

Drinking Water Test Report

To:	Dairy Flat School
From:	Waste Management-Redvale
Sampling Date:	30 March 2026
Sampling Locations:	Staff Room (Figure 1), Health Room (Figure 2), Hall Kitchen (Figure 3)
Sampling Source:	Water Tap
Analytical Institution:	Hill Laboratories

Analysis of Results

A summary of the March 2026 test results, together with comparisons to the October–December 2025 and February 2026 results and relevant New Zealand, WHO, and US EPA drinking-water standards, is presented in Tables 1 and 2. The original Hill Laboratories reports are appended at the end.



Figure 1. Staff Room



Figure 2. Health Room



Figure 3. Hall Kitchen

The March 2026 laboratory results indicate that all samples were microbiologically safe, with *E. coli* not detected (<1 MPN/100 mL) at any location, indicating effective treatment.

Key physical and chemical parameters were within acceptable limits. Turbidity was low (0.10–0.29 NTU), with the lowest value observed at the Hall Kitchen, reflecting the effectiveness of the additional filtration unit. Metal concentrations (including arsenic, copper, and lead) were all well below guideline values, with no exceedances identified.

The water exhibited low mineral content, low alkalinity, and low hardness, which are typical characteristics of treated rainwater. pH values ranged from 5.7 to 7.5, with slightly acidic conditions observed at the Staff Room and Hall Kitchen. This pH range is consistent with rainwater-derived drinking water, which typically exhibits pH values of approximately 5.5 to 7.5 due to its low buffering capacity. While this does not pose a health risk, it may indicate a higher potential for long-term corrosion.

Overall, the results indicate that the drinking water supply is compliant with relevant standards, safe for consumption, and consistent with previous monitoring results. No immediate actions are required.

Thanks,

Dr. Na Zhang (she/her)

Environmental Engineer Redvale Landfill – Operational and Technical Services

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Table 1. Summary of Tap Water Quality Results for October–December 2025 with Comparison to New Zealand, WHO, and US EPA Drinking Water Standards

Parameters	Sample Name: Lab Number:	Oct-25			Nov-25			Dec-25			Drinking Water Standards		
		Staff Room	Health Room	Hall Kitchen	Staff Room	Health Room	Hall Kitchen	Staff Room	Health Room	Hall Kitchen	NZ Maximum Acceptable Value (MAV) ^a	WHO Limit	US EPA Limit
Escherichia coli	MPN / 100mL	< 1	<1	< 1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Turbidity	NTU	0.37	0.41	0.12	0.20	0.21	0.11	0.230	0.277	0.128	≤5 (aesthetic) ^b	<5	<1 (recommended)
pH	pH Units	6.8	7.1	6.8	6.3	6.3	6.2	6.2	7.2	6.0	7.0–8.5 (aesthetic) ^b	6.5–8.5	6.5–8.5
Total Alkalinity	g/m3 as CaCO3	11	13.9	10.6	3.6	3.6	3.4	3.58	6.96	3.18	-	-	-
Free Carbon Dioxide	g/m3 at 25°C	3.3	2.1	3.4	4.0	3.8	4.2	4.9	<1.0	6.1	-	-	-
Total Hardness	g/m3 as CaCO3	14.5	16	14.5	2.3	2.5	3.2	1.79	1.79	2.20	≤200 (aesthetic) ^b	<500	<500
Electrical Conductivity (EC)	mS/m	6.4	7.5	6.3	1.6	1.8	1.6	1.0	1.7	1.0	-	-	-
Electrical Conductivity (EC)	µS/cm	64	75	63	16	18	16	10	17	10	-	<1500	<2500
Approx Total Dissolved Salts	g/m3	43	50	42	11	12	11	6.84	11.69	6.93	≤1000 (aesthetic) ^b	<1000	<500 (aesthetic) ^b
Total Arsenic	g/m3	< 0.0011	<0.0011	< 0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.01	<0.01	<0.01
Total Boron	g/m3	< 0.053	<0.053	< 0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<2.4	<2.4	-
Total Calcium	g/m3	4.4	4.6	4.4	0.57	0.60	0.91	0.438	0.43	0.613	-	-	-
Total Copper	g/m3	0.037	0.121	0.0038	0.061	0.141	0.0037	0.0694	0.128	0.00424	<2	<2	<1.3
Total Iron	g/m3	< 0.021	0.023	< 0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	≤0.3 (aesthetic) ^b	<0.3	<0.3
Total Lead	g/m3	0.00062	0.00118	0.00028	0.00083	0.00088	0.00061	0.000966	0.001078	0.000604	<0.01	<0.01	<0.015
Total Magnesium	g/m3	0.87	1.12	0.86	0.22	0.23	0.21	0.170	0.173	0.163	-	-	-
Total Manganese	g/m3	0.0023	0.0035	0.0012	0.00161	0.00157	0.00093	0.00196	0.00183	0.00151	0.04 (Staining); ≤0.1(Taste)	<0.4	<0.05 (aesthetic) ^b
Total Potassium	g/m3	0.53	0.53	0.53	0.187	0.187	0.172	0.137	0.138	0.144	-	-	-
Total Sodium	g/m3	5.6	5.7	5.6	1.62	1.59	1.52	1.290	1.278	1.298	≤200 (aesthetic) ^b	<200	<20 (health advisory) ^c

