Central Environmental Laboratories
Module 2, Batchelar Agricultural Centre, Batchelar Road
Palmerston North,4472
PO Box 6054 Awapuni Palmerston North,4412
New Zealand

CENTRAL ENVIRONMENTAL LABORATORIES

Analytical Report

COA No: 25/04408-1

P: +64 6 351 4475
E: cenlab@cenlab.co.nz

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: 14/07/2025 **Time received:** 13:44 **Sample date:** 14/07/2025
Sample type: Source

Sample	Test	Result	Units	Comments	Uncertainty
25/04408-01	**Sampled by:** John Sneddon		**Sample time:** 10:00	**Order no.:** PO 4064	
Bunnythorpe Bore	Alkalinity - Total	120	g/m³ CaCO3		
G00914	Arsenic - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Barium - Total	0.02	g/m³	Complies with MAV of 1.5	
	Calcium - Total	39.9	g/m³	Below GV of 100	
	Magnesium Hardness Calculation	29	g/m³ CaCO3	Below GV of 100	
	Total Hardness Calculation	130	g/m³ CaCO3	Within the GV range	
	Calcium Hardness Calculation	100	g/m³ CaCO3	Within the GV range	
	Cadmium - Total	< 0.00006	g/m³	Complies with MAV of 0.004	
	Chloride	21.5	g/m³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m³	Complies with MAV of 2	
	Iron - Total	0.036	g/m³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m³	Complies with MAV of 0.007	
	Magnesium - Total	7.1	g/m³	Below GV of 100	
	Manganese - Total	0.044	g/m³	Complies with MAV of 0.4	
	Nitrate	0.011	g/m³ NO3-N	Complies with MAV of 11.3	
	Sodium - Total	14.1	g/m³	Below GV of 200	
	Nickel - Total	< 0.008	g/m³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Sulfate	11.7	g/m³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m³	Complies with MAV	
25/04408-02	**Sampled by:** John Sneddon		**Sample time:** 13:10	**Order no.:** PO 4064	
Longburn Bore	Alkalinity - Total	130	g/m³ CaCO3		
G00259	Arsenic - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Barium - Total	0.01	g/m³	Complies with MAV of 1.5	
	Calcium - Total	38.4	g/m³	Below GV of 100	
	Magnesium Hardness Calculation	33	g/m³ CaCO3	Below GV of 100	
	Total Hardness Calculation	130	g/m³ CaCO3	Within the GV range	
	Calcium Hardness Calculation	96	g/m³ CaCO3	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m³	Complies with MAV of 0.004	
	Chloride	17.9	g/m³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m³	Complies with MAV of 0.05	

Sample	Test	Result	Units	Comments	Uncertainty
	Copper - Total	< 0.001	g/m³	Complies with MAV of 2	
	Iron - Total	0.082	g/m³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m³	Complies with MAV of 0.007	
	Magnesium - Total	8.0	g/m³	Below GV of 100	
	Manganese - Total	0.036	g/m³	Complies with MAV of 0.4	
	Nitrate	0.014	g/m³ NO3-N	Complies with MAV of 11.3	
	Sodium - Total	13.9	g/m³	Below GV of 200	
	Nickel - Total	< 0.008	g/m³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Sulfate	6.32	g/m³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m³	Complies with MAV	
25/04408-03	**Sampled by:** John Sneddon		**Sample time:** 08:55	**Order no.:** PO 4075	
Ashhurst Bore	Alkalinity - Total	100	g/m³ CaCO3		
G00110	Arsenic - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Barium - Total	0	g/m³	Complies with MAV of 1.5	
	Calcium - Total	33.2	g/m³	Below GV of 100	
	Magnesium Hardness Calculation	24	g/m³ CaCO3	Below GV of 100	
	Total Hardness Calculation	110	g/m³ CaCO3	Within the GV range	
	Calcium Hardness Calculation	83	g/m³ CaCO3	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m³	Complies with MAV of 0.004	
	Chloride	7.44	g/m³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m³	Complies with MAV of 2	
	Iron - Total	0.024	g/m³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m³	Complies with MAV of 0.007	
	Magnesium - Total	5.9	g/m³	Below GV of 100	
	Manganese - Total	0.049	g/m³	Complies with MAV of 0.4	
	Nitrate	0.012	g/m³ NO3-N	Complies with MAV of 11.3	
	Sodium - Total	8.4	g/m³	Below GV of 200	
	Nickel - Total	< 0.008	g/m³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Sulfate	11.4	g/m³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m³	Complies with MAV	
25/04408-04	**Sampled by:** John Sneddon		**Sample time:** 11:15	**Order no.:** PO 4064	
Keith Street Bore 1	Alkalinity - Total	100	g/m³ CaCO3		
G01208	Arsenic - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Barium - Total	0.01	g/m³	Complies with MAV of 1.5	
	Calcium - Total	29.3	g/m³	Below GV of 100	
	Magnesium Hardness Calculation	22	g/m³ CaCO3	Below GV of 100	
	Total Hardness Calculation	95	g/m³ CaCO3	Below GV of 100	
	Calcium Hardness Calculation	73	g/m³ CaCO3	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m³	Complies with MAV of 0.004	
	Chloride	8.07	g/m³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m³	Complies with MAV of 2	
	Iron - Total	0.023	g/m³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m³	Complies with MAV of 0.007	

