

Introduction

Hamilton City Council is committed to providing safe, high quality drinking-water. Hamilton's multi-barrier water treatment, distribution and management systems ensure that when water reaches consumers it is free from harmful contaminants.

Water quality and safety is monitored at the Waiora Treatment Plant and in each of the seven supply zones in accordance with the Drinking-water Standards for New Zealand 2005 (Revised 2018) (DWSNZ). The DWSNZ specify the Maximum Acceptable Values (MAVs) of microorganisms, organic and inorganic chemicals that are of health significance and specify requirements that must be met during treatment and in the distribution. Hamilton City Council reports to the Waikato District Health Board Drinking-water Assessor who reviews and audits compliance data and information. The Ministry of Health gathers this information on a national basis to produce the Annual Report on Drinking-water Quality.

Hamilton City Council undertakes additional testing for chemicals of health significance or for those that can affect the aesthetic quality of water (taste, odour and appearance) in water leaving the plant and the reticulation. These results are not used for compliance purposes but provide additional assurance that Hamilton's water quality remains high. Comprehensive chemical monitoring results are included in this report, along with DWSNZ compliance summaries.

Hamilton City Council complied with the requirements of the DWSNZ and met duties under part 2A (Drinking water) of the Health Act 1956 for the latest annual compliance period (1st July 2018-30th June 2019).

Waiora Treatment Plant Compliance Monitoring

Continuous online monitoring is undertaken at the Waiora Treatment Plant to ensure the plant is operating effectively and within the requirements of the DWSNZ. This data also provides valuable information required to make operational decisions and to optimise the treatment process. Continuously monitored parameters include turbidity of water leaving filters and disinfection criteria like UV dose, chlorine concentration and pH.

Microbiological Compliance

Under the DWSNZ, bacterial disinfection compliance at Waiora Treatment Plant is achieved through the addition of chlorine. Protozoa removal (Giardia and Cryptosporidium) is based on the ability of different treatment barriers to reduce protozoa numbers. The Waiora Treatment Plant is required to achieve at least 3.0 log credit removal of protozoa from the source water. The treatment barriers that are in place at Waiora Treatment Plant are capable of providing 7.0 log credit removal.

Process	Possible protozoa log credits
Coagulation, Sedimentation and Filtration	3.0
Enhanced Individual Filtration	1.0
UV Disinfection	3.0

Chemical Compliance (P2a - Fluoride)

Hamilton City Council adds fluoride to drinking-water for dental health purposes. While online monitoring controls the process, samples are required to be taken under the DWSNZ to verify that concentrations of fluoride in water leaving the plant are well below the MAV.

Summary of Waiora Treatment Plant Annual Compliance Results

	Protozoa	Bacterial	Chemical (P2a)
	Achieved	Achieved	Achieved
2018 Q3 (July – Sept)	✓	✓	✓
2018 Q4 (Oct – Dec)	✓	✓	✓
2019 Q1 (Jan – Mar)	✓	✓	✓
2019 Q2 (Apr – June)	✓	✓	✓

Distribution Supply Zone Annual Compliance 2018/2019

Zone Compliance Monitoring

Under the DWSNZ, E. coli is used as the indicator for microbiological contamination in the distribution. This means that while E. coli itself will not generally cause illness, it provides an indication that water is contaminated with faecal material that could contain other illness causing microorganisms.

E. coli monitoring occurs at sites throughout the Hamilton supply network, including reservoirs. This routine testing also includes total coliforms and heterotrophic plate counts which are useful indicators of general microbiological quality of the water, as well as chlorine, pH and turbidity which are all important in understanding the demands on the chlorine disinfection residual in the network. Only E. coli data is used for compliance and the frequency of monitoring in each supply zone depends on the population size. The table below summarises the guideline or MAV values specified in the DWSNZ for these parameters (not available for Total coliforms of HPC).

Maximum Acceptable Values (MAVs) and Guideline Values (GV) from the DWSNZ

Determinand	Guideline Value	Maximum Acceptable Value	Unit
Chlorine Residual	0.6-1.2	5	mg/L
Turbidity	<2.5	-	NTU
pH	7.0-8.5	-	pH Units
E. coli	-	<1	MPN/100mL

The results for the key parameters measured during monitoring for bacterial compliance in each of the Hamilton City Council supply zones is summarised in the tables below.

