045	0.04	0.02	0.071	0.028	0.52	0.035
Waihou River at Okauia	12	0.022	0.018	0.01	0.051	0.017	1.18	0.013
Waihou River at Te Aroha	12	0.025	0.021	0.01	0.047	0.017	0.68	0.016
Waihou River at Whites Rd	11	0.002	0.001	0	0.01	0.002	2.47	0.001
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	0.063	0.057	0.04	0.119	0.038	1.07	0.041
Waiomou Stm at Matamata-Tauranga Rd	12	0.026	0.021	0.01	0.059	0.013	1.64	0.019
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	0.087	0.078	0.03	0.198	0.032	1.56	0.065
Waitoa River at Landsdowne Rd Br	12	0.051	0.051	0.02	0.093	0.032	0.41	0.042
Waitoa River at Mellon Rd Recorder	12	0.056	0.058	0.04	0.095	0.017	1.42	0.045
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otaua Rd Br opp Moseley Rd	11	0.039	0.034	0.03	0.075	0.012	1.89	0.038
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	0.022	0.02	0.01	0.035	0.015	0.3	0.019
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	0.061	0.057	0.05	0.088	0.024	0.66	0.052
Kirikiri Stm at Tauhara Dr	12	0.068	0.067	0.05	0.108	0.02	0.91	0.055
Komakorau Stm at Henry Rd	12	0.176	0.153	0.09	0.29	0.127	0.55	0.12
Little Waipa Stm at Arapuni - Putaruru Rd	11	0.025	0.012	0	0.1	0.032	2.03	0.011
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	0.403	0.435	0.1	0.88	0.412	0.34	0.23
Mangamingi Stm (Tokoroa) at Paraoonui Rd Br	12	0.031	0.026	0.02	0.06	0.011	1.59	0.026
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	0.069	0.066	0.04	0.126	0.022	1.53	0.049
Mangaonua Stm at Hoeka Rd	12	0.062	0.05	0.04	0.119	0.032	1.3	0.042
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	0.038	0.037	0.02	0.058	0.02	0.4	0.032
Mangatangi River at SH2 Maramarua	11	0.061	0.062	0.03	0.118	0.031	0.81	0.045
Mangatawhiri River at Lyons Rd At Buckingham Br	11	0.032	0.028	0.02	0.05	0.015	0.42	0.023
Mangawara Stm at Rutherford Rd Br	12	0.173	0.186	0.07	0.3	0.144	0.08	0.13
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	0.187	0.198	0.1	0.33	0.148	0.4	0.11
Matahuru Stm at Waiterimu Road Below Confluence	12	0.113	0.121	0.05	0.21	0.088	0.31	0.081
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	0.074	0.075	0.04	0.103	0.048	-0.16	0.054
Ohaeroa Stm at SH22 Br	11	0.04	0.034	0.02	0.062	0.023	0.43	0.029
Opuatia Stm at Ponganui Rd	11	0.04	0.032	0.02	0.079	0.015	1.55	0.029
Pokaiwhenua Stm at Puketurua	12	0.023	0.015	0.01	0.068	0.017	1.88	0.015
Waahi Stm at Te Ohaki Rd	12	0.057	0.057	0.04	0.076	0.019	0.25	0.045
Waerenga Stm at Taniwha Rd	11	0.037	0.03	0.03	0.072	0.016	1.73	0.029
Waitawhiriwhiri Stm at Edgecumbe Street	11	0.177	0.127	0.1	0.36	0.149	1.06	0.11
Whakapipi Stm at SH22 Br	11	0.044	0.035	0.03	0.093	0.009	1.98	0.034
Whakauru Stm at U/S SH1 Br	12	0.033	0.027	0.02	0.07	0.013	1.75	0.026
Whangamarino River at Island Block Rd	9	0.19	0.17	0.07	0.37	0.113	0.67	0.13
Whangamarino River at Jefferies Rd Br	11	0.067	0.062	0.04	0.137	0.028	1.79	0.049
Whangape Stm at Rangiriri-Glen Murray Rd	11	0.091	0.084	0.05	0.18	0.04	1.35	0.068

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	0.037	0.034	0.02	0.068	0.011	1.59	0.033
Kaniwhaniwha Stm at Wright Rd	12	0.027	0.029	0.02	0.038	0.009	-0.3	0.028
Mangaohoi Stm at South Branch Maru Rd	12	0.008	0.007	0.01	0.015	0.005	0.8	0.007
Mangaokewa Stm at Lawrence Street Br	12	0.042	0.037	0.02	0.087	0.022	1.4	0.036
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	0.152	0.159	0.07	0.27	0.119	0.34	0.08
Mangapu River at Otorohanga	9	0.037	0.031	0.02	0.077	0.017	1.97	0.031
Mangarama Stm at Gadsby Rd	10	0.051	0.041	0.01	0.148	0.02	2.03	0.038
Mangarapa Stm at Otorohanga Rd	10	0.028	0.025	0.02	0.04	0.012	0.7	0.026
Mangatutu Stm (Waikeria) at Walker Rd Br	11	0.023	0.024	0.01	0.035	0.012	0.33	0.02
Mangauika Stm at Te Awamutu Borough W/S Intake	10	0.01	0.01	0.01	0.015	0.005	0.44	0.008
Moakurua Stm at Warratah Farm Bridge	10	0.019	0.017	0.01	0.034	0.007	1.25	0.018
Ohote Stm at Whatawhata/Horotiu Rd	12	0.193	0.177	0.09	0.36	0.083	1.05	0.15
Puniu River at Bartons Corner Rd Br	10	0.037	0.036	0.02	0.062	0.017	0.68	0.029
Puniu River at Wharepapa Rd Bridge	12	0.025	0.024	0.01	0.042	0.01	0.83	0.024
Waipa River at Mangaokewa Rd	11	0.061	0.059	0.01	0.104	0.032	0.1	0.053
Waipa River at Ngaruawahia Br	12	0.044	0.042	0.03	0.058	0.02	0.08	0.039
Waipa River at Pukehoua Bridge on Baffin Road	10	0.033	0.028	0.02	0.06	0.016	1.11	0.03
Waipa River at SH3 Otorohanga	10	0.032	0.025	0.02	0.055	0.018	1.09	0.027
Waitomo Stm at SH31 Otorohanga	6	0.026	0.021	0.01	0.046	0.023	0.86	0.02
Waitomo Stm at Tumutumu Rd	10	0.014	0.011	0.01	0.024	0.009	0.8	0.013
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	0.037	0.033	0.01	0.093	0.032	1.19	0.025
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	0.042	0.029	0.02	0.131	0.023	2.52	0.029
Mangakara Stm (Reporoa) at SH5	10	0.021	0.02	0.02	0.036	0.003	2.45	0.019
Mangakino Stm (Whakamaru) at Sandel Rd	11	0.019	0.016	0.01	0.042	0.02	0.79	0.012
Otamakokore Stm at Hossack Rd	12	0.054	0.045	0.02	0.137	0.049	1.23	0.036
Pueto Stm at Broadlands Rd Br	12	0.011	0.01	0.01	0.017	0.003	1.54	0.01
Tahunaatara Stm at Ohakuri Rd	11	0.041	0.033	0.02	0.1	0.014	2.08	0.033
Torepatutahi Stm at Vaile Rd Br	12	0.019	0.016	0.01	0.047	0.009	2.12	0.013
Waiotapu Stm at Campbell Rd Br	12	0.008	0.005	0	0.029	0.006	2.5	0.005
Waiotapu Stm at Homestead Rd Br	12	0.036	0.028	0.02	0.083	0.019	1.69	0.024
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	0.017	0.015	0.01	0.032	0.008	1.11	0.013
Whirinaki Stm at Corbett Rd	12	0.007	0.004	0	0.02	0.008	1.21	0.004
West Coast								
Awakino River at Gribbon Rd	12	0.01	0.008	0	0.023	0.007	1.4	0.008
Awakino River at SH3 Awakau Rd Junction	11	0.017	0.012	0.01	0.045	0.007	1.83	0.014
Manganui River at Off Manganui Rd	12	0.012	0.012	0.01	0.023	0.005	1.44	0.01
Mangaotaki River at SH3 Br	12	0.021	0.016	0.01	0.046	0.013	1.38	0.017
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	0.02	0.018	0.01	0.034	0.009	0.98	0.017
Mokau River at Awakau Rd	12	0.039	0.034	0.02	0.069	0.02	1.02	0.035
Mokau River at Mangaokewa Rd (Off SH30)	12	0.051	0.048	0.03	0.095	0.023	1.16	0.048
Mokau River at Totoro Rd Recorder	11	0.041	0.034	0.02	0.073	0.02	1.05	0.033
Mokauiti Stm at Three Way Point - Aria	11	0.069	0.062	0.04	0.126	0.044	0.89	0.057
Ohautira Stm at Waingaro Te Uku Rd	12	0.027	0.027	0.02	0.042	0.01	0.47	0.026
Oparau River at Langdon Rd (Off Okupata Rd)	10	0.02	0.016	0.01	0.045	0.01	1.81	0.019
Tawarau River at Off Speedies Rd	10	0.019	0.018	0.01	0.03	0.009	0.83	0.016
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	0.039	0.035	0.02	0.07	0.01	1.8	0.039
Waitetuna River at Te Uku-Waingaro Rd	12	0.028	0.029	0.02	0.038	0.012	-0.06	0.029

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	0.014	0.012	0.01	0.024	0.006	1.29	0.013
Kuratau River at SH41 Moerangi	12	0.023	0.02	0.02	0.049	0.009	2.14	0.02
Kuratau River at Te Rae Street T10	12	0.029	0.03	0.02	0.044	0.012	0.41	0.022
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	0.043	0.036	0.03	0.088	0.023	1.36	0.037
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	0.009	0.007	0.01	0.024	0.003	2.39	0.007
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	0.007	0.006	0	0.01	0.002	0.54	0.006
Tokaanu Stm at Off SH41 Turangi	12	0.004	0.002	0	0.021	0.003	2.37	0.001
Waihaha River at SH32	12	0.011	0.009	0	0.039	0.004	2.45	0.009
Waitahanui River at Blake Rd	12	0.004	0.003	0	0.009	0.002	1.77	0.003
Whangamata Stm (Kinloch) at Whangamata Rd	12	0.013	0.007	0	0.039	0.013	1.44	0.007
Whanganui Stm at Lakeside Lake Taupo T8	12	0.018	0.016	0.01	0.041	0.005	2.42	0.016
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	0.022	0.02	0.02	0.038	0.007	1.6	0.018

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 4: Absorbance (440nm) sample statistics for 2022 with 2018-2022 five-year median.

Absorbance (440nm) (✓cm)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	0.005	0.004	0	0.012	0.004	1.04	0.004
Kauaeranga River at Smiths Cableway Recorder	11	0.005	0.002	0	0.019	0.003	1.71	0.003
Ohinemuri River at Karangahake	12	0.004	0.003	0	0.012	0.002	1.93	0.003
Ohinemuri River at Queens Head	12	0.003	0.003	0	0.006	0.001	1.36	0.003
Ohinemuri River at SH25 Br	12	0.003	0.003	0	0.008	0.004	0.82	0.003
Tairua River at Morrisons Br Hikuai	11	0.006	0.004	0	0.014	0.005	1.4	0.004
Tapu River at Tapu-Coroglen Rd	12	0.004	0.003	0	0.015	0.005	1.67	0.002
Waiau River at E309 Rd Ford	11	0.006	0.004	0	0.014	0.005	1.3	0.004
Waitekauri River at U/S Ohinemuri Conflu	12	0.003	0.002	0	0.009	0.003	1.47	0.002
Waiwawa River at SH25 Coroglen	12	0.007	0.005	0	0.024	0.007	1.7	0.005
Wharekawa River at SH25	12	0.006	0.005	0	0.015	0.004	1.53	0.004
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	0.008	0.006	0	0.016	0.004	1.15	0.005
Oraka Stm at Lake Rd	12	0.004	0.003	0	0.009	0.004	0.99	0.003
Piako River at Kiwitahi	12	0.009	0.01	0	0.013	0.004	-0.66	0.008
Piako River at Paeroa-Tahuna Rd Br	12	0.015	0.015	0.01	0.021	0.006	0.3	0.013
Piakonui Stm at Piakonui Rd	12	0.009	0.008	0.01	0.015	0.007	0.59	0.007
Waihou River at Okauia	12	0.004	0.003	0	0.01	0.004	0.84	0.003
Waihou River at Te Aroha	12	0.005	0.005	0	0.01	0.004	0.37	0.003
Waihou River at Whites Rd	11	0.001	0.001	0	0.001	0	0	0.001
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	0.012	0.011	0.01	0.023	0.007	1.13	0.008
Waiomou Stm at Matamata-Tauranga Rd	12	0.005	0.004	0	0.013	0.004	1.82	0.004
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	0.016	0.014	0.01	0.036	0.006	1.44	0.012
Waitoa River at Landsdowne Rd Br	12	0.009	0.008	0	0.019	0.005	0.77	0.007
Waitoa River at Mellon Rd Recorder	12	0.01	0.01	0.01	0.019	0.002	1.71	0.008
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otatau Rd Br opp Moseley Rd	11	0.006	0.006	0	0.012	0.003	1.18	0.006
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	0.004	0.003	0	0.006	0.002	0.34	0.003
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	0.011	0.01	0.01	0.017	0.004	0.53	0.009
Kirikiri-roa Stm at Tauhara Dr	12	0.011	0.01	0.01	0.019	0.003	1.57	0.009
Komakorau Stm at Henry Rd	12	0.029	0.024	0.02	0.063	0.015	1.71	0.019
Little Waipa Stm at Arapuni - Putaruru Rd	11	0.005	0.003	0	0.021	0.007	2.13	0.002
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	0.068	0.074	0.02	0.149	0.067	0.33	0.038
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	0.007	0.006	0	0.014	0.003	1.56	0.006
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	0.012	0.011	0.01	0.022	0.004	1.57	0.009
Mangaonua Stm at Hoeka Rd	12	0.011	0.008	0.01	0.026	0.007	1.56	0.008
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	0.007	0.008	0	0.012	0.004	0.47	0.006
Mangatangi River at SH2 Maramarua	11	0.011	0.011	0	0.021	0.005	0.69	0.008
Mangatawhiri River at Lyons Rd At Buckingham Br	11	0.007	0.006	0	0.011	0.003	0.41	0.004
Mangawara Stm at Rutherford Rd Br	12	0.027	0.028	0.01	0.049	0.02	0.4	0.022
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	0.029	0.033	0.02	0.05	0.024	0.21	0.018
Matahuru Stm at Waiterimu Road Below Confluence	12	0.019	0.02	0.01	0.036	0.013	0.48	0.014
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	0.017	0.018	0.01	0.025	0.006	-0.21	0.012
Ohaeroa Stm at SH22 Br	11	0.008	0.006	0	0.012	0.005	0.27	0.006
Opuatia Stm at Ponganui Rd	11	0.007	0.006	0	0.015	0.003	1.49	0.005
Pokaiwhenua Stm at Puketurua	12	0.004	0.003	0	0.015	0.004	1.82	0.003
Waahi Stm at Te Ohaki Rd	12	0.009	0.009	0.01	0.014	0.003	0.52	0.007
Waerenga Stm at Taniwha Rd	11	0.008	0.006	0.01	0.016	0.004	1.71	0.006
Waitawhiriwhiri Stm at Edgcombe Street	11	0.03	0.024	0.02	0.057	0.025	0.92	0.018
Whakapipi Stm at SH22 Br	11	0.009	0.007	0.01	0.021	0.003	2.17	0.006
Whakauru Stm at U/S SH1 Br	12	0.007	0.006	0	0.014	0.002	1.84	0.006
Whangamarino River at Island Block Rd	9	0.039	0.035	0.01	0.078	0.024	0.65	0.024
Whangamarino River at Jefferies Rd Br	11	0.012	0.011	0.01	0.024	0.006	1.49	0.008
Whangape Stm at Rangiriri-Glen Murray Rd	11	0.017	0.014	0.01	0.034	0.007	1.46	0.011

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	0.007	0.007	0	0.014	0.002	1.82	0.006
Kaniwhaniwha Stm at Wright Rd	12	0.005	0.006	0	0.007	0.002	-0.36	0.006
Mangaohoi Stm at South Branch Maru Rd	12	0.002	0.001	0	0.003	0.001	1.07	0.001
Mangaokewa Stm at Lawrence Street Br	12	0.008	0.007	0	0.018	0.005	1.3	0.007
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	0.027	0.026	0.01	0.048	0.02	0.45	0.015
Mangapu River at Otorohanga	9	0.007	0.006	0	0.016	0.003	2.23	0.006
Mangarama Stm at Gadsby Rd	10	0.008	0.007	0	0.023	0.004	1.94	0.007
Mangarapa Stm at Otorohanga Rd	10	0.005	0.005	0	0.008	0.002	1.16	0.005
Mangatutu Stm (Waikeria) at Walker Rd Br	11	0.005	0.005	0	0.007	0.002	0.23	0.004
Mangauika Stm at Te Awamutu Borough W/S Intake	10	0.002	0.002	0	0.003	0.002	0.47	0.001
Moakururu Stm at Warratah Farm Bridge	10	0.004	0.004	0	0.007	0.001	0.19	0.004
Ohote Stm at Whatawhata/Horotiu Rd	12	0.032	0.031	0.02	0.062	0.014	1.3	0.026
Puniu River at Bartons Corner Rd Br	10	0.008	0.007	0	0.012	0.003	0.6	0.006
Puniu River at Wharepapa Rd Bridge	12	0.005	0.005	0	0.008	0.002	0.46	0.005
Waipa River at Mangaokewa Rd	11	0.012	0.011	0	0.02	0.006	0.16	0.01
Waipa River at Ngaruawahia Br	12	0.008	0.009	0.01	0.011	0.004	-0.01	0.007
Waipa River at Pukehoua Bridge on Baffin Road	10	0.006	0.006	0	0.012	0.003	1.04	0.006
Waipa River at SH3 Otorohanga	10	0.006	0.005	0	0.01	0.003	0.75	0.005
Waitomo Stm at SH31 Otorohanga	6	0.005	0.004	0	0.009	0.004	1.13	0.004
Waitomo Stm at Tumutumumu Rd	10	0.003	0.002	0	0.005	0.002	0.71	0.003
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	0.007	0.006	0	0.018	0.007	1.06	0.005
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	0.008	0.006	0	0.027	0.004	2.57	0.006
Mangakara Stm (Reporoa) at SH5	10	0.004	0.004	0	0.007	0	2.06	0.004
Mangakino Stm (Whakamaru) at Sandel Rd	11	0.004	0.003	0	0.008	0.005	0.62	0.003
Otamakokore Stm at Hossack Rd	12	0.011	0.01	0	0.028	0.008	1.39	0.008
Pueto Stm at Broadlands Rd Br	12	0.001	0.001	0	0.003	0.001	1.93	0.001
Tahunaatara Stm at Ohakuri Rd	11	0.008	0.006	0.01	0.02	0.002	2.12	0.007
Torepatutahi Stm at Vaile Rd Br	12	0.003	0.003	0	0.009	0.003	1.53	0.003
Waiotapu Stm at Campbell Rd Br	12	0.001	0.001	0	0.005	0	3.46	0.001
Waiotapu Stm at Homestead Rd Br	12	0.006	0.005	0	0.014	0.003	1.54	0.004
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	0.003	0.003	0	0.006	0.003	0.8	0.003
Whirinaki Stm at Corbett Rd	12	0.001	0.001	0	0.004	0	2.26	0.001
West Coast								
Awakino River at Gribbon Rd	12	0.002	0.001	0	0.005	0.002	1.26	0.001
Awakino River at SH3 Awakau Rd Junction	11	0.003	0.002	0	0.01	0.002	1.63	0.003
Manganui River at Off Manganui Rd	12	0.002	0.002	0	0.005	0.002	1.25	0.001
Mangaotaki River at SH3 Br	12	0.004	0.003	0	0.009	0.002	1.01	0.003
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	0.004	0.004	0	0.007	0.001	1.4	0.004
Mokau River at Awakau Rd	12	0.007	0.007	0	0.013	0.003	0.93	0.007
Mokau River at Mangaokewa Rd (Off SH30)	12	0.01	0.01	0.01	0.019	0.005	1	0.01
Mokau River at Totoro Rd Recorder	11	0.008	0.007	0	0.014	0.004	0.91	0.006
Mokauiti Stm at Three Way Point - Aria	11	0.013	0.012	0.01	0.024	0.009	0.9	0.01
Ohautira Stm at Waingaro Te Uku Rd	12	0.006	0.006	0	0.009	0.002	0.58	0.005
Oparau River at Langdon Rd (Off Okupata Rd)	10	0.004	0.004	0	0.01	0.002	1.7	0.004
Tawarau River at Off Speedies Rd	10	0.004	0.004	0	0.006	0.002	-0.19	0.004
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	0.007	0.006	0	0.013	0.002	1.61	0.007
Waitetuna River at Te Uku-Waingaro Rd	12	0.006	0.006	0	0.008	0.003	0.14	0.006

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	0.003	0.003	0	0.005	0.002	0.58	0.003
Kuratau River at SH41 Moerangi	12	0.004	0.003	0	0.009	0.002	1.82	0.004
Kuratau River at Te Rae Street T10	12	0.006	0.006	0	0.009	0.003	0.43	0.004
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	0.009	0.007	0.01	0.018	0.005	1.39	0.007
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	0.002	0.001	0	0.005	0	2.56	0.001
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	0.001	0.001	0	0.003	0	1.92	0.001
Tokaanu Stm at Off SH41 Turangi	12	0.001	0.001	0	0.004	0	2.95	0.001
Waihaha River at SH32	12	0.002	0.001	0	0.008	0.001	2.54	0.002
Waitahanui River at Blake Rd	12	0.001	0.001	0	0.004	0	3.46	0.001
Whangamata Stm (Kinloch) at Whangamata Rd	12	0.003	0.001	0	0.008	0.003	1.4	0.001
Whanganui Stm at Lakeside Lake Taupo T8	12	0.004	0.003	0	0.008	0.002	1.94	0.003
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	0.004	0.004	0	0.008	0.001	1.52	0.004

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 5: Black Disk sample statistics for 2022 with 2018-2022 five-year median.

Black Disk (m)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	2	2.2	0.3	3.1	1	-0.86	3.1
Kauaeranga River at Smiths Cableway Recorder	11	3.6	4.1	0.9	5.4	2.9	-0.57	4.6
Ohinemuri River at Karangahake	11	3	3.1	0.4	5.4	2.5	-0.06	3.5
Ohinemuri River at Queens Head	10	4.1	4.6	0.4	5.6	1.7	-1.54	4
Ohinemuri River at SH25 Br	12	2.7	2.8	0.4	5.6	2.7	0.18	3.7
Tapu River at Tapu-Coroglen Rd	12	3.9	4.2	0.3	6.9	3.9	-0.23	4.7
Waiau River at E309 Rd Ford	11	2	2.1	0.4	3.2	1.8	-0.39	2.6
Waitekauri River at U/S Ohinemuri Conflu	11	2.9	2.8	0.2	5.4	2.8	0.04	3.9
Waiwawa River at SH25 Coroglen	12	2.7	2.7	0.4	5.2	2.4	0.02	3.2
Wharekawa River at SH25	10	2.1	2	0.2	5	1.8	0.77	2.9
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	0.8	0.7	0.5	1.3	0.3	0.93	0.9
Oraka Stm at Lake Rd	12	0.8	0.7	0.4	1.4	0.4	0.73	0.9
Piako River at Kiwitahi	12	1.9	1.7	0.4	4	1.2	0.77	1.9
Piako River at Paeroa-Tahuna Rd Br	11	0.8	0.7	0.2	1.5	0.4	0.22	0.9
Piakonui Stm at Piakonui Rd	12	1	0.9	0.5	1.6	0.4	0.69	1.3
Waihou River at Okauia	12	0.8	0.8	0.2	1.6	0.5	0.49	1.1
Waihou River at Te Aroha	12	0.8	0.8	0.4	1.5	0.4	0.69	1
Waihou River at Whites Rd	11	4.4	4.9	1.2	5.5	1	-2.05	4.9
Waiomou Stm at Matamata-Tauranga Rd	12	1.1	1.2	0.3	1.7	0.4	-0.63	1.2
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	7	1.2	1.2	0.7	2	0.6	0.84	1.3
Waitoa River at Landsdowne Rd Br	12	1.7	1.4	0.3	4.8	0.9	1.64	1.6
Waitoa River at Mellon Rd Recorder	11	1.1	1.1	0.3	2.2	0.7	0.51	0.9
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otatau Rd Br opp Moseley Rd	4	1.1	0.6	0.3	2.9	1.4	1.86	0.5
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	1.5	1.5	0.2	3.7	1.3	0.81	1.4
Karapiro Stm at Hickey Rd Bridge - Cambridge	10	0.7	0.7	0.3	1.6	0.4	1.32	0.9
Kirikiroa Stm at Tauhara Dr	12	0.4	0.3	0.2	0.6	0.2	0.54	0.4
Komakorau Stm at Henry Rd	10	0.2	0.2	0.1	0.4	0.1	1.2	0.1
Little Waipa Stm at Arapuni - Putaruru Rd	11	1.5	1.4	0.3	3.1	1.4	0.37	1.8
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	0.4	0.4	0.1	0.6	0.2	-0.4	0.5
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	0.6	0.7	0.2	1	0.5	-0.29	0.8
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	0.7	0.8	0.3	0.9	0.2	-1.75	0.8
Mangaonua Stm at Hoeka Rd	12	0.9	0.9	0.2	1.6	0.4	-0.09	0.9
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	1	1.1	0.3	2.4	0.8	0.9	1.2
Mangatangi River at SH2 Maramarua	9	0.6	0.5	0.3	1	0.2	0.95	0.5
Mangatawhiri River at Lyons Rd At Buckingham Br	9	1.3	1.3	0.5	2.2	0.8	0.18	1.6
Mangawara Stm at Rutherford Rd Br	12	0.2	0.2	0.2	0.4	0.1	2.25	0.2
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	10	0.3	0.3	0.2	0.4	0.1	-0.75	0.2
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	0.1	0.1	0	0.1	0.1	-0.62	0.1
Ohaeroa Stm at SH22 Br	5	0.6	0.6	0.3	0.8	0.2	-0.88	0.8
Opuatia Stm at Ponganui Rd	11	0.5	0.5	0.1	0.7	0.3	-0.34	0.5
Pokaiwhenua Stm at Puketurua	12	1	1.1	0.3	1.8	0.6	0.15	1.1
Waahi Stm at Te Ohaki Rd	5	0.2	0.3	0.1	0.3	0.1	-0.93	0.2
Waerenga Stm at Taniwha Rd	11	0.8	0.6	0.2	2.2	0.5	1.66	0.7
Waitawhiriwhiri Stm at Edgecumbe Street	11	0.3	0.3	0.1	0.6	0.1	1.32	0.3
Whakapipi Stm at SH22 Br	11	1.5	1.4	0.3	2.2	0.8	-0.58	2
Whakauru Stm at U/S SH1 Br	12	0.3	0.3	0.1	0.7	0.2	0.56	0.4
Whangamarino River at Island Block Rd	9	0.3	0.3	0.1	0.5	0.3	0.35	0.2
Whangamarino River at Jefferies Rd Br	11	0.4	0.4	0.1	0.6	0.2	-0.32	0.3
Whangape Stm at Rangiriri-Glen Murray Rd	11	0.2	0.1	0.1	0.5	0.2	0.85	0.1

