

Michelle van Straalen

From: Michelle van Straalen
Sent: Wednesday, 19 February 2020 10:39
To: [REDACTED]
Cc: official information
Subject: HPE CM: LGOIMA 20014 - Fluoride Levels for Hamilton 2017 and 2018
Attachments: City Waters - Compliance - LGOIMA - Fluoride Monitoring and Results - 2017-2018.XLSX

Record Number: D-003238518

Kia ora

Further to your information request of the 26 January 2020 in respect to fluoride measures of all water supplied under Hamilton City Council's jurisdiction, I am now able to provide Hamilton City Council's response.

You requested:

All the fluoride measures of all water supplies under Council jurisdiction for 2017 and 2018.

Our response:

Hamilton City Council is committed to managing Hamilton's drinking water supply to provide safe, high-quality drinking water meeting or exceeding the expectations of our community as well as the legislative requirements set out in the Local Government Act 2002, the Health (Drinking Water) Amendment Act 2007 and Drinking Water Standards for New Zealand (DWSNZ) 2005 (revised 2018).

The Council adds fluoride to drinking water at Waiora Treatment Plant in the form of diluted Hydrofluorosilicic Acid (HFA). HFA is added into the drinking water to achieve a fluoride concentration of no more than 1.0mg/L in the final drinking water, as recommended by the Ministry of Health (MoH) for oral health purposes. The maximum acceptable value (MAV) in the DWSNZ is 1.5mg/L.

The Council provides two alternative drinking water supplies for residents who prefer drinking water with lower levels of fluoride. These are located at Claudelands Event Centre and Taitua Arboretum.

Please find **attached** fluoride monitoring results as requested. Below is a brief description of the monitoring undertaken and where to find the results in the attached spreadsheet.

Spreadsheet tab	Explanation
River	Samples of untreated water are taken at the Waiora Treatment Plant to help understand and monitor fluoride levels that occur naturally in the Waikato River prior to any treatment. Please note, the conventional treatment processes at Waiora Treatment Plant do not reduce fluoride levels in the source water.
In-process - Relift	The Relift is the point in the treatment process after primary treatment (coagulation, sedimentation and filtration) where the water is pumped up to the Granular Activated Carbon filters to undergo secondary filtration and Ultra Violet (UV) disinfection prior to the addition of fluoride and chlorine. These results effectively represent the levels present in the river.
In-process – Post UV	Post UV samples represent water immediately after the fluoride is added.

Treated – Online data	Each treatment process at Waiora is continuously monitored. Alarms alert trained operators when a process begins to deviate beyond set targets. These targets are set well below the MAV listed in the DWSNZ, so action can be taken prior to a transgression of the DWSNZ occurring. With fluoride, the target level is less than the oral health upper target of 1.0mg/L. Online data is stored and automatically generates reports.
Treated – Leaving plant	Fluoride concentrations in drinking water leaving the plant are verified by sampling and testing undertaken by a MoH approved and International Accreditation New Zealand (IANZ) accredited laboratory, as required under the DWSNZ. This occurs twice a week at Waiora Treatment Plant at the City Main Trunk. The City Main Trunk is where water leaves the treatment plant and enters the distribution network. These results are used for compliance purposes.
Claudelands	The Claudelands drinking water fountain is supplied from an on-site system that reduces fluoride levels in the Hamilton mains supply by reverse osmosis. A sample is taken approximately every week at the Claudelands Grandstand tap to help determine when the reverse osmosis membrane needs to be replaced.
Taitua Arboretum	Ad-hoc monitoring of fluoride levels in water from the Taitua Arboretum supply has occurred to confirm its suitability as a low fluoride drinking-water source.

Please feel free to contact me if you have any further queries regarding our request.

Kind regards,

Michelle van Straalen

Official Information Advisor | Legal Services

DDI: 07 974 0589 | Michelle.vanStraalen@hcc.govt.nz



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From: official information

Sent: Wednesday, 29 January 2020 1:41 PM

To: [REDACTED]

Cc: official information <officialinformation@hcc.govt.nz>

Subject: HPE CM: LGOIMA 20014 - Fluoride Levels for Hamilton 2017 and 2018

Kia ora

I write to acknowledge your information request of 26 January 2020 in respect of *Fluoride Levels for Hamilton 2017 and 2018*.

Please be advised that your request has been passed on to the relevant team within Council and you will be informed of the outcome.

The Local Government Official Information and Meetings Act 1987 requires that we advise you of our decision on whether the Council will provide the requested information or not “as soon as reasonably practicable”, no later than 20 working days after the day we received your request. We will respond to you no later than 24 February 2020.

Kind regards,

Michelle van Straalen

Official Information Advisor | Legal Services

DDI: 07 974 0589 | Michelle.vanStraalen@hcc.govt.nz



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From: [REDACTED]
Sent: Sunday, 26 January 2020 10:04 PM
To: Michelle van Straalen <Michelle.vanStraalen@hcc.govt.nz>
Cc: official information <officialinformation@hcc.govt.nz>
Subject: LGOIMA - Fluoride Levels for Hamilton 2017 and 2018

Dear Michelle

Many thanks for supplying me with all the fluoride measures of all water supplies under your jurisdiction for 2019.

I now request the same information under the LGOIMA for 2017 and 2018 please.

I look forward to hearing from you.