Sample	Test	Result	Units	Comments	Uncertainty
	Magnesium - Total	5.4	g/m³	Below GV of 100	
	Manganese - Total	0.032	g/m³	Complies with MAV of 0.4	
	Nitrate	0.012	g/m³ NO3-N	Complies with MAV of 11.3	
	Sodium - Total	10.2	g/m³	Below GV of 200	
	Nickel - Total	< 0.008	g/m³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Sulfate	10.4	g/m³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m³	Complies with MAV	

25/04408-05 **Sampled by:** John Sneddon **Sample time:** 11:32 **Order no.:** PO 4064

Papaioea Park Bore 1	Alkalinity - Total	120	g/m³ CaCO3		
G00104	Arsenic - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Barium - Total	0.01	g/m³	Complies with MAV of 1.5	
	Calcium - Total	38.6	g/m³	Below GV of 100	
	Magnesium Hardness Calculation	29	g/m³ CaCO3	Below GV of 100	
	Total Hardness Calculation	130	g/m³ CaCO3	Within the GV range	
	Calcium Hardness Calculation	97	g/m³ CaCO3	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m³	Complies with MAV of 0.004	
	Chloride	21.9	g/m³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m³	Complies with MAV of 2	
	Iron - Total	0.027	g/m³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m³	Complies with MAV of 0.007	
	Magnesium - Total	7.0	g/m³	Below GV of 100	
	Manganese - Total	0.036	g/m³	Complies with MAV of 0.4	
	Nitrate	0.012	g/m³ NO3-N	Complies with MAV of 11.3	
	Sodium - Total	15.6	g/m³	Below GV of 200	
	Nickel - Total	< 0.008	g/m³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Sulfate	12.5	g/m³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m³	Complies with MAV	

25/04408-06 **Sampled by:** John Sneddon **Sample time:** 11:47 **Order no.:** PO 4064

Papaioea Park Bore 2	Alkalinity - Total	86	g/m³ CaCO3		
G01412	Arsenic - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Barium - Total	0.01	g/m³	Complies with MAV of 1.5	
	Calcium - Total	27.1	g/m³	Below GV of 100	
	Magnesium Hardness Calculation	20	g/m³ CaCO3	Below GV of 100	
	Total Hardness Calculation	88	g/m³ CaCO3	Below GV of 100	
	Calcium Hardness Calculation	68	g/m³ CaCO3	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m³	Complies with MAV of 0.004	
	Chloride	6.81	g/m³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m³	Complies with MAV of 2	
	Iron - Total	0.022	g/m³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m³	Complies with MAV of 0.007	
	Magnesium - Total	4.8	g/m³	Below GV of 100	
	Manganese - Total	0.017	g/m³	Complies with MAV of 0.4	
	Nitrate	0.006	g/m³ NO3-N	Complies with MAV of 11.3	