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Total Zinc	g/m3	0.21	0.189	0.154	0.49	0.48	0.175	0.335	0.320	0.189	≤1.5 (aesthetic) ^b	<3	<5
Chloride	g/m3	9	9.6	9	2.6	2.6	2.7	2.53	2.29	2.16	≤250 (aesthetic) ^b	<250	<250
Nitrate-N	g/m3	0.07	0.07	0.08	0.09	0.09	0.11	0.147	0.126	0.171	<11.3	<11.3	<10
Sulphate	g/m3	4.3	4.6	4.3	0.8	0.8	0.8	0.76	0.77	0.69	≤250 (aesthetic) ^b	<250	<250

^a Taken from the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022'.

^b Taken from 'Aesthetic Value for Drinking Water Notice 2022' issued by the Water Services Regulator ("Taumata Arowai")

^c Refer to non-health-related parameters — things that affect the taste, smell, colour, or appearance of water but don't pose a health risk.

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Table 2. Summary of Tap Water Quality Results for February and March 2026, with Comparison to New Zealand, WHO, and US EPA Drinking Water Standards

Parameters	Sample Name: Lab Number:	Feb-26			March-26			Drinking Water Standards		
		Staff Room	Health Room	Hall Kitchen	Staff Room	Health Room	Hall Kitchen	NZ Maximum Acceptable Value (MAV) ^a	WHO Limit	US EPA Limit
Escherichia coli	MPN / 100mL	<1	<1	<1	<1	<1	<1	<1	<1	<1
Turbidity	NTU	0.22	0.19	0.09	0.21	0.29	0.10	≤5 (aesthetic) ^b	<5	<1 (recommended)
pH	pH Units	5.9	6.0	5.8	6.0	7.5	5.7	7.0–8.5 (aesthetic) ^b	6.5–8.5	6.5–8.5
Total Alkalinity	g/m3 as CaCO3	2.6	2.6	2.4	2.20	6.6	2.0	-	-	-
Free Carbon Dioxide	g/m3 at 25°C	7	5.7	7.7	4.8	<1.0	7.2	-	-	-
Total Hardness	g/m3 as CaCO3	2.70	2.60	2.90	2.71	2.78	2.8	≤200 (aesthetic) ^b	<500	<500
Electrical Conductivity (EC)	mS/m	2.6	2.8	2.7	2.5	3.2	2.6	-	-	-
Electrical Conductivity (EC)	µS/cm	26	28	27	25	32	26	-	<1500	<2500
Approx Total Dissolved Salts	g/m3	17	18	18	16.75	21.33	18	≤1000 (aesthetic) ^b	<1000	<500 (aesthetic) ^b
Total Arsenic	g/m3	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.01	<0.01	<0.01
Total Boron	g/m3	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<2.4	<2.4	-
Total Calcium	g/m3	0.36	0.36	0.49	0.427	0.446	0.49	-	-	-
Total Copper	g/m3	0.078	0.130	0.0044	0.0663	0.0875	0.0063	<2	<2	<1.3
Total Iron	g/m3	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	≤0.3 (aesthetic) ^b	<0.3	<0.3
Total Lead	g/m3	0.001280	0.001330	0.00046	0.001027	0.00092	0.00074	<0.01	<0.01	<0.015
Total Magnesium	g/m3	0.43	0.42	0.42	0.40	0.405	0.38	-	-	-
Total Manganese	g/m3	0.00174	0.00198	0.0026	0.00176	0.00177	0.0028	0.04 (Staining); ≤0.1(Taste)	<0.4	<0.05 (aesthetic) ^b
Total Potassium	g/m3	0.25	0.23	0.24	0.237	0.24	0.23	-	-	-
Total Sodium	g/m3	3.6	3.4	3.6	3.20	3.22	3.2	≤200 (aesthetic) ^b	<200	<20 (health advisory) ^c
Total Zinc	g/m3	0.44	0.45	0.36	0.387	0.399	0.35	≤1.5 (aesthetic) ^b	<3	<5
Chloride	g/m3	6.0	5.6	6.0	5.62	5.6	5.8	≤250 (aesthetic) ^b	<250	<250
Nitrate-N	g/m3	0.15	0.15	0.16	0.170	0.17	0.2	<11.3	<11.3	<10
Sulphate	g/m3	1.2	1.2	1.2	1.12	1.08	1.1	≤250 (aesthetic) ^b	<250	<250

