



Certificate of Analysis

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Client:	Hawkes Bay Regional Council	Lab No:	2467602	SPv1
Contact:	Ariana Mackay	Date Received:	05-Nov-2020	
	C/- Hawkes Bay Regional Council	Date Reported:	11-Nov-2020	
	Private Bag 6006	Quote No:	105684	
	Napier 4142	Order No:	RM1252	
		Client Reference:	Whangawehi (Nov.)	
		Add. Client Ref:	312-200	
		Submitted By:	Ariana Mackay	

Sample Type: Aqueous

Sample Name:	79745 - Whangawehi Strm at Pat O'Brians-3304 04-Nov-2020 1:15 pm	79746 - Mangatupae Strm at Pat O'Brians-3303 04-Nov-2020 1:15 pm	79747 - Whangawehi at George Ormonds -3301 04-Nov-2020 11:00 am	79748 - Coops - Trib of Whangawehi - 3306 04-Nov-2020 9:53 am	79749 - Reserve Stream - Trib of Whangawehi - 3307 04-Nov-2020 10:30 am
Lab Number:	2467602.1	2467602.2	2467602.3	2467602.4	2467602.5

Faecal Coliforms and E. coli profile

Faecal Coliforms	cfu / 100mL	900 #1	70 #1	30 #1	280 #3	140 #1
Escherichia coli	cfu / 100mL	700 #1	60 #1	30 #1	240 #3	100 #1

HBRC Standard River

Turbidity ISO	FNU	2.0	0.32	0.99	1.05	3.9
pH	pH Units	8.2	7.8	7.9	8.3	8.2
Electrical Conductivity (EC)	µS/cm	567	639	544	565	620
Volatile Suspended Solids	g/m ³	0.6	< 0.5	< 0.5	< 0.5	< 0.5
Total Suspended Solids	g/m ³	2.2	< 0.5	0.7	1.0	2.9
Total Nitrogen	g/m ³	0.23	0.30	0.28	0.13	0.31
Total Ammoniacal-N	g/m ³	0.009	< 0.05 #2	< 0.005	< 0.005	0.023
Nitrite-N	g/m ³	0.0014	< 0.0010	< 0.0010	< 0.0010	0.0033
Nitrate-N	g/m ³	0.0136	< 0.0010	< 0.0010	0.0068	0.087
Nitrate-N + Nitrite-N	g/m ³	0.0151	0.0010	0.0014	0.0077	0.090
Total Kjeldahl Nitrogen (TKN)	g/m ³	0.22	0.30	0.28	0.13	0.22
Dissolved Reactive Phosphorus	g/m ³	0.074	0.0186	0.073	0.050	0.087
Total Phosphorus	g/m ³	0.096	0.024	0.096	0.056	0.120

Sample Name:	79750 - Whangawehi US Reserve Confl - 3308 04-Nov-2020 9:16 am	79751 - Whangawehi DS Cattleyards - 3309 04-Nov-2020 9:30 am			
Lab Number:	2467602.6	2467602.7			

Faecal Coliforms and E. coli profile

Faecal Coliforms	cfu / 100mL	360 #3	250 #3	-	-	-
Escherichia coli	cfu / 100mL	200 #3	200 #3	-	-	-

HBRC Standard River

Turbidity ISO	FNU	2.1	0.79	-	-	-
pH	pH Units	8.2	8.2	-	-	-
Electrical Conductivity (EC)	µS/cm	592	609	-	-	-
Volatile Suspended Solids	g/m ³	< 0.5	< 0.5	-	-	-
Total Suspended Solids	g/m ³	1.8	0.6	-	-	-
Total Nitrogen	g/m ³	0.51	0.54	-	-	-
Total Ammoniacal-N	g/m ³	0.007	< 0.005	-	-	-



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised. The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Aqueous						
Sample Name:		79750 - Whangawehi US Reserve Confl - 3308 04-Nov-2020 9:16 am	79751 - Whangawehi DS Cattleyards - 3309 04-Nov-2020 9:30 am			
Lab Number:		2467602.6	2467602.7			
HBRC Standard River						
Nitrite-N	g/m ³	0.0014	0.0028	-	-	-
Nitrate-N	g/m ³	0.27	0.144	-	-	-
Nitrate-N + Nitrite-N	g/m ³	0.27	0.147	-	-	-
Total Kjeldahl Nitrogen (TKN)	g/m ³	0.24	0.39	-	-	-
Dissolved Reactive Phosphorus	g/m ³	0.082	0.052	-	-	-
Total Phosphorus	g/m ³	0.102	0.059	-	-	-

Analyst's Comments

#1 Statistically estimated count based on the theoretical countable range for the stated method. Please interpret this result with caution as the sample was > 10 °C on receipt at the lab. The sample temperature is recommended by the laboratory's reference methods to be less than 10 °C on receipt at the laboratory (but not frozen). However, it is acknowledged that samples that are transported quickly to the laboratory after sampling, may not have been cooled to this temperature.