Sample	Test	Result	Units	Comments	Uncertainty
	Sodium - Total	10.2	g/m³	Below GV of 200	
	Nickel - Total	< 0.008	g/m³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Sulfate	11.1	g/m³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m³	Complies with MAV	

25/04408-07 **Sample time:** 11:47 **Order no.:** PO 4064

Roberts Line Bore 1
G00106

	Notes *	Offline			

25/04408-08 **Sample time:** 11:47 **Order no.:** PO 4064

Roberts Line Bore 2
G01736

	Notes *	Offline			

25/04408-09 **Sampled by:** John Sneddon **Sample time:** 12:27 **Order no.:** PO 4064

Takaro Bore	Alkalinity - Total	99	g/m³ CaCO3		
G00105	Arsenic - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Barium - Total	0.01	g/m³	Complies with MAV of 1.5	
	Calcium - Total	29.0	g/m³	Below GV of 100	
	Magnesium Hardness Calculation	24	g/m³ CaCO3	Below GV of 100	
	Total Hardness Calculation	96	g/m³ CaCO3	Below GV of 100	
	Calcium Hardness Calculation	72	g/m³ CaCO3	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m³	Complies with MAV of 0.004	
	Chloride	10.8	g/m³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m³	Complies with MAV of 0.05	
	Copper - Total	< 0.001	g/m³	Complies with MAV of 2	
	Iron - Total	0.030	g/m³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m³	Complies with MAV of 0.007	
	Magnesium - Total	5.8	g/m³	Below GV of 100	
	Manganese - Total	0.010	g/m³	Complies with MAV of 0.4	
	Nitrate	0.011	g/m³ NO3-N	Complies with MAV of 11.3	
	Sodium - Total	11.6	g/m³	Below GV of 200	
	Nickel - Total	< 0.008	g/m³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Sulfate	4.23	g/m³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m³	Complies with MAV	

25/04408-10 **Sampled by:** John Sneddon **Sample time:** 10:30 **Order no.:** PO 4064

Railway Road Bore	Alkalinity - Total	96	g/m³ CaCO3		
G03043	Arsenic - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Barium - Total	0.01	g/m³	Complies with MAV of 1.5	
	Calcium - Total	30.3	g/m³	Below GV of 100	
	Magnesium Hardness Calculation	20	g/m³ CaCO3	Below GV of 100	
	Total Hardness Calculation	96	g/m³ CaCO3	Below GV of 100	
	Calcium Hardness Calculation	76	g/m³ CaCO3	Below GV of 100	
	Cadmium - Total	< 0.00006	g/m³	Complies with MAV of 0.004	
	Chloride	7.61	g/m³	Below GV of 250	
	Colour -True	< 5	TCU		
	Chromium - Total	< 0.001	g/m³	Complies with MAV of 0.05	

Sample	Test	Result	Units	Comments	Uncertainty
	Copper - Total	< 0.001	g/m³	Complies with MAV of 2	
	Iron - Total	0.013	g/m³	Below GV of 0.3	
	Mercury - Total **	< 0.0001	g/m³	Complies with MAV of 0.007	
	Magnesium - Total	4.9	g/m³	Below GV of 100	
	Manganese - Total	0.019	g/m³	Complies with MAV of 0.4	
	Nitrate	0.012	g/m³ NO3-N	Complies with MAV of 11.3	
	Sodium - Total	11.0	g/m³	Below GV of 200	
	Nickel - Total	< 0.008	g/m³	Complies with MAV of 0.08	
	Lead - Total	< 0.001	g/m³	Complies with MAV of 0.01	
	Sulfate	14.1	g/m³ SO4	Below GV of 250	
	Antimony - Total **	< 0.004	g/m³	Complies with MAV	

25/04408-11 **Sampled by:** John Sneddon **Sample time:** 08:10 **Order no.:** PO 4061