Please note, the Claudelands Grandstand drinking-water fountain is registered as its own supply as the water from the Hamilton City Supply zone undergoes further treatment to reduce fluoride levels back to those found in the Waikato River (around 0.2mg/L). Chlorine is also added back into the water.

Hamilton City Council also provides a UV-treated drinking-water supply tap at Taitua Arboretum from a bore located at the Arboretum. As a specified self-supply, the monitoring data for Taitua Arboretum is not currently required to be submitted for DWSNZ compliance.

Distribution Supply Zone Annual Compliance 2018/2019

Hamilton City Supply Zone (includes Reservoirs)

Registered Population: 167,635

637 samples	Chlorine Residual (mg/L)	Turbidity(NTU)	pH	E. coli (MPN/100mL)
Minimum	0.30	0.12	6.80	<1
Maximum	0.92	0.99	8.30	<1
Average	0.61	0.38	7.60	no transgressions

Temple View Supply Zone

Registered Population: 1,430

81 samples	Chlorine Residual (mg/L)	Turbidity(NTU)	pH	E. coli (MPN/100mL)
Minimum	0.43	0.14	7.00	<1
Maximum	0.84	0.65	7.80	<1
Average	0.64	0.34	7.54	no transgressions

Ruakura/Ryburn Road Supply Zone

Registered Population: 151

15 samples	Chlorine Residual (mg/L)	Turbidity(NTU)	pH	E. coli (MPN/100mL)
Minimum	0.30	0.25	7.15	<1
Maximum	0.82	0.79	7.70	<1
Average	0.59	0.36	7.50	no transgressions

SH26, Morrinsville Road Supply Zone

Registered Population: 57

15 samples	Chlorine Residual (mg/L)	Turbidity(NTU)	pH	E. coli (MPN/100mL)
Minimum	0.48	0.21	7.00	<1
Maximum	0.78	0.47	7.80	<1
Average	0.70	0.31	7.49	no transgressions

Powells Road Supply Zone

Registered Population: 20

18 samples	Chlorine Residual (mg/L)	Turbidity(NTU)	pH	E. coli (MPN/100mL)
Minimum	0.52	0.21	7.00	<1
Maximum	0.70	0.65	7.90	<1
Average	0.63	0.35	7.61	no transgressions

Distribution Supply Zone Annual Compliance 2018/2019

Greenhill Road Supply Zone

Registered Population: 17

16 samples	Chlorine Residual (mg/L)	Turbidity(NTU)	pH	E. coli (MPN/100mL)
Minimum	0.42	0.24	7.40	<1
Maximum	0.71	0.63	8.10	<1
Average	0.60	0.38	7.79	no transgressions

Claudlands Grandstand Drinking Water Fountain

60 samples	Chlorine Residual (mg/L)	Turbidity(NTU)	pH	E. coli (MPN/100mL)
Minimum	0.02	0.06	6.50	<1
Maximum	1.00	0.47	7.80	<1
Average	0.57	0.17	6.97	no transgressions

Taitua Arboretum (no chlorine residual)

72 samples	Chlorine Residual (mg/L)	Turbidity(NTU)	pH
Minimum	0.25	6.10	<1
Maximum	0.97	7.70	<1
Average	0.46	6.52	no transgressions

Comprehensive Chemical Analysis of Hamilton Drinking Water 2018/2019

The following reports are not used for DWNZ compliance but are used to monitor for potential changes in our water supply and provide useful data to assurance consumers that the Hamilton drinking-water supply is safe to drink.

Comprehensive Chemical Analysis of Water Leaving Waioira Treatment Plant 2018/2019

The Guideline Values (GVs) and Maximum Acceptable Values (MAVs) are defined in the Ministry of Health Drinking-water Standards for New Zealand 2005 (Revised 2008). MAVs relate to parameters of health significance and should not be exceeded. GVs are the limits for aesthetic determinands that, if exceeded, may render the water unattractive to consumers.