Certificate of Analysis

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Client:	Waste Management NZ Limited	Lab No:	4158554	DWAUPV1
Contact:	Na Zhang C/- Waste Management NZ Limited PO Box 228 Silverdale Auckland 0944	Date Received:	31-Mar-2026	
		Date Reported:	07-Apr-2026	
		Quote No:	141146	
		Order No:	3875465	
		Client Reference:	DWSNZ Compliance – Roof/Rain	
		Add. Client Ref:	Routine Water + E. coli	
		Submitted By:	Na Zhang	

Sample Type: Drinking Water for DWSNZ Compliance

Sample Name:		Drinking Water - DFS - SR 30-Mar-2026 1:20 pm	Aesthetic Values	Maximum Acceptable Values (MAV)
Lab Number:		4158554.1		
Routine Water + E.coli profile Kit				
Escherichia coli	MPN / 100mL	< 1	-	< 1
Routine Water Profile				
Turbidity	NTU	0.208 ± 0.039	≤ 5	-
pH	pH Units	6.0 ± 0.2	7.0 - 8.5	-
Total Alkalinity	g/m ³ as CaCO ₃	2.20 ± 0.67	-	-
Free Carbon Dioxide	g/m ³ at 25°C	4.8 ± 2.9	-	-
Total Hardness	g/m ³ as CaCO ₃	2.71 ± 0.18	≤ 200	-
Electrical Conductivity (EC)	mS/m	2.5 ± 0.1	-	-
Electrical Conductivity (EC)	µS/cm	25 ± 1	-	-
Approx Total Dissolved Salts	g/m ³	16.75 ± 0.53	≤ 1000	-
Total Arsenic	g/m ³	< 0.0011 ± 0.00074	-	0.01
Total Boron	g/m ³	< 0.053 ± 0.036	-	2.4
Total Calcium	g/m ³	0.427 ± 0.040	-	-
Total Copper	g/m ³	0.0663 ± 0.0067	≤ 1	2
Total Iron	g/m ³	< 0.021 ± 0.014	≤ 0.3	-
Total Lead	g/m ³	0.001027 ± 0.000096	-	0.01
Total Magnesium	g/m ³	0.400 ± 0.035	-	-
Total Manganese	g/m ³	0.00176 ± 0.00040	≤ 0.04 (Staining) ≤ 0.10 (Taste)	0.4
Total Potassium	g/m ³	0.237 ± 0.038	-	-
Total Sodium	g/m ³	3.20 ± 0.20	≤ 200	-
Total Zinc	g/m ³	0.387 ± 0.031	≤ 1.5	-
Chloride	g/m ³	5.62 ± 0.48	≤ 250	-
Nitrate-N	g/m ³	0.170 ± 0.045	-	11.3
Sulphate	g/m ³	1.12 ± 0.35	≤ 250	-

Note: The Maximum Acceptable Values (MAV) are taken from the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022', published under the authority of the New Zealand Government-2022. Copies of this publication are available from: <https://www.legislation.govt.nz/regulation/public/2022/0168/latest/whole.html>

The standards set limits for the concentration of determinands in drinking water. The Maximum Acceptable Values (MAVs) for any determinand must not be exceeded at any time.