Kind regards

[REDACTED]

CWT01 max recorded fluoride mg/L	CWT02 max recorded fluoride mg/L
0.88	0.93
0.88	0.90
0.90	0.90
0.90	0.86
0.90	0.89
0.91	0.88
0.90	0.89
0.89	0.90
0.85	0.93
0.85	0.90
0.84	0.90
0.85	0.90
0.84	0.90
0.84	0.90
0.91	0.90
0.85	0.90
0.84	0.92
0.84	0.92
0.83	0.90
0.84	0.90
0.85	0.92
0.86	0.90
0.87	0.92
0.87	0.90
0.88	0.90
0.87	0.91
0.86	0.94
0.88	0.90
0.83	0.90
0.85	0.90
0.85	0.90
0.91	0.94

Day	Minutes Fluoride > 1.5 mg/L	Minutes Fluoride Added	CWT01 max recorded fluoride mg/L	CWT02 max recorded fluoride mg/L
1-Sep	0.00	1433.57	0.85	0.93
2-Sep	0.00	1423.00	0.85	0.90
3-Sep	0.00	1287.79	0.85	0.90
4-Sep	0.00	1440.00	0.85	0.90
5-Sep	0.00	1340.87	0.85	0.92
6-Sep	0.00	1429.71	0.90	0.92
7-Sep	0.00	1152.83	0.91	0.88
8-Sep	0.00	1438.69	0.90	0.90
9-Sep	0.00	1427.13	0.91	0.92
10-Sep	0.00	1289.01	0.90	0.88
11-Sep	0.00	1402.67	0.91	0.88
12-Sep	0.00	1368.97	0.91	0.88
13-Sep	0.00	1265.50	0.90	0.90
14-Sep	0.00	1101.99	0.86	0.90
15-Sep	0.00	1430.86	0.86	0.92
16-Sep	0.00	1434.94	0.85	0.91
17-Sep	0.00	1388.62	0.84	0.93
18-Sep	0.00	1303.78	0.87	0.90
19-Sep	0.00	1163.70	0.93	0.92
20-Sep	0.00	1440.00	0.89	0.90
21-Sep	0.00	1431.60	0.88	0.92
22-Sep	0.00	1301.14	0.88	0.89
23-Sep	0.00	1365.51	0.89	0.90
24-Sep	0.00	1440.00	0.89	0.91
25-Sep	0.00	1158.60	0.88	0.90
26-Sep	0.00	1200.51	0.86	0.90
27-Sep	0.00	1429.61	0.85	0.91
28-Sep	0.00	1333.31	0.86	0.91
29-Sep	0.00	1436.83	0.88	0.92
30-Sep	0.00	1434.79	0.88	0.90
Month Total:	0.00	40495.53	0.93	0.93

Day	Minutes Fluoride > 1.5 mg/L	Minutes Fluoride Added	CWT01 max recorded fluoride mg/L	CWT02 max recorded fluoride mg/L
1-Oct	0.00	1335.69	0.87	0.90
2-Oct	0.00	1433.20	0.86	0.90
3-Oct	0.00	1262.22	0.89	0.90
4-Oct	0.00	1437.92	0.89	0.90
5-Oct	0.00	1268.53	0.88	0.90
6-Oct	0.00	1435.40	0.89	0.91
7-Oct	0.00	1437.70	0.89	0.90
8-Oct	0.00	1388.72	0.88	0.90
9-Oct	0.00	1436.10	0.88	0.93
10-Oct	0.00	1365.69	0.88	0.90
11-Oct	0.00	1420.86	0.88	0.92
12-Oct	0.00	1345.14	0.88	0.90
13-Oct	0.00	1438.62	0.88	0.91
14-Oct	0.00	1289.93	0.91	0.90
15-Oct	0.00	1381.38	0.90	0.90
16-Oct	0.00	1439.68	0.91	0.91
17-Oct	0.00	1354.15	0.91	0.90
18-Oct	0.00	1439.12	0.90	0.90
19-Oct	0.00	1138.10	0.91	0.90
20-Oct	0.00	1439.02	0.90	0.87
21-Oct	0.00	1431.30	0.90	0.90
22-Oct	0.00	1094.68	0.90	0.88
23-Oct	0.00	1399.76	0.90	0.84
24-Oct	0.00	1139.59	0.90	0.83
25-Oct	0.00	1438.07	0.91	0.83
26-Oct	0.00	1089.42	0.91	0.88
27-Oct	0.00	1439.23	0.89	0.90
28-Oct	0.00	1328.06	0.87	0.90
29-Oct	0.00	1433.12	0.86	0.90
30-Oct	0.00	1397.90	0.90	0.91
31-Oct	0.00	1431.47	0.91	0.90
Month Total:	0.00	42109.77	0.91	0.93

Day	Minutes Fluoride > 1.5 mg/L	Minutes Fluoride Added	CWT01 max recorded fluoride mg/L	CWT02 max recorded fluoride mg/L
1-Nov	0.00	1440.00	0.90	0.90
2-Nov	0.00	1175.39	0.90	0.92
3-Nov	0.00	1366.18	0.89	0.90
4-Nov	0.00	1220.45	0.84	0.90
5-Nov	0.00	1316.06	0.90	0.90
6-Nov	0.00	1438.71	0.90	0.89
7-Nov	0.00	1239.85	0.90	0.88
8-Nov	0.00	1438.77	0.89	0.91
9-Nov	0.00	1373.64	0.91	0.84
10-Nov	0.00	1437.95	0.90	0.85
11-Nov	0.00	1436.73	0.91	0.84
12-Nov	0.00	1198.37	0.90	0.83
13-Nov	0.00	1429.27	0.91	0.88
14-Nov	0.00	1227.67	0.91	0.87
15-Nov	0.00	1440.00	0.88	0.90
16-Nov	0.00	1237.84	0.88	0.90
17-Nov	0.00	1439.26	0.86	0.92
18-Nov	0.00	1438.74	0.87	0.94
19-Nov	0.00	1356.19	0.88	0.90
20-Nov	0.00	1435.19	0.88	0.90
21-Nov	0.00	1333.78	0.85	0.90
22-Nov	0.00	1436.88	0.87	0.90
23-Nov	0.00	1405.63	0.82	0.91
24-Nov	0.00	1425.78	0.88	0.90
25-Nov	0.00	1432.17	0.79	0.91
26-Nov	0.00	1393.70	0.85	0.90
27-Nov	0.00	1433.71	0.85	0.90
28-Nov	0.43	1248.48	0.90	0.92
29-Nov	0.00	1431.23	0.90	0.88
30-Nov	0.00	1364.20	0.90	0.86
Month Total:	0.43	40991.82	0.91	0.94

