



CENTRAL ENVIRONMENTAL LABORATORIES

Central Environmental Laboratories
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 New Zealand

Analytical Report

COA No.: 24/06269-1

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Palmerston North City Council
 Water Unit
 Private Bag 11034
 Palmerston North

Compliance of samples tested are assessed according to 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022'

Date received: 23/07/2024

Time received: 14:58

Sampled by: John Sneddon

Sample date: 23/07/2024

Sample type: Source

Order no.: 4064

Sample	Test	Result	Units	Comments	Uncertainty
24/06269-01		Sample time: 10:52			
Bunnythorpe Bore G00914	Alkalinity - Total	110	g/m ³ CaCO ₃		
	Arsenic - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Barium - Total	0.02	g/m ³	Complies with MAV of 1.5	
	Calcium - Total	38.0	g/m ³	Below GV of 100	
	Magnesium Hardness Calculation	29	g/m ³ CaCO ₃	Below GV of 100	
	Total Hardness Calculation	120	g/m ³ CaCO ₃	Within the GV range	
	Calcium Hardness Calculation	95	g/m ³ CaCO ₃	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m ³	Complies with MAV of 0.004	
	Chloride	21.1	g/m ³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m ³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m ³	Complies with MAV of 2	
	Iron - Total	0.034	g/m ³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m ³	Complies with MAV of 0.007	
	Magnesium - Total	7.1	g/m ³	Below GV of 100	
	Manganese - Total	0.045	g/m ³	Complies with MAV of 0.4	
	Nitrate	< 0.005	g/m ³ NO ₃ -N	Complies with MAV of 11.3	
	Sodium - Total	14.0	g/m ³	Below GV of 200	
	Nickel - Total	< 0.008	g/m ³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Sulfate	11.0	g/m ³ SO ₄	Below GV of 250	
	Antimony - Total **	< 0.004	g/m ³	Complies with MAV of 0.02	

24/06269-02 **Sample time: 09:30**

Longburn Bore G00259	Alkalinity - Total	120	g/m ³ CaCO ₃		
	Arsenic - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Barium - Total	0.01	g/m ³	Complies with MAV of 1.5	
	Calcium - Total	34.9	g/m ³	Below GV of 100	
	Magnesium Hardness Calculation	30	g/m ³ CaCO ₃	Below GV of 100	
	Total Hardness Calculation	120	g/m ³ CaCO ₃	Within the GV range	
	Calcium Hardness Calculation	87	g/m ³ CaCO ₃	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m ³	Complies with MAV of 0.004	

Sample	Test	Result	Units	Comments	Uncertainty
	Chloride	17.4	g/m ³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m ³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m ³	Complies with MAV of 2	
	Iron - Total	0.065	g/m ³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m ³	Complies with MAV of 0.007	
	Magnesium - Total	7.4	g/m ³	Below GV of 100	
	Manganese - Total	0.032	g/m ³	Complies with MAV of 0.4	
	Nitrate	< 0.005	g/m ³ NO3-N	Complies with MAV of 11.3	
	Sodium - Total	12.6	g/m ³	Below GV of 200	
	Nickel - Total	< 0.008	g/m ³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Sulfate	5.85	g/m ³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m ³	Complies with MAV of 0.02	

24/06269-03

Sample time: 11:42

Order no.: 4075

Ashhurst Bore G00110	Alkalinity - Total	100	g/m ³ CaCO3		
	Arsenic - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Barium - Total	< 0.00	g/m ³	Complies with MAV of 1.5	
	Calcium - Total	30.8	g/m ³	Below GV of 100	
	Magnesium Hardness Calculation	23	g/m ³ CaCO3	Below GV of 100	
	Total Hardness Calculation	100	g/m ³ CaCO3	Within the GV range	
	Calcium Hardness Calculation	77	g/m ³ CaCO3	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m ³	Complies with MAV of 0.004	
	Chloride	6.77	g/m ³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m ³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m ³	Complies with MAV of 2	
	Iron - Total	0.019	g/m ³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m ³	Complies with MAV of 0.007	
	Magnesium - Total	5.7	g/m ³	Below GV of 100	
	Manganese - Total	0.049	g/m ³	Complies with MAV of 0.4	
	Nitrate	0.005	g/m ³ NO3-N	Complies with MAV of 11.3	
	Sodium - Total	8.1	g/m ³	Below GV of 200	
	Nickel - Total	< 0.008	g/m ³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Sulfate	10.6	g/m ³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m ³	Complies with MAV of 0.02	