The Aesthetic Values are taken the publication, 'Aesthetic Values for Drinking Water Notice 2022' issued by the Water Services Regulator ("Taumata Arowai"). Aesthetic values specify or provide minimum or maximum values for substances and other characteristics that relate to the acceptability of drinking water to consumers (such as appearance, taste or odour).

The reported uncertainty is an expanded uncertainty with a level of confidence of approximately 95 percent (i.e. two standard deviations, calculated using a coverage factor of 2). Reported uncertainties are calculated from the performance of typical matrices, and do not include variation due to sampling. For further information on uncertainty of measurement at Hill Laboratories, refer to the technical note on our website: www.hill-laboratories.com/files/Intro_To_UOM.pdf, or contact the laboratory.

Note that the units: g/m³ are the same as mg/L and ppm.

pH/Alkalinity and Corrosiveness Assessment

The pH of a water sample is a measure of its acidity or basicity. Waters with a low pH can be corrosive and those with a high pH can promote scale formation in pipes and hot water cylinders.

The guideline level for pH in drinking water is 7.0-8.5. Below this range the water will be corrosive and may cause problems with disinfection if such treatment is used.

The alkalinity of a water is a measure of its acid neutralising capacity and is usually related to the concentration of carbonate, bicarbonate and hydroxide. Low alkalinities (25 g/m^3) promote corrosion and high alkalinities can cause problems with scale formation in metal pipes and tanks.

With the pH and alkalinity levels found it is likely this water will be quite corrosive towards metal piping and fixtures.

Hardness/Total Dissolved Salts Assessment

The water contains a very low amount of dissolved solids and would be regarded as being very soft.

Nitrate Assessment

Nitrate-nitrogen at elevated levels is considered undesirable in natural waters as this element can cause a health disorder called methaemaglobinaemia. Very young infants (less than six months old) are especially vulnerable. The 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022' sets a maximum permissible level of 11.3 g/m^3 as Nitrate-nitrogen (50 g/m^3 as Nitrate).

Nitrate-nitrogen was detected in this water but at such a low level to not be of concern.

Boron Assessment

Boron may be present in natural waters and if present at high concentrations can be toxic to plants.

Boron was not detected in this water.

Metals Assessment

Iron and manganese are two problem elements that commonly occur in natural waters. These elements may cause unsightly stains and produce a brown/black precipitate. Iron is not toxic but manganese, at concentrations above 0.5 g/m^3 , may adversely affect health. At concentrations below this it may cause stains on clothing and sanitary ware.

Iron was not detected in the water

Manganese was found in this water at a low level.

Treatment to remove iron and/or manganese should not be necessary.

Bacteriological Tests

The Drinking Water Standards for NZ state that there should be no Escherichia coli (E coli) in water used for human consumption. The presence of these organisms would indicate that other pathogens of faecal origin may be present. Results obtained for Total Coliforms are only significant if the sample has not also been tested for E coli.

Escherichia coli was not detected in this sample.

Final Assessment

The parameter pH did NOT meet the guidelines laid down in the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022' and the 'Aesthetic Values for Drinking Water Notice 2022' issued by the Water Services Regulator ("Taumata Arowai") for water which is suitable for drinking purposes.