CWT01 max recorded fluoride mg/L	CWT02 max recorded fluoride mg/L
0.90	0.81
0.90	0.90
0.94	0.92

Day	Minutes Fluoride > 1.5 mg/L	Minutes Fluoride Added	CWT01 max recorded fluoride mg/L	CWT02 max recorded fluoride mg/L
1-Sep	0.00	1440.00	0.92	0.92
2-Sep	0.00	1440.00	0.88	0.90
3-Sep	0.00	1334.55	0.94	0.92

Day	Minutes Fluoride > 1.5 mg/L	Minutes Fluoride Added	CWT01 max recorded fluoride mg/L	CWT02 max recorded fluoride mg/L
1-Oct	0.00	840.62	1.19	0.90
2-Oct	0.00	1440.00	0.88	0.92
3-Oct	0.00	1440.00	0.94	0.92

Day	Minutes Fluoride > 1.5 mg/L	Minutes Fluoride Added	CWT01 max recorded fluoride mg/L	CWT02 max recorded fluoride mg/L
1-Nov	0.00	1408.00	0.91	0.92
2-Nov	0.00	1440.00	0.88	0.91
3-Nov	0.00	1438.42	0.92	0.97

0.91	0.88
0.91	0.88
0.95	0.89
0.89	0.83
0.87	0.89
0.91	0.89
0.94	0.90
0.96	0.91
0.95	0.89
0.95	0.89
0.96	0.88
0.94	0.93
0.91	0.91
0.91	0.89
0.96	0.95
0.96	0.93
0.98	0.90
0.97	0.89
0.96	0.91
0.93	0.93
0.93	0.91
0.91	0.88
0.92	0.86
0.92	0.85
0.90	0.90
0.88	0.93
0.89	0.94
0.91	0.92
0.98	0.95

4-Sep	0.00	1439.83	0.93	0.89
5-Sep	0.00	1440.00	0.91	0.86
6-Sep	0.00	1440.00	0.88	0.81
7-Sep	0.00	1440.00	0.91	0.81
8-Sep	0.00	1440.00	0.90	0.79
9-Sep	0.00	1440.00	0.91	0.78
10-Sep	0.00	1399.09	0.95	0.89
11-Sep	0.00	1440.00	0.91	0.91
12-Sep	0.00	1440.00	0.89	0.89
13-Sep	0.00	1440.00	0.92	0.88
14-Sep	0.00	1440.00	0.89	0.84
15-Sep	0.00	1439.09	0.92	0.86
16-Sep	0.00	1440.00	0.91	0.85
17-Sep	0.00	1436.30	0.93	0.85
18-Sep	0.00	1431.73	0.95	0.89
19-Sep	0.00	1408.57	0.95	0.86
20-Sep	0.00	1440.00	0.89	0.74
21-Sep	1.92	1423.05	1.31	0.88
22-Sep	5.00	1432.89	2.00	0.90
23-Sep	7.65	1436.25	2.00	0.89
24-Sep	5.42	1434.36	1.94	0.91
25-Sep	5.55	1433.77	1.45	0.90
26-Sep	9.87	1105.09	2.00	0.86
27-Sep	8.93	1279.28	2.00	0.88
28-Sep	0.00	1429.16	0.95	0.70
29-Sep	0.00	543.58	1.02	0.83
30-Sep	0.00	0.00	0.00	0.00
Month Total:	44.34	40126.59	2.00	0.92

4-Oct	0.00	1440.00	0.92	0.90
5-Oct	0.00	1440.00	0.91	0.89
6-Oct	0.00	1440.00	0.91	0.87
7-Oct	0.00	1440.00	0.91	0.86
8-Oct	0.00	1440.00	0.91	0.90
9-Oct	0.00	1438.34	0.94	0.92
10-Oct	0.00	1439.43	0.97	0.95
11-Oct	0.00	1438.46	0.89	0.94
12-Oct	0.00	1439.53	0.88	0.92
13-Oct	0.00	1440.00	0.93	0.93
14-Oct	0.00	1440.00	0.90	0.88
15-Oct	0.00	1440.00	0.89	0.89
16-Oct	0.00	1440.00	0.86	0.92
17-Oct	0.00	1440.00	0.80	0.88
18-Oct	0.00	1136.85	0.90	0.92
19-Oct	0.00	948.00	0.88	0.91
20-Oct	0.00	1433.84	0.97	0.97
21-Oct	0.00	1438.39	0.91	0.93
22-Oct	0.00	1440.00	0.93	0.96
23-Oct	0.00	1438.49	0.90	0.93
24-Oct	0.00	540.46	0.86	0.88
25-Oct	0.00	0.00	0.00	0.00
26-Oct	0.00	513.30	0.92	0.89
27-Oct	0.00	1440.00	0.91	0.89
28-Oct	0.00	1440.00	0.90	0.88
29-Oct	0.00	1440.00	0.89	0.89
30-Oct	0.00	1440.00	0.91	0.91
31-Oct	0.00	1440.00	0.87	0.88
Month Total:	0.00	39965.71	1.19	0.97