BDL = Below Detection Limit

Test	Unit	Detection Limit	No. Samples	No. of Detectable results	Min.	Max.	Average	MAV	Complies	GV	Meets
Individual Tests											
True Hazen Colour	Hazen units	10	2	1	BDL	10.0	≤10			10	✓
pH	pH units	0.1	2	2	6.8	7.3	7.1			7.0-8.5	✓
Total Alkalinity	g/m ³ as CaCO ₃	1.0	1	1	30.4	30.4	30.4				
Total Hardness	g/m ³ as CaCO ₃	1.0	2	2	27	41	34			100-300	✓
Electrical Conductivity (EC)	mS/m	0.1	2	2	16.4	17.5	17.0				
Total Dissolved Solids (TDS)	g/m ³	10	2	2	120	129	125			1000	✓
Dissolved Calcium	g/m ³	0.05	2	2	6.3	12.1	9.2				
Total Iodine	g/m ³	0.001	2	2	0.0010	0.0016	0.0013				
Dissolved Iron	g/m ³	0.02	4	0	BDL	BDL	BDL				
Dissolved Magnesium	g/m ³	0.02	2	2	2.7	2.7	2.7				
Dissolved Manganese	g/m ³	0.0005	4	0	BDL	BDL	BDL				
Dissolved Potassium	g/m ³	0.05	4	4	2.9	3.6	3.2				
Dissolved Sodium	g/m ³	0.02	2	2	13.9	18.7	16.3				
Bromide	g/m ³	0.05	2	0	BDL	BDL	BDL				
Bromate	g/m ³	0.005	2	0	BDL	BDL	BDL	0.01	✓		
Total Cyanide	g/m ³	0.001	2	0	BDL	BDL	BDL	0.6	✓		
Chloride	g/m ³	0.5	2	2	13.5	15.7	14.6			250	✓
Chlorite	g/m ³	0.005	2	0	BDL	BDL	BDL	0.8	✓		
Chlorate	g/m ³	0.005	2	0	BDL	BDL	BDL	0.8	✓		
Total Ammoniacal-N	g/m ³	0.01	2	0	BDL	BDL	BDL				
Nitrite-N	g/m ³	0.002	2	0	BDL	BDL	BDL	0.2	✓		
Nitrate-N	g/m ³	0.001	2	2	0.37	0.56	0.47	50	✓		
Nitrate-N + Nitrite-N	g/m ³	0.002	2	2	0.37	0.56	0.47				

Comprehensive Chemical Analysis of Water Leaving Waioira Treatment Plant 2018/2019

Test	Unit	Detection Limit	No. Samples	No. of Detectable results	Min.	Max.	Average	MAV	Complies	GV	Meets
Reactive Silica	g/m ³ as SiO ₂	0.1	2	2	31.0	35.0	33.0				
Un-ionised hydrogen sulphide	g/m ³	0.002	2	0	BDL	BDL	BDL				
Total Sulphide	g/m ³	0.002	2	0	BDL	BDL	BDL				
Sulphate	g/m ³	0.5	2	2	21.0	26.0	23.5		250	✓	
Dissolved Organic Carbon (DOC)	g/m ³	0.5	1	1	BDL	1.0	1.0				
Total Organic Carbon (TOC)	g/m ³	0.5	4	2	BDL	1.1	1.0				
Trace Metals											
Total Aluminium	g/m ³	0.0032	4	4	0.006	0.022	0.017		0.1	✓	
Total Antimony	g/m ³	0.00021	4	4	0.00043	0.00072	0.00055	0.02	✓		
Total Arsenic	g/m ³	0.0011	13	10	BDL	0.0035	≤0.0021	0.01	✓		
Total Barium	g/m ³	0.0053	2	2	0.0154	0.0169	0.0162	0.7	✓		
Total Beryllium	g/m ³	0.00011	2	0	BDL	BDL	BDL				
Total Boron	g/m ³	0.0053	2	2	0.189	0.200	0.195	1.4	✓		
Total Cadmium	g/m ³	0.000053	2	0	BDL	BDL	BDL	0.004	✓		
Total Calcium	g/m ³	0.053	4	4	6.0	12.5	10.7				
Total Chromium	g/m ³	0.00053	2	0	BDL	BDL	BDL	0.05	✓		
Total Copper	g/m ³	0.00053	4	2	BDL	0.00118	≤0.000875	2.0	✓	1	✓
Total Iron	g/m ³	0.021	4	0	BDL	BDL	BDL			0.2	✓
Total Lead	g/m ³	0.00011	4	0	BDL	BDL	BDL	0.01	✓		
Total Lithium	g/m ³	0.00021	2	2	0.054	0.065	0.060				
Total Magnesium	g/m ³	0.021	2	2	2.6	2.8	2.7				
Total Manganese	g/m ³	0.00053	4	3	BDL	0.00103	≤0.00092	0.4	✓	0.04	✓
Total Mercury	g/m ³	0.00008	2	0	BDL	BDL	BDL	0.007	✓		
Total Molybdenum	g/m ³	0.00021	2	2	0.00023	0.00058	0.00041	0.07	✓		
Total Nickel	g/m ³	0.00053	2	0	BDL	BDL	BDL	0.08	✓		
Total Potassium	g/m ³	0.053	2	2	2.9	3.4	3.2				
Total Selenium	g/m ³	0.0011	2	0	BDL	BDL	BDL				
Total Silver	g/m ³	0.00011	2	0	BDL	BDL	BDL				
Total Sodium	g/m ³	0.021	2	2	13.8	17.9	15.9			200	✓
Total Tin	g/m ³	0.00053	2	0	BDL	BDL	BDL				