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	0.8	0.9	0.2	1.3	0.5	-0.57	0.9
Kaniwhaniwha Stm at Wright Rd	4	0.8	0.5	0.3	1.7	0.8	1.66	0.8
Mangaohoi Stm at South Branch Maru Rd	12	1.2	1.3	0.8	1.7	0.3	-0.14	1.4
Mangaokewa Stm at Lawrence Street Br	12	0.8	0.8	0.1	1.9	0.7	0.65	0.8
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	9	0.5	0.3	0.1	1.2	0.6	0.99	0.6
Mangapu River at Otorohanga	2	0.6	0.6	0.2	1	-	-	0.7
Mangarapa Stm at Otorohanga Rd	6	0.7	0.6	0.2	1.9	0.7	1.32	0.9
Mangatutu Stm (Waikeria) at Walker Rd Br	11	1.2	1.1	0.5	2.5	1	0.74	1.6
Mangauika Stm at Te Awamutu Borough W/S Intake	10	3.8	3.7	2.5	5.2	1.4	0.14	3.4
Moakurarua Stm at Warratah Farm Bridge	2	0.9	0.9	0.4	1.3	-	-	1
Ohote Stm at Whatawhata/Horotiu Rd	12	0.4	0.4	0.2	0.6	0.2	0.08	0.5
Puniu River at Bartons Corner Rd Br	7	0.9	0.7	0.6	1.7	0.5	1.33	0.9
Puniu River at Wharepapa Rd Bridge	12	1.3	1.5	0.4	2.2	1.2	-0.01	1.4
Waipa River at Mangaokewa Rd	11	1.8	1.7	1	2.7	0.9	0.02	1.9
Waipa River at Ngaruawahia Br	11	0.6	0.7	0.3	0.9	0.3	-0.5	0.6
Waipa River at Pukehoua Bridge on Baffin Road	6	0.5	0.4	0.2	1	0.6	0.78	0.7
Waipa River at SH3 Otorohanga	10	1	0.9	0.2	2.3	0.8	1	1.3
Waitomo Stm at SH31 Otorohanga	5	0.6	0.6	0.2	1.5	0.5	1.58	0.6
Waitomo Stm at Tumutumu Rd	10	0.7	0.6	0.3	1.6	0.6	0.98	1
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	1	0.9	0.3	1.8	0.7	0.51	1.2
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	9	0.9	0.9	0.6	1.2	0.3	-0.36	1
Mangakara Stm (Reporoa) at SH5	8	0.7	0.7	0.4	0.9	0.3	-0.28	0.7
Mangakino Stm (Whakamaru) at Sandel Rd	7	1.5	1.7	0.5	2.2	1	-0.81	1.9
Otamakokore Stm at Hossack Rd	12	1.1	1	0.6	1.8	0.5	0.64	1.3
Pueto Stm at Broadlands Rd Br	12	1.7	1.7	1	2.2	0.6	-0.16	1.6
Tahunaatara Stm at Ohakuri Rd	11	1.1	1	0.5	1.9	0.4	0.67	1.2
Waiotapu Stm at Campbell Rd Br	12	1.1	1.1	0.2	1.7	0.6	-0.56	1.1
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	1.1	1.1	0.4	1.4	0.5	-0.81	1.3
West Coast								
Awakino River at Gribbon Rd	12	2.2	2.1	1.1	4.2	1.3	0.73	2.2
Awakino River at SH3 Awakau Rd Junction	11	1	0.7	0.2	2.6	1.2	1.03	1.3
Manganui River at Off Manganui Rd	10	1	0.9	0.3	1.9	0.7	0.73	1.2
Mangaotaki River at SH3 Br	12	0.8	0.7	0.3	1.8	0.6	1.18	1
Marokopa River at Speedies Rd (Off Te Anga Rd)	8	0.9	0.9	0.4	1.6	0.9	0.15	1
Mokau River at Awakau Rd	8	0.5	0.2	0.1	1.2	0.8	0.72	0.6
Mokau River at Mangaokewa Rd (Off SH30)	1	1.5	1.5	1.5	1.5	-	-	1.1
Mokau River at Totoro Rd Recorder	10	1	0.5	0.1	2.8	1.7	1.01	1.1
Mokauiti Stm at Three Way Point - Aria	11	0.6	0.7	0.1	1.8	0.8	0.79	0.8
Ohautira Stm at Waingaro Te Uku Rd	9	1	1.1	0.2	1.6	0.6	-0.64	1.1
Oparau River at Langdon Rd (Off Okupata Rd)	9	1.5	1.6	0.9	2.2	0.5	-0.07	1.5
Tawarau River at Off Speedies Rd	10	1	0.9	0.4	1.8	0.9	0.52	1.1
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	7	1.1	0.9	0.5	1.7	0.7	0.32	0.9
Waitetuna River at Te Uku-Waingaro Rd	8	1	1.1	0.3	1.6	0.7	-0.43	0.9
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	2.3	2.1	1	4.7	1.3	1.21	2.5
Kuratau River at SH41 Moerangi	12	2.1	2.1	0.8	3.5	1.8	-0.01	2.8
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	1.1	1.1	0.5	1.4	0.4	-0.87	1.2
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	3	3.6	0.2	5	4.1	-0.39	3.6
Waihaha River at SH32	12	3.5	4.3	0.2	5	2.1	-1.01	3.4
Waitahanui River at Blake Rd	12	2.7	2.4	1.4	5	1.2	1.21	3.1

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 6: Conductivity sample statistics for 2022 with 2018-2022 five-year median.

Conductivity at 25 DegC ($\mu\text{S}/\text{cm}$)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	75	77	51	87	14	-0.95	83
Kauaeranga River at Smiths Cableway Recorder	11	68	74	40	82	15	-1.07	74
Ohinemuri River at Karangahake	12	149	150	80	237	83	0.37	150
Ohinemuri River at Queens Head	12	237	209	115	438	177	0.83	241
Ohinemuri River at SH25 Br	12	72	73	55	79	6	-2.13	76
Tairua River at Morrisons Br Hikuai	11	54	54	44	63	10	-0.35	59
Tapu River at Tapu-Coroglen Rd	12	95	96	69	108	16	-1.05	102
Waiau River at E309 Rd Ford	11	89	92	72	104	10	-0.35	96
Waitekauri River at U/S Ohinemuri Conflu	12	101	100	61	139	35	-0.06	111
Waiwawa River at SH25 Coroglen	12	61	63	41	76	15	-0.49	66
Wharekawa River at SH25	12	68	69	54	78	10	-0.32	72
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	115	111	97	132	16	0.06	119
Oraka Stm at Lake Rd	12	137	131	103	190	42	0.64	144
Piako River at Kiwitahi	12	161	157	148	184	17	0.86	153
Piako River at Paeroa-Tahuna Rd Br	12	245	242	195	288	27	-0.16	236
Piakonui Stm at Piakonui Rd	12	76	72	60	96	23	0.34	76
Waihou River at Okauia	12	103	103	92	117	11	0.2	105
Waihou River at Te Aroha	12	107	109	81	128	17	-0.51	113
Waihou River at Whites Rd	11	84	83	76	88	4	-0.87	85
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	51	52	42	56	6	-0.72	54
Waiomou Stm at Matamata-Tauranga Rd	12	70	69	64	83	8	1.04	68
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	185	180	151	229	54	0.34	182
Waitoa River at Landsdowne Rd Br	12	176	174	130	215	30	-0.2	170
Waitoa River at Mellon Rd Recorder	12	356	313	213	627	198	1	309
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otatau Rd Br opp Moseley Rd	11	290	282	243	399	46	1.44	262
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	748	663	325	1331	483	0.56	724
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	138	133	109	165	46	0.13	139
Kirikiri-roa Stm at Tauhara Dr	12	200	201	158	215	15	-1.9	199
Komakorau Stm at Henry Rd	12	299	274	236	445	97	1.19	259
Little Waipa Stm at Arapuni - Putaruru Rd	11	108	108	93	118	12	-0.32	108
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	195	188	98	319	47	0.71	193
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	125	136	73	146	27	-1.42	134
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	275	278	256	288	17	-0.81	271
Mangaonua Stm at Hoeka Rd	12	206	214	157	230	19	-1.48	208
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	104	100	88	124	20	0.39	101
Mangatangi River at SH2 Maramarua	11	134	133	120	161	14	1.05	132
Mangatawhiri River at Lyons Rd At Buckingham Br	11	117	113	99	137	17	0.23	123
Mangawara Stm at Rutherford Rd Br	12	265	247	220	381	73	1.31	226
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	223	218	211	264	10	2	216
Matahuru Stm at Waiterimu Road Below Confluence	12	144	139	121	201	16	2.32	139
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	178	176	136	231	63	0.37	175
Ohaeroa Stm at SH22 Br	11	169	157	139	203	52	0.5	169
Opuatia Stm at Ponganui Rd	11	178	176	149	197	21	-0.46	183
Pokaiwhenua Stm at Puketurua	12	120	119	108	132	13	0.14	115
Waahi Stm at Te Ohaki Rd	12	410	353	124	660	274	0	441
Waerenga Stm at Taniwha Rd	11	127	125	112	152	17	0.88	121
Waitawhiriwhiri Stm at Edgcombe Street	11	212	206	159	288	10	0.92	204
Whakapipi Stm at SH22 Br	11	199	192	151	245	52	0.14	195
Whakauru Stm at U/S SH1 Br	12	89	89	77	100	9	-0.29	86
Whangamarino River at Island Block Rd	9	176	176	143	225	51	0.39	171
Whangamarino River at Jefferies Rd Br	11	173	178	141	213	28	0.28	158
Whangape Stm at Rangiriri-Glen Murray Rd	11	222	184	128	337	122	0.6	220

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	128	123	97	174	24	0.94	123
Kaniwhaniwha Stm at Wright Rd	12	94	99	8	124	11	-2.71	104
Mangaohoi Stm at South Branch Maru Rd	12	75	74	57	94	20	0.06	80
Mangaokewa Stm at Lawrence Street Br	12	152	135	98	218	76	0.43	155
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	192	185	160	240	61	0.41	184
Mangapu River at Otorohanga	9	177	167	158	227	17	1.62	194
Mangarama Stm at Gadsby Rd	10	226	223	187	267	44	-0.09	242
Mangarapa Stm at Otorohanga Rd	10	168	155	134	219	45	0.73	177
Mangatutu Stm (Waikeria) at Walker Rd Br	11	68	73	52	77	14	-0.82	71
Manguaika Stm at Te Awamutu Borough W/S Intake	10	70	69	57	88	14	0.7	66
Moakurarua Stm at Warratah Farm Bridge	10	110	103	99	127	16	0.68	113
Ohote Stm at Whatawhata/Horotiu Rd	12	182	185	157	218	25	0.58	186
Puniu River at Bartons Corner Rd Br	10	84	85	72	93	9	-0.1	86
Puniu River at Wharepapa Rd Bridge	12	63	62	52	74	6	0.31	63
Waipa River at Mangaokewa Rd	11	50	50	42	61	9	0.39	51
Waipa River at Ngaruawahia Br	12	132	130	116	150	27	0.32	129
Waipa River at Pukehoua Bridge on Baffin Road	10	117	118	94	136	6	-0.62	121
Waipa River at SH3 Otorohanga	10	90	86	69	144	9	2.5	85
Waitomo Stm at SH31 Otorohanga	6	191	189	152	242	13	0.88	189
Waitomo Stm at Tumutumumu Rd	10	188	184	165	227	37	0.81	187
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	144	146	129	159	15	0.07	144
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	96	96	86	103	4	-0.65	93
Mangakara Stm (Reporoa) at SH5	10	99	99	93	109	6	0.84	101
Mangakino Stm (Whakamaru) at Sandel Rd	11	69	71	55	76	10	-1.03	70
Otamakokore Stm at Hossack Rd	12	368	365	268	437	105	-0.25	381
Pueto Stm at Broadlands Rd Br	12	118	119	111	122	5	-0.91	119
Tahunaatara Stm at Ohakuri Rd	11	81	80	74	89	10	0.36	80
Torepatutahi Stm at Vaile Rd Br	12	109	116	86	127	23	-0.48	103
Waiotapu Stm at Campbell Rd Br	12	680	661	494	813	205	-0.13	679
Waiotapu Stm at Homestead Rd Br	12	441	420	319	551	186	0.08	454
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	409	402	342	468	68	-0.08	436
Whirinaki Stm at Corbett Rd	12	71	72	62	77	5	-0.67	71
West Coast								
Awakino River at Gribbon Rd	12	71	70	63	79	11	0.26	71
Awakino River at SH3 Awakau Rd Junction	11	139	124	103	199	56	0.6	136
Manganui River at Off Manganui Rd	12	110	104	92	139	22	0.89	110
Mangaotaki River at SH3 Br	12	134	131	121	153	19	0.63	138
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	140	140	110	173	33	0.32	139
Mokau River at Awakau Rd	12	136	122	95	212	50	1.1	130
Mokau River at Mangaokewa Rd (Off SH30)	12	67	66	55	78	13	-0.01	69
Mokau River at Totoro Rd Recorder	11	118	113	93	147	35	0.37	124
Mokauiti Stm at Three Way Point - Aria	11	124	102	85	306	33	2.93	114
Ohautira Stm at Waingaro Te Uku Rd	12	142	142	113	163	28	-0.48	143
Oparau River at Langdon Rd (Off Okupata Rd)	10	88	85	71	117	16	1.18	87
Tawarau River at Off Speedies Rd	10	132	132	106	165	37	0.44	131
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	160	159	129	189	42	-0.11	156
Waitetuna River at Te Uku-Waingaro Rd	12	107	106	94	122	17	0.14	108

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	56	57	42	70	10	-0.31	61
Kuratau River at SH41 Moerangi	12	39	39	31	48	6	0.4	41
Kuratau River at Te Rae Street T10	12	63	63	54	75	10	0.5	67
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	125	125	119	132	6	0.24	126
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	43	45	25	54	16	-0.61	46
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	114	110	95	141	31	0.69	119
Tokaanu Stm at Off SH41 Turangi	12	100	102	92	108	8	-0.34	102
Waihaha River at SH32	12	44	45	28	56	8	-0.66	46
Waitahanui River at Blake Rd	12	73	73	67	80	5	0.12	76
Whangamata Stm (Kinloch) at Whangamata Rd	12	89	90	81	93	5	-1	90
Whanganui Stm at Lakeside Lake Taupo T8	12	54	55	34	70	12	-0.46	57
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	76	77	63	86	9	-0.33	78

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 7: Dissolved oxygen (%) sample statistics for 2022 with 2018-2022 five-year median.

Dissolved Oxygen (% sat.)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	93.77	94.75	84.5	97.6	3.55	-1.6	94
Kauaeranga River at Smiths Cableway Recorder	11	97.62	98.2	94.2	100.1	2.48	-0.73	98
Ohinemuri River at Karangahake	12	105	102.75	97.9	116.9	10.8	0.77	104
Ohinemuri River at Queens Head	12	99.17	101.65	68.2	112	7.45	-2.28	103
Ohinemuri River at SH25 Br	12	105.3	103.1	96.4	122.4	11.85	0.96	108
Tairua River at Morrisons Br Hikuaui	11	97.98	97.5	94.7	100.6	2.9	0.09	97
Tapu River at Tapu-Coroglen Rd	12	100.7	100.45	98	105.2	3.25	0.62	100
Waiau River at E309 Rd Ford	11	101.3	101.1	96.4	108.6	2.75	0.92	101
Waitekauri River at U/S Ohinemuri Conflu	12	102.2	102.25	96.5	108.7	6.9	0.16	103
Waiwawa River at SH25 Coroglen	12	99.48	99.35	96.2	103.2	2.4	0.22	100
Wharekawa River at SH25	12	98.22	96.75	90.9	112.1	3	1.8	97
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	97.67	98	95.4	99.5	2.42	-0.47	98
Oraka Stm at Lake Rd	12	91.17	91	88	94	3.8	-0.01	92
Piako River at Kiwitahi	12	68.26	73.65	31.5	98	41.45	-0.46	84
Piako River at Paeroa-Tahuna Rd Br	12	79.71	84.8	60	89.6	15.1	-1.03	85
Piakonui Stm at Piakonui Rd	12	98.23	98.1	96.3	100.3	1.65	0.24	99
Waihou River at Okauia	12	92.96	93.25	90.3	94.2	1.75	-1.06	94
Waihou River at Te Aroha	12	86.35	86.95	79.9	90.7	1.7	-1.13	89
Waihou River at Whites Rd	11	95.09	94.8	91.6	100.8	5.05	0.51	97
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	92.52	93.05	88.9	96.1	2.6	-0.39	93
Waiomou Stm at Matamata-Tauranga Rd	12	94.49	94.7	91.4	97	1.65	-0.44	96
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	86.92	88.3	76	98.5	10.78	-0.21	90
Waitoa River at Landsdowne Rd Br	12	78.1	81.35	55.7	91.2	13.45	-1.03	88
Waitoa River at Mellon Rd Recorder	12	66.1	70.45	45.4	76.8	15.25	-0.9	75
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otatau Rd Br opp Moseley Rd	11	93.72	90.1	73.1	117.4	16.65	0.41	88
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	84.13	84.5	72.9	95.3	11.65	-0.05	85
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	89.23	89.5	79.5	96.8	11	-0.26	90
Kirikiri-roa Stm at Tauhara Dr	12	74.79	75.35	65	83.9	8.35	-0.11	73
Komakorau Stm at Henry Rd	12	64.26	62.5	53.2	91.9	9	1.95	63
Little Waipa Stm at Arapuni - Putaruru Rd	11	86.41	87.9	70	96.3	10.22	-0.92	91
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	87.73	88.65	79.3	91.3	5.15	-1.16	88
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	97.87	98	93.6	101.6	4.2	-0.24	99
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	79.55	80.25	68.3	85.4	5.5	-1.43	80
Mangaonua Stm at Hoeka Rd	12	73.49	75.25	60.2	82.3	10.9	-0.65	81
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	98.93	98.6	97	101.1	0.95	0.6	99
Mangatangi River at SH2 Maramarua	11	86.11	87	78.1	92.3	7.15	-0.48	87
Mangatawhiri River at Lyons Rd At Buckingham Br	11	102.5	101.3	91.9	116.8	8.47	0.67	108
Mangawara Stm at Rutherford Rd Br	12	65.27	67.9	54.7	71.8	12.05	-0.66	71
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	86.06	85.9	83	88.8	2.85	0.36	86
Matahuru Stm at Waiterimu Road Below Confluence	12	81.86	82.9	71.3	90.1	8.7	-0.46	84
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	85.25	92.1	31.4	100	14.63	-2.11	92
Ohaeroa Stm at SH22 Br	11	89.51	91.9	81.9	95.5	11.88	-0.47	93
Opuatia Stm at Ponganui Rd	11	91.86	94.3	82	96.2	7.15	-1.04	95
Pokaiwhenua Stm at Puketurua	12	93.61	93.75	89.7	97.3	4.2	-0.33	96
Waahi Stm at Te Ohaki Rd	12	84.77	83.25	75.7	97.2	8.15	0.55	84
Waerenga Stm at Taniwha Rd	11	91.32	93.4	81.5	96.5	9.47	-0.72	95
Waitawhiriwhiri Stm at Edgcombe Street	11	76.71	76.6	67.7	83.6	9.23	-0.16	80
Whakapipi Stm at SH22 Br	11	84.65	91.2	66.4	98.8	23.95	-0.58	93
Whakauru Stm at U/S SH1 Br	12	94.67	94.05	91.1	97.6	3.45	0.14	96
Whangamarino River at Island Block Rd	9	51.38	43.5	4.9	122.2	59.63	0.86	61
Whangamarino River at Jefferies Rd Br	11	71.44	66.3	60.3	84.1	20.55	0.21	76
Whangape Stm at Rangiriri-Glen Murray Rd	11	76.13	86.5	28.5	98.8	29.27	-1.21	87

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	86.41	86.45	79.6	93.1	7.75	-0.06	87
Kaniwhaniwha Stm at Wright Rd	12	92.98	92.85	81.2	99.6	4.2	-1.04	92
Mangaohoi Stm at South Branch Maru Rd	12	98.83	98.9	94.1	101.5	1.6	-1.41	99
Mangaokewa Stm at Lawrence Street Br	12	92.84	93.85	86.2	98.3	5.55	-0.5	94
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	99.92	88	79.3	144.7	32.4	1.22	96
Mangapu River at Otorohanga	9	87.71	89.5	82	92	7.45	-0.4	91
Mangarama Stm at Gadsby Rd	10	96.86	93.75	67.3	131.4	19.8	0.75	102
Mangarapa Stm at Otorohanga Rd	10	94.24	91.8	87.5	108.8	8.1	1.16	94
Mangatutu Stm (Waikeria) at Walker Rd Br	11	95.48	96.2	89	98.4	2.15	-1.84	96
Mangauika Stm at Te Awamutu Borough W/S Intake	10	98.7	98.9	97	100	1.7	-0.42	99
Moakurarua Stm at Warratah Farm Bridge	10	94.65	95.45	90.8	96.9	3.7	-0.97	96
Ohote Stm at Whatawhata/Horotiu Rd	12	45.68	49.05	19.7	74.9	33.3	-0.07	48.2
Puniu River at Bartons Corner Rd Br	10	93	92.05	85.5	103	7.3	0.76	93
Puniu River at Wharepapa Rd Bridge	12	105.9	103.35	96.9	119.5	10.1	1.04	104
Waipa River at Mangaokewa Rd	11	100.5	100.6	99.3	101.5	1.25	-0.23	101
Waipa River at Ngaruawahia Br	12	85.18	87.7	65.1	92	5.2	-2.29	87
Waipa River at Pukehoua Bridge on Baffin Road	10	88.11	89.2	81.8	91.9	4.9	-0.73	91
Waipa River at SH3 Otorohanga	10	98.68	95.3	93	115	3.7	1.69	100
Waitomo Stm at SH31 Otorohanga	6	93.17	92.8	87.4	100.2	5	0.52	95
Waitomo Stm at Tumutumumu Rd	10	99.11	97.5	95.7	109.5	2.1	2.38	99
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	85.17	86.15	76.6	88.1	3.75	-1.73	87
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	92.13	92.3	89.5	94.2	3.2	-0.42	94
Mangakara Stm (Reporoa) at SH5	10	91.99	92.15	89.5	93.9	3	-0.35	92
Mangakino Stm (Whakamaru) at Sandel Rd	11	102	102.3	98.7	103.3	1.65	-1.55	102
Otamakokore Stm at Hossack Rd	12	89.27	93.8	64.1	99.2	12	-1.44	93
Pueto Stm at Broadlands Rd Br	12	92.84	93.35	90.5	94.5	2.45	-0.46	94
Tahunaatara Stm at Ohakuri Rd	11	100	99.6	96.9	107.5	2.13	2.05	101
Torepatutahi Stm at Vaile Rd Br	12	85.93	86.95	66.1	101.7	13.05	-0.58	92
Waiotapu Stm at Campbell Rd Br	12	86.22	87	79.6	89.9	2.25	-1.35	88
Waiotapu Stm at Homestead Rd Br	12	83.63	84.1	76.1	90.9	6.75	0.07	85
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	97.07	97.2	93.8	100.1	2.35	-0.43	98
Whirinaki Stm at Corbett Rd	12	96.69	95.7	93.5	100.7	4.05	0.46	98
West Coast								
Awakino River at Gribbon Rd	12	99.85	99.8	97.4	104.1	1.65	1.06	100
Awakino River at SH3 Awakau Rd Junction	11	100.5	99.5	96.1	112.1	4.58	1.57	101
Manganui River at Off Manganui Rd	12	97.95	98.05	94.9	101.5	5	0.04	99
Mangaotaki River at SH3 Br	12	100.4	100.2	98.1	102.9	1.6	0.28	101
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	101.9	101.45	98.8	108.2	3.9	1.04	102
Mokau River at Awakau Rd	12	94.16	94.6	88.3	101.7	5.9	0.07	94
Mokau River at Mangaokewa Rd (Off SH30)	12	96.79	97.45	86.9	100.4	2.15	-2.5	98
Mokau River at Totoro Rd Recorder	11	100.4	101.1	97.2	103.3	2.52	-0.39	101
Mokauiti Stm at Three Way Point - Aria	11	85.32	86.5	73.3	93.5	9.77	-0.68	90
Ohautira Stm at Waingaro Te Uku Rd	12	94.51	95.45	85.3	98.3	3	-2.05	96
Oparau River at Langdon Rd (Off Okupata Rd)	10	101.3	100.4	98.2	108	3.1	1.36	101
Tawarau River at Off Speedies Rd	10	102.4	102.15	99.2	105.7	2	0.18	103
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	94.84	97	78	110.3	6.35	-0.33	96
Waitetuna River at Te Uku-Waingaro Rd	12	97.3	97.95	94.1	100.1	3.45	-0.25	98

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	101	99.5	92.9	111.7	5.05	0.63	99
Kuratau River at SH41 Moerangi	12	94.02	95.2	86.9	99.8	5.55	-0.39	94
Kuratau River at Te Rae Street T10	12	101	101	93.5	108.8	4.8	0.19	100
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	86.13	86.2	82.4	91.4	3.35	0.56	87
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	99.48	100.35	91	106.7	6.4	-0.5	98
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	100.9	100.5	86.3	113.9	11.2	-0.14	99
Tokaanu Stm at Off SH41 Turangi	12	81.21	81.35	76.2	85.8	3.95	-0.24	81
Waihaha River at SH32	12	101.9	101.65	95	110.1	4.95	0.35	101
Waitahanui River at Blake Rd	12	98.89	98.85	93.7	104	4.9	0	98
Whangamata Stm (Kinloch) at Whangamata Rd	12	93.13	93.3	89	97.9	3.9	0.05	94
Whanganui Stm at Lakeside Lake Taupo T8	12	100.4	100.8	91.7	110.3	5.5	0.02	100
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	95.7	96.1	90.6	102.2	4.35	0.29	96

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 8: Dissolved Oxygen (g/m³) sample statistics for 2022 with 2018-2022 five-year median.