24/06269-04

Sample time: 12:10

Keith Street Bore 1 G01208	Alkalinity - Total	95	g/m ³ CaCO3		
	Arsenic - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Barium - Total	0.01	g/m ³	Complies with MAV of 1.5	
	Calcium - Total	28.6	g/m ³	Below GV of 100	
	Magnesium Hardness Calculation	22	g/m ³ CaCO3	Below GV of 100	
	Total Hardness Calculation	93	g/m ³ CaCO3	Below GV of 100	
	Calcium Hardness Calculation	71	g/m ³ CaCO3	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m ³	Complies with MAV of 0.004	
	Chloride	7.32	g/m ³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m ³	Complies with MAV of 0.05	

Sample	Test	Result	Units	Comments	Uncertainty
	Copper - Total	< 0.001	g/m ³	Complies with MAV of 2	
	Iron - Total	0.021	g/m ³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m ³	Complies with MAV of 0.007	
	Magnesium - Total	5.2	g/m ³	Below GV of 100	
	Manganese - Total	0.032	g/m ³	Complies with MAV of 0.4	
	Nitrate	< 0.005	g/m ³ NO3-N	Complies with MAV of 11.3	
	Sodium - Total	9.7	g/m ³	Below GV of 200	
	Nickel - Total	< 0.008	g/m ³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Sulfate	9.73	g/m ³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m ³	Complies with MAV of 0.02	

24/06269-05

Papaioea Park Bore 1 G00104	Notes *	Not in operation			
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24/06269-06

Sample time: 14:20

Papaioea Park Bore 2 G01412	Alkalinity - Total	86	g/m ³ CaCO3		
	Arsenic - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Barium - Total	0.01	g/m ³	Complies with MAV of 1.5	
	Calcium - Total	26.1	g/m ³	Below GV of 100	
	Magnesium Hardness Calculation	19	g/m ³ CaCO3	Below GV of 100	
	Total Hardness Calculation	84	g/m ³ CaCO3	Below GV of 100	
	Calcium Hardness Calculation	65	g/m ³ CaCO3	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m ³	Complies with MAV of 0.004	
	Chloride	6.12	g/m ³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m ³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m ³	Complies with MAV of 2	
	Iron - Total	0.030	g/m ³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m ³	Complies with MAV of 0.007	
	Magnesium - Total	4.6	g/m ³	Below GV of 100	
	Manganese - Total	0.017	g/m ³	Complies with MAV of 0.4	
	Nitrate	< 0.005	g/m ³ NO3-N	Complies with MAV of 11.3	
	Sodium - Total	9.7	g/m ³	Below GV of 200	
	Nickel - Total	< 0.008	g/m ³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Sulfate	10.4	g/m ³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m ³	Complies with MAV of 0.02	

24/06269-07

Sample time: 12:40

Roberts Line Bore 1 G00106	Alkalinity - Total	95	g/m ³ CaCO3		
	Arsenic - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Barium - Total	0.02	g/m ³	Complies with MAV of 1.5	
	Calcium - Total	30.8	g/m ³	Below GV of 100	
	Magnesium Hardness Calculation	20	g/m ³ CaCO3	Below GV of 100	
	Total Hardness Calculation	97	g/m ³ CaCO3	Below GV of 100	
	Calcium Hardness Calculation	77	g/m ³ CaCO3	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m ³	Complies with MAV of 0.004	
	Chloride	7.38	g/m ³	Below GV of 250	
	Colour -True	< 5	TCU		

Sample	Test	Result	Units	Comments	Uncertainty
	Chromium - Total	< 0.001	g/m ³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m ³	Complies with MAV of 2	
	Iron - Total	0.062	g/m ³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m ³	Complies with MAV of 0.007	
	Magnesium - Total	4.8	g/m ³	Below GV of 100	
	Manganese - Total	0.026	g/m ³	Complies with MAV of 0.4	
	Nitrate	< 0.005	g/m ³ NO ₃ -N	Complies with MAV of 11.3	
	Sodium - Total	10.9	g/m ³	Below GV of 200	
	Nickel - Total	< 0.008	g/m ³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Sulfate	10.6	g/m ³ SO ₄	Below GV of 250	
	Antimony - Total **	< 0.004	g/m ³	Complies with MAV of 0.02	