Comprehensive Chemical Analysis of Water Leaving Waiora Treatment Plant 2018/2019

Test	Unit	Detection Limit	No. Samples	No. of Detectable results	Min.	Max.	Average	MAV	Complies	GV	Meets
Total Uranium	g/m ³	0.000021	2	0	BDL	BDL	BDL				
Total Zinc	g/m ³	0.0011	4	4	0.0019	0.0047	0.0034			1.5	✓
Halogenated Acetic Acids											
Bromochloroacetic acid	g/m ³	0.004	2	1	BDL	0.0008	≤0.0008				
Dibromoacetic acid	g/m ³	0.004	2	0	BDL	BDL	BDL				
Dichloroacetic acid	g/m ³	0.004	2	0	BDL	BDL	BDL	0.05	✓		
Monobromoacetic acid	g/m ³	0.004	2	0	BDL	BDL	BDL				
Monochloroacetic acid	g/m ³	0.005	2	0	BDL	BDL	BDL	0.02	✓		
Trichloroacetic acid	g/m ³	0.004	2	0	BDL	BDL	BDL	0.2	✓		
Total HAA	g/m ³	0.03	2	0	BDL	BDL	BDL				
Sum of HAA DWSNZ MAV ratios			2	0	BDL	BDL	BDL				
Halogenated Volatile Disinfection By-Products											
Sum of Haloacetonitriles DWSNZ MAV ratios			2	1	BDL	0.018	≤0.018				
Bromochloroacetonitrile	g/m ³	0.0002	2	2	0.0003	0.0005	0.0004				
Bromodichloromethane	g/m ³	0.00007	2	2	0.00163	0.00280	0.00222	0.06	✓		
Bromoform (tribromomethane)	g/m ³	0.00007	2	2	0.00060	0.00085	0.00073	0.1	✓		
Carbon tetrachloride	g/m ³	0.0007	2	0	BDL	BDL	BDL	0.005	✓		
Chloroform (Trichloromethane)	g/m ³	0.007	2	0	BDL	BDL	BDL	0.4	✓		
Chloropicrin	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,2-Dibromo-3-chloropropane	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.001	✓		
Dibromoacetonitrile	g/m ³	0.0003	2	1	BDL	0.0005	≤0.0005	0.08	✓		
Dibromochloromethane	g/m ³	0.00007	2	2	0.00177	0.00330	0.00254	0.15	✓		
1,2-Dibromoethane (ethylene dibromide, EDB)	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.0004	✓		
1,1-Dichloro-2-propanone	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Dichloroacetonitrile	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.02	✓		
Tetrachloroethene (tetrachloroethylene)	g/m ³	0.0002	2	0	BDL	BDL	BDL	0.05	✓		
1,1,1-Trichloro-2-propanone	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Trichloroacetonitrile	g/m ³	0.0003	2	0	BDL	BDL	BDL				

Comprehensive Chemical Analysis of Water Leaving Waiora Treatment Plant 2018/2019