Dissolved Oxygen (g/m ³)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	9.65	9.75	7.9	11.3	1.4	-0.41	9.7
Kauaeranga River at Smiths Cableway Recorder	11	9.98	10	8.2	11.7	1.7	-0.01	10.1
Ohinemuri River at Karangahake	12	10.27	10.3	9.3	11.4	0.7	0.33	10.4
Ohinemuri River at Queens Head	12	9.67	9.9	6.5	11.3	1.45	-1.21	10.2
Ohinemuri River at SH25 Br	12	10.29	10.1	8.9	12.2	1.55	0.55	10.5
Tairua River at Morrisons Br Hikuaui	11	9.77	9.6	8.4	11.2	1.15	-0.02	9.7
Tapu River at Tapu-Coroglen Rd	12	10.23	10.15	8.7	12	1.15	0.47	10.4
Waiau River at E309 Rd Ford	11	10.16	10.3	9	11.6	1.3	0.3	10.4
Waitekauri River at U/S Ohinemuri Conflu	12	10.13	9.95	9.1	11.5	0.85	0.72	10.2
Waiwawa River at SH25 Coroglen	12	9.95	9.75	8.7	11.5	1.3	0.37	10.1
Wharekawa River at SH25	12	9.8	9.65	8.5	11.2	0.65	0.46	9.7
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	9.66	9.6	8.9	10.4	0.92	-0.08	9.8
Oraka Stm at Lake Rd	12	9.17	9.2	8.3	10.2	1.15	0.08	9.3
Piako River at Kiwitahi	12	6.78	7.6	2.9	9.6	4.7	-0.6	8.5
Piako River at Paeroa-Tahuna Rd Br	12	7.99	8.25	5.3	9.6	1.95	-0.83	8.3
Piakonui Stm at Piakonui Rd	12	9.93	10.05	8.8	11.1	0.5	-0.07	10.1
Waihou River at Okauia	12	9.41	9.5	8.5	10.2	0.6	-0.36	9.6
Waihou River at Te Aroha	12	8.69	8.8	7.6	9.6	0.95	-0.4	9.1
Waihou River at Whites Rd	11	9.95	9.9	9.3	10.6	0.95	0.09	10.1
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	9.78	9.65	8.6	11.2	1.3	0.36	9.8
Waiomou Stm at Matamata-Tauranga Rd	12	9.6	9.75	8.6	10.5	0.4	-0.5	9.8
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	8.42	8.3	6.7	9.9	1.97	-0.19	8.9
Waitoa River at Landsdowne Rd Br	12	7.79	8.2	4.9	9.5	0.85	-1.36	9.3
Waitoa River at Mellon Rd Recorder	12	6.55	7.05	3.9	7.9	1.85	-1.01	7.4
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otaua Rd Br opp Moseley Rd	11	8.95	8.8	7.3	11.3	1.25	0.67	8.5
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	8.52	8.65	7	9.9	1.9	-0.14	8.3
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	8.85	9	6.8	10.4	1.45	-0.6	9.1
Kirikirihoa Stm at Tauhara Dr	12	7.5	7.65	6.15	8.6	1.4	-0.19	7.4
Komakorau Stm at Henry Rd	12	6.48	6.05	5	9.8	1.5	1.4	6.2
Little Waipa Stm at Arapuni - Putaruru Rd	11	8.88	9.2	7	10.2	1.65	-0.5	9.4
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	8.64	8.8	7.3	9.9	0.8	-0.23	8.8
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	9.86	9.65	9.2	11.2	1.1	0.74	9.9
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	7.91	8	6.4	8.8	1	-0.59	8.1
Mangaonua Stm at Hoeka Rd	12	7.27	7.45	5.4	8.6	1.25	-0.76	8
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	9.94	10.05	8.6	11	0.8	-0.36	10.1
Mangatangi River at SH2 Maramarua	11	8.25	8.1	7.4	9.3	1.15	0.52	8.4
Mangatawhiri River at Lyons Rd At Buckingham Br	11	9.86	10.2	8.3	11.1	1	-0.61	10.3
Mangawara Stm at Rutherford Rd Br	12	6.56	6.7	5.03	8.3	1.45	-0.09	7.1
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	8.55	8.8	7.5	9.6	0.75	-0.2	8.8
Matahuru Stm at Waiterimu Road Below Confluence	12	8.3	8.3	7	9.7	1.65	0.17	8.3
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	8.29	8.9	3.3	10.8	1.7	-1.49	8.9
Ohaeroa Stm at SH22 Br	11	8.93	8.9	7.8	10.2	1.65	0.05	9.4
Opuatia Stm at Ponganui Rd	11	9.12	8.9	7.6	10.4	1.43	-0.1	9.5
Pokaiwhenua Stm at Puketurua	12	9.64	9.5	9	10.7	1.1	0.46	9.8
Waahi Stm at Te Ohaki Rd	12	8.2	8.3	7	9.4	0.75	-0.03	8.1
Waerenga Stm at Taniwha Rd	11	9.08	8.8	7.9	10.3	1.65	0.15	9.6
Waitawhiriwhiri Stm at Edgumbe Street	11	7.53	7.7	6.1	8.6	1.35	-0.23	7.7
Whakapipi Stm at SH22 Br	11	8.35	8.6	6.5	10.1	2.92	-0.24	9.2
Whakauru Stm at U/S SH1 Br	12	9.77	9.7	8.9	11	1.15	0.53	9.8
Whangamarino River at Island Block Rd	9	4.91	4.6	0.4	11.5	5.2	0.77	5.8
Whangamarino River at Jefferies Rd Br	11	7.12	7.1	5.6	8.7	2.63	0.18	7.5
Whangape Stm at Rangiriri-Glen Murray Rd	11	7.44	7.7	2.7	10	3.55	-0.8	8.5

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	8.82	8.8	7.3	10.1	1.35	-0.19	8.8
Kaniwhaniwha Stm at Wright Rd	12	9.33	9.15	8.55	10.7	1.15	0.59	9.2
Mangaohoi Stm at South Branch Maru Rd	12	9.78	9.6	9	11	1.05	0.72	9.9
Mangaokewa Stm at Lawrence Street Br	12	9.52	9.35	8	11.6	1.45	0.5	9.8
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	9.52	9.1	7.8	12.5	2.6	0.64	9.7
Mangapu River at Otorohanga	9	8.66	8.7	7.7	9.7	1.07	0.03	9.1
Mangarama Stm at Gadsby Rd	10	9.48	9.6	6.2	12.4	1.8	-0.1	10.5
Mangarapa Stm at Otorohanga Rd	10	9.23	9.25	8.1	10.4	1.3	-0.06	9.3
Mangatutu Stm (Waikeria) at Walker Rd Br	11	9.58	9.3	8.7	10.9	1.07	0.66	9.7
Mangauika Stm at Te Awamutu Borough W/S Intake	10	10.24	10.25	9.4	11	1	-0.14	10.4
Moakurarua Stm at Warratah Farm Bridge	10	9.6	9.65	8.5	10.7	1.2	-0.12	9.9
Ohote Stm at Whatawhata/Horotiu Rd	12	4.63	4.9	1.9	7.8	3.77	-0.04	4.7
Puniu River at Bartons Corner Rd Br	10	9.27	9.1	8.3	10.7	0.9	0.6	9.5
Puniu River at Wharepapa Rd Bridge	12	10.48	10.5	9.7	11.6	1.05	0.24	10.4
Waipa River at Mangaokewa Rd	11	9.91	10	9	10.8	1.2	-0.11	10
Waipa River at Ngaruawahia Br	12	8.5	8.45	5.94	10.2	1.4	-0.78	8.4
Waipa River at Pukehoua Bridge on Baffin Road	10	8.77	8.85	7.7	10.1	1.4	0.03	9.1
Waipa River at SH3 Otorohanga	10	9.72	9.8	8.8	10.7	1.2	-0.08	10.1
Waitomo Stm at SH31 Otorohanga	6	9.27	9.55	8.2	10	1.1	-0.8	9.7
Waitomo Stm at Tumutumumu Rd	10	10.04	10.15	9.3	10.5	0.7	-0.47	10.2
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	8.25	8.35	7.2	9	0.8	-0.59	8.3
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	9.42	9.3	8.8	10.5	0.8	0.77	9.4
Mangakara Stm (Reporoa) at SH5	10	9.41	9.45	8.6	10.4	0.9	0.23	9.3
Mangakino Stm (Whakamaru) at Sandel Rd	11	10.64	10.4	10	11.6	0.78	0.81	10.7
Otamakokore Stm at Hossack Rd	12	7.9	7.95	5.8	9	1.45	-0.89	8.2
Pueto Stm at Broadlands Rd Br	12	9.37	9.2	8.8	10	0.7	0.5	9.3
Tahunaatara Stm at Ohakuri Rd	11	10.25	10.2	9.4	11.5	1.2	0.41	10.2
Torepatutahi Stm at Vaile Rd Br	12	8.59	8.95	6.4	9.9	1.5	-1.01	9.3
Waiotapu Stm at Campbell Rd Br	12	6.66	6.75	6	7.1	0.45	-0.67	6.7
Waiotapu Stm at Homestead Rd Br	12	7.72	7.75	6.7	8.4	0.9	-0.42	7.8
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	8.38	8.3	7.8	9.2	0.7	0.27	8.4
Whirinaki Stm at Corbett Rd	12	10	9.85	9.4	10.7	0.75	0.48	10.1
West Coast								
Awakino River at Gribbon Rd	12	10.19	10.15	9.3	11.9	0.6	1.55	10.4
Awakino River at SH3 Awakau Rd Junction	11	10.18	10.2	9.1	11.6	0.95	0.6	10.4
Manganui River at Off Manganui Rd	12	10.08	10.05	9	11.7	0.85	0.62	10.2
Mangaotaki River at SH3 Br	12	10.3	10.35	9.1	12.1	1.15	0.48	10.4
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	10.28	10.25	9	10.9	0.7	-1.16	10.6
Mokau River at Awakau Rd	12	9.41	9.35	8.2	11.2	1.55	0.38	9.5
Mokau River at Mangaokewa Rd (Off SH30)	12	9.95	10.15	8.3	11.8	1.5	0.08	10.2
Mokau River at Totoro Rd Recorder	11	9.94	9.8	8.6	11.1	1.38	0.03	10.4
Mokauiti Stm at Three Way Point - Aria	11	8.39	8.8	6.2	9.6	2	-0.57	9.2
Ohautira Stm at Waingaro Te Uku Rd	12	9.7	9.8	8.5	11.4	1.3	0.39	9.8
Oparau River at Langdon Rd (Off Okupata Rd)	10	10.14	10.25	9.2	11.1	1.1	-0.04	10.4
Tawarau River at Off Speedies Rd	10	10.4	10.45	9.8	10.9	0.8	-0.19	10.6
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	9.4	9.5	7.13	10.9	1.9	-0.59	9.8
Waitetuna River at Te Uku-Waingaro Rd	12	9.86	9.95	8.6	10.9	1.16	-0.29	10

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	10.53	10.5	9.8	11.5	0.9	0.36	10.5
Kuratau River at SH41 Moerangi	12	9.79	9.7	8.8	10.8	0.85	0.07	9.8
Kuratau River at Te Rae Street T10	12	10.01	10.1	9	10.8	1.15	-0.28	10
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	9.11	9.1	8.6	9.7	0.5	0.36	9.1
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	10.53	10.55	9.6	11.6	1	0.2	10.4
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	10.17	10.3	7.6	11.4	1.47	-1.27	10.3
Tokaanu Stm at Off SH41 Turangi	12	8.32	8.4	7.9	8.9	0.4	0.34	8.4
Waihaha River at SH32	12	10.58	10.6	9.7	11.3	0.55	-0.22	10.6
Waitahanui River at Blake Rd	12	10.46	10.3	10.1	11.3	0.45	1.43	10.4
Whangamata Stm (Kinloch) at Whangamata Rd	12	9.85	9.75	9.6	10.4	0.5	0.82	10
Whanganui Stm at Lakeside Lake Taupo T8	12	10.42	10.35	9	11.4	1.05	-0.38	10.5
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	9.97	10	8.8	10.8	0.85	-0.32	10.1

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 9: Dissolved reactive phosphorous sample statistics for 2022 with 2018-2022 five-year median.

Dissolved Reactive Phosphorus (g/m ³)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	0.002	0.002	0	0.004	0	3.46	0.002
Kauaeranga River at Smiths Cableway Recorder	11	0.002	0.002	0	0.002	0	0	0.002
Ohinemuri River at Karangahake	12	0.003	0.002	0	0.01	0.001	2.35	0.002
Ohinemuri River at Queens Head	12	0.003	0.002	0	0.005	0.001	1.47	0.002
Ohinemuri River at SH25 Br	12	0.004	0.002	0	0.011	0.004	1.6	0.002
Tairua River at Morrisons Br Hikuai	11	0.002	0.002	0	0.002	0	0	0.002
Tapu River at Tapu-Coroglen Rd	12	0.002	0.002	0	0.004	0	3.46	0.002
Waiau River at E309 Rd Ford	11	0.002	0.002	0	0.005	0	3.32	0.002
Waitekauri River at U/S Ohinemuri Conflu	12	0.002	0.002	0	0.002	0	0	0.002
Waiwawa River at SH25 Coroglen	12	0.002	0.002	0	0.002	0	0	0.002
Wharekawa River at SH25	12	0.002	0.002	0	0.002	0	0	0.002
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	0.034	0.031	0.02	0.047	0.011	0.48	0.033
Oraka Stm at Lake Rd	12	0.099	0.074	0.05	0.24	0.065	1.88	0.14
Piako River at Kiwitahi	12	0.037	0.0315	0.02	0.06	0.016	1.11	0.028
Piako River at Paeroa-Tahuna Rd Br	12	0.164	0.118	0.04	0.45	0.202	1.11	0.13
Piakonui Stm at Piakonui Rd	12	0.011	0.0095	0.01	0.018	0.01	0.19	0.01
Waihou River at Okauia	12	0.056	0.0585	0.04	0.072	0.017	-0.41	0.063
Waihou River at Te Aroha	12	0.047	0.049	0.02	0.078	0.023	-0.04	0.06
Waihou River at Whites Rd	11	0.071	0.072	0.07	0.079	0.004	0.79	0.068
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	0.013	0.011	0.01	0.023	0.01	0.37	0.011
Waiomou Stm at Matamata-Tauranga Rd	12	0.017	0.016	0.01	0.031	0.006	1.29	0.016
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	0.026	0.024	0.02	0.045	0.016	0.63	0.017
Waitoa River at Landsdowne Rd Br	12	0.024	0.024	0	0.06	0.016	1.1	0.018
Waitoa River at Mellon Rd Recorder	12	0.063	0.0605	0.04	0.091	0.031	0.17	0.047
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otatau Rd Br opp Moseley Rd	11	0.01	0.004	0	0.05	0.012	2.49	0.002
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	0.002	0.002	0	0.002	0	0	0.002
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	0.044	0.0415	0.02	0.082	0.029	0.62	0.042
Kirikiri-roa Stm at Tauhara Dr	12	0.01	0.0095	0	0.015	0.006	-0.45	0.009
Komakorau Stm at Henry Rd	12	0.01	0.01	0	0.024	0.011	0.42	0.006
Little Waipa Stm at Arapuni - Putaruru Rd	11	0.058	0.054	0.04	0.122	0.025	1.96	0.048
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	0.523	0.36	0.06	2	0.621	1.92	0.17
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	0.157	0.1715	0.1	0.22	0.073	-0.05	0.16
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	0.067	0.066	0.05	0.091	0.021	0.25	0.061
Mangaonua Stm at Hoeka Rd	12	0.021	0.0135	0	0.107	0.009	3.22	0.009
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	0.014	0.0135	0.01	0.024	0.008	0.43	0.013
Mangatangi River at SH2 Maramarua	11	0.023	0.023	0.01	0.046	0.016	0.78	0.015
Mangatawhiri River at Lyons Rd At Buckingham Br	11	0.01	0.01	0.01	0.013	0.003	0.63	0.009
Mangawara Stm at Rutherford Rd Br	12	0.061	0.0685	0.01	0.145	0.072	0.5	0.037
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	0.077	0.082	0.03	0.16	0.083	0.48	0.033
Matahuru Stm at Waiterimu Road Below Confluence	12	0.024	0.022	0.02	0.036	0.011	0.37	0.019
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	0.002	0.002	0	0.002	0	0	0.002
Ohaeroa Stm at SH22 Br	11	0.008	0.007	0	0.014	0.005	0.39	0.007
Opuatia Stm at Ponganui Rd	11	0.006	0.006	0	0.009	0.003	-0.07	0.005
Pokaiwhenua Stm at Puketurua	12	0.091	0.0885	0.06	0.123	0.03	0.17	0.078
Waahi Stm at Te Ohaki Rd	12	0.006	0.002	0	0.025	0.005	1.7	0.002
Waerenga Stm at Taniwha Rd	11	0.049	0.02	0.01	0.33	0.02	3.24	0.018
Waitawhiriwhiri Stm at Edgcombe Street	11	0.051	0.025	0.01	0.195	0.06	1.81	0.018
Whakapipi Stm at SH22 Br	11	0.017	0.017	0	0.034	0.01	0.25	0.022
Whakauru Stm at U/S SH1 Br	12	0.05	0.0325	0.03	0.196	0.009	2.98	0.031
Whangamarino River at Island Block Rd	9	0.008	0.007	0	0.02	0.006	1	0.005
Whangamarino River at Jefferies Rd Br	11	0.037	0.034	0.01	0.08	0.021	1.21	0.024
Whangape Stm at Rangiriri-Glen Murray Rd	11	0.004	0.002	0	0.017	0	2.35	0.002

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	0.006	0.006	0	0.009	0.003	-0.49	0.005
Kaniwhaniwha Stm at Wright Rd	12	0.008	0.007	0	0.015	0.004	1.47	0.006
Mangaohoi Stm at South Branch Maru Rd	12	0.035	0.0365	0.01	0.057	0.026	-0.18	0.036
Mangaokewa Stm at Lawrence Street Br	12	0.014	0.0125	0.01	0.025	0.003	1.95	0.012
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	0.111	0.0935	0.04	0.25	0.082	1.03	0.076
Mangapu River at Otorohanga	9	0.014	0.013	0	0.026	0.007	0.27	0.013
Mangarama Stm at Gadsby Rd	10	0.013	0.0115	0.01	0.025	0.006	1.46	0.01
Mangarapa Stm at Otorohanga Rd	10	0.011	0.01	0.01	0.015	0.003	0.63	0.01
Mangatutu Stm (Waikeria) at Walker Rd Br	11	0.008	0.007	0	0.013	0.004	0.61	0.007
Mangauika Stm at Te Awamutu Borough W/S Intake	10	0.006	0.006	0	0.01	0.003	-0.13	0.005
Moakururu Stm at Warratah Farm Bridge	10	0.008	0.0085	0	0.012	0.005	-0.68	0.008
Ohote Stm at Whatawhata/Horotiu Rd	12	0.018	0.0175	0.01	0.03	0.006	1.22	0.014
Puniu River at Bartons Corner Rd Br	10	0.018	0.019	0.01	0.024	0.004	-0.02	0.019
Puniu River at Wharepapa Rd Bridge	12	0.023	0.022	0.01	0.041	0.016	0.44	0.025
Waipa River at Mangaokewa Rd	11	0.004	0.004	0	0.008	0.003	0.52	0.004
Waipa River at Ngaruawahia Br	12	0.016	0.014	0.01	0.024	0.009	0.22	0.014
Waipa River at Pukehoua Bridge on Baffin Road	10	0.011	0.01	0	0.02	0.006	0.03	0.011
Waipa River at SH3 Otorohanga	10	0.009	0.008	0	0.015	0.006	0.1	0.007
Waitomo Stm at SH31 Otorohanga	6	0.007	0.007	0.01	0.008	0.002	-0.67	0.006
Waitomo Stm at Tumutumumu Rd	10	0.008	0.0075	0.01	0.013	0.001	1.35	0.008
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	0.052	0.0465	0.03	0.085	0.026	0.82	0.043
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	0.038	0.031	0.02	0.1	0.004	2.84	0.029
Mangakara Stm (Reporoa) at SH5	10	0.041	0.0395	0.03	0.049	0.009	0.18	0.042
Mangakino Stm (Whakamaru) at Sandel Rd	11	0.037	0.038	0.02	0.049	0.017	-0.34	0.037
Otamakokore Stm at Hossack Rd	12	0.135	0.136	0.11	0.166	0.033	0.34	0.13
Pueto Stm at Broadlands Rd Br	12	0.06	0.0585	0.05	0.071	0.006	0.97	0.06
Tahunaatara Stm at Ohakuri Rd	11	0.034	0.033	0.03	0.044	0.009	0.59	0.032
Torepatutahi Stm at Vaile Rd Br	12	0.073	0.072	0.06	0.084	0.008	0.02	0.072
Waiotapu Stm at Campbell Rd Br	12	0.003	0.002	0	0.009	0	3.46	0.002
Waiotapu Stm at Homestead Rd Br	12	0.033	0.0325	0.02	0.06	0.012	1.53	0.032
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	0.063	0.0615	0.05	0.076	0.009	0.58	0.07
Whirinaki Stm at Corbett Rd	12	0.06	0.0565	0.05	0.081	0.01	1.43	0.055
West Coast								
Awakino River at Gribbon Rd	12	0.013	0.014	0.01	0.019	0.006	-0.43	0.011
Awakino River at SH3 Awakau Rd Junction	11	0.01	0.011	0	0.018	0.006	0.05	0.008
Manganui River at Off Manganui Rd	12	0.013	0.014	0.01	0.018	0.007	-0.7	0.011
Mangaotaki River at SH3 Br	12	0.011	0.0115	0	0.016	0.005	-0.55	0.01
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	0.012	0.012	0.01	0.015	0.003	-0.17	0.011
Mokau River at Awakau Rd	12	0.008	0.008	0	0.012	0.003	-0.73	0.007
Mokau River at Mangaokewa Rd (Off SH30)	12	0.015	0.0135	0.01	0.025	0.008	0.13	0.013
Mokau River at Totoro Rd Recorder	11	0.01	0.01	0	0.017	0.003	0.54	0.009
Mokauiti Stm at Three Way Point - Aria	11	0.01	0.008	0.01	0.014	0.005	0.49	0.008
Ohautira Stm at Waingaro Te Uku Rd	12	0.022	0.0225	0.01	0.032	0.012	-0.62	0.02
Oparau River at Langdon Rd (Off Okupata Rd)	10	0.007	0.007	0	0.015	0.002	0.68	0.006
Tawarau River at Off Speedies Rd	10	0.013	0.0125	0.01	0.017	0.004	0.56	0.012
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	0.01	0.008	0	0.019	0.005	0.96	0.008
Waitetuna River at Te Uku-Waingaro Rd	12	0.012	0.0125	0	0.016	0.004	-1.26	0.012

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	0.024	0.023	0.02	0.035	0.009	0.33	0.023
Kuratau River at SH41 Moerangi	12	0.002	0.002	0	0.006	0	3.46	0.002
Kuratau River at Te Rae Street T10	12	0.002	0.002	0	0.007	0	3.46	0.002
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	0.121	0.1225	0.11	0.13	0.011	-0.15	0.11
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	0.012	0.0125	0.01	0.016	0.004	-0.25	0.012
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	0.002	0.002	0	0.004	0	3.32	0.002
Tokaanu Stm at Off SH41 Turangi	12	0.073	0.073	0.07	0.083	0.007	0.63	0.071
Waihaha River at SH32	12	0.017	0.016	0.01	0.028	0.006	0.37	0.015
Waitahanui River at Blake Rd	12	0.039	0.0395	0.03	0.045	0.007	-0.01	0.038
Whangamata Stm (Kinloch) at Whangamata Rd	12	0.066	0.068	0.05	0.073	0.011	-0.84	0.064
Whanganui Stm at Lakeside Lake Taupo T8	12	0.008	0.007	0	0.015	0.004	0.3	0.007
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	0.018	0.016	0.01	0.025	0.01	0.28	0.017

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 10: Total Phosphorous sample statistics for 2022 with 2018-2022 five-year median.