#2 Severe matrix interferences required that a dilution be performed prior to analysis of this sample, resulting in a detection limit higher than that normally achieved for the NH₄N analysis.

#3 Please interpret this result with caution as the sample was > 10 °C on receipt at the lab. The sample temperature is recommended by the laboratory's reference methods to be less than 10 °C on receipt at the laboratory (but not frozen). However, it is acknowledged that samples that are transported quickly to the laboratory after sampling, may not have been cooled to this temperature.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1-7
Turbidity - ISO 7027 Method	Analysis using a Hach 2100N IS, Turbidity meter. ISO 7027:1999(E) (modified).	0.05 FNU	1-7
pH	pH meter. APHA 4500-H ⁺ B 23 rd ed. 2017. Note: It is not possible to achieve the APHA Maximum Storage Recommendation for this test (15 min) when samples are analysed upon receipt at the laboratory, and not in the field. Samples and Standards are analysed at an equivalent laboratory temperature (typically 18 to 22 °C). Temperature compensation is used.	0.1 pH Units	1-7
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B 23 rd ed. 2017.	1 µS/cm	1-7
Volatile Suspended Solids	Filtration (GF/C, 1.2 µm). Ashing 550°C, 30 min. Gravimetric. APHA 2540 E (modified) 23 rd ed. 2017.	0.5 g/m ³	1-7
Total Suspended Solids	Filtration of a 2L sample using Whatman 934 AH, Advantec GC-50 or equivalent filters (nominal pore size 1.2 - 1.5µm), gravimetric determination. APHA 2540 D (modified) 23 rd ed. 2017.	0.5 g/m ³	1-7
Total Nitrogen	Calculation: TKN + Nitrate-N + Nitrite-N. Please note: The Default Detection Limit of 0.05 g/m ³ is only attainable when the TKN has been determined using a trace method utilising duplicate analyses. In cases where the Detection Limit for TKN is 0.10 g/m ³ , the Default Detection Limit for Total Nitrogen will be 0.11 g/m ³ .	0.05 g/m ³	1-7
Total Ammoniacal-N Trace	Phenol/hypochlorite colorimetry. Flow injection analyser. (NH ₄ -N = NH ₄ ⁺ -N + NH ₃ -N). APHA 4500-NH ₃ H 23 rd ed. 2017.	0.005 g/m ³	1-7
Nitrite-N Trace	Automated Azo dye colorimetry, Flow injection analyser. APHA 4500-NO ₂ ⁻ I (modified) 23 rd ed. 2017.	0.0010 g/m ³	1-7
Nitrate-N	Calculation: (Nitrate-N + Nitrite-N) - NO ₂ N. In-House.	0.0010 g/m ³	1-7
Nitrate-N + Nitrite-N Trace	Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NO ₃ ⁻ I (modified) 23 rd ed. 2017.	0.0010 g/m ³	1-7

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Total Kjeldahl Nitrogen (TKN)	Total Kjeldahl digestion, phenol/hypochlorite colorimetry. Discrete Analyser. APHA 4500-N _{org} D (modified) 4500 NH ₃ F (modified) 23 rd ed. 2017.	0.10 g/m ³	1-7
Dissolved Reactive Phosphorus (trace)	Filtered sample. Molybdenum blue colorimetry. Flow injection analyser. APHA 4500-P G 23 rd ed. 2017.	0.0010 g/m ³	1-7
Total Phosphorus	Total phosphorus digestion, ascorbic acid colorimetry. Discrete Analyser. APHA 4500-P B & E (modified from manual analysis and also modified to include a reductant to reduce interference from any arsenic present in the sample) 23 rd ed. 2017. NWASCO, Water & soil Miscellaneous Publication No. 38, 1982.	0.004 g/m ³	1-7
HBRC Standard River		-	1-7
Faecal Coliforms and E. coli profile			
Faecal Coliforms	Membrane Filtration, Count on mFC agar, Incubated at 44.5°C for 22 hours, Confirmation. APHA 9222 D 23 rd ed. 2017.	1 cfu / 100mL	1-7
Escherichia coli	Membrane filtration, Count on mFC agar, Incubated at 44.5°C for 22 hours, MUG Confirmation. APHA 9222 I 23 rd ed. 2017.	1 cfu / 100mL	1-7

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 05-Nov-2020 and 11-Nov-2020. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

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Ara Heron BSc (Tech)
Client Services Manager - Environmental