Test	Unit	Detection Limit	No. Samples	No. of Detectable results	Min.	Max.	Average	MAV	Complies	GV	Meets
1,1,1-Trichloroethane	g/m ³	0.0002	2	0	BDL	BDL	BDL				
Trichloroethene (trichloroethylene)	g/m ³	0.00007	2	0	BDL	BDL	BDL	0.02	✓		
Total Trihalomethanes (THM)	g/m ³	0.007	2	1	BDL	0.007	≤0.007				
Chloroform MAV ratio	g/m ³	0.018	2	0	BDL	BDL	BDL				
Bromodichloromethane MAV ratio		0.002	2	2	0.027	0.047	0.037				
Dibromochloromethane MAV ratio		0.001	2	2	0.012	0.022	0.017				
Bromoform MAV ratio			2	2	0.006	0.009	0.008				
Sum of THM DWSNZ MAV ratios			2	2	0.045	0.078	0.062	1	✓		
Pesticides											
Alachlor	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.02	✓		
Aldrin	g/m ³	0.000005	2	0	BDL	BDL	BDL				
Atrazine	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.002	✓		
Atrazine-desethyl	g/m ³	0.00004	2	0	BDL	BDL	BDL				
Atrazine-desisopropyl	g/m ³	0.00008	2	0	BDL	BDL	BDL				
Azinphos-methyl	g/m ³	0.00008	2	0	BDL	BDL	BDL	0.004	✓		
gamma-BHC (Lindane)	g/m ³	0.00001	2	0	BDL	BDL	BDL	0.002	✓		
Bromacil	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.4	✓		
Carbofuran	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.008	✓		
cis-Chlordane	g/m ³	0.000005	2	0	BDL	BDL	BDL				
trans-Chlordane	g/m ³	0.000005	2	0	BDL	BDL	BDL				
Chlorpyrifos	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.04	✓		
Chlorpyrifos-methyl	g/m ³	0.00004	2	0	BDL	BDL	BDL				
Chlortoluron	g/m ³	0.00008	2	0	BDL	BDL	BDL	0.04	✓		
Cyanazine	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.0007	✓		
2,4'-DDD	g/m ³	0.00001	2	0	BDL	BDL	BDL				
4,4'-DDD	g/m ³	0.00001	2	0	BDL	BDL	BDL				
2,4'-DDE	g/m ³	0.00001	2	0	BDL	BDL	BDL				
4,4'-DDE	g/m ³	0.00001	2	0	BDL	BDL	BDL				

Comprehensive Chemical Analysis of Water Leaving Waiora Treatment Plant 2018/2019

Test	Unit	Detection Limit	No. Samples	No. of Detectable results	Min.	Max.	Average	MAV	Complies	GV	Meets
2,4'-DDT	g/m ³	0.00001	2	0	BDL	BDL	BDL				
4,4'-DDT	g/m ³	0.00001	2	0	BDL	BDL	BDL				
Diazinon	g/m ³	0.00002	2	0	BDL	BDL	BDL				
Dieldrin	g/m ³	0.000005	2	0	BDL	BDL	BDL				
Dimethoate	g/m ³	0.00008	2	0	BDL	BDL	BDL	0.008	✓		
Diuron	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.02	✓		
Endrin	g/m ³	0.000005	2	0	BDL	BDL	BDL	0.001	✓		
Endrin aldehyde	g/m ³	0.000005	2	0	BDL	BDL	BDL				
Endrin ketone	g/m ³	0.00001	2	0	BDL	BDL	BDL				
Heptachlor	g/m ³	0.000005	2	0	BDL	BDL	BDL				
Heptachlor epoxide	g/m ³	0.000005	2	0	BDL	BDL	BDL				
Hexachlorobenzene	g/m ³	0.00004	2	0	BDL	BDL	BDL				
Hexazinone	g/m ³	0.00002	2	0	BDL	BDL	BDL	0.4	✓		
Malathion	g/m ³	0.00004	2	0	BDL	BDL	BDL				
Metalaxyl	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.1	✓		
Methoxychlor	g/m ³	0.000005	2	0	BDL	BDL	BDL	0.02	✓		
Metolachlor	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.01	✓		
Metribuzin	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.07	✓		
Molinate	g/m ³	0.00008	2	0	BDL	BDL	BDL	0.007	✓		
Oxadiazon	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.2	✓		
Parathion-methyl	g/m ³	0.00004	2	0	BDL	BDL	BDL				
Pendimethalin	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.02	✓		
Permethrin	g/m ³	0.00002	2	0	BDL	BDL	BDL				
Pirimiphos-methyl	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.1	✓		
Procymidone	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.7	✓		
Prometryn	g/m ³	0.00002	2	0	BDL	BDL	BDL				
Propanil	g/m ³	0.0002	2	0	BDL	BDL	BDL				
Propazine	g/m ³	0.00002	2	0	BDL	BDL	BDL	0.07	✓		

Comprehensive Chemical Analysis of Water Leaving Waiora Treatment Plant 2018/2019