Total Phosphorus (g/m ³)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	0.011	0.008	0	0.038	0.008	2.52	0.008
Kauaeranga River at Smiths Cableway Recorder	11	0.004	0.002	0	0.011	0.004	1.52	0.002
Ohinemuri River at Karangahake	12	0.015	0.011	0.01	0.039	0.019	1.12	0.008
Ohinemuri River at Queens Head	12	0.012	0.01	0	0.041	0.007	2.66	0.011
Ohinemuri River at SH25 Br	12	0.014	0.011	0.01	0.031	0.009	1.32	0.011
Tairua River at Morrisons Br Hikuai	11	0.007	0.007	0	0.014	0.005	0.88	0.005
Tapu River at Tapu-Coroglen Rd	12	0.007	0.005	0	0.032	0.006	2.92	0.005
Waiau River at E309 Rd Ford	11	0.01	0.007	0	0.025	0.006	1.5	0.008
Waitekauri River at U/S Ohinemuri Conflu	12	0.007	0.006	0	0.022	0.005	1.86	0.006
Waiwawa River at SH25 Coroglen	12	0.005	0.004	0	0.012	0.003	1.29	0.004
Wharekawa River at SH25	12	0.008	0.007	0	0.021	0.005	1.55	0.007
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	0.053	0.049	0.04	0.077	0.014	0.69	0.05
Oraka Stm at Lake Rd	12	0.143	0.114	0.08	0.34	0.081	1.96	0.18
Piako River at Kiwitahi	12	0.072	0.059	0.04	0.172	0.035	1.91	0.057
Piako River at Paeroa-Tahuna Rd Br	12	0.26	0.222	0.1	0.58	0.188	1.08	0.25
Piakonui Stm at Piakonui Rd	12	0.026	0.025	0.01	0.049	0.019	0.67	0.023
Waihou River at Okauia	12	0.085	0.08	0.07	0.111	0.028	0.76	0.09
Waihou River at Te Aroha	12	0.08	0.085	0.04	0.1	0.016	-1.24	0.096
Waihou River at Whites Rd	11	0.078	0.078	0.07	0.097	0.009	0.98	0.08
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	0.043	0.032	0.02	0.117	0.024	1.7	0.029
Waiomou Stm at Matamata-Tauranga Rd	12	0.036	0.029	0.02	0.071	0.014	1.66	0.034
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	0.061	0.063	0.03	0.101	0.034	0.64	0.05
Waitoa River at Landsdowne Rd Br	12	0.057	0.052	0.01	0.176	0.041	2.01	0.048
Waitoa River at Mellon Rd Recorder	12	0.128	0.12	0.07	0.24	0.062	1.19	0.11
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otaua Rd Br opp Moseley Rd	11	0.045	0.033	0.01	0.082	0.051	0.41	0.039
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	0.012	0.009	0.01	0.027	0.01	1.15	0.01
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	0.098	0.095	0.06	0.176	0.047	1.02	0.1
Kirikiri-roa Stm at Tauhara Dr	12	0.064	0.067	0.05	0.084	0.017	-0.1	0.067
Komakorau Stm at Henry Rd	12	0.098	0.074	0.06	0.21	0.066	1.49	0.1
Little Waipa Stm at Arapuni - Putaruru Rd	11	0.09	0.064	0.05	0.26	0.05	2.53	0.064
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	0.784	0.695	0.17	2.3	0.69	1.65	0.4
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	0.243	0.23	0.16	0.47	0.106	1.65	0.23
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	0.15	0.144	0.11	0.22	0.036	1	0.13
Mangaonua Stm at Hoeka Rd	12	0.079	0.063	0.03	0.23	0.039	1.94	0.062
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	0.038	0.04	0.02	0.075	0.027	0.69	0.03
Mangatangi River at SH2 Maramarua	11	0.068	0.065	0.04	0.116	0.042	0.4	0.068
Mangatawhiri River at Lyons Rd At Buckingham Br	11	0.025	0.025	0.02	0.037	0.009	0.68	0.023
Mangawara Stm at Rutherford Rd Br	12	0.196	0.188	0.1	0.32	0.119	0.25	0.18
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	0.198	0.198	0.1	0.3	0.078	0.01	0.17
Matahuru Stm at Waiterimu Road Below Confluence	12	0.097	0.09	0.06	0.176	0.051	0.96	0.09
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	0.205	0.192	0.14	0.28	0.089	0.26	0.17
Ohaeroa Stm at SH22 Br	11	0.037	0.033	0.02	0.062	0.013	0.95	0.029
Opuatia Stm at Ponganui Rd	11	0.039	0.025	0.02	0.127	0.008	2.28	0.024
Pokaiwhenua Stm at Puketurua	12	0.14	0.125	0.1	0.27	0.041	1.9	0.11
Waahi Stm at Te Ohaki Rd	12	0.079	0.067	0.04	0.196	0.04	2.3	0.053
Waerenga Stm at Taniwha Rd	11	0.091	0.054	0.04	0.41	0.037	3.04	0.049
Waitawhiriwhiri Stm at Edgcombe Street	11	0.127	0.089	0.06	0.31	0.085	1.54	0.08
Whakapipi Stm at SH22 Br	11	0.042	0.038	0.03	0.084	0.012	2.12	0.051
Whakauru Stm at U/S SH1 Br	12	0.13	0.096	0.06	0.35	0.047	1.88	0.08
Whangamarino River at Island Block Rd	9	0.149	0.151	0.04	0.25	0.141	-0.09	0.14
Whangamarino River at Jefferies Rd Br	11	0.116	0.092	0.06	0.26	0.038	1.8	0.1
Whangape Stm at Rangiriri-Glen Murray Rd	11	0.128	0.089	0.06	0.25	0.112	0.48	0.12

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	0.027	0.025	0.01	0.073	0.01	2.59	0.024
Kaniwhaniwha Stm at Wright Rd	12	0.029	0.027	0.02	0.049	0.011	1	0.028
Mangaohoi Stm at South Branch Maru Rd	12	0.047	0.049	0.03	0.069	0.035	0.02	0.052
Mangaokewa Stm at Lawrence Street Br	12	0.079	0.042	0.02	0.27	0.028	1.97	0.041
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	0.265	0.23	0.1	0.57	0.223	1.01	0.19
Mangapu River at Otorohanga	9	0.089	0.069	0.02	0.21	0.088	1.09	0.052
Mangarama Stm at Gadsby Rd	10	0.082	0.069	0.02	0.199	0.076	0.9	0.034
Mangarapa Stm at Otorohanga Rd	10	0.066	0.055	0.02	0.182	0.057	1.89	0.038
Mangatutu Stm (Waikeria) at Walker Rd Br	11	0.023	0.023	0.01	0.038	0.014	0.28	0.021
Mangauika Stm at Te Awamutu Borough W/S Intake	10	0.009	0.009	0.01	0.014	0.004	0.69	0.009
Moakururu Stm at Warratah Farm Bridge	10	0.028	0.026	0.01	0.049	0.017	0.53	0.024
Ohote Stm at Whatawhata/Horotiu Rd	12	0.096	0.097	0.06	0.127	0.033	-0.14	0.096
Puniu River at Bartons Corner Rd Br	10	0.061	0.056	0.03	0.104	0.042	0.59	0.05
Puniu River at Wharepapa Rd Bridge	12	0.047	0.047	0.04	0.064	0.018	0.34	0.048
Waipa River at Mangaokewa Rd	11	0.017	0.014	0.01	0.037	0.006	1.43	0.017
Waipa River at Ngaruawahia Br	12	0.059	0.049	0.03	0.121	0.032	1.42	0.052
Waipa River at Pukehoua Bridge on Baffin Road	10	0.061	0.045	0.01	0.132	0.055	0.89	0.044
Waipa River at SH3 Otorohanga	10	0.03	0.026	0.01	0.05	0.014	0.25	0.024
Waitomo Stm at SH31 Otorohanga	6	0.04	0.031	0.02	0.087	0.032	1.27	0.031
Waitomo Stm at Tumutumu Rd	10	0.024	0.021	0.01	0.04	0.014	0.59	0.02
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	0.107	0.088	0.06	0.186	0.079	0.78	0.073
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	0.083	0.053	0.04	0.33	0.014	3.04	0.051
Mangakara Stm (Reporoa) at SH5	10	0.072	0.071	0.06	0.101	0.017	1	0.07
Mangakino Stm (Whakamaru) at Sandel Rd	11	0.052	0.05	0.04	0.067	0.009	0.58	0.052
Otamakokore Stm at Hossack Rd	12	0.164	0.158	0.13	0.23	0.029	1.19	0.16
Pueto Stm at Broadlands Rd Br	12	0.077	0.075	0.07	0.098	0.011	1.02	0.08
Tahunaatara Stm at Ohakuri Rd	11	0.06	0.049	0.04	0.093	0.03	0.92	0.052
Torepatutahi Stm at Vaile Rd Br	12	0.09	0.091	0.07	0.107	0.014	-0.23	0.095
Waiotapu Stm at Campbell Rd Br	12	0.079	0.071	0.02	0.154	0.032	0.92	0.065
Waiotapu Stm at Homestead Rd Br	12	0.138	0.14	0.06	0.23	0.058	0.43	0.11
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	0.082	0.081	0.07	0.094	0.011	0.09	0.09
Whirinaki Stm at Corbett Rd	12	0.075	0.063	0.05	0.14	0.016	1.84	0.062
West Coast								
Awakino River at Gribbon Rd	12	0.018	0.018	0.01	0.025	0.008	0.13	0.018
Awakino River at SH3 Awakau Rd Junction	11	0.026	0.022	0.01	0.056	0.014	1.08	0.019
Manganui River at Off Manganui Rd	12	0.03	0.027	0.01	0.063	0.019	1.17	0.025
Mangaotaki River at SH3 Br	12	0.033	0.027	0.01	0.085	0.019	1.87	0.025
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	0.028	0.023	0.02	0.074	0.006	2.91	0.025
Mokau River at Awakau Rd	12	0.075	0.05	0.02	0.23	0.055	1.6	0.033
Mokau River at Mangaokewa Rd (Off SH30)	12	0.04	0.036	0.03	0.102	0.013	2.66	0.037
Mokau River at Totoro Rd Recorder	11	0.062	0.044	0.01	0.21	0.047	1.91	0.03
Mokauiti Stm at Three Way Point - Aria	11	0.063	0.053	0.02	0.151	0.052	1.13	0.043
Ohautira Stm at Waingaro Te Uku Rd	12	0.05	0.047	0.03	0.127	0.014	2.52	0.038
Oparau River at Langdon Rd (Off Okupata Rd)	10	0.015	0.014	0.01	0.022	0.005	0.56	0.015
Tawarau River at Off Speedies Rd	10	0.023	0.023	0.02	0.03	0.004	0.14	0.023
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	0.053	0.034	0.03	0.171	0.03	2.32	0.034
Waitetuna River at Te Uku-Waingaro Rd	12	0.035	0.031	0.02	0.075	0.011	2.26	0.032

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	0.031	0.032	0.02	0.043	0.017	-0.16	0.034
Kuratau River at SH41 Moerangi	12	0.006	0.005	0	0.019	0.005	1.87	0.005
Kuratau River at Te Rae Street T10	12	0.012	0.013	0.01	0.019	0.005	-0.03	0.013
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	0.15	0.152	0.12	0.17	0.014	-0.87	0.14
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	0.017	0.015	0.01	0.051	0.004	2.94	0.016
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	0.012	0.012	0.01	0.015	0.002	0.21	0.013
Tokaanu Stm at Off SH41 Turangi	12	0.078	0.079	0.07	0.088	0.008	0.65	0.079
Waihaha River at SH32	12	0.021	0.019	0.01	0.041	0.01	1.31	0.023
Waitahanui River at Blake Rd	12	0.043	0.044	0.03	0.051	0.005	-0.91	0.045
Whangamata Stm (Kinloch) at Whangamata Rd	12	0.074	0.074	0.05	0.09	0.011	-0.29	0.075
Whanganui Stm at Lakeside Lake Taupo T8	12	0.016	0.013	0.01	0.053	0.008	2.82	0.016
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	0.034	0.033	0.01	0.058	0.009	0.5	0.033

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 11: Ammoniacal nitrogen sample statistics for 2022 with 2018-2022 five-year median.

Ammoniacal Nitrogen (g/m ³)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	0.006	0.005	0.01	0.014	0	2.26	0.005
Kauaeranga River at Smiths Cableway Recorder	11	0.005	0.005	0.01	0.01	0	3.32	0.005
Ohinemuri River at Karangahake	12	0.02	0.016	0.01	0.063	0.025	1.43	0.005
Ohinemuri River at Queens Head	12	0.08	0.084	0.01	0.195	0.08	0.6	0.08
Ohinemuri River at SH25 Br	12	0.009	0.005	0.01	0.017	0.009	0.93	0.005
Tairua River at Morrisons Br Hikuai	11	0.006	0.005	0.01	0.011	0	3.32	0.005
Tapu River at Tapu-Coroglen Rd	12	0.005	0.005	0.01	0.005	0	0	0.005
Waiau River at E309 Rd Ford	11	0.005	0.005	0.01	0.005	0	0	0.005
Waitekauri River at U/S Ohinemuri Conflu	12	0.007	0.005	0.01	0.028	0	3.46	0.005
Waiwawa River at SH25 Coroglen	12	0.006	0.005	0.01	0.014	0	3.46	0.005
Wharekawa River at SH25	12	0.005	0.005	0.01	0.005	0	0	0.005
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	0.008	0.005	0.01	0.021	0.005	1.9	0.005
Oraka Stm at Lake Rd	12	0.033	0.03	0.01	0.104	0.034	1.36	0.04
Piako River at KIWITAHĪ	12	0.017	0.005	0.01	0.065	0.02	1.8	0.005
Piako River at Paeroa-Tahuna Rd Br	12	0.058	0.044	0.01	0.162	0.051	1.32	0.037
Piakonui Stm at Piakonui Rd	12	0.006	0.005	0.01	0.019	0	3.46	0.005
Waihou River at Okauia	12	0.018	0.014	0.01	0.052	0.02	0.99	0.012
Waihou River at Te Aroha	12	0.02	0.019	0.01	0.046	0.017	0.62	0.024
Waihou River at Whites Rd	11	0.007	0.005	0.01	0.016	0	2.33	0.005
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	0.008	0.005	0.01	0.024	0.003	2.5	0.005
Waiomou Stm at Matamata-Tauranga Rd	12	0.013	0.008	0.01	0.056	0.01	2.82	0.005
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	0.023	0.011	0.01	0.1	0.012	1.98	0.011
Waitoa River at Landsdowne Rd Br	12	0.017	0.005	0.01	0.086	0.013	2.46	0.011
Waitoa River at Mellon Rd Recorder	12	0.083	0.066	0.01	0.25	0.114	0.92	0.043
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otaua Rd Br opp Moseley Rd	11	0.046	0.036	0.01	0.115	0.075	0.42	0.045
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	0.033	0.03	0.01	0.059	0.024	0.12	0.037
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	0.031	0.027	0.01	0.089	0.021	1.42	0.021
Kirikiri-roa Stm at Tauhara Dr	12	0.22	0.215	0.08	0.33	0.134	-0.12	0.2
Komakorau Stm at Henry Rd	12	0.499	0.535	0.05	1.15	0.716	0.24	0.66
Little Waipa Stm at Arapuni - Putaruru Rd	11	0.023	0.014	0.01	0.093	0.024	2.34	0.011
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	0.217	0.22	0.1	0.43	0.129	0.84	0.22
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	0.059	0.044	0.01	0.115	0.062	0.24	0.09
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	0.024	0.025	0.01	0.036	0.01	-0.9	0.024
Mangaonua Stm at Hoeka Rd	12	0.068	0.079	0.02	0.102	0.045	-0.65	0.077
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	0.006	0.005	0.01	0.011	0	2.1	0.005
Mangatangi River at SH2 Maramarua	11	0.019	0.019	0.01	0.055	0.017	1.44	0.02
Mangatawhiri River at Lyons Rd At Buckingham Br	11	0.005	0.005	0.01	0.005	0	0	0.005
Mangawara Stm at Rutherford Rd Br	12	0.326	0.395	0.13	0.52	0.309	-0.23	0.35
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	0.094	0.098	0.04	0.139	0.071	-0.12	0.1
Matahuru Stm at Waiterimu Road Below Confluence	12	0.06	0.037	0.01	0.21	0.059	1.67	0.046
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	0.005	0.005	0.01	0.005	0	0	0.005
Ohaeroa Stm at SH22 Br	11	0.015	0.013	0.01	0.051	0.014	2.13	0.012
Opuatia Stm at Ponganui Rd	11	0.007	0.005	0.01	0.013	0.006	1.19	0.008
Pokaiwhenua Stm at Puketurua	12	0.021	0.011	0.01	0.102	0.023	2.61	0.01
Waahi Stm at Te Ohaki Rd	12	0.017	0.005	0.01	0.056	0.028	1.17	0.008
Waerenga Stm at Taniwha Rd	11	0.017	0.016	0.01	0.035	0.007	0.48	0.017
Waitawhiriwhiri Stm at Edgcombe Street	11	0.511	0.48	0.35	0.67	0.193	0.14	0.58
Whakapipi Stm at SH22 Br	11	0.03	0.011	0.01	0.23	0.013	3.26	0.012
Whakauru Stm at U/S SH1 Br	12	0.034	0.016	0.01	0.2	0.018	2.98	0.014
Whangamarino River at Island Block Rd	9	0.241	0.24	0.01	0.58	0.227	0.42	0.19
Whangamarino River at Jefferies Rd Br	11	0.039	0.035	0.01	0.087	0.014	1.32	0.037
Whangape Stm at Rangiriri-Glen Murray Rd	11	0.101	0.005	0.01	0.91	0.038	3.24	0.005

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	0.014	0.015	0.01	0.021	0.006	-0.72	0.014
Kaniwhaniwha Stm at Wright Rd	12	0.021	0.021	0.01	0.04	0.019	0.07	0.017
Mangaohoi Stm at South Branch Maru Rd	12	0.006	0.005	0.01	0.012	0	3.46	0.005
Mangaokewa Stm at Lawrence Street Br	12	0.013	0.008	0.01	0.048	0.012	2.06	0.014
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	0.082	0.085	0.01	0.192	0.097	0.41	0.056
Mangapu River at Otorohanga	9	0.038	0.04	0.01	0.092	0.027	1.42	0.022
Mangarama Stm at Gadsby Rd	10	0.057	0.034	0.01	0.3	0.034	2.91	0.017
Mangarapa Stm at Otorohanga Rd	10	0.032	0.031	0.01	0.056	0.023	0.16	0.027
Mangatutu Stm (Waikeria) at Walker Rd Br	11	0.011	0.005	0.01	0.038	0.008	1.91	0.005
Mangauika Stm at Te Awamutu Borough W/S Intake	10	0.005	0.005	0.01	0.005	0	0	0.005
Moakururu Stm at Warratah Farm Bridge	10	0.008	0.005	0.01	0.018	0.008	1.24	0.005
Ohote Stm at Whatawhata/Horotiu Rd	12	0.078	0.07	0.02	0.2	0.027	1.96	0.066
Puniu River at Bartons Corner Rd Br	10	0.023	0.024	0.01	0.042	0.033	-0.02	0.02
Puniu River at Wharepapa Rd Bridge	12	0.006	0.005	0.01	0.013	0	2.32	0.005
Waipa River at Mangaokewa Rd	11	0.008	0.005	0.01	0.02	0.007	1.36	0.005
Waipa River at Ngaruawahia Br	12	0.029	0.024	0.01	0.057	0.027	0.65	0.022
Waipa River at Pukehoua Bridge on Baffin Road	10	0.026	0.02	0.01	0.073	0.023	1.31	0.019
Waipa River at SH3 Otorohanga	10	0.017	0.013	0.01	0.052	0.02	1.6	0.012
Waitomo Stm at SH31 Otorohanga	6	0.015	0.015	0.01	0.028	0.017	0.26	0.013
Waitomo Stm at Tumutumumu Rd	10	0.005	0.005	0.01	0.005	0	0	0.005
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	0.02	0.017	0.01	0.052	0.015	1.3	0.015
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	0.014	0.005	0.01	0.074	0.005	2.88	0.005
Mangakara Stm (Reporoa) at SH5	10	0.014	0.017	0.01	0.023	0.013	-0.5	0.02
Mangakino Stm (Whakamaru) at Sandel Rd	11	0.006	0.005	0.01	0.016	0	3.32	0.005
Otamakokore Stm at Hossack Rd	12	0.014	0.005	0.01	0.049	0.015	1.82	0.005
Pueto Stm at Broadlands Rd Br	12	0.009	0.008	0.01	0.015	0.008	0.35	0.005
Tahunaatara Stm at Ohakuri Rd	11	0.009	0.005	0.01	0.023	0.01	1.24	0.005
Torepatutahi Stm at Vaile Rd Br	12	0.009	0.005	0.01	0.023	0.005	1.63	0.008
Waiotapu Stm at Campbell Rd Br	12	0.928	0.93	0.68	1.1	0.215	-0.35	0.87
Waiotapu Stm at Homestead Rd Br	12	0.301	0.305	0.13	0.49	0.163	0.03	0.28
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	0.006	0.005	0.01	0.012	0	3.46	0.005
Whirinaki Stm at Corbett Rd	12	0.007	0.005	0.01	0.017	0	2.56	0.005
West Coast								
Awakino River at Gribbon Rd	12	0.005	0.005	0.01	0.005	0	0	0.005
Awakino River at SH3 Awakau Rd Junction	11	0.007	0.005	0.01	0.026	0	2.92	0.005
Manganui River at Off Manganui Rd	12	0.006	0.005	0.01	0.013	0	2.32	0.005
Mangaotaki River at SH3 Br	12	0.008	0.005	0.01	0.016	0.008	0.97	0.005
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	0.005	0.005	0.01	0.005	0	0	0.005
Mokau River at Awakau Rd	12	0.016	0.016	0.01	0.037	0.016	0.73	0.015
Mokau River at Mangaokewa Rd (Off SH30)	12	0.005	0.005	0.01	0.005	0	0	0.005
Mokau River at Totoro Rd Recorder	11	0.016	0.011	0.01	0.048	0.016	1.41	0.011
Mokauiti Stm at Three Way Point - Aria	11	0.021	0.021	0.01	0.038	0.017	-0.18	0.017
Ohautira Stm at Waingaro Te Uku Rd	12	0.006	0.005	0.01	0.013	0	2.08	0.005
Oparau River at Langdon Rd (Off Okupata Rd)	10	0.007	0.005	0.01	0.023	0	3.16	0.005
Tawarau River at Off Speedies Rd	10	0.005	0.005	0.01	0.005	0	0	0.005
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	0.015	0.012	0.01	0.029	0.017	0.32	0.005
Waitetuna River at Te Uku-Waingaro Rd	12	0.01	0.005	0.01	0.023	0.01	0.93	0.005

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	0.005	0.005	0.01	0.005	0	0	0.005
Kuratau River at SH41 Moerangi	12	0.006	0.005	0.01	0.012	0	3.46	0.005
Kuratau River at Te Rae Street T10	12	0.011	0.005	0.01	0.025	0.014	0.8	0.005
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	0.008	0.005	0.01	0.016	0.008	1.01	0.005
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	0.005	0.005	0.01	0.005	0	0	0.005
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	0.005	0.005	0.01	0.005	0	0	0.005
Tokaanu Stm at Off SH41 Turangi	12	0.005	0.005	0.01	0.005	0	0	0.005
Waihaha River at SH32	12	0.005	0.005	0.01	0.005	0	0	0.005
Waitahanui River at Blake Rd	12	0.005	0.005	0.01	0.005	0	0	0.005
Whangamata Stm (Kinloch) at Whangamata Rd	12	0.006	0.005	0.01	0.011	0	3.46	0.005
Whanganui Stm at Lakeside Lake Taupo T8	12	0.005	0.005	0.01	0.005	0	0	0.005
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	0.007	0.005	0.01	0.024	0	3.46	0.005

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 12: Nitrate/nitrite nitrogen sample statistics for 2022 with 2018-2022 five-year median.

Nitrate/Nitrite Nitrogen (g/m ³)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	0.07	0.028	0	0.34	0.121	2.07	0.021
Kauaeranga River at Smiths Cableway Recorder	11	0.016	0.011	0	0.065	0.023	1.75	0.005
Ohinemuri River at Karangahake	12	0.654	0.67	0.3	1.23	0.43	0.63	0.49
Ohinemuri River at Queens Head	12	1.292	1.29	0.67	1.96	0.67	0	1.06
Ohinemuri River at SH25 Br	12	0.551	0.43	0.18	1.19	0.6	0.61	0.45
Tairua River at Morrisons Br Hikuaui	11	0.055	0.049	0	0.15	0.06	0.9	0.017
Tapu River at Tapu-Coroglen Rd	12	0.009	0.003	0	0.052	0.004	2.17	0.004
Waiau River at E309 Rd Ford	11	0.058	0.043	0	0.158	0.1	0.71	0.028
Waitekauri River at U/S Ohinemuri Conflu	12	0.17	0.148	0	0.49	0.242	0.76	0.11
Waiwawa River at SH25 Coroglen	12	0.02	0.012	0	0.07	0.017	1.66	0.009
Wharekawa River at SH25	12	0.087	0.081	0.01	0.21	0.052	0.87	0.046
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	0.324	0.33	0.18	0.48	0.143	0.02	0.3
Oraka Stm at Lake Rd	12	2.133	2.1	1.88	2.4	0.275	0.31	2.2
Piako River at Kiwitahi	12	1.305	1.07	0.01	4.3	2.299	0.95	0.5
Piako River at Paeroa-Tahuna Rd Br	12	1.778	1.555	0.14	4.1	2.185	0.41	1.1
Piakonui Stm at Piakonui Rd	12	0.353	0.3	0.12	0.78	0.301	0.82	0.24
Waihou River at Okauia	12	1.237	1.125	0.93	1.77	0.455	0.79	1.2
Waihou River at Te Aroha	12	1.072	1.025	0.52	1.56	0.255	0.12	1.2
Waihou River at Whites Rd	11	0.864	0.87	0.84	0.88	0.01	-0.89	0.86
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	0.142	0.145	0.09	0.2	0.062	0.14	0.16
Waiomou Stm at Matamata-Tauranga Rd	12	0.658	0.55	0.26	1.31	0.715	0.56	0.49
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	0.311	0.125	0.02	1.25	0.38	1.75	0.14
Waitoa River at Landsdowne Rd Br	12	1.493	1.51	0.24	2.5	1.365	-0.06	1.4
Waitoa River at Mellon Rd Recorder	12	2.097	2.075	0.57	4.2	2.17	0.42	1.9
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otatau Rd Br opp Moseley Rd	11	1.426	1.25	0.24	2.5	1.478	-0.07	1.3
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	0.543	0.515	0.12	0.99	0.575	0.1	0.43
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	1.008	0.915	0.14	2.6	0.965	0.84	0.59
Kirikiriroa Stm at Tauhara Dr	12	0.859	0.755	0.37	1.88	0.535	1.31	0.59
Komakorau Stm at Henry Rd	12	2.997	1.48	1.24	11.2	1.235	2.1	1.4
Little Waipa Stm at Arapuni - Putaruru Rd	11	2.096	2.1	1.56	2.6	0.813	0.11	2
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	1.304	0.855	0.42	4	0.77	1.81	0.8
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	2.672	2.6	1.39	3.8	0.95	-0.06	2.4
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	2.054	2	1.19	2.8	0.66	-0.24	2.2
Mangaonua Stm at Hoeka Rd	12	1.624	1.605	1.07	2.1	0.605	-0.14	1.4
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	0.739	0.69	0.24	1.9	0.52	1.53	0.46
Mangatangi River at SH2 Maramarua	11	0.436	0.196	0.01	1.96	0.415	1.94	0.18
Mangatawhiri River at Lyons Rd At Buckingham Br	11	0.133	0.036	0	0.61	0.151	1.89	0.022
Mangawara Stm at Rutherford Rd Br	12	1.987	0.895	0.32	9.5	1.26	2.44	0.9
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	1.497	1.41	1	2.3	0.503	0.73	1.7
Matahuru Stm at Waiterimu Road Below Confluence	12	0.909	0.5	0.03	3.9	1.123	1.97	0.7
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	0.11	0.003	0	0.72	0.035	2.23	0.003
Ohaeroa Stm at SH22 Br	11	1.674	1.76	1.15	2.1	0.462	-0.35	1.7
Opuatia Stm at Ponganui Rd	11	0.839	0.82	0.42	1.28	0.39	0.17	0.81
Pokaiwhenua Stm at Puketurua	12	2.277	2.15	1.96	2.9	0.605	0.85	2.1
Waahi Stm at Te Ohaki Rd	12	0.268	0.001	0	1.22	0.324	1.74	0.01
Waerenga Stm at Taniwha Rd	11	0.811	0.85	0.12	1.65	0.713	0.1	0.78
Waitawhiriwhiri Stm at Edgcombe Street	11	1.246	0.94	0.69	5	0.19	3.27	0.84
Whakapipi Stm at SH22 Br	11	3.536	3.3	2	5	1.025	-0.03	3.6
Whakauru Stm at U/S SH1 Br	12	1.753	1.635	1.41	2.4	0.44	1	1.3
Whangamarino River at Island Block Rd	9	0.276	0.186	0.01	1.03	0.236	2.16	0.15
Whangamarino River at Jefferies Rd Br	11	1.009	0.68	0.01	4.3	0.945	2.12	0.63
Whangape Stm at Rangiriri-Glen Murray Rd	11	0.235	0.02	0	1.03	0.402	1.53	0.01