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 Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Drinking Water for DWSNZ Compliance			
Test	Method Description	Default Detection Limit	Sample No
Routine Water Profile		-	1
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) : Online Edition.	-	1
Turbidity	Analysis by Turbidity meter. APHA 2130 B (modified) : Online Edition.	0.05 NTU	1
pH	pH meter. APHA 4500-H ⁺ B (modified) : Online Edition. 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
Total Alkalinity	Titration to pH 4.5 (M-alkalinity), autotitrator. APHA 2320 B (modified for Alkalinity <20) : Online Edition.	1.0 g/m ³ as CaCO ₃	1
Free Carbon Dioxide	Calculation: from alkalinity and pH, valid where TDS is not >500 mg/L and alkalinity is almost entirely due to hydroxides, carbonates or bicarbonates. APHA 4500-CO ₂ D : Online Edition.	1.0 g/m ³ at 25°C	1
Total Hardness	Calculation from Total Calcium and Total Magnesium. APHA 2340 B : Online Edition.	1.0 g/m ³ as CaCO ₃	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B : Online Edition.	0.1 mS/m	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B : Online Edition.	1 µS/cm	1
Approx Total Dissolved Salts	Calculation: from Electrical Conductivity.	2 g/m ³	1
Total Arsenic	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.0011 g/m ³	1
Total Boron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Calcium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Copper	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00053 g/m ³	1
Total Iron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00011 g/m ³	1
Total Magnesium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Manganese	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00053 g/m ³	1
Total Potassium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Sodium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.0011 g/m ³	1
Chloride	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m ³	1
Nitrate-N	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.05 g/m ³	1
Sulphate	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m ³	1
Escherichia coli	MPN count using Colilert (Incubated at 35°C for 24 hours) and 97 wells. APHA 9223 B : Online Edition.	1 MPN / 100mL	1

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

Testing was completed between 31-Mar-2026 and 07-Apr-2026. 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.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Kim Harrison MSc
Client Services Manager - Environmental

Certificate of Analysis

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Client:	Waste Management NZ Limited	Lab No:	4158560	DWAUPV1
Contact:	Na Zhang C/- Waste Management NZ Limited PO Box 228 Silverdale Auckland 0944	Date Received:	31-Mar-2026	
		Date Reported:	07-Apr-2026	
		Quote No:	141146	
		Order No:	3875468	
		Client Reference:	DWSNZ Compliance – Roof/Rain	
		Add. Client Ref:	Routine Water + E. coli	
		Submitted By:	Na Zhang	

Sample Type: Drinking Water for DWSNZ Compliance

Sample Name:		Drinking Water - DFS - HR 30-Mar-2026 1:35 pm	Aesthetic Values	Maximum Acceptable Values (MAV)
Lab Number:		4158560.1		
Routine Water + E.coli profile Kit				
Escherichia coli	MPN / 100mL	< 1	-	< 1
Routine Water Profile				
Turbidity	NTU	0.288 ± 0.044	≤ 5	-
pH	pH Units	7.5 ± 0.2	7.0 - 8.5	-
Total Alkalinity	g/m ³ as CaCO ₃	6.60 ± 0.72	-	-
Free Carbon Dioxide	g/m ³ at 25°C	< 1.0 ± 0.19	-	-
Total Hardness	g/m ³ as CaCO ₃	2.78 ± 0.18	≤ 200	-
Electrical Conductivity (EC)	mS/m	3.2 ± 0.1	-	-
Electrical Conductivity (EC)	µS/cm	32 ± 1	-	-
Approx Total Dissolved Salts	g/m ³	21.33 ± 0.59	≤ 1000	-
Total Arsenic	g/m ³	< 0.0011 ± 0.00074	-	0.01
Total Boron	g/m ³	< 0.053 ± 0.036	-	2.4
Total Calcium	g/m ³	0.446 ± 0.040	-	-
Total Copper	g/m ³	0.0875 ± 0.0088	≤ 1	2
Total Iron	g/m ³	< 0.021 ± 0.014	≤ 0.3	-
Total Lead	g/m ³	0.000918 ± 0.000092	-	0.01
Total Magnesium	g/m ³	0.405 ± 0.036	-	-
Total Manganese	g/m ³	0.00177 ± 0.00040	≤ 0.04 (Staining) ≤ 0.10 (Taste)	0.4
Total Potassium	g/m ³	0.240 ± 0.039	-	-
Total Sodium	g/m ³	3.22 ± 0.20	≤ 200	-
Total Zinc	g/m ³	0.399 ± 0.032	≤ 1.5	-
Chloride	g/m ³	5.62 ± 0.48	≤ 250	-
Nitrate-N	g/m ³	0.170 ± 0.045	-	11.3
Sulphate	g/m ³	1.08 ± 0.35	≤ 250	-

Note: The Maximum Acceptable Values (MAV) are taken from the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022', published under the authority of the New Zealand Government-2022. Copies of this publication are available from: <https://www.legislation.govt.nz/regulation/public/2022/0168/latest/whole.html>

The standards set limits for the concentration of determinands in drinking water. The Maximum Acceptable Values (MAVs) for any determinand must not be exceeded at any time.