4-Nov	0.00	1438.72	0.92	0.99
5-Nov	0.00	1439.28	0.90	0.93
6-Nov	0.00	1439.41	0.92	0.97
7-Nov	0.00	1440.00	0.87	0.90
8-Nov	0.00	1440.00	0.90	0.93
9-Nov	0.00	1435.96	0.92	0.95
10-Nov	0.00	1440.00	0.89	0.90
11-Nov	0.00	1440.00	0.89	0.90
12-Nov	0.00	1439.51	0.91	0.91
13-Nov	0.00	1440.00	0.87	0.90
14-Nov	0.00	1440.00	0.83	0.90
15-Nov	0.00	1440.00	0.87	0.91
16-Nov	0.00	1440.00	0.88	0.91
17-Nov	0.00	1440.00	0.86	0.88
18-Nov	0.00	1439.88	0.93	0.95
19-Nov	0.00	1440.00	0.93	0.94
20-Nov	0.00	1440.00	0.87	0.90
21-Nov	0.00	1428.54	0.92	0.93
22-Nov	0.00	1439.74	0.94	0.95
23-Nov	0.00	1332.28	1.02	1.03
24-Nov	0.00	1435.03	0.96	0.97
25-Nov	0.00	1440.00	0.89	0.92
26-Nov	0.00	1440.00	0.94	0.95
27-Nov	0.00	1439.01	0.89	0.96
28-Nov	0.00	1438.46	0.88	0.95
29-Nov	0.00	1380.16	0.89	0.96
30-Nov	0.00	1438.56	0.88	0.94
Month Total:	0.00	42970.96	1.02	1.03

Day	Minutes Fluoride > 1.5 mg/L	Minutes Fluoride Added	CWT01 max recorded fluoride mg/L	CWT02 max recorded fluoride mg/L
1-Dec	0.00	1436.93	0.92	0.86
2-Dec	0.00	1438.62	0.91	0.85
3-Dec	0.00	1436.93	0.91	0.87
4-Dec	0.00	1142.15	0.90	0.85
5-Dec	0.00	1436.95	0.93	0.83
6-Dec	0.00	1432.05	0.91	0.86
7-Dec	0.00	1424.54	0.90	0.84
8-Dec	0.00	1432.08	0.92	0.86
9-Dec	0.00	1392.30	0.92	0.82
10-Dec	0.00	1434.99	0.91	0.84
11-Dec	0.00	1361.18	0.93	0.88
12-Dec	0.00	1435.18	0.93	0.90
13-Dec	0.00	1428.79	0.91	0.94
14-Dec	0.00	1380.59	0.89	0.92
15-Dec	0.00	1431.40	0.89	0.96
16-Dec	0.00	1430.26	0.88	0.91
17-Dec	0.00	1430.75	0.91	0.92
18-Dec	0.00	1431.67	0.90	0.90
19-Dec	0.00	1413.76	0.91	0.91
20-Dec	0.00	1434.73	0.91	0.90
21-Dec	0.00	1368.57	0.90	0.91
22-Dec	0.00	1432.87	0.90	0.91
23-Dec	0.00	1430.73	0.91	0.90
24-Dec	0.00	1240.51	0.92	0.91
25-Dec	0.00	1438.49	0.89	0.91
26-Dec	0.00	1438.49	0.89	0.91
27-Dec	0.00	942.63	0.89	0.93
28-Dec	0.00	1335.40	0.86	0.91
29-Dec	0.00	1432.35	0.86	0.90
30-Dec	0.00	1431.28	0.87	0.91
31-Dec	0.00	1371.70	0.86	0.92
Month Total:	0.00	43048.87	0.93	0.96

Day	Minutes Fluoride > 1.5 mg/L	Minutes Fluoride Added	CWT01 max recorded fluoride mg/L	CWT02 max recorded fluoride mg/L
1-Dec	0.00	1438.54	0.90	0.98
2-Dec	0.00	1440.00	0.88	0.93
3-Dec	0.00	1436.13	0.92	0.98

4-Dec	0.00	1394.96	0.92	0.99
5-Dec	0.00	1440.00	0.90	0.91
6-Dec	0.00	501.60	0.96	0.99
7-Dec	0.00	501.60	0.96	0.99
8-Dec	0.00	501.60	0.96	0.99
9-Dec	0.00	1437.13	0.92	0.93
10-Dec	0.00	1440.00	0.91	0.87
11-Dec	0.00	567.29	0.90	0.99
12-Dec	0.00	1009.65	0.86	0.91
13-Dec	0.00	1440.00	0.90	0.86
14-Dec	0.00	1250.37	0.93	0.89
15-Dec	0.00	866.57	1.01	1.00
16-Dec	0.00	672.70	0.91	0.88
17-Dec	0.00	785.72	1.40	1.42
18-Dec	0.00	1438.17	0.97	0.95
19-Dec	0.00	1435.61	0.93	0.94
20-Dec	0.00	1440.00	0.88	0.96
21-Dec	0.00	1352.60	0.87	0.90
22-Dec	0.00/7.78	142.78	0.83	2.00
23-Dec	0.00	0.00	0.00	0.00
24-Dec	0.00	885.38	0.93	0.93
25-Dec	0.00	1438.94	0.92	0.93
26-Dec	0.00	1325.55	0.94	0.98
27-Dec	0.00	1432.70	0.92	0.99
28-Dec	0.00	1439.23	0.93	0.97
29-Dec	0.00	1393.20	1.01	1.07
30-Dec	0.00	1439.91	0.92	0.95
31-Dec	0.00	1432.69	0.92	0.95
Month Total:	7.78	34720.62	1.40	2.00