24/06269-08

Sample time: 12:50

Roberts Line Bore 2 G01736	Alkalinity - Total	83	g/m ³ CaCO ₃		
	Arsenic - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Barium - Total	0.01	g/m ³	Complies with MAV of 1.5	
	Calcium - Total	30.5	g/m ³	Below GV of 100	
	Magnesium Hardness Calculation	19	g/m ³ CaCO ₃	Below GV of 100	
	Total Hardness Calculation	95	g/m ³ CaCO ₃	Below GV of 100	
	Calcium Hardness Calculation	76	g/m ³ CaCO ₃	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m ³	Complies with MAV of 0.004	
	Chloride	10.9	g/m ³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m ³	Complies with MAV of 0.05	
	Copper - Total	0.004	g/m ³	Complies with MAV of 2	
	Iron - Total	0.038	g/m ³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m ³	Complies with MAV of 0.007	
	Magnesium - Total	4.6	g/m ³	Below GV of 100	
	Manganese - Total	0.019	g/m ³	Complies with MAV of 0.4	
	Nitrate	0.032	g/m ³ NO ₃ -N	Complies with MAV of 11.3	
	Sodium - Total	10.8	g/m ³	Below GV of 200	
	Nickel - Total	< 0.008	g/m ³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Sulfate	13.4	g/m ³ SO ₄	Below GV of 250	
	Antimony - Total **	< 0.004	g/m ³	Complies with MAV of 0.02	

24/06269-09

Sample time: 09:50

Takaro Bore G00105	Alkalinity - Total	98	g/m ³ CaCO ₃		
	Arsenic - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Barium - Total	0.01	g/m ³	Complies with MAV of 1.5	
	Calcium - Total	27.5	g/m ³	Below GV of 100	
	Magnesium Hardness Calculation	23	g/m ³ CaCO ₃	Below GV of 100	
	Total Hardness Calculation	91	g/m ³ CaCO ₃	Below GV of 100	
	Calcium Hardness Calculation	69	g/m ³ CaCO ₃	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m ³	Complies with MAV of 0.004	
	Chloride	10.2	g/m ³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m ³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m ³	Complies with MAV of 2	
	Iron - Total	0.028	g/m ³	Below GV of 0.3	

Sample	Test	Result	Units	Comments	Uncertainty
	Mercury - Total **	< 0.0001	g/m ³	Complies with MAV of 0.007	
	Magnesium - Total	5.5	g/m ³	Below GV of 100	
	Manganese - Total	0.010	g/m ³	Complies with MAV of 0.4	
	Nitrate	< 0.005	g/m ³ NO3-N	Complies with MAV of 11.3	
	Sodium - Total	11.1	g/m ³	Below GV of 200	
	Nickel - Total	< 0.008	g/m ³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Sulfate	3.96	g/m ³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m ³	Complies with MAV of 0.02	

24/06269-10

Sample time: 08:50

Order no.: 4061

Turitea Dam S00082	Alkalinity - Total	15	g/m ³ CaCO3		
	Arsenic - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Barium - Total	0.02	g/m ³	Complies with MAV of 1.5	
	Calcium - Total	4.6	g/m ³	Below GV of 100	
	Magnesium Hardness Calculation	7	g/m ³ CaCO3	Below GV of 100	
	Total Hardness Calculation	19	g/m ³ CaCO3	Below GV of 100	
	Calcium Hardness Calculation	11	g/m ³ CaCO3	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m ³	Complies with MAV of 0.004	
	Chloride	14.2	g/m ³	Below GV of 250	
	Colour -True	22	TCU		
	Chromium - Total	< 0.001	g/m ³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m ³	Complies with MAV of 2	
	Iron - Total	0.153	g/m ³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m ³	Complies with MAV of 0.007	
	Magnesium - Total	1.7	g/m ³	Below GV of 100	
	Manganese - Total	0.011	g/m ³	Complies with MAV of 0.4	
	Nitrate	0.104	g/m ³ NO3-N	Complies with MAV of 11.3	
	Sodium - Total	10.0	g/m ³	Below GV of 200	
	Nickel - Total	< 0.008	g/m ³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Sulfate	4.41	g/m ³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m ³	Complies with MAV of 0.02	