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The reported uncertainty is an expanded uncertainty with a level of confidence of approximately 95 percent (i.e. two standard deviations, calculated using a coverage factor of 2). Reported uncertainties are calculated from the performance of typical matrices, and do not include variation due to sampling. For further information on uncertainty of measurement at Hill Laboratories, refer to the technical note on our website: www.hill-laboratories.com/files/Intro_To_UOM.pdf, or contact the laboratory.

Note that the units: g/m³ are the same as mg/L and ppm.

pH/Alkalinity and Corrosiveness Assessment

The pH of a water sample is a measure of its acidity or basicity. Waters with a low pH can be corrosive and those with a high pH can promote scale formation in pipes and hot water cylinders.

The guideline level for pH in drinking water is 7.0-8.5. Below this range the water will be corrosive and may cause problems with disinfection if such treatment is used.

The alkalinity of a water is a measure of its acid neutralising capacity and is usually related to the concentration of carbonate, bicarbonate and hydroxide. Low alkalinities (25 g/m^3) promote corrosion and high alkalinities can cause problems with scale formation in metal pipes and tanks.

The pH of this water is within the NZ Drinking Water Guidelines, the ideal range being 7.0 to 8.0.

Hardness/Total Dissolved Salts Assessment

The water contains a very low amount of dissolved solids and would be regarded as being very soft.

Nitrate Assessment

Nitrate-nitrogen at elevated levels is considered undesirable in natural waters as this element can cause a health disorder called methaemaglobinaemia. Very young infants (less than six months old) are especially vulnerable. The 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022' sets a maximum permissible level of 11.3 g/m^3 as Nitrate-nitrogen (50 g/m^3 as Nitrate).

Nitrate-nitrogen was detected in this water but at such a low level to not be of concern.

Boron Assessment

Boron may be present in natural waters and if present at high concentrations can be toxic to plants.

Boron was not detected in this water.

Metals Assessment

Iron and manganese are two problem elements that commonly occur in natural waters. These elements may cause unsightly stains and produce a brown/black precipitate. Iron is not toxic but manganese, at concentrations above 0.5 g/m^3 , may adversely affect health. At concentrations below this it may cause stains on clothing and sanitary ware.

Iron was not detected in the water

Manganese was found in this water at a low level.

Treatment to remove iron and/or manganese should not be necessary.

Bacteriological Tests

The Drinking Water Standards for NZ state that there should be no Escherichia coli (E coli) in water used for human consumption. The presence of these organisms would indicate that other pathogens of faecal origin may be present. Results obtained for Total Coliforms are only significant if the sample has not also been tested for E coli.

Escherichia coli was not detected in this sample.

Final Assessment

All parameters tested for meet the guidelines laid down in the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022' and the 'Aesthetic Values for Drinking Water Notice 2022' issued by the Water Services Regulator ("Taumata Arowai") for water which is suitable for drinking purposes.