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	0.59	0.48	0.22	1.51	0.34	1.58	0.42
Kaniwhaniwha Stm at Wright Rd	12	0.424	0.316	0.02	1.43	0.478	1.29	0.25
Mangaohoi Stm at South Branch Maru Rd	12	0.196	0.193	0.12	0.3	0.143	0.15	0.18
Mangaokewa Stm at Lawrence Street Br	12	0.765	0.645	0.36	1.3	0.49	0.52	0.62
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	1.976	1.97	0.43	5.2	1.42	1.56	1.2
Mangapu River at Otorohanga	9	1.024	1.02	0.36	1.53	0.302	-0.56	0.91
Mangarama Stm at Gadsby Rd	10	1.136	1.16	0.69	1.45	0.22	-0.77	0.9
Mangarapa Stm at Otorohanga Rd	10	1.129	1.125	0.53	1.84	0.59	0.24	0.92
Mangatutu Stm (Waikeria) at Walker Rd Br	11	0.447	0.49	0.09	0.94	0.524	0.24	0.34
Mangauika Stm at Te Awamutu Borough W/S Intake	10	0.025	0.026	0.01	0.041	0.018	-0.14	0.034
Moakurarua Stm at Warratah Farm Bridge	10	0.508	0.515	0.18	0.94	0.17	0.49	0.41
Ohote Stm at Whatawhata/Horotiu Rd	12	0.721	0.355	0.08	3.2	0.712	2.16	0.4
Puniu River at Bartons Corner Rd Br	10	0.896	0.965	0.32	1.36	0.81	-0.39	0.67
Puniu River at Wharepapa Rd Bridge	12	0.628	0.635	0.37	0.92	0.365	-0.03	0.55
Waipa River at Mangaokewa Rd	11	0.372	0.32	0.17	0.67	0.208	0.91	0.32
Waipa River at Ngaruawahia Br	12	0.877	0.97	0.18	1.94	0.785	0.44	0.67
Waipa River at Pukehoua Bridge on Baffin Road	10	0.794	0.82	0.14	1.58	0.4	-0.01	0.61
Waipa River at SH3 Otorohanga	10	0.653	0.63	0.18	1.3	0.46	0.55	0.45
Waitomo Stm at SH31 Otorohanga	6	0.557	0.57	0.41	0.68	0.19	-0.16	0.54
Waitomo Stm at Tumutumumu Rd	10	0.635	0.605	0.52	0.81	0.1	0.82	0.6
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	2.942	3.1	2.1	3.3	0.4	-1.44	3.1
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	0.814	0.815	0.41	1.26	0.69	-0.04	0.63
Mangakara Stm (Reporoa) at SH5	10	1.594	1.59	1.4	1.81	0.22	0.06	1.6
Mangakino Stm (Whakamaru) at Sandel Rd	11	0.92	0.82	0.6	1.16	0.322	-0.04	0.78
Otamakokore Stm at Hossack Rd	12	1.149	1.31	0.63	1.85	0.765	0.02	0.88
Pueto Stm at Broadlands Rd Br	12	0.727	0.715	0.6	0.88	0.15	0.27	0.66
Tahunaatara Stm at Ohakuri Rd	11	0.886	0.85	0.5	1.29	0.62	0.09	0.7
Torepatutahi Stm at Vaile Rd Br	12	0.773	0.795	0.46	1.15	0.345	0.07	0.63
Waiotapu Stm at Campbell Rd Br	12	0.952	0.94	0.77	1.1	0.15	-0.18	1
Waiotapu Stm at Homestead Rd Br	12	1.476	1.47	1.13	1.82	0.325	0.05	1.5
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	1.619	1.625	1.36	1.9	0.375	0.15	1.5
Whirinaki Stm at Corbett Rd	12	0.87	0.875	0.79	0.96	0.08	-0.03	0.84
West Coast								
Awakino River at Gribbon Rd	12	0.09	0.053	0.03	0.17	0.117	0.4	0.07
Awakino River at SH3 Awakau Rd Junction	11	0.287	0.34	0.05	0.45	0.267	-0.3	0.2
Manganui River at Off Manganui Rd	12	0.136	0.105	0	0.27	0.205	0.12	0.1
Mangaotaki River at SH3 Br	12	0.795	0.69	0.43	1.18	0.425	0.28	0.67
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	0.312	0.29	0.18	0.45	0.18	0.5	0.27
Mokau River at Awakau Rd	12	0.58	0.505	0.09	1.04	0.445	0.18	0.41
Mokau River at Mangaokewa Rd (Off SH30)	12	0.503	0.44	0.24	0.91	0.425	0.57	0.4
Mokau River at Totoro Rd Recorder	11	0.657	0.61	0.29	1.16	0.363	0.55	0.57
Mokauiti Stm at Three Way Point - Aria	11	0.478	0.32	0.05	1.2	0.435	0.86	0.27
Ohautira Stm at Waingaro Te Uku Rd	12	0.337	0.285	0.03	0.98	0.318	1.17	0.26
Oparau River at Langdon Rd (Off Okupata Rd)	10	0.163	0.126	0.01	0.38	0.259	0.52	0.11
Tawarau River at Off Speedies Rd	10	0.361	0.345	0.23	0.5	0.2	0.27	0.31
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	0.513	0.29	0	1.54	0.763	1.07	0.33
Waitetuna River at Te Uku-Waingaro Rd	12	0.397	0.28	0.06	1.12	0.29	1.37	0.31

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	0.065	0.068	0.02	0.102	0.043	-0.29	0.083
Kuratau River at SH41 Moerangi	12	0.084	0.082	0.05	0.121	0.035	0.14	0.11
Kuratau River at Te Rae Street T10	12	0.579	0.53	0.35	0.9	0.35	0.41	0.61
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	0.761	0.76	0.63	0.83	0.075	-0.83	0.76
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	0.046	0.045	0.02	0.084	0.021	0.49	0.05
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	0.005	0.001	0	0.018	0.006	1.59	0.005
Tokaanu Stm at Off SH41 Turangi	12	0.483	0.45	0.4	0.57	0.1	0.33	0.45
Waihaha River at SH32	12	0.086	0.084	0.05	0.128	0.026	0.32	0.083
Waitahanui River at Blake Rd	12	0.409	0.405	0.39	0.44	0.03	0.53	0.41
Whangamata Stm (Kinloch) at Whangamata Rd	12	1.251	1.235	1.18	1.36	0.11	0.53	1.4
Whanganui Stm at Lakeside Lake Taupo T8	12	0.379	0.345	0.24	0.63	0.2	0.65	0.32
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	0.88	0.945	0.55	1.25	0.52	-0.06	0.68

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 13: Total Kjeldahl nitrogen sample statistics for 2022 with 2018-2022 five-year median.

Total Kjeldahl Nitrogen (g/m ³)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	0.12	0.09	0.03	0.5	0.09	2.7	0.09
Kauaeranga River at Smiths Cableway Recorder	11	0.07	0.03	0.03	0.21	0.07	1.39	0.07
Ohinemuri River at Karangahake	12	0.18	0.15	0.09	0.43	0.09	1.68	0.16
Ohinemuri River at Queens Head	12	0.27	0.23	0.12	0.57	0.13	1.4	0.28
Ohinemuri River at SH25 Br	12	0.11	0.1	0.03	0.28	0.04	1.7	0.11
Tairua River at Morrisons Br Hikuai	11	0.09	0.06	0.03	0.24	0.07	1.5	0.07
Tapu River at Tapu-Coroglen Rd	12	0.08	0.04	0.03	0.42	0.05	3.15	0.06
Waiau River at E309 Rd Ford	11	0.1	0.08	0.03	0.28	0.1	1.47	0.08
Waitekauri River at U/S Ohinemuri Conflu	12	0.15	0.11	0.03	0.55	0.1	2.16	0.09
Waiwawa River at SH25 Coroglen	12	0.09	0.07	0.03	0.21	0.11	0.91	0.09
Wharekawa River at SH25	12	0.09	0.07	0.03	0.27	0.08	1.59	0.08
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	0.14	0.11	0.06	0.33	0.06	1.71	0.12
Oraka Stm at Lake Rd	12	0.29	0.24	0.14	0.62	0.16	1.37	0.29
Piako River at Kiwitahi	12	0.35	0.35	0.14	0.64	0.2	0.23	0.33
Piako River at Paeroa-Tahuna Rd Br	12	0.7	0.62	0.34	1.57	0.23	1.92	0.57
Piakonui Stm at Piakonui Rd	12	0.23	0.17	0.1	0.48	0.17	1.08	0.16
Waihou River at Okauia	12	0.27	0.21	0.07	0.67	0.21	1.17	0.17
Waihou River at Te Aroha	12	0.23	0.23	0.09	0.43	0.17	0.61	0.2
Waihou River at Whites Rd	11	0.04	0.03	0.03	0.11	0	2.36	0.03
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	0.21	0.16	0.08	0.82	0.11	3.02	0.15
Waiomou Stm at Matamata-Tauranga Rd	12	0.19	0.14	0.07	0.43	0.1	1.54	0.16
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	0.33	0.31	0.19	0.51	0.13	0.56	0.28
Waitoa River at Landsdowne Rd Br	12	0.41	0.35	0.18	1.01	0.16	2.22	0.34
Waitoa River at Mellon Rd Recorder	12	0.6	0.57	0.26	1.22	0.32	1.22	0.47
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otatau Rd Br opp Moseley Rd	11	0.44	0.47	0.29	0.67	0.17	0.5	0.47
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	0.22	0.21	0.13	0.38	0.12	0.84	0.23
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	0.41	0.35	0.24	1.04	0.21	2.27	0.36
Kirikiri-roa Stm at Tauhara Dr	12	0.52	0.5	0.36	0.71	0.15	0.31	0.5
Komakorau Stm at Henry Rd	12	1.56	1.88	0.71	2.4	1.17	-0.25	1.7
Little Waipa Stm at Arapuni - Putaruru Rd	11	0.29	0.19	0.13	1.02	0.19	2.56	0.17
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	1.39	1.44	0.28	2.8	1.3	0.32	1.2
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	0.59	0.44	0.31	1.42	0.34	1.53	0.5
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	0.48	0.42	0.38	0.77	0.14	1.82	0.4
Mangaonua Stm at Hoeka Rd	12	0.46	0.38	0.2	1.04	0.2	1.54	0.37
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	0.36	0.24	0.13	1.31	0.31	2.44	0.2
Mangatangi River at SH2 Maramarua	11	0.34	0.31	0.16	0.64	0.16	1.01	0.33
Mangatawhiri River at Lyons Rd At Buckingham Br	11	0.12	0.1	0.06	0.2	0.07	0.72	0.11
Mangawara Stm at Rutherford Rd Br	12	1.18	1.31	0.51	2.3	0.92	0.42	1.1
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	0.84	0.95	0.37	1.34	0.56	-0.19	0.71
Matahuru Stm at Waiterimu Road Below Confluence	12	0.57	0.5	0.16	1.7	0.36	1.87	0.56
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	4.59	5	2.7	6.4	3.25	-0.22	4.4
Ohaeroa Stm at SH22 Br	11	0.32	0.29	0.27	0.41	0.09	0.86	0.28
Opuatia Stm at Ponganui Rd	11	0.3	0.25	0.17	0.74	0.09	2.03	0.27
Pokaiwhenua Stm at Puketurua	12	0.35	0.2	0.14	1.07	0.28	1.72	0.22
Waahi Stm at Te Ohaki Rd	12	0.8	0.73	0.32	1.88	0.4	1.69	0.79
Waerenga Stm at Taniwha Rd	11	0.3	0.25	0.15	0.62	0.09	1.73	0.27
Waitawhiriwhiri Stm at Edgcombe Street	11	1.12	1	0.81	2.1	0.38	2.07	1.1
Whakapipi Stm at SH22 Br	11	0.35	0.38	0.21	0.53	0.15	0.21	0.33
Whakauru Stm at U/S SH1 Br	12	0.48	0.34	0.17	1.29	0.2	2.03	0.33
Whangamarino River at Island Block Rd	9	2.26	1.68	0.86	4.6	2	0.78	1.8
Whangamarino River at Jefferies Rd Br	11	0.55	0.46	0.27	0.9	0.35	0.73	0.48
Whangape Stm at Rangiriri-Glen Murray Rd	11	2.1	1.17	0.27	4.8	2.91	0.7	1.7

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	0.21	0.18	0.1	0.52	0.11	2.04	0.19
Kaniwhaniwha Stm at Wright Rd	12	0.18	0.17	0.1	0.28	0.07	0.15	0.18
Mangaohoi Stm at South Branch Maru Rd	12	0.11	0.1	0.07	0.26	0.03	2.63	0.11
Mangaokewa Stm at Lawrence Street Br	12	0.45	0.3	0.15	1.57	0.34	2	0.25
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	0.89	0.95	0.34	1.73	0.79	0.31	0.61
Mangapu River at Otorohanga	9	0.44	0.38	0.17	0.98	0.3	1.4	0.29
Mangarama Stm at Gadsby Rd	10	0.51	0.43	0.22	1.03	0.38	0.88	0.32
Mangarapa Stm at Otorohanga Rd	10	0.4	0.36	0.21	0.82	0.16	1.61	0.3
Mangatutu Stm (Waikeria) at Walker Rd Br	11	0.14	0.15	0.08	0.21	0.06	0.01	0.15
Mangauika Stm at Te Awamutu Borough W/S Intake	10	0.04	0.03	0.03	0.1	0	2.35	0.03
Moakurarua Stm at Warratah Farm Bridge	10	0.17	0.14	0.09	0.32	0.07	1.3	0.16
Ohote Stm at Whatawhata/Horotiu Rd	12	0.76	0.76	0.48	1.11	0.36	0.19	0.73
Puniu River at Bartons Corner Rd Br	10	0.31	0.33	0.13	0.52	0.29	0.09	0.25
Puniu River at Wharepapa Rd Bridge	12	0.24	0.22	0.13	0.43	0.16	0.81	0.2
Waipa River at Mangaokewa Rd	11	0.2	0.17	0.12	0.37	0.08	1.41	0.18
Waipa River at Ngaruawahia Br	12	0.27	0.24	0.12	0.57	0.22	0.92	0.26
Waipa River at Pukehoua Bridge on Baffin Road	10	0.34	0.28	0.16	0.85	0.09	1.96	0.26
Waipa River at SH3 Otorohanga	10	0.21	0.18	0.12	0.39	0.11	0.9	0.19
Waitomo Stm at SH31 Otorohanga	6	0.24	0.18	0.12	0.44	0.17	1.09	0.19
Waitomo Stm at Tumutumumu Rd	10	0.12	0.11	0.05	0.2	0.1	0.43	0.12
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	0.45	0.35	0.16	0.84	0.42	0.56	0.32
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	0.29	0.17	0.1	1.28	0.14	2.91	0.18
Mangakara Stm (Reporoa) at SH5	10	0.23	0.24	0.07	0.36	0.08	-0.4	0.27
Mangakino Stm (Whakamaru) at Sandel Rd	11	0.13	0.11	0.05	0.27	0.07	1.13	0.11
Otamakokore Stm at Hossack Rd	12	0.29	0.24	0.12	0.6	0.19	1.07	0.23
Pueto Stm at Broadlands Rd Br	12	0.1	0.09	0.07	0.21	0.03	2.16	0.08
Tahunaatara Stm at Ohakuri Rd	11	0.23	0.2	0.1	0.48	0.16	1.13	0.19
Torepatutahi Stm at Vaile Rd Br	12	0.13	0.13	0.03	0.3	0.04	1.03	0.12
Waiotapu Stm at Campbell Rd Br	12	1.03	1.08	0.76	1.2	0.24	-0.68	1
Waiotapu Stm at Homestead Rd Br	12	0.67	0.69	0.3	1.1	0.47	0.02	0.58
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	0.18	0.17	0.08	0.32	0.1	0.75	0.16
Whirinaki Stm at Corbett Rd	12	0.1	0.04	0.03	0.38	0.06	1.94	0.06
West Coast								
Awakino River at Gribbon Rd	12	0.05	0.03	0.03	0.11	0.05	0.99	0.06
Awakino River at SH3 Awakau Rd Junction	11	0.14	0.11	0.06	0.32	0.11	1.35	0.13
Manganui River at Off Manganui Rd	12	0.1	0.1	0.03	0.16	0.05	-0.33	0.11
Mangaotaki River at SH3 Br	12	0.2	0.18	0.1	0.37	0.13	0.79	0.18
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	0.14	0.12	0.07	0.25	0.12	0.76	0.15
Mokau River at Awakau Rd	12	0.35	0.29	0.17	0.75	0.2	1.29	0.24
Mokau River at Mangaokewa Rd (Off SH30)	12	0.23	0.17	0.12	0.64	0.11	2.55	0.22
Mokau River at Totoro Rd Recorder	11	0.38	0.28	0.15	0.9	0.35	1.18	0.23
Mokauiti Stm at Three Way Point - Aria	11	0.44	0.41	0.23	0.73	0.3	0.44	0.34
Ohautira Stm at Waingaro Te Uku Rd	12	0.15	0.15	0.07	0.33	0.08	1.25	0.13
Oparau River at Langdon Rd (Off Okupata Rd)	10	0.09	0.08	0.06	0.16	0.03	1.28	0.12
Tawarau River at Off Speedies Rd	10	0.11	0.1	0.07	0.16	0.05	0.45	0.12
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	0.29	0.25	0.14	0.61	0.16	1.54	0.25
Waitetuna River at Te Uku-Waingaro Rd	12	0.15	0.15	0.07	0.3	0.07	1.09	0.16

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	0.06	0.06	0.03	0.1	0.04	-0.03	0.07
Kuratau River at SH41 Moerangi	12	0.07	0.07	0.03	0.19	0.03	1.9	0.07
Kuratau River at Te Rae Street T10	12	0.14	0.14	0.06	0.18	0.04	-1.16	0.13
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	0.19	0.2	0.13	0.26	0.07	0.05	0.2
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	0.04	0.03	0.03	0.15	0.03	2.5	0.03
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	0.08	0.08	0.03	0.14	0.05	-0.06	0.09
Tokaanu Stm at Off SH41 Turangi	12	0.03	0.03	0.03	0.03	0	-1.15	0.03
Waihaha River at SH32	12	0.08	0.06	0.03	0.3	0.05	2.21	0.07
Waitahanui River at Blake Rd	12	0.05	0.03	0.03	0.1	0.05	0.91	0.03
Whangamata Stm (Kinloch) at Whangamata Rd	12	0.11	0.11	0.05	0.17	0.04	-0.13	0.13
Whanganui Stm at Lakeside Lake Taupo T8	12	0.1	0.07	0.03	0.41	0.02	3.11	0.09
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	0.18	0.17	0.09	0.41	0.05	2.1	0.17

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 14: Total nitrogen sample statistics for 2022 with 2018-2022 five-year median.

Total Nitrogen (g/m ³)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	0.19	0.15	0.03	0.54	0.1	1.57	0.13
Kauaeranga River at Smiths Cableway Recorder	11	0.09	0.09	0.03	0.21	0.05	1.19	0.07
Ohinemuri River at Karangahake	12	0.84	0.78	0.49	1.41	0.38	0.69	0.72
Ohinemuri River at Queens Head	12	1.56	1.51	0.86	2.27	0.69	0.21	1.4
Ohinemuri River at SH25 Br	12	0.66	0.58	0.27	1.29	0.46	0.62	0.59
Tairua River at Morrisons Br Hikuai	11	0.14	0.12	0.03	0.29	0.11	0.46	0.1
Tapu River at Tapu-Coroglen Rd	12	0.09	0.05	0.03	0.42	0.07	2.86	0.06
Waiau River at E309 Rd Ford	11	0.15	0.1	0.03	0.34	0.16	0.66	0.1
Waitekauri River at U/S Ohinemuri Conflu	12	0.32	0.27	0.07	0.73	0.28	0.89	0.2
Waiwawa River at SH25 Coroglen	12	0.11	0.1	0.03	0.23	0.1	0.63	0.11
Wharekawa River at SH25	12	0.17	0.13	0.03	0.36	0.16	0.6	0.12
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	0.46	0.42	0.27	0.71	0.23	0.46	0.46
Oraka Stm at Lake Rd	12	2.42	2.42	2.14	2.64	0.28	-0.14	2.5
Piako River at Kiwitahi	12	1.65	1.38	0.16	4.94	2.45	0.95	0.9
Piako River at Paeroa-Tahuna Rd Br	12	2.47	2.13	0.48	5.67	2.19	0.67	1.9
Piakonui Stm at Piakonui Rd	12	0.58	0.54	0.27	1.09	0.28	0.81	0.41
Waihou River at Okauia	12	1.51	1.33	1	2.44	0.48	1.1	1.4
Waihou River at Te Aroha	12	1.3	1.2	0.75	1.88	0.44	0.38	1.3
Waihou River at Whites Rd	11	0.9	0.9	0.87	0.98	0.02	1.85	0.9
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	0.35	0.28	0.2	1	0.09	2.95	0.32
Waiomou Stm at Matamata-Tauranga Rd	12	0.84	0.72	0.33	1.74	0.68	0.74	0.66
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	0.64	0.49	0.21	1.76	0.43	1.72	0.46
Waitoa River at Landsdowne Rd Br	12	1.9	1.86	0.75	3.51	1.52	0.38	1.8
Waitoa River at Mellon Rd Recorder	12	2.7	2.67	0.83	5.42	2.52	0.51	2.6
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otatau Rd Br opp Moseley Rd	11	1.87	1.78	0.74	2.98	1.65	-0.12	1.9
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	0.76	0.67	0.25	1.32	0.58	0.31	0.68
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	1.42	1.2	0.42	3.15	0.99	1.05	1
Kirikiriroa Stm at Tauhara Dr	12	1.38	1.27	0.78	2.51	0.73	1	1.1
Komakorau Stm at Henry Rd	12	4.56	3.34	1.95	13.19	2.09	1.89	3.1
Little Waipa Stm at Arapuni - Putaruru Rd	11	2.38	2.58	1.82	2.82	0.77	-0.43	2.1
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	2.69	2.24	0.7	6.7	2.04	1.27	2
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	3.27	3.11	2.4	4.15	1.03	0.29	2.9
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	2.53	2.4	1.76	3.27	0.48	0.06	2.6
Mangaonua Stm at Hoeka Rd	12	2.08	2	1.42	3.14	0.75	0.73	1.8
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	1.1	0.96	0.4	2.4	0.64	1.12	0.75
Mangatangi River at SH2 Maramarua	11	0.77	0.59	0.2	2.6	0.46	1.95	0.54
Mangatawhiri River at Lyons Rd At Buckingham Br	11	0.25	0.18	0.06	0.77	0.22	1.69	0.16
Mangawara Stm at Rutherford Rd Br	12	3.17	2.27	0.92	11.49	2.06	2.08	2.1
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	2.34	2.25	1.48	3.47	1.18	0.29	2.7
Matahuru Stm at Waiterimu Road Below Confluence	12	1.48	1.07	0.19	5.6	1.35	1.99	1.3
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	4.7	5	2.7	6.4	2.85	-0.22	4.5
Ohaeroa Stm at SH22 Br	11	1.99	2.06	1.5	2.37	0.41	-0.55	2
Opuatia Stm at Ponganui Rd	11	1.14	0.99	0.72	2.02	0.31	1.64	1.1
Pokaiwhenua Stm at Puketurua	12	2.63	2.69	2.14	3.12	0.89	-0.07	2.3
Waahi Stm at Te Ohaki Rd	12	1.07	0.89	0.62	1.88	0.53	1.04	1.1
Waerenga Stm at Taniwha Rd	11	1.11	1.16	0.35	1.9	0.87	-0.29	1.1
Waitawhiriwhiri Stm at Edgumbe Street	11	2.37	1.84	1.56	7.1	0.33	3.22	1.9
Whakapipi Stm at SH22 Br	11	3.89	3.6	2.49	5.21	0.92	-0.06	3.9
Whakauru Stm at U/S SH1 Br	12	2.23	2.16	1.65	3	0.77	0.35	1.7
Whangamarino River at Island Block Rd	9	2.54	1.87	1.17	4.7	1.96	0.82	2
Whangamarino River at Jefferies Rd Br	11	1.56	1.25	0.35	5.18	0.84	2.2	1.2
Whangape Stm at Rangiriri-Glen Murray Rd	11	2.33	2	0.73	4.8	2.72	0.68	1.8

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	0.8	0.65	0.4	1.79	0.38	1.55	0.61
Kaniwhaniwha Stm at Wright Rd	12	0.61	0.49	0.15	1.7	0.51	1.34	0.46
Mangaohoi Stm at South Branch Maru Rd	12	0.3	0.33	0.2	0.39	0.15	-0.39	0.32
Mangaokewa Stm at Lawrence Street Br	12	1.21	1.23	0.51	2.18	0.7	0.22	0.9
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	2.87	2.79	0.8	6.6	2.32	0.98	1.9
Mangapu River at Otorohanga	9	1.47	1.42	0.53	1.99	0.49	-1.09	1.2
Mangarama Stm at Gadsby Rd	10	1.64	1.53	1.13	2.2	0.63	0.3	1.2
Mangarapa Stm at Otorohanga Rd	10	1.52	1.51	0.74	2.43	0.48	0.36	1.3
Mangatutu Stm (Waikeria) at Walker Rd Br	11	0.59	0.65	0.17	1.1	0.55	0.15	0.51
Mangauika Stm at Te Awamutu Borough W/S Intake	10	0.06	0.05	0.04	0.13	0.03	1.57	0.09
Moakururu Stm at Warratah Farm Bridge	10	0.68	0.67	0.32	1.11	0.26	0.29	0.6
Ohote Stm at Whatawhata/Horotiu Rd	12	1.48	1.26	0.58	4.31	1.03	1.95	1.3
Puniu River at Bartons Corner Rd Br	10	1.21	1.27	0.45	1.88	1.09	-0.38	1
Puniu River at Wharepapa Rd Bridge	12	0.86	0.91	0.5	1.21	0.43	-0.27	0.78
Waipa River at Mangaokewa Rd	11	0.57	0.54	0.43	0.84	0.13	1.19	0.53
Waipa River at Ngaruawahia Br	12	1.15	1.28	0.31	2.51	0.91	0.54	0.9
Waipa River at Pukehoua Bridge on Baffin Road	10	1.14	1.24	0.31	1.85	0.65	-0.55	0.9
Waipa River at SH3 Otorohanga	10	0.87	0.92	0.33	1.56	0.49	0.29	0.7
Waitomo Stm at SH31 Otorohanga	6	0.79	0.82	0.53	0.93	0.06	-1.82	0.81
Waitomo Stm at Tumutumumu Rd	10	0.76	0.72	0.6	0.99	0.1	0.85	0.73
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	3.39	3.44	2.89	3.84	0.27	-0.65	3.5
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	1.11	1.14	0.51	2.09	0.76	0.52	0.9
Mangakara Stm (Reporoa) at SH5	10	1.83	1.8	1.62	2.04	0.31	0.03	1.9
Mangakino Stm (Whakamaru) at Sandel Rd	11	1.05	0.95	0.76	1.39	0.39	0.32	0.88
Otamakokore Stm at Hossack Rd	12	1.44	1.52	0.75	2.33	0.94	0.09	1.1
Pueto Stm at Broadlands Rd Br	12	0.83	0.84	0.67	0.96	0.13	-0.48	0.74
Tahunaatara Stm at Ohakuri Rd	11	1.12	1.3	0.64	1.64	0.72	-0.15	0.9
Torepatutahi Stm at Vaile Rd Br	12	0.91	0.95	0.49	1.33	0.42	-0.14	0.76
Waiotapu Stm at Campbell Rd Br	12	1.98	1.99	1.69	2.27	0.36	-0.03	2
Waiotapu Stm at Homestead Rd Br	12	2.15	2.14	1.59	2.92	0.54	0.38	2
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	1.8	1.83	1.49	2.11	0.42	-0.07	1.6
Whirinaki Stm at Corbett Rd	12	0.97	0.94	0.82	1.34	0.13	1.63	0.9
West Coast								
Awakino River at Gribbon Rd	12	0.14	0.14	0.06	0.22	0.11	-0.17	0.13
Awakino River at SH3 Awakau Rd Junction	11	0.42	0.51	0.16	0.66	0.33	-0.28	0.31
Manganui River at Off Manganui Rd	12	0.24	0.22	0.07	0.38	0.22	-0.01	0.22
Mangaotaki River at SH3 Br	12	0.99	0.92	0.57	1.32	0.51	-0.03	0.9
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	0.45	0.43	0.25	0.68	0.19	0.22	0.41
Mokau River at Awakau Rd	12	0.93	0.91	0.29	1.41	0.62	-0.25	0.65
Mokau River at Mangaokewa Rd (Off SH30)	12	0.74	0.7	0.37	1.11	0.52	0.08	0.66
Mokau River at Totoro Rd Recorder	11	1.04	1.09	0.44	1.47	0.68	-0.34	0.87
Mokauiti Stm at Three Way Point - Aria	11	0.91	0.88	0.35	1.56	0.49	0.14	0.62
Ohautira Stm at Waingaro Te Uku Rd	12	0.49	0.41	0.15	1.22	0.28	1.4	0.39
Oparau River at Langdon Rd (Off Okupata Rd)	10	0.26	0.26	0.1	0.44	0.24	0.18	0.23
Tawarau River at Off Speedies Rd	10	0.47	0.46	0.32	0.62	0.18	0.02	0.44
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	0.8	0.64	0.21	1.91	0.77	1.21	0.6
Waitetuna River at Te Uku-Waingaro Rd	12	0.55	0.43	0.19	1.36	0.28	1.54	0.46

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	0.12	0.11	0.05	0.17	0.07	-0.22	0.15
Kuratau River at SH41 Moerangi	12	0.16	0.15	0.11	0.28	0.03	2.18	0.18
Kuratau River at Te Rae Street T10	12	0.72	0.68	0.5	1	0.35	0.27	0.72
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	0.95	0.97	0.87	1.05	0.11	0	0.95
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	0.09	0.08	0.05	0.18	0.03	1.83	0.1
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	0.09	0.09	0.03	0.15	0.05	-0.26	0.1
Tokaanu Stm at Off SH41 Turangi	12	0.51	0.47	0.43	0.6	0.1	0.33	0.48
Waihaha River at SH32	12	0.16	0.13	0.1	0.39	0.06	2.04	0.16
Waitahanui River at Blake Rd	12	0.46	0.45	0.42	0.5	0.07	0.14	0.46
Whangamata Stm (Kinloch) at Whangamata Rd	12	1.36	1.35	1.27	1.53	0.1	1.06	1.6
Whanganui Stm at Lakeside Lake Taupo T8	12	0.48	0.49	0.3	0.72	0.24	0.27	0.45
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	1.07	1.12	0.67	1.51	0.62	0.03	0.84

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 15: Turbidity sample statistics for 2022 with 2018-2022 five-year median.