6/06/2017	0.64	mg/L
8/06/2017	0.73	mg/L
13/07/2017	0.73	mg/L
18/07/2017	0.82	mg/L
20/07/2017	0.73	mg/L
25/07/2017	0.81	mg/L
27/07/2017	0.87	mg/L
1/08/2017	0.93	mg/L
3/08/2017	0.88	mg/L
8/08/2017	0.86	mg/L
10/08/2017	0.67	mg/L
15/08/2017	0.74	mg/L
17/08/2017	0.67	mg/L
22/08/2017	0.66	mg/L
24/08/2017	0.78	mg/L
29/08/2017	0.89	mg/L
31/08/2017	0.83	mg/L
5/09/2017	0.72	mg/L
7/09/2017	0.74	mg/L
12/09/2017	0.74	mg/L
14/09/2017	0.74	mg/L
19/09/2017	0.78	mg/L
21/09/2017	0.71	mg/L
26/09/2017	0.77	mg/L
28/09/2017	0.68	mg/L
3/10/2017	0.73	mg/L
5/10/2017	0.78	mg/L
10/10/2017	0.66	mg/L
12/10/2017	0.83	mg/L
17/10/2017	0.80	mg/L
19/10/2017	0.77	mg/L
24/10/2017	0.74	mg/L
26/10/2017	0.68	mg/L
31/10/2017	0.69	mg/L
2/11/2017	0.81	mg/L
7/11/2017	0.67	mg/L
9/11/2017	0.70	mg/L
14/11/2017	0.77	mg/L
16/11/2017	0.78	mg/L
21/11/2017	0.17	mg/L
23/11/2017	0.71	mg/L
28/11/2017	0.66	mg/L
30/11/2017	0.79	mg/L
5/12/2017	0.83	mg/L
7/12/2017	0.62	mg/L
12/12/2017	0.83	mg/L
14/12/2017	0.72	mg/L
19/12/2017	0.77	mg/L
21/12/2017	0.81	mg/L
27/12/2017	0.91	mg/L
28/12/2017	0.57	mg/L

3/01/2018	0.65	mg/L	
4/01/2018	0.60	mg/L	

9/01/2018	0.91	mg/L	
11/01/2018	0.69	mg/L	
16/01/2018	0.74	mg/L	
18/01/2018	0.92	mg/L	
23/01/2018	0.76	mg/L	
25/01/2018	0.18	mg/L	
30/01/2018	0.20	mg/L	
1/02/2018	0.89	mg/L	
7/02/2018	0.94	mg/L	
8/02/2018	0.59	mg/L	
13/02/2018	0.75	mg/L	
15/02/2018	0.75	mg/L	
20/02/2018	0.69	mg/L	
23/02/2018	0.13	mg/L	
27/02/2018	0.76	mg/L	
1/03/2018	0.66	mg/L	
6/03/2018	0.71	mg/L	
8/03/2018	0.73	mg/L	
13/03/2018	0.74	mg/L	
15/03/2018	0.75	mg/L	
20/03/2018	0.67	mg/L	
22/03/2018	0.74	mg/L	
27/03/2018	0.65	mg/L	
29/03/2018	0.83	mg/L	
3/04/2018	0.74	mg/L	
5/04/2018	0.86	mg/L	
10/04/2018	0.80	mg/L	
12/04/2018	0.76	mg/L	
17/04/2018	0.87	mg/L	
19/04/2018	0.81	mg/L	
24/04/2018	0.76	mg/L	
26/04/2018	0.77	mg/L	
1/05/2018	0.81	mg/L	
3/05/2018	0.77	mg/L	
8/05/2018	0.79	mg/L	
10/05/2018	0.84	mg/L	
15/05/2018	0.72	mg/L	
17/05/2018	0.88	mg/L	
22/05/2018	0.78	mg/L	
24/05/2018	0.74	mg/L	
29/05/2018	0.67	mg/L	
31/05/2018	0.78	mg/L	
5/06/2018	0.73	mg/L	
7/06/2018	0.71	mg/L	
12/06/2018	0.63	mg/L	
14/06/2018	0.84	mg/L	
19/06/2018	0.76	mg/L	
21/06/2018	0.84	mg/L	
26/06/2018	0.82	mg/L	
28/06/2018	0.68	mg/L	
3/07/2018	0.57	mg/L	
5/07/2018	0.55	mg/L	
10/07/2018	0.55	mg/L	
12/07/2018	0.71	mg/L	

17/07/2018	0.74	mg/L
19/07/2018	0.71	mg/L
25/07/2018	0.70	mg/L
26/07/2018	0.81	mg/L
31/07/2018	0.80	mg/L
2/08/2018	0.77	mg/L
7/08/2018	0.72	mg/L
9/08/2018	0.89	mg/L
14/08/2018	0.83	mg/L
16/08/2018	0.86	mg/L
21/08/2018	0.82	mg/L
24/08/2018	0.73	mg/L
28/08/2018	0.71	mg/L
30/08/2018	0.77	mg/L
4/09/2018	0.77	mg/L
6/09/2018	0.72	mg/L
11/09/2018	0.69	mg/L
13/09/2018	0.74	mg/L
18/09/2018	0.78	mg/L
20/09/2018	0.69	mg/L
25/09/2018	0.85	mg/L
27/09/2018	0.84	mg/L
2/10/2018	0.74	mg/L
4/10/2018	0.77	mg/L
9/10/2018	0.71	mg/L
11/10/2018	0.75	mg/L
16/10/2018	0.85	mg/L
18/10/2018	0.27	mg/L
23/10/2018	0.75	mg/L
25/10/2018	0.13	mg/L
30/10/2018	0.70	mg/L
1/11/2018	0.75	mg/L
6/11/2018	0.76	mg/L
8/11/2018	0.74	mg/L
2/11/2018	0.73	mg/L
13/11/2018	0.78	mg/L
16/11/2018	0.81	mg/L
20/11/2018	0.85	mg/L
22/11/2018	0.83	mg/L
27/11/2018	0.81	mg/L
29/11/2018	0.79	mg/L
4/12/2018	0.77	mg/L
6/12/2018	0.81	mg/L
11/12/2018	0.84	mg/L
13/12/2018	0.77	mg/L
18/12/2018	0.73	mg/L
20/12/2018	0.75	mg/L
24/12/2018	0.14	mg/L
27/12/2018	0.77	mg/L