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 Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Drinking Water for DWSNZ Compliance			
Test	Method Description	Default Detection Limit	Sample No
Routine Water Profile		-	1
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) : Online Edition.	-	1
Turbidity	Analysis by Turbidity meter. APHA 2130 B (modified) : Online Edition.	0.05 NTU	1
pH	pH meter. APHA 4500-H ⁺ B (modified) : Online Edition. 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
Total Alkalinity	Titration to pH 4.5 (M-alkalinity), autotitrator. APHA 2320 B (modified for Alkalinity <20) : Online Edition.	1.0 g/m ³ as CaCO ₃	1
Free Carbon Dioxide	Calculation: from alkalinity and pH, valid where TDS is not >500 mg/L and alkalinity is almost entirely due to hydroxides, carbonates or bicarbonates. APHA 4500-CO ₂ D : Online Edition.	1.0 g/m ³ at 25°C	1
Total Hardness	Calculation from Total Calcium and Total Magnesium. APHA 2340 B : Online Edition.	1.0 g/m ³ as CaCO ₃	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B : Online Edition.	0.1 mS/m	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B : Online Edition.	1 µS/cm	1
Approx Total Dissolved Salts	Calculation: from Electrical Conductivity.	2 g/m ³	1
Total Arsenic	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.0011 g/m ³	1
Total Boron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Calcium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Copper	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00053 g/m ³	1
Total Iron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00011 g/m ³	1
Total Magnesium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Manganese	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00053 g/m ³	1
Total Potassium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Sodium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.0011 g/m ³	1
Chloride	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m ³	1
Nitrate-N	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.05 g/m ³	1
Sulphate	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m ³	1
Escherichia coli	MPN count using Colilert (Incubated at 35°C for 24 hours) and 97 wells. APHA 9223 B : Online Edition.	1 MPN / 100mL	1

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

Testing was completed between 31-Mar-2026 and 07-Apr-2026. 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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Kim Harrison MSc
Client Services Manager - Environmental

Certificate of Analysis

Page 1 of 4

Client:	Waste Management NZ Limited	Lab No:	4158556	DWAPV1
Contact:	Na Zhang C/- Waste Management NZ Limited PO Box 228 Silverdale Auckland 0944	Date Received:	31-Mar-2026	
		Date Reported:	07-Apr-2026	
		Quote No:	141146	
		Order No:	3875469	
		Client Reference:	DWSNZ Compliance – Roof/Rain	
		Add. Client Ref:	Routine Water + E. coli	
		Submitted By:	Na Zhang	

Sample Type: Drinking Water for DWSNZ Compliance

Sample Name:		Drinking Water-DFS-HK 30-Mar-2026 1:55 pm		Aesthetic Values	Maximum Acceptable Values (MAV)
Lab Number:		4158556.1			
Routine Water + E.coli profile Kit					
Escherichia coli	MPN / 100mL	< 1		-	< 1
Routine Water Profile					
Turbidity	NTU	0.10		≤ 5	-
pH	pH Units	5.7		7.0 - 8.5	-
Total Alkalinity	g/m ³ as CaCO ₃	2.0		-	-
Free Carbon Dioxide	g/m ³ at 25°C	7.2		-	-
Total Hardness	g/m ³ as CaCO ₃	2.8		≤ 200	-
Electrical Conductivity (EC)	mS/m	2.6		-	-
Electrical Conductivity (EC)	µS/cm	26		-	-
Approx Total Dissolved Salts	g/m ³	18		≤ 1000	-
Total Arsenic	g/m ³	< 0.0011		-	0.01
Total Boron	g/m ³	< 0.053		-	2.4
Total Calcium	g/m ³	0.49		-	-
Total Copper	g/m ³	0.0063		≤ 1	2
Total Iron	g/m ³	< 0.021		≤ 0.3	-
Total Lead	g/m ³	0.00074		-	0.01
Total Magnesium	g/m ³	0.38		-	-
Total Manganese	g/m ³	0.0028		≤ 0.04 (Staining) ≤ 0.10 (Taste)	0.4
Total Potassium	g/m ³	0.23		-	-
Total Sodium	g/m ³	3.2		≤ 200	-
Total Zinc	g/m ³	0.35		≤ 1.5	-
Chloride	g/m ³	5.8		≤ 250	-
Nitrate-N	g/m ³	0.20		-	11.3
Sulphate	g/m ³	1.1		≤ 250	-

Note: The Maximum Acceptable Values (MAV) are taken from the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022', published under the authority of the New Zealand Government-2022. Copies of this publication are available from: <https://www.legislation.govt.nz/regulation/public/2022/0168/latest/whole.html>

The standards set limits for the concentration of determinands in drinking water. The Maximum Acceptable Values (MAVs) for any determinand must not be exceeded at any time.

The Aesthetic Values are taken the publication, 'Aesthetic Values for Drinking Water Notice 2022' issued by the Water Services Regulator ("Taumata Arowai"). Aesthetic values specify or provide minimum or maximum values for substances and other characteristics that relate to the acceptability of drinking water to consumers (such as appearance, taste or odour).