Turbidity (NTU)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	2.6	1.3	0.6	10.4	3.2	1.89	1.3
Kauaeranga River at Smiths Cableway Recorder	11	1.5	0.7	0.3	5.3	1.3	1.69	0.8
Ohinemuri River at Karangahake	12	3.5	0.7	0.4	17.3	2.2	1.98	0.8
Ohinemuri River at Queens Head	12	1.5	0.7	0.3	5.5	1.5	1.73	0.9
Ohinemuri River at SH25 Br	12	1.6	1.3	0.5	4.4	1.7	1.16	0.9
Tairua River at Morrisons Br Hikuai	11	1.9	1.3	0.5	5	2.3	0.97	0.8
Tapu River at Tapu-Coroglen Rd	12	2.7	0.7	0.2	18	2.6	3.07	0.7
Waiau River at E309 Rd Ford	11	3.9	2.7	0.8	14.2	4.1	1.95	1.9
Waitekauri River at U/S Ohinemuri Conflu	12	1.5	0.7	0.3	7.3	1.1	2.61	0.6
Waiwawa River at SH25 Coroglen	12	2.3	1.5	0.6	9.4	2.1	2.53	1.2
Wharekawa River at SH25	12	3.2	1.9	0.6	10.3	3.8	1.36	1.3
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	9.5	9.6	4.9	17.7	6	0.75	6.4
Oraka Stm at Lake Rd	12	6.3	6	1.5	19.1	5.2	1.87	4.9
Piako River at Kiwitahi	12	3.7	2.3	0.6	13.4	3.5	1.9	2.6
Piako River at Paeroa-Tahuna Rd Br	12	12.6	9.9	1.9	56	6.4	2.97	7.7
Piakonui Stm at Piakonui Rd	12	5.6	5.8	2.5	10.6	5.1	0.54	3.7
Waihou River at Okauia	12	6.2	4.4	1.5	21	5	1.83	3.4
Waihou River at Te Aroha	12	6.9	6.4	2.5	16	6	1.07	4.8
Waihou River at Whites Rd	11	0.5	0.3	0.1	2.5	0.3	3.01	0.5
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	8.3	4.3	2.1	31	3.8	1.97	4.6
Waiomou Stm at Matamata-Tauranga Rd	12	4.5	3.3	1.4	14.4	4	1.95	3.6
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	5.8	6	1.7	9	5.8	-0.29	5.1
Waitoa River at Landsdowne Rd Br	12	5.6	3.1	0.5	30	3.5	2.66	3.2
Waitoa River at Mellon Rd Recorder	12	8	5.6	2.3	22	7.8	1.34	7
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otaua Rd Br opp Moseley Rd	11	7.4	8.4	2.6	11.7	6	-0.16	9.9
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	7.6	2.2	1.7	27	9.5	1.42	3.3
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	10.8	7.1	2.2	29	5.5	1.59	6.6
Kirikiri Stm at Tauhara Dr	12	27.7	26	11.9	43	16	0.18	24.5
Komakorau Stm at Henry Rd	12	72.5	68.5	11.9	158	66	0.56	77
Little Waipa Stm at Arapuni - Putaruru Rd	11	4.6	3.4	0.4	14.8	6.1	1.24	1.7
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	20.1	18.3	9.2	42	7.5	1.44	19.4
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	12.5	6.3	1.8	55	11.9	2.15	5
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	11.2	9.8	6.9	21	7.1	1.17	9.4
Mangaonua Stm at Hoeka Rd	12	14.1	9.9	3.7	45	7.4	1.92	12.3
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	6.6	5.1	1.8	16.1	7.1	0.93	3.7
Mangatangi River at SH2 Maramarua	11	11	10.8	5.6	21	7.5	0.73	13.6
Mangatawhiri River at Lyons Rd At Buckingham Br	11	5.1	3.7	1	13.8	5.5	1.17	2.9
Mangawara Stm at Rutherford Rd Br	12	36.2	34	17.2	54	14	0.07	42.5
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	47.7	51	22	76	29.8	-0.08	48
Matahuru Stm at Waiterimu Road Below Confluence	12	29.2	23.5	6.3	88	19	2.16	30
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	107.5	95	82	164	51	0.94	89
Ohaeroa Stm at SH22 Br	11	14.4	12.1	4.8	30	12.9	0.8	8.3
Opuatia Stm at Ponganui Rd	11	21.9	12.3	5.1	80	13.6	2.01	12.1
Pokaiwhenua Stm at Puketurua	12	6.1	3.1	1.2	19.3	8.7	1.25	2.6
Waahi Stm at Te Ohaki Rd	12	51.5	30.5	22	192	24	2.74	33
Waerenga Stm at Taniwha Rd	11	15.5	10.9	1.1	70	14.6	2.59	8.5
Waitawhiriwhiri Stm at Edgumbe Street	11	32.2	35	12.6	49	15.5	-0.56	33
Whakapipi Stm at SH22 Br	11	6	3.3	1.1	26	5.3	2.66	3.2
Whakauru Stm at U/S SH1 Br	12	14.1	12.5	7	32	8.4	1.5	10
Whangamarino River at Island Block Rd	9	38.8	26	3	128	46.5	1.65	39.5
Whangamarino River at Jefferies Rd Br	11	29.4	23	10.5	101	8.7	2.68	28
Whangape Stm at Rangiriri-Glen Murray Rd	11	61.3	44	8.1	162	70.8	0.88	59

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	12.1	7.1	4.7	38	7.7	1.88	7.3
Kaniwhaniwha Stm at Wright Rd	12	8.4	8.4	2.9	19.1	5.6	1.15	6.6
Mangaohoi Stm at South Branch Maru Rd	12	2	1.2	0.8	5.3	1.7	1.45	1.5
Mangaokewa Stm at Lawrence Street Br	12	21.3	6.5	2.2	125	14.4	2.62	5.9
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	22.4	23.5	3.5	58	17.6	0.96	12.7
Mangapu River at Otorohanga	9	37	28	2.9	100	44.9	1.07	14.6
Mangarama Stm at Gadsby Rd	10	51.4	32	2.5	155	76.5	1.06	10.8
Mangarapa Stm at Otorohanga Rd	10	27.5	19.3	2.3	123	28.3	2.52	6.4
Mangatutu Stm (Waikeria) at Walker Rd Br	11	3.4	3.4	0.9	8.1	4	0.59	2.4
Mangauika Stm at Te Awamutu Borough W/S Intake	10	0.3	0.2	0.1	0.6	0.2	1.55	0.6
Moakururu Stm at Warratah Farm Bridge	10	9.6	6.1	2.4	21	16.6	0.73	6.2
Ohote Stm at Whatawhata/Horotiu Rd	12	24.4	17.8	10.1	50	14.8	1.27	15.9
Puniu River at Bartons Corner Rd Br	10	8.7	5.8	1.3	24	9.9	1	6.4
Puniu River at Wharepapa Rd Bridge	12	4.8	3.1	1.2	10.3	6.9	0.75	3
Waipa River at Mangaokewa Rd	11	1.9	1.7	0.9	3.4	1.4	0.58	1.9
Waipa River at Ngaruawahia Br	12	15.8	7.3	4.3	51	19.4	1.47	8.3
Waipa River at Pukehoua Bridge on Baffin Road	10	19.9	16.8	0.9	51	24.8	0.79	10.7
Waipa River at SH3 Otorohanga	10	8.1	6.1	1	21	7.1	1.01	4
Waitomo Stm at SH31 Otorohanga	6	19.4	18.5	2.2	46	12.6	1.14	12.6
Waitomo Stm at Tumutumu Rd	10	10.5	7.8	1.5	32	11.2	1.59	5.4
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	6.4	3.9	1.7	15.8	6.6	1.06	3.8
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	10.2	5	2.9	57	3.8	3.1	5
Mangakara Stm (Reporoa) at SH5	10	6	5.6	2.1	17.1	3.9	2.03	5.6
Mangakino Stm (Whakamaru) at Sandel Rd	11	2.5	1.7	0.6	7.6	2.7	1.46	1.5
Otamakokore Stm at Hossack Rd	12	3.8	3.5	1.1	9.8	1.7	1.87	3.2
Pueto Stm at Broadlands Rd Br	12	2.1	1.8	1	3.4	1.1	0.55	2.4
Tahunaatara Stm at Ohakuri Rd	11	5.1	2.6	1.4	13	5.9	1.03	2.5
Torepatutahi Stm at Vaile Rd Br	12	1.1	0.9	0.6	3.8	0.4	3.16	1.1
Waiotapu Stm at Campbell Rd Br	12	8.9	7.5	3.5	22	4.9	1.59	7.4
Waiotapu Stm at Homestead Rd Br	12	14.2	15.2	3.4	26	10.8	-0.11	12.8
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	3.5	3	1.4	6.3	2.9	0.4	2.9
Whirinaki Stm at Corbett Rd	12	4.4	0.5	0.2	30	2.7	2.54	0.5
West Coast								
Awakino River at Gribbon Rd	12	1.6	0.9	0.4	4.8	1.3	1.6	1.3
Awakino River at SH3 Awakau Rd Junction	11	9.3	7.4	0.8	37	7.4	2.02	3.2
Manganui River at Off Manganui Rd	12	9.9	4.3	1	46	8.8	2.23	3.6
Mangaotaki River at SH3 Br	12	9.5	7.4	1.2	26	11.7	0.97	4.6
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	9.1	3.9	1.4	43	9.5	2.57	4.4
Mokau River at Awakau Rd	12	48.5	22.6	2.8	200	44.8	1.81	11.9
Mokau River at Mangaokewa Rd (Off SH30)	12	5.1	3.6	2	15.1	4.3	1.66	3.3
Mokau River at Totoro Rd Recorder	11	37.6	15.6	1	157	57.8	1.79	6.9
Mokauiti Stm at Three Way Point - Aria	11	39.8	7.9	2.9	119	58.9	0.96	8.7
Ohautira Stm at Waingaro Te Uku Rd	12	20.6	3.8	1.9	121	6.3	2.24	4.3
Oparau River at Langdon Rd (Off Okupata Rd)	10	2.5	1.9	0.9	5.5	3	0.88	2.7
Tawarau River at Off Speedies Rd	10	6	4.1	1.1	18	9.1	1.21	3.5
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	33.9	6.2	2.7	186	24.2	2.28	6.6
Waitetuna River at Te Uku-Waingaro Rd	12	14	5.4	2.3	79	3.8	2.5	6.2

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	0.9	0.9	0.3	1.7	0.3	0.86	1.1
Kuratau River at SH41 Moerangi	12	2.5	1.6	0.8	7	2.1	1.45	1.7
Kuratau River at Te Rae Street T10	12	1.5	1.2	0.7	5.3	0.5	3.01	1.2
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	3	2.7	1.9	4.7	1.1	1.03	3.2
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	3.4	0.9	0.3	21	3.2	2.88	0.8
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	1.9	1.5	0.7	5.2	0.8	2.25	1.2
Tokaanu Stm at Off SH41 Turangi	12	0.2	0.1	0	0.7	0.2	1.94	0.2
Waihaha River at SH32	12	1.6	0.4	0.2	14.1	0.4	3.45	0.6
Waitahanui River at Blake Rd	12	1.2	0.9	0.2	2.8	1.6	0.43	0.8
Whangamata Stm (Kinloch) at Whangamata Rd	12	0.8	0.6	0.5	2.5	0.3	2.83	1.2
Whanganui Stm at Lakeside Lake Taupo T8	12	2.6	1.3	0.7	15.6	0.5	3.29	1.5
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	6	4.3	1.7	18.2	5.7	1.8	3.7

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 16: pH sample statistics for 2022 with 2018-2022 five-year median.

Location	pH							18-22 median
	Count	Mean	Median	Min	Max	IQR	Skew	
Coromandel								
Hikutaia River at Old Maratoto Rd	12	7.1	7	6.8	7.5	0.2	1.19	7.1
Kauaeranga River at Smiths Cableway Recorder	11	7	7	6.5	7.4	0.2	-0.65	7.1
Ohinemuri River at Karangahake	12	7.5	7.3	6.8	8.7	0.7	1.18	7.3
Ohinemuri River at Queens Head	12	7.2	7.2	6.7	7.6	0.3	0.1	7.1
Ohinemuri River at SH25 Br	12	7.1	7	6.6	8.1	0.6	1.08	7.2
Tairua River at Morrisons Br Hikuaui	11	6.8	6.8	6.5	7.2	0.1	0.49	7
Tapu River at Tapu-Coroglen Rd	12	7.5	7.5	7.3	7.7	0.2	0.16	7.5
Waiau River at E309 Rd Ford	11	7.4	7.4	6.9	7.6	0.3	-0.8	7.4
Waitekauri River at U/S Ohinemuri Conflu	12	7.2	7.2	6.8	7.8	0.4	0.77	7.3
Waiwawa River at SH25 Coroglen	12	7	7	6.4	7.4	0.3	-0.77	7.1
Wharekawa River at SH25	12	6.9	6.8	6.6	7.3	0.2	0.99	7
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	7.4	7.4	7	7.5	0.2	-1.59	7.4
Oraka Stm at Lake Rd	12	7.3	7.3	7.2	7.5	0.1	-0.15	7.4
Piako River at Kiwitahi	12	7.1	7.1	6.7	7.8	0.4	0.86	7.1
Piako River at Paeroa-Tahuna Rd Br	12	7.4	7.4	6.9	8	0.6	0.17	7.4
Piakonui Stm at Piakonui Rd	12	7.3	7.2	6.9	7.6	0.3	0.19	7.2
Waihou River at Okauia	12	7.4	7.3	7	7.7	0.3	-0.11	7.4
Waihou River at Te Aroha	12	7.3	7.2	7	7.7	0.3	0.73	7.2
Waihou River at Whites Rd	11	7	7	6.9	7.3	0.2	1.45	6.9
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	7.1	7.1	6.7	7.4	0.3	-0.5	7.2
Waiomou Stm at Matamata-Tauranga Rd	12	7.1	7.2	6.8	7.5	0.3	-0.13	7.2
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	7.2	7.3	6.8	7.4	0.3	-1.16	7.3
Waitoa River at Landsdowne Rd Br	12	7.2	7.1	6.8	7.8	0.3	0.96	7.1
Waitoa River at Mellon Rd Recorder	12	7.5	7.5	6.9	8.1	0.8	0.18	7.5
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otatau Rd Br opp Moseley Rd	11	7.2	7.3	6.3	7.9	0.5	-0.72	7.3
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	7.9	8	7.1	8.3	0.4	-1.23	7.9
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	7.3	7.3	6.8	7.8	0.3	0.3	7.2
Kirikiriroa Stm at Tauhara Dr	12	7	7.1	6.6	7.5	0.4	0.04	7
Komakorau Stm at Henry Rd	12	6.5	6.7	5.7	7	0.5	-1.12	6.7
Little Waipa Stm at Arapuni - Putaruru Rd	11	7	7	6.8	7.3	0.1	1.2	7
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	6.9	7.1	5.6	7.8	0.5	-1.01	7.1
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	7.4	7.3	6.8	7.8	0.3	-0.52	7.5
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	7.4	7.4	7.1	7.6	0.3	-0.51	7.4
Mangaonua Stm at Hoeka Rd	12	7.1	7	6.8	7.7	0.2	1.98	7
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	7.4	7.4	7	7.7	0.3	-0.11	7.4
Mangatangi River at SH2 Maramarua	11	7.2	7.2	6.7	7.4	0.3	-0.91	7.2
Mangatawhiri River at Lyons Rd At Buckingham Br	11	7.3	7.4	6.9	7.5	0.3	-1.15	7.4
Mangawara Stm at Rutherford Rd Br	12	6.7	6.9	5.9	7.2	0.5	-0.94	6.9
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	7.1	7.1	6.7	7.7	0.4	0.59	7.1
Matahuru Stm at Waiterimu Road Below Confluence	12	7.1	7.3	6.1	7.6	0.5	-1.35	7.2
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	8.3	8.5	7.1	9.8	1.3	0.49	8
Ohaeroa Stm at SH22 Br	11	7.5	7.5	7	7.8	0.3	-0.82	7.5
Opuatia Stm at Ponganui Rd	11	7.6	7.6	7.2	7.8	0.3	-0.64	7.6
Pokaiwhenua Stm at Puketurua	12	7.2	7.2	7.1	7.4	0.1	0.14	7.2
Waahi Stm at Te Ohaki Rd	12	7.9	8	7	8.6	0.7	-0.58	7.8
Waerenga Stm at Taniwha Rd	11	7.3	7.3	7	7.6	0.2	-0.36	7.4
Waitawhiriwhiri Stm at Edgecumbe Street	11	7.1	7.3	6.3	7.5	0.5	-1.48	7.1
Whakapipi Stm at SH22 Br	11	7.4	7.4	7	7.7	0.2	-0.64	7.4
Whakauru Stm at U/S SH1 Br	12	7.4	7.4	7	7.5	0.3	-1.22	7.4
Whangamarino River at Island Block Rd	9	7	6.9	6.5	7.6	0.5	0.8	7
Whangamarino River at Jefferies Rd Br	11	7.1	7.2	6.6	7.5	0.4	-0.73	7.2
Whangape Stm at Rangiriri-Glen Murray Rd	11	7.6	7.4	7.1	8.5	0.4	1.48	7.5

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	7.1	7.2	6.4	7.5	0.3	-1.13	7.1
Kaniwhaniwha Stm at Wright Rd	12	7.2	7.3	6.6	7.6	0.4	-0.62	7.2
Mangaohoi Stm at South Branch Maru Rd	12	7.4	7.5	6.8	7.8	0.5	-0.69	7.5
Mangaokewa Stm at Lawrence Street Br	12	7.4	7.4	6.9	7.7	0.3	-1	7.4
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	7.3	7.1	6.5	8.6	1.2	0.78	7.4
Mangapu River at Otorohanga	9	7.5	7.4	7.1	7.9	0.2	0.18	7.6
Mangarama Stm at Gadsby Rd	10	7.6	7.6	6.7	8.4	0.4	-0.18	7.9
Mangarapa Stm at Otorohanga Rd	10	7.6	7.5	7.1	8.1	0.2	0.72	7.6
Mangatutu Stm (Waikeria) at Walker Rd Br	11	7.1	7.2	6.5	7.5	0.4	-0.7	7.2
Mangauika Stm at Te Awamutu Borough W/S Intake	10	7.3	7.3	6.7	7.6	0.4	-0.99	7.4
Moakururu Stm at Warratah Farm Bridge	10	7.4	7.5	6.9	7.7	0.3	-1.27	7.5
Ohote Stm at Whatawhata/Horotiu Rd	12	6.7	6.8	6.1	7.1	0.4	-1.05	6.8
Puniu River at Bartons Corner Rd Br	10	7.1	7.1	6.5	7.5	0.5	-0.6	7.2
Puniu River at Wharepapa Rd Bridge	12	7.3	7.3	6.5	8.3	0.6	0.14	7.4
Waipa River at Mangaokewa Rd	11	7.1	7.1	6.6	7.5	0.4	-0.28	7.3
Waipa River at Ngaruawahia Br	12	7.3	7.3	6.7	7.6	0.3	-0.68	7.3
Waipa River at Pukehoua Bridge on Baffin Road	10	7.3	7.3	6.8	7.6	0.2	-0.86	7.4
Waipa River at SH3 Otorohanga	10	7.1	7.1	6.7	7.6	0.2	0.87	7.3
Waitomo Stm at SH31 Otorohanga	6	7.7	7.7	7.3	8.1	0.2	0.27	7.8
Waitomo Stm at Tumutumu Rd	10	7.8	7.8	7.3	8.2	0.2	-0.71	7.9
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	7.1	7.1	6.8	7.4	0.3	0.26	7.1
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	7.3	7.3	7	7.5	0.2	-0.75	7.3
Mangakara Stm (Reporoa) at SH5	10	7.1	7.2	6.8	7.4	0.2	-0.42	7.1
Mangakino Stm (Whakamaru) at Sandel Rd	11	7.2	7.3	6.7	7.6	0.5	-0.79	7.4
Otamakokore Stm at Hossack Rd	12	8	8	7.6	8.2	0.3	-0.51	8
Pueto Stm at Broadlands Rd Br	12	7.5	7.5	7.3	7.6	0	-1.06	7.5
Tahunaatara Stm at Ohakuri Rd	11	7.4	7.4	7	7.6	0.1	-1.63	7.5
Torepatutahi Stm at Vaile Rd Br	12	7.3	7.3	7.1	7.7	0.2	0.63	7.3
Waiotapu Stm at Campbell Rd Br	12	5	5	4.3	5.5	0.8	-0.14	5.6
Waiotapu Stm at Homestead Rd Br	12	6.9	6.8	6.6	7.1	0.3	0.3	6.9
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	7.6	7.7	7.4	7.7	0.1	-1.32	7.7
Whirinaki Stm at Corbett Rd	11	7.2	7.3	7	7.4	0.1	-1.14	7.3
West Coast								
Awakino River at Gribbon Rd	12	7.2	7.3	6.7	7.5	0.3	-1.11	7.4
Awakino River at SH3 Awakau Rd Junction	11	7.5	7.5	7	8	0.3	0.16	7.5
Manganui River at Off Manganui Rd	12	7.3	7.3	6.7	7.5	0.3	-1.38	7.4
Mangaotaki River at SH3 Br	12	7.7	7.8	7.1	8	0.3	-1.54	7.8
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	7.8	7.8	7.2	8.2	0.4	-0.61	7.8
Mokau River at Awakau Rd	12	7.4	7.5	6.9	7.8	0.3	-0.63	7.5
Mokau River at Mangaokewa Rd (Off SH30)	12	7.2	7.2	6.6	7.4	0.3	-1.26	7.3
Mokau River at Totoro Rd Recorder	11	7.6	7.6	7	7.9	0.4	-0.39	7.6
Mokauiti Stm at Three Way Point - Aria	11	7.1	7.1	6.8	7.6	0.4	0.53	7.3
Ohautira Stm at Waingaro Te Uku Rd	12	7.3	7.4	6.6	7.7	0.3	-1.31	7.4
Oparau River at Langdon Rd (Off Okupata Rd)	10	7.3	7.3	6.7	7.8	0.4	-0.17	7.4
Tawarau River at Off Speedies Rd	10	7.8	7.8	7.2	8.2	0.4	-0.45	7.9
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	7.4	7.5	6.6	8	0.5	-0.82	7.5
Waitetuna River at Te Uku-Waingaro Rd	12	7.3	7.3	6.7	7.5	0.3	-1.29	7.4

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	7.4	7.5	7	7.7	0.3	-0.73	7.5
Kuratau River at SH41 Moerangi	12	6.9	6.9	6.6	7.2	0.2	-0.16	7
Kuratau River at Te Rae Street T10	12	7.4	7.4	6.9	7.7	0.3	-0.6	7.4
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	7.5	7.5	7.1	7.7	0.3	-0.74	7.5
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	7.3	7.3	6.9	7.5	0.3	-0.55	7.3
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	7.5	7.5	6.9	7.7	0.2	-1.77	7.5
Tokaanu Stm at Off SH41 Turangi	12	7.3	7.3	7	7.6	0.3	-0.34	7.3
Waihaha River at SH32	12	7.2	7.2	6.8	7.4	0.3	-0.71	7.2
Waitahanui River at Blake Rd	12	7.5	7.5	7	7.6	0.1	-1.94	7.5
Whangamata Stm (Kinloch) at Whangamata Rd	12	7.4	7.3	7	7.6	0.2	-0.62	7.4
Whanganui Stm at Lakeside Lake Taupo T8	12	7.3	7.3	6.8	7.6	0.3	-0.88	7.4
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	7.4	7.5	6.9	7.5	0.1	-2.01	7.4

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 17: *Escherichia coli* sample statistics for 2022 with 2018-2022 five-year median.