Parameter Fluoride
Supply Taitua Arboretum
Site Taitua Arboretum drinking-water Tap
Frequency Ad hoc previously - to be sampled six monthly
Method Ion Selective Electrode
Purpose Monitoring water quality

Sample Number	Sampling Date	Result	Units
2015005110	17/07/2015	<0.10	mg/L
2019004813	13/06/2019	0.050	mg/L
2020000377	16/01/2020	0.069	mg/L
2020000421	16/01/2020	0.066	mg/L

Parameter Fluoride
Supply Hamilton (HAM001)
Plant Waiora Treatment Plant (TP00066)
Zone Claudelands grandstand tap (HAM001CG)
Site Claudelands drinking-water fountain
Frequency Approximately once a week
Purpose Process control - indicates when membrane requires replacement (target <0.2mg/L based on level in Waikato River)

Sampling Date	Result	Units
4/01/2017	0.35	mg/L
12/01/2017	0.41	mg/L
16/01/2017	0.37	mg/L
24/01/2017	0.05	mg/L
1/02/2017	0.05	mg/L
9/02/2017	0.06	mg/L
17/02/2017	0.07	mg/L
21/02/2017	0.08	mg/L
23/02/2017	0.11	mg/L
2/03/2017	0.10	mg/L
8/03/2017	0.16	mg/L
16/03/2017	0.19	mg/L
20/03/2017	0.21	mg/L
28/03/2017	0.14	mg/L
31/03/2017	0.22	mg/L
4/04/2017	0.23	mg/L
10/04/2017	0.23	mg/L
20/04/2017	0.14	mg/L
28/04/2017	0.29	mg/L
5/05/2017	0.69	mg/L
9/05/2017	0.79	mg/L
17/05/2017	0.10	mg/L
22/05/2017	0.11	mg/L
1/06/2017	0.04	mg/L
9/06/2017	0.05	mg/L
15/06/2017	0.04	mg/L
22/06/2017	0.05	mg/L
28/06/2017	0.06	mg/L
4/07/2017	0.07	mg/L
10/07/2017	0.06	mg/L
19/07/2017	0.10	mg/L
28/07/2017	0.14	mg/L
1/08/2017	0.15	mg/L
7/08/2017	0.09	mg/L
10/08/2017	0.11	mg/L
16/08/2017	0.11	mg/L
21/08/2017	0.10	mg/L
23/08/2017	0.10	mg/L
29/08/2017	0.18	mg/L
1/09/2017	0.13	mg/L
5/09/2017	0.13	mg/L
6/09/2017	0.13	mg/L

2017	Fluoride	2018	Fluoride
minimum	0.04	minimum	0.05
maximum	0.79	maximum	0.52
average	0.16	average	0.19

11/09/2017	0.14	mg/L	
15/09/2017	0.13	mg/L	
20/09/2017	0.13	mg/L	
26/09/2017	0.16	mg/L	
29/09/2017	0.18	mg/L	
2/10/2017	0.16	mg/L	
10/10/2017	0.20	mg/L	
18/10/2017	0.21	mg/L	
26/10/2017	0.32	mg/L	
31/10/2017	0.25	mg/L	
3/11/2017	0.12	mg/L	
6/11/2017	0.24	mg/L	
8/11/2017	0.27	mg/L	
14/11/2017	0.04	mg/L	
16/11/2017	0.04	mg/L	
22/11/2017	0.06	mg/L	
30/11/2017	0.06	mg/L	
6/11/2017	0.09	mg/L	
30/11/2017	0.07	mg/L	
11/12/2017	0.08	mg/L	
19/12/2017	0.12	mg/L	
27/12/2017	0.17	mg/L	
4/01/2018	0.28	mg/L	
9/01/2018	0.22	mg/L	
17/01/2018	0.52	mg/L	
22/01/2018	0.48	mg/L	
1/02/2018	0.37	mg/L	
8/02/2018	0.23	mg/L	
12/02/2018	0.08	mg/L	
16/02/2018	0.09	mg/L	
20/02/2018	0.11	mg/L	
1/03/2018	0.08	mg/L	
6/03/2018	0.10	mg/L	
12/03/2018	0.12	mg/L	
20/03/2018	0.16	mg/L	
26/03/2018	0.14	mg/L	
4/04/2018	0.26	mg/L	
9/04/2018	0.30	mg/L	
17/04/2018	0.42	mg/L	
26/04/2018	0.42	mg/L	
2/05/2018	0.42	mg/L	
11/05/2018	0.05	mg/L	
17/05/2018	0.20	mg/L	
24/05/2018	0.29	mg/L	
30/05/2018	0.14	mg/L	
5/06/2018	0.17	mg/L	
14/06/2018	0.18	mg/L	
18/06/2018	0.08	mg/L	
26/06/2018	0.07	mg/L	
4/07/2018	0.09	mg/L	