Note that the units: g/m³ are the same as mg/L and ppm.



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.

pH/Alkalinity and Corrosiveness Assessment

The pH of a water sample is a measure of its acidity or basicity. Waters with a low pH can be corrosive and those with a high pH can promote scale formation in pipes and hot water cylinders.

The guideline level for pH in drinking water is 7.0-8.5. Below this range the water will be corrosive and may cause problems with disinfection if such treatment is used.

The alkalinity of a water is a measure of its acid neutralising capacity and is usually related to the concentration of carbonate, bicarbonate and hydroxide. Low alkalinities (25 g/m^3) promote corrosion and high alkalinities can cause problems with scale formation in metal pipes and tanks.

With the pH and alkalinity levels found it is likely this water will be quite corrosive towards metal piping and fixtures.

Hardness/Total Dissolved Salts Assessment

The water contains a very low amount of dissolved solids and would be regarded as being very soft.

Nitrate Assessment

Nitrate-nitrogen at elevated levels is considered undesirable in natural waters as this element can cause a health disorder called methaemaglobinaemia. Very young infants (less than six months old) are especially vulnerable. The 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022' sets a maximum permissible level of 11.3 g/m^3 as Nitrate-nitrogen (50 g/m^3 as Nitrate).

Nitrate-nitrogen was detected in this water but at such a low level to not be of concern.

Boron Assessment

Boron may be present in natural waters and if present at high concentrations can be toxic to plants.

Boron was not detected in this water.

Metals Assessment

Iron and manganese are two problem elements that commonly occur in natural waters. These elements may cause unsightly stains and produce a brown/black precipitate. Iron is not toxic but manganese, at concentrations above 0.5 g/m^3 , may adversely affect health. At concentrations below this it may cause stains on clothing and sanitary ware.

Iron was not detected in the water

Manganese was found in this water at a low level.

Treatment to remove iron and/or manganese should not be necessary.

Bacteriological Tests

The Drinking Water Standards for NZ state that there should be no Escherichia coli (E coli) in water used for human consumption. The presence of these organisms would indicate that other pathogens of faecal origin may be present. Results obtained for Total Coliforms are only significant if the sample has not also been tested for E coli.

Escherichia coli was not detected in this sample.

Final Assessment

The parameter pH did NOT meet the guidelines laid down in the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022' and the 'Aesthetic Values for Drinking Water Notice 2022' issued by the Water Services Regulator ("Taumata Arowai") for water which is suitable for drinking purposes.

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 Labs, 28 Duke Street, Frankton, Hamilton 3204.

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Total Digestion	Nitric acid digestion. APHA 3030 E (modified) : Online Edition.	-	1
Turbidity	Analysis by Turbidity meter. APHA 2130 B (modified) : Online Edition.	0.05 NTU	1
pH	pH meter. APHA 4500-H ⁺ B (modified) : Online Edition. 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
Total Alkalinity	Titration to pH 4.5 (M-alkalinity), autotitrator. APHA 2320 B (modified for Alkalinity <20) : Online Edition.	1.0 g/m ³ as CaCO ₃	1
Free Carbon Dioxide	Calculation: from alkalinity and pH, valid where TDS is not >500 mg/L and alkalinity is almost entirely due to hydroxides, carbonates or bicarbonates. APHA 4500-CO ₂ D : Online Edition.	1.0 g/m ³ at 25°C	1
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Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B : Online Edition.	0.1 mS/m	1
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Total Calcium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Copper	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00053 g/m ³	1
Total Iron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00011 g/m ³	1
Total Magnesium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Manganese	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00053 g/m ³	1
Total Potassium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Sodium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.0011 g/m ³	1
Chloride	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m ³	1
Nitrate-N	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.05 g/m ³	1
Sulphate	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m ³	1
Escherichia coli	MPN count using Colilert (Incubated at 35°C for 24 hours) and 97 wells. APHA 9223 B : Online Edition.	1 MPN / 100mL	1

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

Testing was completed between 31-Mar-2026 and 07-Apr-2026. For completion dates of individual analyses please contact the laboratory.

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Client Services Manager - Environmental