



## Certificate of Analysis

<b>Client:</b>	Lotus at Siam.Co.NZ Limited	<b>Lab No:</b>	2250102	DWPv2
<b>Contact:</b>	Duncan Laing 9 Ernlea Terrace Cashmere Christchurch 8022	<b>Date Received:</b>	30-Sep-2019	
		<b>Date Reported:</b>	11-Oct-2019	
		<b>Quote No:</b>	90913	
		<b>Order No:</b>		
		<b>Client Reference:</b>	Spring Water	
		<b>Submitted By:</b>	Duncan Laing	

### Sample Type: Aqueous

Sample Name:		Lotus Spa 30-Sep-2019 8:40 am		Guideline Value	Maximum Acceptable Values (MAV)
Lab Number:		2250102.1			
Individual Tests					
Total Legionellae*	cfu / mL	< 10		-	-
Routine Water Profile					
pH	pH Units	7.8		7.0 - 8.5	-
Total Alkalinity	g/m <sup>3</sup> as CaCO <sub>3</sub>	52		-	-
Free Carbon Dioxide	g/m <sup>3</sup> at 25°C	1.8		-	-
Total Hardness	g/m <sup>3</sup> as CaCO <sub>3</sub>	43		< 200	-
Electrical Conductivity (EC)	mS/m	12.1		-	-
Electrical Conductivity (EC)	µS/cm	121		-	-
Approx Total Dissolved Salts	g/m <sup>3</sup>	81		< 1000	-
Total Boron	g/m <sup>3</sup>	0.0197		-	1.4
Total Calcium	g/m <sup>3</sup>	14.2		-	-
Total Copper	g/m <sup>3</sup>	0.0084		< 1	2
Total Iron	g/m <sup>3</sup>	< 0.021		< 0.2	-
Total Magnesium	g/m <sup>3</sup>	1.75		-	-
Total Manganese	g/m <sup>3</sup>	< 0.00053		< 0.04 (Staining) < 0.10 (Taste)	0.4
Total Potassium	g/m <sup>3</sup>	0.83		-	-
Total Sodium	g/m <sup>3</sup>	7.2		< 200	-
Total Zinc	g/m <sup>3</sup>	0.050		< 1.5	-
Chloride	g/m <sup>3</sup>	4.1		< 250	-
Nitrate-N	g/m <sup>3</sup>	0.24		-	11.3
Sulphate	g/m <sup>3</sup>	2.8		< 250	-

**Note:** The Guideline Values and Maximum Acceptable Values (MAV) are taken from the publication 'Drinking-water Standards for New Zealand 2005 (Revised 2018)', Ministry of Health. Copies of this publication are available from <https://www.health.govt.nz/publication/drinking-water-standards-new-zealand-2005-revised-2018>

The Maximum Acceptable Values (MAVs) have been defined by the Ministry of Health for parameters of health significance and should not be exceeded. The Guideline Values are the limits for aesthetic determinands that, if exceeded, may render the water unattractive to consumers.

**Under Section 69ZZ (2) of the Health Act (1965), the laboratory is required to report the results of any analysis or test carried out (for the purposes of testing for compliance with the New Zealand Drinking Water Standards 2005 (Revised 2018)) that indicates any non-compliance (transgression) with the Maximum Acceptable Values (MAVs) to the Drinking Water Assessor.**

Note that the units g/m<sup>3</sup> 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 \*, which are not accredited.

# 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 clean 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. 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
Routine Water Profile		-	1
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter. Performed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch.	-	1
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) 23 <sup>rd</sup> ed. 2017.	-	1
pH	pH meter. Analysed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch. APHA 4500-H <sup>+</sup> B 23 <sup>rd</sup> 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
Total Alkalinity	Titration to pH 4.5 (M-alkalinity), autotitrator. Analysed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch. APHA 2320 B (modified for Alkalinity <20) 23 <sup>rd</sup> ed. 2017.	1.0 g/m <sup>3</sup> as CaCO <sub>3</sub>	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 <sub>2</sub> D 23 <sup>rd</sup> ed. 2017.	1.0 g/m <sup>3</sup> at 25°C	1
Total Hardness	Calculation from Calcium and Magnesium. APHA 2340 B 23 <sup>rd</sup> ed. 2017.	1.0 g/m <sup>3</sup> as CaCO <sub>3</sub>	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. Analysed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch. APHA 2510 B 23 <sup>rd</sup> ed. 2017.	0.1 mS/m	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B 23 <sup>rd</sup> ed. 2017.	1 µS/cm	1
Approx Total Dissolved Salts	Calculation: from Electrical Conductivity.	2 g/m <sup>3</sup>	1
Total Boron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017.	0.0053 g/m <sup>3</sup>	1
Total Calcium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017.	0.053 g/m <sup>3</sup>	1
Total Copper	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017 / US EPA 200.8.	0.00053 g/m <sup>3</sup>	1
Total Iron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017.	0.021 g/m <sup>3</sup>	1
Total Magnesium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017.	0.021 g/m <sup>3</sup>	1
Total Manganese	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017 / US EPA 200.8.	0.00053 g/m <sup>3</sup>	1
Total Potassium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017.	0.053 g/m <sup>3</sup>	1
Total Sodium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017.	0.021 g/m <sup>3</sup>	1
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017 / US EPA 200.8.	0.0011 g/m <sup>3</sup>	1
Chloride	Filtered sample from Christchurch. Ion Chromatography. APHA 4110 B (modified) 23 <sup>rd</sup> ed. 2017.	0.5 g/m <sup>3</sup>	1
Nitrate-N	Filtered sample from Christchurch. Ion Chromatography. APHA 4110 B (modified) 23 <sup>rd</sup> ed. 2017.	0.05 g/m <sup>3</sup>	1
Sulphate	Filtered sample from Christchurch. Ion Chromatography. APHA 4110 B (modified) 23 <sup>rd</sup> ed. 2017.	0.5 g/m <sup>3</sup>	1
Total Legionellae*	Spread plate, Count on BMPAa & GVPC agars, Incubated at 36°C for 7 days, Confirmation. Analysed at Hill Laboratories - Microbiology; 101C Waterloo Road, Christchurch. AS/NZ 3896:2017; AS 3666.3:2011.	10 cfu / mL	1

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

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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Martin Cowell - BSc  
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