9/07/2018	0.16	mg/L	
18/07/2018	0.18	mg/L	
27/07/2018	0.49	mg/L	
2/08/2018	0.32	mg/L	
14/08/2018	0.31	mg/L	
23/08/2018	0.38	mg/L	
5/09/2018	0.17	mg/L	
10/09/2018	0.13	mg/L	
12/09/2018	0.16	mg/L	
25/09/2018	0.11	mg/L	
1/10/2018	0.07	mg/L	
4/10/2018	0.06	mg/L	
9/10/2018	0.07	mg/L	
18/10/2018	0.11	mg/L	
29/10/2018	0.07	mg/L	
2/11/2018	0.11	mg/L	
14/11/2018	0.07	mg/L	
23/11/2018	0.09	mg/L	
6/12/2018	0.08	mg/L	
11/12/2018	0.09	mg/L	
13/12/2018	0.05	mg/L	
21/12/2018	0.10	mg/L	
27/12/2018	0.08	mg/L	

Parameter Fluoride
Supply Hamilton (HAM001)
Plant Waiora Treatment Plant (TP00066)
Site Waiora Treatment Plant - Post UV - immediately after fluoride addition
Frequency Sampled twice weekly
Method Ion Selective Electrode
Purpose Process monitoring

Sample Number	Date	Result	Units
2016009778	4/01/2017	0.54	mg/L
170104019	10/01/2017	0.68	mg/L
2017000167	12/01/2017	0.73	mg/L
2017000247	17/01/2017	0.68	mg/L
2017000342	19/01/2017	0.77	mg/L
2017000448	24/01/2017	0.19	mg/L
2017000551	26/01/2017	0.71	mg/L
2017000606	31/01/2017	0.53	mg/L
2017000703	2/02/2017	0.71	mg/L
2017000816	7/02/2017	0.65	mg/L
2017000943	9/02/2017	0.77	mg/L
2017001043	14/02/2017	0.55	mg/L
2017001123	16/02/2017	0.49	mg/L
2017001239	21/02/2017	0.67	mg/L
2017001318	23/02/2017	0.49	mg/L
2017001822	14/03/2017	0.99	mg/L
2017001892	16/03/2017	0.77	mg/L
2017002019	21/03/2017	1.01	mg/L
2017002097	23/03/2017	0.78	mg/L
2017002194	28/03/2017	0.78	mg/L
2017002286	30/03/2017	0.14	mg/L
2017002389	4/04/2017	0.76	mg/L
2017002511	6/04/2017	0.73	mg/L
2017002740	13/04/2017	0.11	mg/L
2017002801	18/04/2017	0.12	mg/L
2017002860	20/04/2017	0.14	mg/L
2017002950	24/04/2017	0.77	mg/L
2017003044	27/04/2017	0.24	mg/L
2017003130	2/05/2017	0.6	mg/L
2017003191	4/05/2017	0.81	mg/L
2017003462	9/05/2017	0.63	mg/L
2017003529	11/05/2017	0.38	mg/L
2017003612	16/05/2017	0.37	mg/L
2017003698	18/05/2017	0.12	mg/L
2017003803	23/05/2017	0.15	mg/L
2017003848	25/05/2017	0.95	mg/L
2017003926	30/05/2017	0.11	mg/L
2017003993	1/06/2017	0.16	mg/L
2017004044	6/06/2017	0.13	mg/L
2017004120	8/06/2017	0.75	mg/L
2017004226	13/06/2017	0.72	mg/L
2017004292	15/06/2017	0.71	mg/L
2017004372	20/06/2017	0.74	mg/L
2017004455	22/06/2017	0.42	mg/L
2017004532	27/06/2017	0.74	mg/L
2017004573	29/06/2017	0.36	mg/L
2017004695	4/07/2017	0.41	mg/L
2017004785	6/07/2017	0.75	mg/L
2017004917	11/07/2017	0.75	mg/L
2017004972	13/07/2017	0.61	mg/L
2017005071	18/07/2017	0.71	mg/L
2017005127	20/07/2017	0.64	mg/L
2017005253	25/07/2017	0.55	mg/L
2017005307	27/07/2017	0.94	mg/L
2017005388	1/08/2017	0.93	mg/L
2017005464	3/08/2017	0.93	mg/L
2017005557	8/08/2017	0.46	mg/L
2017005619	10/08/2017	0.74	mg/L
2017005684	15/08/2017	0.25	mg/L
2017005760	17/08/2017	0.62	mg/L
2017005832	22/08/2017	0.75	mg/L
2017005887	24/08/2017	0.39	mg/L
2017005997	29/08/2017	0.18	mg/L
2017006044	31/08/2017	0.29	mg/L
2017006169	5/09/2017	0.73	mg/L