24/06269-11

Sample time: 10:20

Railway Road Bore G03043	Alkalinity - Total	91	g/m ³ CaCO3		
	Arsenic - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Barium - Total	0.01	g/m ³	Complies with MAV of 1.5	
	Calcium - Total	29.6	g/m ³	Below GV of 100	
	Magnesium Hardness Calculation	19	g/m ³ CaCO3	Below GV of 100	
	Total Hardness Calculation	92	g/m ³ CaCO3	Below GV of 100	
	Calcium Hardness Calculation	74	g/m ³ CaCO3	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m ³	Complies with MAV of 0.004	
	Chloride	6.75	g/m ³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m ³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m ³	Complies with MAV of 2	
	Iron - Total	0.012	g/m ³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m ³	Complies with MAV of 0.007	
	Magnesium - Total	4.5	g/m ³	Below GV of 100	
	Manganese - Total	0.019	g/m ³	Complies with MAV of 0.4	

Sample	Test	Result	Units	Comments	Uncertainty
	Nitrate	< 0.005	g/m ³ NO ₃ -N	Complies with MAV of 11.3	
	Sodium - Total	10.4	g/m ³	Below GV of 200	
	Nickel - Total	< 0.008	g/m ³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m ³	Complies with MAV of 0.01	
	Sulfate	13.3	g/m ³ SO ₄	Below GV of 250	
	Antimony - Total **	< 0.004	g/m ³	Complies with MAV of 0.02	

< is less than > is more than, g/m³ is equivalent to mg/L and ppm, MAV - Maximum Acceptable Value. GV - Guideline Value

Notes: * Test is not accredited.

** This test has been outsourced. Subcontracted reports can be supplied on request.

Test Methodology:

Test Code	Test	Methodology	Detection Limit
Alk.001	Alkalinity - Total	APHA 24th Ed. 2320 B	1 g/m ³ CaCO ₃
As.079	Arsenic - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.001 g/m ³
Ba.079	Barium - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.001 g/m ³
Ca.079	Calcium - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.1 g/m ³
Calc.003	Magnesium Hardness Calculation	Calculation: 4.118 x Magnesium	1 g/m ³ CaCO ₃
Calc.006	Total Hardness Calculation	Calculation: Calcium Hardness + Magnesium Hardness	1 g/m ³ CaCO ₃
Calc.013	Calcium Hardness Calculation	Calculation: 2.479 x Calcium	1 g/m ³ CaCO ₃
Cd.079	Cadmium - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.00006 g/m ³
Cl.002CG	Chloride	APHA 24th Ed. 4110 B	0.1 g/m ³
Color003	Colour -True	APHA 24th Ed. 2120 B, 0.45 micron filtered, 455 nm	5 TCU
Cr.079	Chromium - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.001 g/m ³
Cu.079	Copper - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.001 g/m ³
Fe.079	Iron - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.005 g/m ³
Hg.686	Mercury - Total	In house procedure based on US EPA 200.8, acid digestion.	g/m ³
Mg.079	Magnesium - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.1 g/m ³
Mn.079	Manganese - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.005 g/m ³
N3.002CG	Nitrate	APHA 24th Ed. 4110 B	0.005 g/m ³ NO ₃ -N
Na.079	Sodium - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.1 g/m ³
Ni.079	Nickel - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.008 g/m ³
Obs.016	Notes	Notes / Observations by Administration.	
Pb.079	Lead - Total	APHA 24th Ed. 3125 B, Nitric acid digestion (sum of 206Pb, 207Pb and 208Pb)	0.001 g/m ³
S.002CG	Sulfate	APHA 24th Ed. 4110 B	0.05 g/m ³ SO ₄
Sb.689	Antimony - Total	In house procedure based on US EPA 200.8, acid digestion.	0.004 g/m ³

Test analysis was initiated between 23/07/2024 and 01/08/2024. For start dates of individual analyses please contact the laboratory.



Report released by

Johan Bosch

Date: 02 August 2024

Principal Analyst

Key Technical Person:

Johan Bosch

Nishani Thennakoon

This Laboratory is accredited by International Accreditation New Zealand.

Tests and sampling procedures have been performed in accordance with the conditions of our accreditation.

Where not supplied test methods, detection limits and uncertainties are available on request.

When samples are collected by the client or an agent of the client, results reported apply only to samples as received at the Laboratory.

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