Test	Unit	Detection Limit	No. Samples	No. of Detectable results	Min.	Max.	Average	MAV	Complies	GV	Meets
Pyriproxyfen	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.4	✓		
Simazine	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.002	✓		
Terbacil	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.04	✓		
Terbutylazine	g/m ³	0.00002	2	0	BDL	BDL	BDL	0.008	✓		
Terbutylazine-desethyl	g/m ³	0.00004	2	0	BDL	BDL	BDL				
Thiabendazole	g/m ³	0.0002	2	0	BDL	BDL	BDL	0.4	✓		
Total Chlordane [(cis+trans)*100/42]	g/m ³	0.00002	2	0	BDL	BDL	BDL				
Trifluralin	g/m ³	0.00004	2	0	BDL	BDL	BDL	0.03	✓		
Volatile Organic Compounds - BTEX											
Benzene	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.01	✓		
Toluene	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.8	✓	0.03	✓
Ethylbenzene	g/m ³	0.0005	2	0	BDL	BDL	BDL	0.3	✓	0.002	✓
m&p-Xylene	g/m ³	0.0005	2	0	BDL	BDL	BDL				
o-Xylene	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Volatile Organic Compounds - Halogenated Aliphatics											
Bromomethane (Methyl Bromide)	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Carbon tetrachloride	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.005	✓		
Chloroethane	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Chloromethane	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,2-Dibromo-3-chloropropane	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.001	✓		
1,2-Dibromoethane (ethylene dibromide, EDB)	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.0004	✓		
Dibromomethane	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Dichlorodifluoromethane	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,1-Dichloroethane	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,2-Dichloroethane	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.03	✓		
1,1-Dichloroethene	g/m ³	0.0003	2	0	BDL	BDL	BDL				
cis-1,2-Dichloroethene	g/m ³	0.0003	2	0	BDL	BDL	BDL				
trans-1,2-Dichloroethene	g/m ³	0.0003	2	0	BDL	BDL	BDL				

Comprehensive Chemical Analysis of Water Leaving Waiora Treatment Plant 2018/2019

Test	Unit	Detection Limit	No. Samples	No. of Detectable results	Min.	Max.	Average	MAV	Complies	GV	Meets
Dichloromethane (methylene chloride)	g/m ³	0.010	2	0	BDL	BDL	BDL	0.02	✓		
1,2-Dichloropropane	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.05	✓		
1,3-Dichloropropane	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,1-Dichloropropene	g/m ³	0.0003	2	0	BDL	BDL	BDL				
cis-1,3-Dichloropropene	g/m ³	0.0005	2	0	BDL	BDL	BDL				
trans-1,3-Dichloropropene	g/m ³	0.0005	2	0	BDL	BDL	BDL				
Hexachlorobutadiene	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.0007	✓		
1,1,1,2-Tetrachloroethane	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,1,2,2-Tetrachloroethane	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Tetrachloroethene (tetrachloroethylene)	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.05	✓		
1,1,1-Trichloroethane	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,1,2-Trichloroethane	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Trichloroethene (trichloroethylene)	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.02	✓		
Trichlorofluoromethane	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,2,3-Trichloropropane	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,1,2-Trichlorotrifluoroethane (Freon113)	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Vinyl chloride	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.0003	✓		
Volatile Organic Compounds - Halogenated Aromatics											
Bromobenzene	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Chlorobenzene (monochlorobenzene)	g/m ³	0.0003	2	0	BDL	BDL	BDL				
2-Chlorotoluene	g/m ³	0.0003	2	0	BDL	BDL	BDL				
4-Chlorotoluene	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,2-Dichlorobenzene	g/m ³	0.0003	2	0	BDL	BDL	BDL	1.5	✓	0.001	✓
1,3-Dichlorobenzene	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,4-Dichlorobenzene	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.4	✓	0.0003	✓
1,2,3-Trichlorobenzene	g/m ³	0.0003	2	0	BDL	BDL	BDL			0.01	✓
1,2,4-Trichlorobenzene	g/m ³	0.0003	2	0	BDL	BDL	BDL			0.005	✓
1,3,5-Trichlorobenzene	g/m ³	0.0003	2	0	BDL	BDL	BDL			0.05	✓

Comprehensive Chemical Analysis of Water Leaving Waiora Treatment Plant 2018/2019