2017	Fluoride	2018	Fluoride
minimum	0.11	minimum	0.12
maximum	1.01	maximum	0.96
average	0.58	average	0.70



2017006233	7/09/2017	0.85 mg/L
2017006332	12/09/2017	0.16 mg/L
2017006425	14/09/2017	0.79 mg/L
2017006557	19/09/2017	0.78 mg/L
2017006667	21/09/2017	0.81 mg/L
2017006765	26/09/2017	0.55 mg/L
2017006838	28/09/2017	0.83 mg/L
2017006958	3/10/2017	0.15 mg/L
2017007024	5/10/2017	0.33 mg/L
2017007141	10/10/2017	0.6 mg/L
2017007254	12/10/2017	0.86 mg/L
2017007343	17/10/2017	0.55 mg/L
2017007409	19/10/2017	0.61 mg/L
2017007497	24/10/2017	0.54 mg/L
2017007593	26/10/2017	0.59 mg/L
2017007683	31/10/2017	0.79 mg/L
2017007759	2/11/2017	0.18 mg/L
2017007875	7/11/2017	0.14 mg/L
2017007940	9/11/2017	0.73 mg/L
2017008028	14/11/2017	0.76 mg/L
2017008132	16/11/2017	0.23 mg/L
2017008220	21/11/2017	0.6 mg/L
2017008309	23/11/2017	0.46 mg/L
2017008404	28/11/2017	0.17 mg/L
2017008473	30/11/2017	0.68 mg/L
2017008612	5/12/2017	0.85 mg/L
2017008703	7/12/2017	0.63 mg/L
2017008830	12/12/2017	0.83 mg/L
2017008902	14/12/2017	0.52 mg/L
2017009015	19/12/2017	0.76 mg/L
2017009099	21/12/2017	0.91 mg/L
2017009190	27/12/2017	0.73 mg/L
2017009238	28/12/2017	0.43 mg/L
2017009307	3/01/2018	0.49 mg/L
2017009379	4/01/2018	0.19 mg/L
2018000019	9/01/2018	0.86 mg/L
2018000099	11/01/2018	0.92 mg/L
2018000199	16/01/2018	0.95 mg/L
2018000316	18/01/2018	0.96 mg/L
2018000436	23/01/2018	0.81 mg/L
2018000533	25/01/2018	0.76 mg/L
2018000606	30/01/2018	0.89 mg/L
2018000695	1/02/2018	0.93 mg/L
2018000848	7/02/2018	0.83 mg/L
2018000906	8/02/2018	0.23 mg/L
2018001004	13/02/2018	0.71 mg/L
2018001097	15/02/2018	0.67 mg/L
2018001194	20/02/2018	0.43 mg/L
2018001252	23/02/2018	0.17 mg/L
2018001355	27/02/2018	0.85 mg/L
2018001434	1/03/2018	0.73 mg/L
2018001570	6/03/2018	0.72 mg/L
2018001661	8/03/2018	0.71 mg/L
2018001751	13/03/2018	0.6 mg/L
2018001845	15/03/2018	0.66 mg/L
2018001966	20/03/2018	0.59 mg/L
2018002044	22/03/2018	0.84 mg/L
2018002137	27/03/2018	0.18 mg/L
2018002206	29/03/2018	0.8 mg/L
2018002280	3/04/2018	0.7 mg/L
2018002392	5/04/2018	0.46 mg/L
2018002523	10/04/2018	0.83 mg/L
2018002608	12/04/2018	0.28 mg/L
2018003249	8/05/2018	0.78 mg/L
2018003341	10/05/2018	0.43 mg/L
2018003440	15/05/2018	0.77 mg/L
2018003529	17/05/2018	0.91 mg/L
2018003732	22/05/2018	0.76 mg/L
2018003811	24/05/2018	0.8 mg/L
2018003958	29/05/2018	0.72 mg/L
2018004004	31/05/2018	0.81 mg/L
2018004127	5/06/2018	0.83 mg/L
2018004235	7/06/2018	0.12 g/m3

2018004391	12/06/2018	0.67	g/m3
2018004467	14/06/2018	0.89	g/m3
2018004610	19/06/2018	0.14	g/m3
2018004671	21/06/2018	0.84	g/m3
2018004793	26/06/2018	0.84	g/m3
2018004876	28/06/2018	0.72	g/m3
2018005089	5/07/2018	0.61	g/m3
2018005469	19/07/2018	0.8	mg/L
2018005601	25/07/2018	0.75	mg/L
2018005663	26/07/2018	0.15	mg/L
2018005783	31/07/2018	0.81	mg/L
2018005896	2/08/2018	0.16	mg/L
2018005996	7/08/2018	0.82	mg/L
2018006069	9/08/2018	0.94	mg/L
2018006171	14/08/2018	0.85	mg/L
2018006251	16/08/2018	0.92	mg/L
2018006388	21/08/2018	0.87	mg/L
2018006680	24/08/2018	0.79	mg/L
2018006758	28/08/2018	0.72	mg/L
2018006863	30/08/2018	0.71	mg/L
2018007038	4/09/2018	0.76	mg/L
2018007110	6/09/2018	0.79	mg/L
2018007202	11/09/2018	0.79	mg/L
2018007325	13/09/2018	0.78	mg/L
2018007462	18/09/2018	0.81	mg/L
2018007552	20/09/2018	0.74	mg/L
2018007751	25/09/2018	0.92	mg/L
2018007827	27/09/2018	0.87	mg/L
2018007950	2/10/2018	0.76	mg/L
2018008038	4/10/2018	0.83	mg/L
2018008147	9/10/2018	0.79	mg/L
2018008248	11/10/2018	0.79	mg/L
2018008358	16/10/2018	0.88	mg/L
2018008418	18/10/2018	0.85	mg/L
2018008495	23/10/2018	0.76	mg/L
2018008586	25/10/2018	0.14	mg/L
2018008792	30/10/2018	0.71	mg/L
2018008876	1/11/2018	0.72	mg/L
2018009025	6/11/2018	0.75	mg/L
2018009104	8/11/2018	0.78	mg/L
2018009204	13/11/2018	0.82	mg/L
2018009282	16/11/2018	0.81	mg/L
2018009363	20/11/2018	0.84	mg/L
2018009530	22/11/2018	0.88	mg/L
2018009655	27/11/2018	0.81	mg/L
2018009702	29/11/2018	0.78	mg/L
2018009968	4/12/2018	0.74	mg/L
2018010049	6/12/2018	0.14	mg/L
2018010168	11/12/2018	0.17	mg/L
2018010254	13/12/2018	0.76	mg/L
2018010417	18/12/2018	0.71	mg/L
2018010522	20/12/2018	0.74	mg/L
2018010578	24/12/2018	0.73	mg/L
2018010604	27/12/2018	0.79	mg/L