Turitea Dam	Alkalinity - Total	12	g/m³ CaCO3	
S00082	Arsenic - Total	< 0.001	g/m³	Complies with MAV of 0.01
	Barium - Total	0.02	g/m³	Complies with MAV of 1.5
	Calcium - Total	4.0	g/m³	Below GV of 100
	Magnesium Hardness Calculation	7	g/m³ CaCO3	Below GV of 100
	Total Hardness Calculation	17	g/m³ CaCO3	Below GV of 100
	Calcium Hardness Calculation	10	g/m³ CaCO3	Below GV of 100
	Cadmium - Total	< 0.00006	g/m³	Complies with MAV of 0.004
	Chloride	14.1	g/m³	Below GV of 250
	Colour -True	19	TCU	
	Chromium - Total	< 0.001	g/m³	Complies with MAV of 0.05
	Copper - Total	< 0.001	g/m³	Complies with MAV of 2
	Iron - Total	0.199	g/m³	Below GV of 0.3
	Mercury - Total **	< 0.0001	g/m³	Complies with MAV of 0.007
	Magnesium - Total	1.6	g/m³	Below GV of 100
	Manganese - Total	0.011	g/m³	Complies with MAV of 0.4
	Nitrate	0.212	g/m³ NO3-N	Complies with MAV of 11.3
	Sodium - Total	10.2	g/m³	Below GV of 200
	Nickel - Total	< 0.008	g/m³	Complies with MAV of 0.08
	Lead - Total	< 0.001	g/m³	Complies with MAV of 0.01
	Sulfate	4.39	g/m³ SO4	Below GV of 250
	Antimony - Total **	< 0.004	g/m³	Complies with MAV

< 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/m³ CaCO3
As.079	Arsenic - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.001 g/m³
Ba.079	Barium - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.001 g/m³
Ca.079	Calcium - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.1 g/m³
Calc.003	Magnesium Hardness Calculation	Non-endorsed calculation: 4.118 x Magnesium	1 g/m³ CaCO3
Calc.006	Total Hardness Calculation	Non-endorsed calculation: Calcium Hardness + Magnesium Hardness	1 g/m³ CaCO3
Calc.013	Calcium Hardness Calculation	Non-endorsed calculation: 2.479 x Calcium	1 g/m³ CaCO3
Cd.079	Cadmium - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.00006 g/m³
Cl.002CG	Chloride	APHA 24th Ed. 4110 B	0.1 g/m³
Color003	Colour -True	APHA 24th Ed. 2120 B, 0.45 micron filtered, 455 nm	5 TCU

Test Code	Test	Methodology	Detection Limit
Cr.079	Chromium - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.001 g/m³
Cu.079	Copper - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.001 g/m³
Fe.079	Iron - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.005 g/m³
Hg.126	Mercury - Total	APHA Online Ed. 3125 B, Nitric acid digestion	g/m³
Mg.079	Magnesium - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.1 g/m³
Mn.079	Manganese - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.005 g/m³
N3.002CG	Nitrate	APHA 24th Ed. 4110 B	0.005 g/m³ NO3-N
Na.079	Sodium - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.1 g/m³
Ni.079	Nickel - Total	APHA 24th Ed. 3125 B, Nitric acid digestion	0.008 g/m³
Obs.016	Notes	Non-endorsed observation.	
Pb.079	Lead - Total	APHA 24th Ed. 3125 B, Nitric acid digestion (sum of 206Pb, 207Pb and 208Pb)	0.001 g/m³
S.002CG	Sulfate	APHA 24th Ed. 4110 B	0.05 g/m³ SO4
Sb.126	Antimony - Total	APHA 3125 B : Online Edition	0.004 g/m³

Test analysis was initiated between 14/07/2025 and 24/07/2025. For start dates of individual analyses please contact the laboratory.

Report released by **Johan Bosch** **Date: 28 July 2025**

Principal Analyst

Key Technical Person:

Carrie-Ann Leighton

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.
Observations, Comments, Notes and Calculations are not Accredited.
Calculations are available on request. Where not supplied, 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.