<i>Escherichia coli</i> (✓100ml)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	989	400	110	3700	1285	1.48	425
Kauaeranga River at Smiths Cableway Recorder	11	130	80	20	370	209	0.96	110
Ohinemuri River at Karangahake	12	677	125	18	4600	312	2.6	56
Ohinemuri River at Queens Head	12	866	180	37	6300	557	2.97	90
Ohinemuri River at SH25 Br	12	1205	200	29	6700	350	2.08	150
Tairua River at Morrisons Br Hikuaia	11	677	120	32	3400	530	2.01	120
Tapu River at Tapu-Coroglen Rd	12	370	85	32	3300	100	3.43	105
Waiau River at E309 Rd Ford	11	529	130	90	3400	410	3.05	160
Waitekauri River at U/S Ohinemuri Conflu	12	580	120	20	4100	190	2.71	125
Waiwawa River at SH25 Coroglen	12	206	80	18	1100	195	2.64	110
Wharekawa River at SH25	12	841	195	40	4500	1020	2.21	290
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	505	140	37	4100	222	3.27	100
Oraka Stm at Lake Rd	12	1753	1200	480	7000	1300	2.73	750
Piako River at Kiwitahi	12	1133	600	240	3800	1060	1.66	540
Piako River at Paeroa-Tahuna Rd Br	12	1517	940	220	6300	1300	2.2	900
Piakonui Stm at Piakonui Rd	12	269	83	3	1200	273	1.83	120
Waihou River at Okauia	12	1136	520	140	6200	755	2.79	360
Waihou River at Te Aroha	12	1488	485	190	9000	1255	3.02	420
Waihou River at Whites Rd	11	347	210	5	1800	145	2.83	140
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	234	95	10	1000	254	1.74	60
Waiomou Stm at Matamata-Tauranga Rd	12	1206	465	200	5700	940	2.38	480
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	597	460	210	1200	595	0.86	335
Waitoa River at Landsdowne Rd Br	12	1035	800	250	2600	1195	0.95	1100
Waitoa River at Mellon Rd Recorder	12	799	610	140	1600	755	0.48	700
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otatau Rd Br opp Moseley Rd	11	693	500	170	2000	568	1.48	325
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	923	295	140	4700	520	2.22	270
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	2579	490	110	25000	890	3.45	450
Kirikiri-roa Stm at Tauhara Dr	12	795	545	230	3000	250	2.85	600
Komakorau Stm at Henry Rd	12	4926	1900	410	37000	2650	3.38	2000
Little Waipa Stm at Arapuni - Putaruru Rd	11	1222	300	100	6300	1168	2.47	285
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	8982	2350	380	60000	7550	3.07	1000
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	3687	1450	310	16000	4435	1.97	850
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	1310	1050	500	3100	900	1.31	1000
Mangaonua Stm at Hoeka Rd	12	2878	1550	200	18000	1485	3.24	1500
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	1153	740	80	3700	1380	1.32	220
Mangatangi River at SH2 Maramarua	11	885	700	310	2400	680	1.63	750
Mangatawhiri River at Lyons Rd At Buckingham Br	11	642	600	190	1400	568	0.75	415
Mangawara Stm at Rutherford Rd Br	12	1883	1550	800	3800	1450	0.85	2050
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	2073	1300	500	10000	1500	2.96	1200
Matahuru Stm at Waiterimu Road Below Confluence	12	1418	1350	300	3300	1240	0.75	950
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	242	90	14	1600	225	3.04	50
Ohaeroa Stm at SH22 Br	11	831	660	300	2100	465	1.54	660
Opuatia Stm at Ponganui Rd	11	1105	390	90	5500	680	2.21	305
Pokaiwhenua Stm at Puketurua	12	2805	750	200	16000	2765	2.53	505
Waahi Stm at Te Ohaki Rd	12	290	50	16	1500	222	2.12	50
Waerenga Stm at Taniwha Rd	11	2745	1200	280	11000	1375	1.88	1100
Waitawhiriwhiri Stm at Edgcombe Street	11	5327	1200	400	33000	5350	2.85	1600
Whakapipi Stm at SH22 Br	11	872	540	240	2500	598	1.58	495
Whakauru Stm at U/S SH1 Br	12	2857	2150	580	7400	3850	1.05	1200
Whangamarino River at Island Block Rd	9	206	150	18	600	331	1.01	110
Whangamarino River at Jefferies Rd Br	11	1790	700	400	11000	843	3.14	1050
Whangape Stm at Rangiriri-Glen Murray Rd	11	210	300	10	400	369	-0.16	90

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	1317	325	170	12000	305	3.45	300
Kaniwhaniwha Stm at Wright Rd	12	477	400	70	1400	470	1.36	445
Mangaohoi Stm at South Branch Maru Rd	12	172	56	11	1100	149	2.92	60
Mangaokewa Stm at Lawrence Street Br	12	6264	605	190	38000	1235	2.13	655
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	2560	2300	500	6300	2000	1.02	1050
Mangapu River at Otorohanga	9	2214	900	260	7600	2883	1.5	900
Mangarama Stm at Gadsby Rd	10	1788	1050	310	4400	3200	0.86	485
Mangarapa Stm at Otorohanga Rd	10	1190	1100	330	2600	1200	0.59	700
Mangatutu Stm (Waikeria) at Walker Rd Br	11	260	240	130	430	170	0.39	210
Mangauika Stm at Te Awamutu Borough W/S Intake	10	16	9	1	70	18	2.21	10
Moakurarua Stm at Warratah Farm Bridge	10	533	345	180	1300	560	1.13	315
Ohote Stm at Whatawhata/Horotiu Rd	12	1138	850	290	4500	600	2.89	790
Puniu River at Bartons Corner Rd Br	10	1476	750	140	4600	2000	1.3	250
Puniu River at Wharepapa Rd Bridge	12	381	270	90	1200	365	1.54	215
Waipa River at Mangaokewa Rd	11	724	160	70	5000	105	2.88	190
Waipa River at Ngaruawahia Br	12	478	205	53	2000	675	1.9	200
Waipa River at Pukehoua Bridge on Baffin Road	10	1411	650	140	4600	1560	1.44	400
Waipa River at SH3 Otorohanga	10	759	425	160	2400	730	1.54	340
Waitomo Stm at SH31 Otorohanga	6	1673	1350	340	3500	2500	0.37	700
Waitomo Stm at Tumutumu Rd	10	608	325	80	1700	890	1.06	320
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	2393	800	140	9800	2350	1.82	785
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	1501	630	130	7100	1500	2.33	400
Mangakara Stm (Reporoa) at SH5	10	1011	540	90	4600	1000	2.56	510
Mangakino Stm (Whakamaru) at Sandel Rd	11	188	150	24	500	108	1.15	110
Otamakokore Stm at Hossack Rd	12	663	400	150	2600	745	2.28	400
Pueto Stm at Broadlands Rd Br	12	84	80	30	160	76	0.38	48
Tahunaatara Stm at Ohakuri Rd	11	510	210	100	2100	340	2	200
Torepatutahi Stm at Vaile Rd Br	12	266	225	90	610	175	1.35	235
Waiotapu Stm at Campbell Rd Br	12	327	5	1	3700	58	3.46	5
Waiotapu Stm at Homestead Rd Br	12	841	300	50	5700	605	3.26	300
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	373	250	140	1300	195	2.38	175
Whirinaki Stm at Corbett Rd	12	1044	145	31	6300	228	2.15	62
West Coast								
Awakino River at Gribbon Rd	12	289	115	41	2000	170	3.3	110
Awakino River at SH3 Awakau Rd Junction	11	556	230	51	2200	430	1.77	230
Manganui River at Off Manganui Rd	12	516	155	60	3400	200	3.01	255
Mangaotaki River at SH3 Br	12	2128	655	160	17000	790	3.28	400
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	480	245	120	1400	540	1.31	240
Mokau River at Awakau Rd	12	1196	355	53	6900	1120	2.42	245
Mokau River at Mangaokewa Rd (Off SH30)	12	3021	270	80	29000	890	3.39	235
Mokau River at Totoro Rd Recorder	11	2455	390	70	17000	2443	3.03	240
Mokauiti Stm at Three Way Point - Aria	11	1517	900	220	6000	1885	2.06	310
Ohautira Stm at Waingaro Te Uku Rd	12	665	525	120	1500	720	0.68	380
Oparau River at Langdon Rd (Off Okupata Rd)	10	239	190	80	600	120	1.5	200
Tawarau River at Off Speedies Rd	10	577	235	140	1700	1020	1.15	230
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	358	220	120	1400	108	2.87	220
Waitetuna River at Te Uku-Waingaro Rd	12	638	750	190	1100	670	-0.13	365

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	51	33	11	160	56	1.43	26
Kuratau River at SH41 Moerangi	12	61	36	6	220	55	1.65	23
Kuratau River at Te Rae Street T10	12	113	83	24	370	118	1.7	80
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	109	110	23	220	65	0.57	110
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	231	21	6	2400	22	3.44	23
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	12	2	1	80	9	2.83	5
Tokaanu Stm at Off SH41 Turangi	12	21	19	8	60	17	2.02	18
Waihaha River at SH32	12	27	21	1	100	21	1.93	17
Waitahanui River at Blake Rd	12	56	36	3	140	70	0.65	29
Whangamata Stm (Kinloch) at Whangamata Rd	12	231	205	60	600	110	1.54	120
Whanganui Stm at Lakeside Lake Taupo T8	12	145	75	20	1000	55	3.37	70
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	401	250	62	1200	395	1.42	185

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Table 18: Water temperature sample statistics for 2022 with 2018-2022 five-year median.

Water Temperature (°C)								
Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Coromandel								
Hikutaia River at Old Maratoto Rd	12	14.6	14	8.8	21.4	5.1	0.37	13.9
Kauaeranga River at Smiths Cableway Recorder	11	14.9	13.4	8.5	22.2	6.3	0.41	13.9
Ohinemuri River at Karangahake	12	16.6	15.9	10.2	23.9	5.6	0.58	16.1
Ohinemuri River at Queens Head	12	16.5	16.1	11	22.8	4.8	0.54	16.2
Ohinemuri River at SH25 Br	12	16.1	15.7	10.8	21.8	4.4	0.42	16.1
Tairua River at Morrisons Br Hikuai	11	15.9	15.3	9.8	23.2	6	0.56	15.7
Tapu River at Tapu-Coroglen Rd	12	15	14.7	8.5	22.8	4.8	0.21	14.2
Waiau River at E309 Rd Ford	11	15.4	15.2	9.7	21.3	3.9	0.25	14
Waitekauri River at U/S Ohinemuri Conflu	12	15.7	15.3	10.2	22.5	4.4	0.6	15.6
Waiwawa River at SH25 Coroglen	12	15.8	15.5	9.7	22	5.2	0.34	15.5
Wharekawa River at SH25	12	15.8	15.4	9.6	22.8	5	0.41	15.6
Hauraki								
Mangawhero Stm (Kaihere) at Mangawara Rd	11	15.7	16	11.9	19.3	4.5	0.02	15
Oraka Stm at Lake Rd	12	15	14.7	11.6	18.8	4	0.28	14.8
Piako River at Kiwitahi	12	16.3	15.5	11.7	23	4.7	0.86	15.2
Piako River at Paeroa-Tahuna Rd Br	12	15.7	14.9	11.5	21.8	5	0.56	15.3
Piakonui Stm at Piakonui Rd	12	14.3	13.6	10	19.6	2.3	0.73	13.5
Waihou River at Okauia	12	14.8	14.2	11.6	19.3	2.9	0.71	14
Waihou River at Te Aroha	12	15.2	14.4	12	19.3	4.4	0.48	14.9
Waihou River at Whites Rd	11	13	13	12	14.3	1.2	0.31	13
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	11.9	11.4	7.7	16.3	4.1	0.1	11.7
Waiomou Stm at Matamata-Tauranga Rd	12	14.6	13.9	10.8	19.9	3.3	0.76	13.5
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	11	17.1	16.9	12	22.2	4.3	0.09	16.7
Waitoa River at Landsdowne Rd Br	12	15.6	14.8	11.3	22	4.1	0.84	15.5
Waitoa River at Mellon Rd Recorder	12	16.3	15.1	11.9	23	5.3	0.74	15.9
Tributaries to the Lower Waikato								
Awaroa River (Waiuku) at Otatau Rd Br opp Moseley Rd	11	17.8	18.1	12.5	23	4	-0.14	17.6
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	12	15.5	14.8	11	21.2	5.9	0.35	15.7
Karapiro Stm at Hickey Rd Bridge - Cambridge	12	16.1	15.5	10.8	22.6	4	0.53	14.6
Kirikiri-roa Stm at Tauhara Dr	12	15.5	15.5	11.8	18.6	4.5	-0.13	15.3
Komakorau Stm at Henry Rd	12	15.5	15.6	9.1	20.6	4.9	-0.32	16.1
Little Waipa Stm at Arapuni - Putaruru Rd	11	13.9	14.1	11.4	16.3	2.6	-0.03	14.1
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	12	16.1	15	11.9	21.6	4.1	0.68	15.4
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	13.7	13.6	9.1	17.8	4	-0.03	13.8
Mangaone Stm (Waikato) at Annebrooke Rd Br	10	15.7	15.4	11.6	18.7	4.1	-0.19	14.7
Mangaonua Stm at Hoeka Rd	12	15.9	15.4	12.5	20.7	3	0.77	14.9
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	15.3	14.6	10.5	21.8	3.2	0.8	14.5
Mangatangi River at SH2 Maramarua	11	17.5	17.6	12.1	22.9	4.3	0.05	16.9
Mangatawhiri River at Lyons Rd At Buckingham Br	11	17.2	16.8	12.2	22	5.3	0.12	16.6
Mangawara Stm at Rutherford Rd Br	12	15.8	15.9	9.4	21.2	5.8	-0.11	15.9
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11	15.6	15.1	11.9	20.1	3.4	0.47	14.7
Matahuru Stm at Waiterimu Road Below Confluence	12	15.2	15.6	9.6	19.8	5.4	-0.18	15.8
Northern Outlet Canal (Pungarehu Canal) at D/S of Ctrl Gates	11	17.4	17.6	11.5	24.4	4.8	0.08	17.6
Ohaeroa Stm at SH22 Br	11	15.9	16.6	12.3	18.9	3.8	-0.22	15.1
Opuatia Stm at Ponganui Rd	11	16	16.7	11.8	19.3	4.1	-0.25	15.2
Pokaiwhenua Stm at Puketurua	12	13.7	13.7	10.4	17.4	3.1	0.14	13.8
Waahi Stm at Te Ohaki Rd	12	17.3	16.9	13	24.1	7.3	0.39	17.6
Waerenga Stm at Taniwha Rd	11	15.9	16.3	12	19.9	3.3	-0.18	15.3
Waitawhiriwhiri Stm at Edgcombe Street	11	16.6	17.3	12.3	20.4	4.4	-0.2	16.7
Whakapipi Stm at SH22 Br	11	16.3	16.6	12.5	20.1	2.3	-0.07	16.2
Whakauru Stm at U/S SH1 Br	12	12.5	12.6	8.5	16.4	3.7	0.01	12.9
Whangamarino River at Island Block Rd	9	17.3	16.9	12	24	5.9	0.32	17.4
Whangamarino River at Jefferies Rd Br	11	16	16.3	11.8	21.1	3.5	0.18	15.5
Whangape Stm at Rangiriri-Glen Murray Rd	11	17	18.1	12	20.5	4.1	-0.63	17.3

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Waipa River and Tributaries								
Firewood Creek at Waingaro Road Bridge	12	14.8	15.3	9.7	19.4	4.2	-0.22	14.4
Kaniwhaniwha Stm at Wright Rd	12	15.5	14.7	10.3	21.7	6.5	0.35	15.2
Mangaohoi Stm at South Branch Maru Rd	12	14.7	14.7	10.3	18.9	5.4	0.06	14.4
Mangaokewa Stm at Lawrence Street Br	12	14.3	14	8.5	19.3	4.9	-0.21	13.6
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	10	17	16.7	11	24.5	6.7	0.23	18
Mangapu River at Otorohanga	9	15.9	15.2	12.1	20.5	4.2	0.33	15.2
Mangarama Stm at Gadsby Rd	10	16	16.4	12	19.6	4.1	-0.21	15.2
Mangarapa Stm at Otorohanga Rd	10	16.2	16.7	11.8	20.2	4.7	-0.2	15.7
Mangatutu Stm (Waikeria) at Walker Rd Br	11	15.1	13.9	10.3	20.4	5.2	0.31	14.5
Mangauika Stm at Te Awamutu Borough W/S Intake	10	12.8	12.3	9.8	15.7	3.6	0.18	11.9
Moakururu Stm at Warratah Farm Bridge	10	14.8	14.5	10.6	18.4	3.8	-0.05	14.2
Ohote Stm at Whatawhata/Horotiu Rd	12	15.6	15	10.7	19.8	4.6	0.01	15.8
Puniu River at Bartons Corner Rd Br	10	15.5	14.8	10.7	21.6	6.8	0.41	15.7
Puniu River at Wharepapa Rd Bridge	12	15.5	14.9	10.3	20.6	6	0.02	15.5
Waipa River at Mangaokewa Rd	11	13.8	13.4	9.7	18	5.3	0.04	13
Waipa River at Ngaruawahia Br	12	15.9	15.8	11.1	22.7	6.4	0.39	15.7
Waipa River at Pukehoua Bridge on Baffin Road	10	15.6	15.7	11.2	20.4	4.4	0.09	15
Waipa River at SH3 Otorohanga	10	15.9	15.9	11.4	21	5.1	0.13	14.9
Waitomo Stm at SH31 Otorohanga	6	15.4	15.5	12.1	17.8	2.5	-0.59	15.1
Waitomo Stm at Tumutumumu Rd	10	14.5	14.4	12.3	17	2.5	0.23	14
Tributaries to the Upper Waikato								
Kawaunui Stm at SH5 Br	12	15.1	15.2	12.7	17.5	2.8	-0.09	15.4
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10	13	13	9.7	16.3	2.4	-0.01	13.3
Mangakara Stm (Reporoa) at SH5	10	13.1	13.1	9.4	16.5	3.6	-0.12	13.1
Mangakino Stm (Whakamaru) at Sandel Rd	11	12.3	12.2	9.6	15	2.7	-0.13	12.4
Otamakokore Stm at Hossack Rd	12	19.6	19	16.7	24.3	4	0.68	19.8
Pueto Stm at Broadlands Rd Br	12	13.5	13.7	11.4	15.6	2.3	0	13.8
Tahunaatara Stm at Ohakuri Rd	11	13.2	12.1	8.5	17.9	4.6	0.3	13.3
Torepatutahi Stm at Vaile Rd Br	12	14	13.8	10.1	17.5	3.1	-0.07	14.5
Waiotapu Stm at Campbell Rd Br	12	27	26.7	23.6	31.1	3.5	0.39	27.4
Waiotapu Stm at Homestead Rd Br	12	17.8	17	13.8	23	3.6	0.6	17.6
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	21.5	21.5	17.9	24.1	2.8	-0.37	21.8
Whirinaki Stm at Corbett Rd	12	12.3	12.5	10.3	13.8	1.2	-0.54	12.6
West Coast								
Awakino River at Gribbon Rd	12	14	14.4	8	19.9	3.7	-0.13	13.1
Awakino River at SH3 Awakau Rd Junction	11	14.8	15.2	8.3	18.3	5.1	-0.64	14.6
Manganui River at Off Manganui Rd	12	14.3	14.4	7.8	20.1	4.6	-0.23	13.6
Mangaotaki River at SH3 Br	12	14.1	13.6	8.5	19.4	4.3	-0.05	13.5
Marokopa River at Speedies Rd (Off Te Anga Rd)	10	14.8	15.3	11.7	18.1	3.9	-0.05	14.3
Mokau River at Awakau Rd	12	15.7	14.9	9.6	22.4	5.8	0.2	14.8
Mokau River at Mangaokewa Rd (Off SH30)	12	13.2	12.5	7.5	17	5.3	-0.18	12.5
Mokau River at Totoro Rd Recorder	11	15.9	15.8	11.5	20.8	5	0.03	14.6
Mokauiti Stm at Three Way Point - Aria	11	15.9	15	11.2	22.3	5.7	0.4	14.5
Ohautira Stm at Waingaro Te Uku Rd	12	14.5	14.3	8.9	19.4	4.8	-0.18	14.4
Oparau River at Langdon Rd (Off Okupata Rd)	10	15.1	14.8	10.6	18.9	5.8	0.08	14.3
Tawarau River at Off Speedies Rd	10	14.6	14.8	11.6	18.2	3.5	0.18	13.8
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	9	16.2	16.3	11	23	7.2	0.38	16.1
Waitetuna River at Te Uku-Waingaro Rd	12	15.1	14.7	10.2	20.4	5.4	0.17	15.3

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

Location	Count	Mean	Median	Min	Max	IQR	Skew	18-22 median
Inflows to Lake Taupo								
Hinemaiaia River at SH1	12	11.9	11.6	8.3	16.5	3.8	0.33	11.7
Kuratau River at SH41 Moerangi	12	10.3	9.9	7.8	13.3	2.7	0.38	10.1
Kuratau River at Te Rae Street T10	12	14.2	14.2	9.5	19	5.8	0.16	13.6
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	11.3	11	9.2	13.4	2.3	0.25	11.3
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	11.2	11.1	7.4	16	4	0.32	11.3
Tokaanu Power Stn Tailrace Canal at SH41 Bridge Over Canal	11	13.4	13	8.5	19.1	6.1	0.22	13.2
Tokaanu Stm at Off SH41 Turangi	12	12.4	12.3	11.7	13.3	0.9	0.33	12.3
Waihaha River at SH32	12	11.7	11	8.7	15.5	3.8	0.36	11.7
Waitahanui River at Blake Rd	12	11.2	11.1	9.1	12.9	1.9	-0.06	11.1
Whangamata Stm (Kinloch) at Whangamata Rd	12	11.1	11	9.2	12.6	1.6	-0.14	10.8
Whanganui Stm at Lakeside Lake Taupo T8	12	12	11.8	8.4	17	4	0.41	11.6
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	11.9	11.7	8.7	15.3	2.7	0.09	11.6

IQR = inter-quartile range; Skew = skewness (> 1 is lightly skewed, >2 is highly skewed)

3.1.2 Comparison with Water Quality Guidelines and Standards

Table 19: Regional rivers monitoring programme comparison with water quality guidelines and standards. Dissolved oxygen (DO), pH, turbidity (Turb), NH₄N, Temperature (Temp), Total Phosphorous (TP), Total Nitrogen (TN), Black disk (BDisk), and *Escherichia coli* (Ecoli)

	SATISFACTORY										EXCELLENT									
	Ecological Health							Recreation			Ecological Health							Recreation		
	DO	pH	Turb	NH ₄ N	Temp	TP	TN	BDisk	Ecoli	Median Ecoli	DO	pH	Turb	NH ₄ N	Temp	TP	TN	BDisk	Ecoli	Median Ecoli
Coromandel																				
Hikutaia River at Old Maratoto Rd	12	12	9	12	7	12	11	9	8	N	10	10	8	12	6	8	3	0	0	N
Kauaeranga River at Smiths Cableway Recorder	11 ¹	11 ¹	10 ¹	11 ¹	6 ¹	11 ¹	11 ¹	9 ¹	11 ¹	Y	11 ¹	8 ¹	9 ¹	11 ¹	4 ¹	10 ¹	9 ¹	6 ¹	5 ¹	N
Ohinemuri River at Karangahake	12	12	10	12	6	12	1	9 ¹	10	Y	12	8	9	12	2	5	0	3 ¹	5	N
Ohinemuri River at Queens Head	11	12	11	12	5	11	0	9 ²	8	N	11	9	9	9	1	6	0	6 ²	3	N
Ohinemuri River at SH25 Br	12	12	12	12	6	12	3	8	9	N	12	5	8	12	3	5	0	2	1	N
Tairua River at Morrisons Br Hikuai	11 ¹	11 ¹	10 ¹	11 ¹	4 ¹	11 ¹	11 ¹	-	8 ¹	Y	11 ¹	2 ¹	6 ¹	11 ¹	3 ¹	9 ¹	3 ¹	-	4 ¹	N
Tapu River at Tapu-Coroglen Rd	12	12	11	12	7	12	12	11	11	Y	12	12	8	12	5	11	9	7	2	N
Waiau River at E309 Rd Ford	11 ¹	11 ¹	8 ¹	11 ¹	7 ¹	11 ¹	11 ¹	8 ¹	8 ¹	N	11 ¹	10 ¹	5 ¹	11 ¹	5 ¹	7 ¹	4 ¹	0 ¹	0 ¹	N
Waitekauri River at U/S Ohinemuri Conflu	12	12	11	12	6	12	10	8 ¹	10	Y	12	10	9	12	4	9	1	3 ¹	4	N
Waiwawa River at SH25 Coroglen	12	11	11	12	7	12	12	9	11	Y	12	8	7	12	3	11	6	3	6	N
Wharekawa River at SH25	12	12	9	12	6	12	12	6 ²	8	N	12	4	6	12	4	9	2	1 ²	2	N
Hauraki																				
Mangawhero Stm (Kaihere) at Mangawara Rd	11 ¹	11 ¹	1 ¹	11 ¹	7 ¹	1 ¹	8 ¹	0 ¹	10 ¹	N	11 ¹	11 ¹	0 ¹	11 ¹	1 ¹	0 ¹	0 ¹	0 ¹	2 ¹	N
Oraka Stm at Lake Rd	12	12	4	12	8	0	0	0	1	N	8	12	2	11	3	0	0	0	0	N
Piako River at Kiwitahi	5	12	9	12	6	1	4	7	6	N	2	7	4	12	3	0	0	0	0	N
Piako River at Paeroa-Tahuna Rd Br	7	12	3	12	6	0	1	0 ¹	5	N	0	10	1	10	2	0	0	0 ¹	0	N
Piakonui Stm at Piakonui Rd	12	12	5	12	8	10	6	1	10	Y	12	11	0	12	4	0	0	0	6	N
Waihou River at Okauia	12	12	6	12	8	0	0	1	6	N	12	12	2	12	3	0	0	0	0	N
Waihou River at Te Aroha	11	12	5	12	7	0	0	0	7	N	1	12	0	12	3	0	0	0	0	N
Waihou River at Whites Rd	11 ¹	11 ¹	11 ¹	11 ¹	6 ¹	0 ¹	0 ¹	10 ¹	9 ¹	N	11 ¹	6 ¹	10 ¹	11 ¹	6 ¹	0 ¹	0 ¹	9 ¹	1 ¹	N
Waiohotu Stm at Waiohotu Rd (Off SH5)	12	12	8	12	12	9	11	-	10	Y	10	10	0	12	8	0	0	-	5	N
Waiomou Stm at Matamata-Tauranga Rd	12	12	8	12	8	9	3	1	7	N	12	9	3	12	3	0	0	0	0	N
Waitakaruru River (Hauraki Plains) at Coxhead Rd Br	8 ¹	11 ¹	4 ¹	11 ¹	4 ¹	1 ¹	6 ¹	2 ⁵	7 ¹	N	3 ¹	10 ¹	2 ¹	10 ¹	0 ¹	0 ¹	0 ¹	0 ⁵	0 ¹	N
Waitoa River at Landsdowne Rd Br	7	12	10	12	7	4	0	4	4	N	1	9	4	12	3	0	0	1	0	N
Waitoa River at Mellon Rd Recorder	0	12	5	12	6	0	0	2 ¹	4	N	0	9	0	8	2	0	0	0 ¹	0	N

	SATISFACTORY										EXCELLENT									
	Ecological Health							Recreation			Ecological Health							Recreation		
	DO	pH	Turb	NH ₄ N	Temp	TP	TN	BDisk	Ecoli	Median Ecoli	DO	pH	Turb	NH ₄ N	Temp	TP	TN	BDisk	Ecoli	Median Ecoli
Tributaries to the Lower Waikato																				
Awaroa River (Waiuku) at Otatau Rd Br opp Moseley Rd	10 ¹	10 ¹	4 ¹	11 ¹	4 ¹	6 ¹	0 ¹	1 ⁸	6 ¹	N	6 ¹	9 ¹	0 ¹	10 ¹	0 ¹	0 ¹	0 ¹	0 ⁸	0 ¹	N
Awaroa Stm (Rotowaro) at Sansons Br @ Rotowaro-Huntly Rd	7	12	9	12	7	12	3	5	8	N	3	7	3	12	2	7	0	0	0	N
Karapiro Stm at Hickey Rd Bridge - Cambridge	11	12	1	12	7	0	2	1 ²	7	N	6	11	0	12	3	0	0	0 ²	0	N
Kirikiroa Stm at Tauhara Dr	2	12	0	12	8	0	0	0	6	N	0	7	0	1	1	0	0	0	0	N
Komakorau Stm at Henry Rd	1	8	0	9	7	0	0	2	1	N	1	1	0	2	2	0	0	0 ²	0	N
Little Waipa Stm at Arapuni - Putaruru Rd	10 ¹	11 ¹	7 ¹	11 ¹	8 ¹	0 ¹	0 ¹	4 ¹	7 ¹	N	4 ¹	7 ¹	4 ¹	11 ¹	4 ¹	0 ¹	0 ¹	0 ¹	0 ¹	N
Mangakotukutuku Stm (Rukuhia) at Peacockes Rd	11	10	0	12	7	0	0	0	1	N	5	7	0	0	3	0	0	0	0	N
Mangamingi Stm (Tokoroa) at Paraonui Rd Br	12	12	5	12	9	0	0	0	2	N	12	11	1	11	5	0	0	0	0	N
Mangaone Stm (Waikato) at Annebrooke Rd Br	5 ²	10 ²	0 ²	10 ²	7 ²	0 ²	0 ²	0 ²	1 ²	N	0 ²	10 ²	0 ²	10 ²	1 ²	0 ²	0 ²	0 ²	0 ²	N
Mangaonua Stm at Hoeka Rd	3	12	1	12	6	3	0	0	2	N	0	8	0	11	2	0	0	0	0	N
Mangaonua Stm at Te Miro Rd (a.k.a Waitakaruru stm)	12	12	6	12	7	6	1	1	4	N	12	12	2	12	3	0	0	0	0	N
Mangatangi River at SH2 Maramarua	10 ¹	11 ¹	0 ¹	11 ¹	4 ¹	2 ¹	4 ¹	0 ³	4 ¹	N	2 ¹	10 ¹	0 ¹	11 ¹	0 ¹	0 ¹	0 ¹	0 ³	0 ¹	N
Mangatawhiri River at Lyons Rd At Buckingham Br	11 ¹	11 ¹	7 ¹	11 ¹	3 ¹	11 ¹	9 ¹	3 ³	4 ¹	N	11 ¹	10 ¹	3 ¹	11 ¹	0 ¹	0 ¹	2 ¹	0 ³	0 ¹	N
Mangawara Stm at Rutherford Rd Br	0	10	0	12	7	0	0	0	0	N	0	4	0	0	2	0	0	0	0	N
Mangawhero Stm (Cambridge) at Cambridge-Ohaupo Rd	11 ¹	11 ¹	0 ¹	11 ¹	7 ¹	0 ¹	0 ¹	0 ²	2 ¹	N	0 ¹	8 ¹	0 ¹	6 ¹	3 ¹	0 ¹	0 ¹	0 ²	0 ¹	N
Matahuru Stm at Waiterimu Road Below Confluence Northern Outlet Canal (a.k.a.Pungarehu Canal) at DownStream of Control Gates	9 ¹	9 ¹	0 ¹	11 ¹	5 ¹	0 ¹	0 ¹	0 ¹	10 ¹	Y	6 ¹	5 ¹	0 ¹	11 ¹	0 ¹	0 ¹	0 ¹	0 ¹	5 ¹	N
Ohaeroa Stm at SH22 Br	11 ¹	11 ¹	1 ¹	11 ¹	6 ¹	6 ¹	0 ¹	0 ⁷	5 ¹	N	7 ¹	11 ¹	0 ¹	11 ¹	1 ¹	0 ¹	0 ¹	0 ⁷	0 ¹	N
Opuatia Stm at Ponganui Rd	11 ¹	11 ¹	0 ¹	11 ¹	7 ¹	9 ¹	0 ¹	0 ¹	7 ¹	N	7 ¹	11 ¹	0 ¹	11 ¹	1 ¹	0 ¹	0 ¹	0 ¹	0 ¹	N
Pokaiwhenua Stm at Puketurua	12	12	8	12	9	0	0	1	6	N	10	12	5	11	4	0	0	0	0	N
Waahi Stm at Te Ohaki Rd	9	12	0	12	3	0	0	0 ⁷	10	Y	2	7	0	12	0	0	0	0 ⁷	7	N
Waerenga Stm at Taniwha Rd	11 ¹	11 ¹	3 ¹	11 ¹	6 ¹	3 ¹	3 ¹	2 ¹	2 ¹	N	7 ¹	11 ¹	3 ¹	11 ¹	1 ¹	0 ¹	0 ¹	0 ¹	0 ¹	N
Waitawhiriwhiri Stm at Edgecumbe Street	5 ¹	10 ¹	0 ¹	11 ¹	6 ¹	0 ¹	0 ¹	0 ¹	1 ¹	N	0 ¹	8 ¹	0 ¹	0 ¹	1 ¹	0 ¹	0 ¹	0 ¹	0 ¹	N
Whakapipi Stm at SH22 Br	7 ¹	11	6 ¹	11 ¹	5 ¹	6 ¹	0 ¹	5 ¹	6 ¹	N	7 ¹	11 ¹	3 ¹	10 ¹	1 ¹	0 ¹	0 ¹	0 ¹	0 ¹	N
Whakauru Stm at U/S SH1 Br	12	12	0	12	11	0	0	0	0	N	12	12	0	11	8	0	0	0	0	N
Whangamarino River at Island Block Rd	2 ³	9 ³	1 ³	9 ³	2 ³	0 ³	0 ³	0 ³	8 ³	N	2 ³	4 ³	0 ³	2 ³	0 ³	0 ³	0 ³	0 ³	3 ³	N
Whangamarino River at Jefferies Rd Br	3 ¹	11 ¹	0 ¹	11 ¹	6 ¹	0 ¹	1 ¹	0 ¹	4 ¹¹	N	0 ¹	8 ¹	0 ¹	11 ¹	1 ¹	0 ¹	0 ¹	0 ¹	0 ¹	N
Whangape Stm at Rangiriri-Glen Murray Rd	7 ¹	11 ¹	0 ¹	10 ¹	4 ¹	0 ¹	0 ¹	0 ¹	11 ¹	N	3 ¹	10 ¹	0 ¹	9 ¹	0 ¹	0 ¹	0 ¹	0 ¹	4 ¹	N

	SATISFACTORY										EXCELLENT									
	Ecological Health							Recreation			Ecological Health							Recreation		
	DO	pH	Turb	NH ₄ N	Temp	TP	TN	BDisk	Ecoli	Median Ecoli	DO	pH	Turb	NH ₄ N	Temp	TP	TN	BDisk	Ecoli	Median Ecoli
Waipa River and Tributaries																				
Firewood Creek at Waingaro Road Bridge	10	11	1	12	9	11	2	0	10	N	3	9	0	12	4	0	0	0	0	N
Kaniwhaniwha Stm at Wright Rd	12	12	4	12	8	10	6	1 ⁸	8	N	10	10	0	12	3	0	0	0 ⁸	0	N
Mangaohoi Stm at South Branch Maru Rd	12	12	11	12	9	5	12	1	11	Y	12	11	8	12	3	0	0	0	6	N
Mangaokewa Stm at Lawrence Street Br	12	12	4	12	10	6	0	1	5	N	9	11	0	12	3	0	0	0	0	N
Mangapiko Stm (Pirongia/Te Awamutu) at Bowman Rd	9 ²	10 ²	2 ²	10 ²	6 ²	0 ²	0 ²	0 ³	1 ²	N	4 ²	4 ²	0 ²	7 ²	1 ²	0 ²	0 ²	0 ³	0 ²	N
Mangapu River at Otorohanga	9 ³	9 ³	1 ³	9 ³	4 ³	1 ³	0 ³	0 ¹⁰	2 ³³	N	3 ³	9 ³	0 ³	9 ³	1 ³	0 ³	0 ³	0 ¹⁰	0 ³	N
Mangarama Stm at Gadsby Rd	9 ²	10 ²	2 ²	10 ²	6 ²	3 ²	0 ²	-	3 ²	N	6 ²	7 ²	0 ²	9 ²	1 ²	0 ²	0 ²	-	0 ²	N
Mangarapa Stm at Otorohanga Rd	10 ²	10 ²	1 ²	10 ²	6 ²	3 ²	0 ²	1 ⁶	3 ²	N	5 ²	9 ²	0 ²	10 ²	1 ²	0 ²	0 ²	0 ⁶	0 ²	N
Mangatutu Stm (Waikeria) at Walker Rd Br	11 ¹	11 ¹	8 ¹	11 ¹	6 ¹	11 ¹	4 ¹	3 ¹	11 ¹	N	10 ¹	8 ¹	5 ¹	11 ¹	2 ¹	0 ¹	0 ¹	0 ¹	0 ¹	N
Mangauika Stm at Te Awamutu Borough W/S Intake	10 ²	10 ²	10 ²	10 ²	10 ²	10	10 ²²	10 ²	10 ²	Y	10 ²	9 ²	10 ²	10 ²	7 ²	7 ²	9 ²	4 ²	9 ²	Y
Moakurua Stm at Warratah Farm Bridge	10 ²	10 ²	4 ²	10 ²	7 ²	8 ²	2 ²	0 ¹⁰	7 ²	N	10 ²	9 ²	0 ²	10 ²	2 ²	0 ²	0 ²	0 ¹⁰	0 ²	N
Ohote Stm at Whatawhata/Horotiu Rd	0	10	0	12	8	0	0	0	2	N	0	3	0	11	2	0	0	2	0	N
Puniu River at Bartons Corner Rd Br	10 ²	10 ²	5 ²	10 ²	5 ²	3 ²	1 ²	1 ⁵	4 ²	N	7 ²	7 ²	1 ²	10 ²	1 ²	0 ²	0 ²	0 ⁵	0 ²	N
Puniu River at Wharepapa Rd Bridge	12	12	8	12	8	4	0	4	9	N	12	9	4	12	2	0	0	0	0	N
Waipa River at SH3 Otorohanga	10 ²	10 ²	5 ²	10 ²	6 ²	8 ²	3 ²	2 ²	6 ²	N	10 ²	7 ²	1 ²	10 ²	1 ²	0 ²	0 ²	0 ²	0 ²	N
Waipa River at Pukehoua Bridge on Baffin Road	10 ²	10 ²	2 ²	10 ²	6 ²	2 ²	2 ²	0 ⁶	3 ²	N	4 ²	9 ²	1 ²	10 ²	1 ²	0 ²	0 ²	0 ⁶	0 ²	N
Waipa River at Mangaokewa Rd	11 ¹	11 ¹	11 ¹	11 ¹	10 ¹	11 ¹	4 ¹	6 ¹	9 ¹	N	11 ¹	8 ¹	7 ¹	11 ¹	5 ¹	1 ¹	0 ¹	0 ¹	0 ¹	N
Waipa River at Ngaruawahia Br	11	12	2	12	6	3	2	0 ¹	8	N	2	11	0	12	1	0	0	0 ¹	1	N
Waitomo Stm at SH31 Otorohanga	6 ⁶	6 ⁶	1 ⁶	6 ⁶	4 ⁶	4 ⁶	0 ⁶	0 ⁷	2 ⁶	N	5 ⁶	5 ⁶	0 ⁶	6 ⁶	1 ⁶	0 ⁶	0 ⁶	0 ⁷	0 ⁶	N
Waitomo Stm at Tumutumumu Rd	10 ²	10 ²	3 ²	10 ²	6 ²	9 ²	0 ²	0 ²	6 ²	N	10 ²	9 ²	1 ²	10 ²	4 ²	0 ²	0 ²	0 ²	0 ²	N
Tributaries to the Upper Waikato																				
Kawaunui Stm at SH5 Br	11	12	7	12	7	0	0	2	1	N	0	10	1	12	3	0	0	0	0	N
Mangaharakeke Stm (Atiamuri) at SH30 (Off Jct SH1)	10 ²	10 ²	4 ²	10 ²	8 ²	0 ²	0 ²	0 ³	5 ²	N	8 ²	10 ²	0 ²	10 ²	6 ²	0 ²	0 ²	0 ³	0 ²	N
Mangakara Stm (Reporoa) at SH5	10 ²	10 ²	4 ²	10 ²	8 ²	0 ²	0 ²	0 ⁴	5 ²	N	9 ²	9 ²	0 ²	10 ²	6 ²	0 ²	0 ²	0 ⁴	0 ²	N
Mangakino Stm (Whakamaru) at Sandel Rd	11 ¹	11 ¹	9 ¹	11 ¹	10 ¹	1 ¹	0 ¹	4 ⁵	11 ¹	N	11 ¹	8 ¹	6 ¹	11 ¹	8 ¹	0 ¹	0 ¹	0 ⁵	2 ¹	N
Otamakokore Stm at Hossack Rd	10	12	11	12	3	0	0	1	7	N	7	7	2	12	0	0	0	0	0	N
Pueto Stm at Broadlands Rd Br	12	12	12	12	9	0	0	7	12	Y	12	12	7	12	7	0	0	0	5	N
Tahunaatara Stm at Ohakuri Rd	11 ¹	11 ¹	6 ¹	11 ¹	10 ¹	0 ¹	0 ¹	2 ¹	8 ¹	N	11 ¹	11 ¹	3 ¹	11 ¹	4 ¹	0 ¹	0 ¹	0 ¹	0 ¹	N
Torepatutahi Stm at Vaile Rd Br	9	12	12	12	9	0	1	-	11	N	4	12	11	12	4	0	0	-	0	N
Waiootapu Stm at Campbell Rd Br	11	0	2	6	0	1	0	1	11	Y	0	0	0	0	0	0	0	0	9	Y
Waiootapu Stm at Homestead Rd Br	10	12	2	12	4	0	0	-	8	N	1	4	0	0	0	0	0	-	1	N
Waipapa Stm (Mokai) at Tirohanga Rd Br	12	12	8	12	0	0	0	0	10	N	12	12	2	12	0	0	0	0	0	N
Whirinaki Stm at Corbett Rd	12	11 ¹	9	12	11	0	0	-	10	N	12	11 ¹	9	12	7	0	0	-	2	N

	SATISFACTORY										EXCELLENT									
	Ecological Health							Recreation			Ecological Health						Recreation			
	DO	pH	Turb	NH ₄ N	Temp	TP	TN	BDisk	Ecoli	Median Ecoli	DO	pH	Turb	NH ₄ N	Temp	TP	TN	BDisk	Ecoli	Median Ecoli
West Coast																				
Awakino River at Gribbon Rd	12	12	12	12	10	12	12	9	11	Y	12	11	9	12	6	0	4	1	3	N
Awakino River at SH3 Awakau Rd Junction	11 ¹	11 ¹	4 ¹	11 ¹	8 ¹	9 ¹	5 ¹	3 ¹	8 ¹	N	11 ¹	11 ¹	2 ¹	11 ¹	2 ¹	0 ¹	0 ¹	0 ¹	1 ¹	N
Manganui River at Off Manganui Rd	12	12	6	12	9	10	12	2 ²	10	N	12	11	2	12	3	0	2	0 ²	0	N
Mangaotaki River at SH3 Br	12	12	4	12	9	9	0	2	6	N	12	12	1	12	3	0	0	0	0	N
Marokopa River at Speedies Rd (Off Te Anga Rd)	10 ²	10 ²	6 ²	10 ²	7 ²	9 ²	6 ²	1 ⁴	7 ²	N	10 ²	9 ²	1 ²	10 ²	1 ²	0 ²	0 ²	0 ⁴	0 ²	N
Mokau River at Awakau Rd	12	12	3	12	7	5	1	0 ⁴	9	N	9	11	0	12	3	0	0	0 ⁴	1	N
Mokau River at Mangaokewa Rd (Off SH30)	12	12	7	12	11	9	3	0 ¹¹	7	N	11	10	0	12	5	0	0	0 ¹¹	0	N
Mokau River at Totoro Rd Recorder	11 ¹	11 ¹	3 ¹	11 ¹	7 ¹	5 ¹	1 ¹	3 ²	6 ¹	N	11 ¹	11 ¹	2 ¹	11 ¹	2 ¹	0 ¹	0 ¹	0 ²	0 ¹	N
Mokauiti Stm at Three Way Point - Aria	8 ¹	11 ¹	2	11 ¹	7 ¹	4 ¹	2 ¹	1 ¹	4 ¹	N	3 ¹	9 ¹	0 ¹	11 ¹	2 ¹	0 ¹	0 ¹	0 ¹	0 ¹	N
Ohautira Stm at Waingaro Te Uku Rd	12	12	7	12	9	4	7	0 ³	6	N	11	10	1	12	4	0	0	0 ³	0	N
Oparau River at Langdon Rd (Off Okupata Rd)	10 ²	10 ²	9 ²	10 ²	7 ²	10 ²	10 ²	5 ³	9 ²	N	10 ²	8 ²	5 ²	10 ²	2 ²	1 ²	1 ²	0 ³	0 ²	N
Tawarau River at Off Speedies Rd	10 ²	10 ²	5 ²	10 ²	7 ²	10 ²	6 ²	1 ²	7 ²	N	10 ²	8 ²	3 ²	10 ²	3 ²	0 ²	0 ²	0 ²	0 ²	N
Waingaro River (Pukemiro) at Ruakiwi Rd Off SH22	8 ³	9 ³	3 ³	9 ³	4 ³	6 ³	3 ³	1 ⁵	8 ³	N	7 ³	7 ³	0 ³	9 ²	0 ³	0 ³	0 ³	0 ⁵	0 ³	N
Waitetuna River at Te Uku-Waingaro Rd	12	12	5	12	8	9	7	1 ⁴	5	N	12	11	0	12	2	0	0a	0 ⁴	0	N
Inflows to Lake Taupo																				
Hinemaiaia River at SH1	12	12	12	12	12	10	12	8	12	Y	12	12	12	12	9	0	3	1	8	N
Kuratau River at SH41 Moerangi	12	12	10	12	12	12	12	7	12	Y	10	5	7	12	12	11	0	0	7	N
Kuratau River at Te Rae Street T10	12	12	11	12	11	12	0	-	12	Y	12	11	11	12	5	3	0	-	4	N
Mapara Stm (Lake Taupo) at Off Mapara Rd (Whakaipo Res) T1	12	12	12	12	12	0	0	0	12	Y	2	12	1	12	8	0	0	0	3	N
Tauranga-Taupo River at 20 Metres U/S SH1 Bridge	12	12	10	12	12	11	12	8	11	Y	12	11	7	12	11	2	9	5	10	Y
Tokaanu Power Station Tailrace Canal at SH41 Bridge Over Canal	11 ¹	12	11	12	11 ¹	12	12	-	12	Y	10 ¹	11	10	12	5 ¹	0	7	-	11	Y
Tokaanu Stm at Off SH41 Turangi	8	12	12	12	10	0	7	-	12	Y	0	12	12	12	7	0	0	-	11	Y
Waihaha River at SH32	12	12	11	12	12	11	12	11	12	Y	12	10	11	12	10	0	1	7	10	Y
Waitahanui River at Blake Rd	12	12	12	12	12	2	11	11	12	Y	12	12	10	12	8	0	0	2	7	N
Whangamata Stm (Kinloch) at Whangamata Rd	12	12	12	12	12	0	0	-	11	N	10	12	11	12	8	0	0	-	0	N
Whanganui Stm at Lakeside Lake Taupo T8	12	12	11	12	12	11	6	-	11	Y	12	11	10	12	9	3	0	-	5	N
Whareroa Stm (Taupo) at Lakeside Lake Taupo T9	12	12	8	12	12	10	0	-	9	N	12	11	1	12	9	0	0	-	0	N

Superscripts denote the number of missing samples when there were fewer than 12 in the year.

Median *E.coli* refers to whether the sample median meets the satisfactory guideline of <126/100 ml or the excellent guideline of <23/100 ml for recreational use.

4 References

- Salu A 2022. Regional rivers water quality monitoring programme data report 2020. Waikato Regional Council Technical Report 2022/33. Hamilton, Waikato Regional Council.
- Vant B 2018. Trends in river water quality in the Waikato region, 1993-2017. Waikato Regional Council Technical Report 2018/30. Hamilton, Waikato Regional Council.
- Waikato Regional Council (Environment Waikato) 1999. Waikato state of the environment report 1998. Hamilton, Waikato Regional Council (Environment Waikato).

Appendix I: Water quality guidelines and standards

Table 20: Details of water quality guidelines and standards for “satisfactory” water quality

Parameter	Critical Value(s)	Source
Dissolved oxygen	>80% of saturation concentration	RMA Third Schedule, Classes AE, F, and FS.
pH	6.5–9	ANZECC (1992) and Canadian guidelines for freshwater aquatic life (1987).
Turbidity	<5 NTU	Studies of adverse effects on underwater light—and thus on plant and invertebrate production—in certain South Island streams (Davies-Colley 1991).
Ammoniacal-nitrogen	<0.88 g/m ³	USEPA (1998) value for 1-hour exposure at pH 9.
Temperature	<12°C (May – Sep) <20°C (Oct – Apr)	Waikato Regional Council Draft Regional Plan standards for trout fisheries and trout spawning (1997).
Total phosphorus	<0.04 g/m ³	From upper quartile values for 77 New Zealand rivers in NIWA’s National Water Quality Network (after Smith & Maasdam 1994)—note that the guidelines for “excellent” conditions are the lower quartile concentrations for these rivers.
Total nitrogen	<0.5 g/m ³	From upper quartile values for 77 New Zealand rivers in NIWA’s National Water Quality Network (after Smith & Maasdam 1994)—note that the guidelines for “excellent” conditions are the lower quartile concentrations for these rivers.
Water clarity at baseflow	>1.6 m	“Baseflow” defined as flows less than the upper decile flow. Guideline from Ministry for the Environment (1994).
<i>Escherichia coli</i>	<550/100 mL	Ministry of the Environment (2003) Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas.
Median <i>Escherichia coli</i>	<126/100 mL	Ministry of the Environment (1999) guidelines for the management of recreational and marine shellfish-gathering waters.

Appendix II: Water quality monitoring parameters

Field instruments and analytical methods

Table 21: Regional River monitoring programme - water quality parameters and analytical methods

Id ¹	Parameter	Method
A340F	Absorbance @ 340 nm filtered	Spectrophotometer, 1 cm path length, APHA method 5910B
A440F	Absorbance @ 440 nm filtered	Spectrophotometer, 1 cm path length, APHA method 5910B
A780	Absorbance @ 780 nm filtered	Spectrophotometer, 1 cm path length, APHA method 5910B
BDISK	Black disk	Field measurement, horizontal water transparency (20mm, 60mm, 100mm, 200mm disk) in river or trough (20mm only)
COND	Conductivity	Lab Meter @ 25°C. APHA method 2510B
DO	Dissolved oxygen	Field measurement (Hach DO meter, model HQ30d)
DO (% Sat)	Dissolved oxygen (percent saturation)	Field measurement (Hach DO meter, model HQ30d)
DRP	Dissolved reactive Phosphorus	Filtered sample. Molybdenum blue colourimetry. Flow injection analyser. APHA 4500-P G (modified)
E. coli	Escherichia coli	Membrane Filtration (mFC Agar) confirmation by MUG Agar. APHA method 9222 I
ENT	Enterococci bacteria	Membrane Filtration (mE Agar) confirmation by EIA Agar. APHA method 9230 C
FC	Faecal coliforms	Membrane Filtration (mFC Agar). APHA method 9222 D
NH ₄ -N	Ammoniacal Nitrogen (Total)	Phenol/hypochlorite colourimetry. Flow injection analyser. Filtration. APHA method 4500-NH ₃ H (modified).
Total Oxidised Nitrogen	Nitrite/Nitrate Nitrogen	Automated Cadmium reduction. Flow injection analyser. APHA method 4500 – NO ₃ ⁻ I (modified).
pH	pH	Lab Meter @ 25°C. APHA method 4500-H ⁺ B
TEMP	Temperature	Field measurement (Hach DO meter, model HQ30d)
TKN	Total Kjeldahl-Nitrogen	Acid digestion. Phenol/Hypochlorite colorimetry. Discrete analyser. APHA method 4500-N _{org} D
TN	Total Nitrogen	Calculated from NNN + TKN (Nitrite/Nitrate Nitrogen + Total Kjeldahl-Nitrogen)
TP	Total Phosphorus As Reductant	Acid persulphate digestion, Colorimetry. Discrete Analyser. APHA method 4500-P B & E (modified). Also modified to include the use of reductant to eliminate interference from arsenic present in the sample. NAWASCA Pub 38, 1982
TURB	Turbidity	Turbidity Meter Hach 2100N. APHA method 2130 B

¹ Water quality parameter identification code refers to Waikato Regional Council's water quality database (WISKI) parameter short name.

APHA = Standards Methods for the Examination of Water and Wastewater, 22nd Edition, 2012, APHA, AWWA, WEF