Test	Unit	Detection Limit	No. Samples	No. of Detectable results	Min.	Max.	Average	MAV	Complies	GV	Meets
Volatile Organic Compounds - Monoaromatic Hydrocarbons											
n-Butylbenzene	g/m ³	0.0005	2	0	BDL	BDL	BDL				
tert-Butylbenzene	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Isopropylbenzene (Cumene)	g/m ³	0.0005	2	0	BDL	BDL	BDL				
4-Isopropyltoluene (p-Cymene)	g/m ³	0.0005	2	0	BDL	BDL	BDL				
n-Propylbenzene	g/m ³	0.0005	2	0	BDL	BDL	BDL				
sec-Butylbenzene	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Styrene	g/m ³	0.0005	2	0	BDL	BDL	BDL	0.03	✓	0.004	✓
1,2,4-Trimethylbenzene	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,3,5-Trimethylbenzene	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Volatile Organic Compounds - Ketones											
Acetone	g/m ³	0.05	2	0	BDL	BDL	BDL				
2-Butanone (MEK)	g/m ³	0.05	2	0	BDL	BDL	BDL				
Methyl tert-butylether (MTBE)	g/m ³	0.0003	2	0	BDL	BDL	BDL				
4-Methylpentan-2-one (MIBK)	g/m ³	0.010	2	0	BDL	BDL	BDL				
Volatile Organic Compounds - Trihalomethanes											
Bromodichloromethane	g/m ³	0.0003	2	2	0.0016	0.0028	0.0022	0.06	✓		
Bromoform (tribromomethane)	g/m ³	0.0003	2	2	0.0004	0.0008	0.0006	0.1	✓		
Chloroform (Trichloromethane)	g/m ³	0.0003	2	2	0.0012	0.0018	0.0015	0.4	✓		
Dibromochloromethane	g/m ³	0.0003	2	2	0.0016	0.0034	0.0025				
Other Volatile Organic Compounds											
Carbon disulphide	g/m ³	0.0005	2	0	BDL	BDL	BDL				
Naphthalene	g/m ³	0.0005	2	0	BDL	BDL	BDL				

Comprehensive Chemical Analysis of Hamilton Water Supply 2018/2019

The Guideline Values (GVs) and Maximum Acceptable Values (MAVs) are defined in the Ministry of Health Drinking-water Standards for New Zealand 2005 (Revised 2008). MAVs relate to parameters of health significance and should not be exceeded. GV is the limits for aesthetic determinands that, if exceeded, may make the water unattractive to consumers.

BDL = Below Detection Limit

Test	Unit	Detection Limit	No. of Samples	No. of Detectable Results	Min.	Max.	Average	MAV	Complies	GV	Meets
Individual Tests											
Total Hardness	g/m ³ as CaCO ₃	1.0	2	2	35	41	38			200	✓
Dissolved Calcium	g/m ³	0.05	2	2	10.0	12.5	11.3				
Dissolved Magnesium	g/m ³	0.02	2	2	2.3	2.5	2.4				
Nitrite-N	g/m ³	0.002	2	0	BDL	BDL	BDL	0.2	✓		
Nitrate-N	g/m ³	0.001	2	2	0.30	0.57	0.44	50	✓		
Nitrate-N + Nitrite-N	g/m ³	0.002	2	2	0.30	0.57	0.44				
Reactive Silica	g/m ³ as SiO ₂	0.1	2	2	35	38	36.50				
Trace Metals											
Total Aluminium	g/m ³	0.0032	2	2	0.0140	0.0166	0.0153			0.1	✓
Total Antimony	g/m ³	0.00021	2	2	0.00047	0.00069	0.00058	0.02	✓		
Total Arsenic	g/m ³	0.0011	2	1	BDL	0.0029	≤0.0029	0.01	✓		
Total Barium	g/m ³	0.0053	2	2	0.0150	0.0179	0.0165	0.7	✓		
Total Beryllium	g/m ³	0.00011	2	0	BDL	BDL	BDL				
Total Boron	g/m ³	0.0053	2	2	0.20	0.28	0.24	1.4	✓		
Total Cadmium	g/m ³	0.000053	2	0	BDL	BDL	BDL	0.004	✓		
Total Calcium	g/m ³	0.053	2	2	10.40	12.50	11.45				
Total Chromium	g/m ³	0.00053	2	0	BDL	BDL	BDL	0.05	✓		
Total Copper	g/m ³	0.00053	2	2	0.0031	0.0039	0.0035	2	✓	1	✓
Total Iron	g/m ³	0.021	2	0	BDL	BDL	BDL			0.2	✓
Total Lead	g/m ³	0.00011	2	2	0.00011	0.00083	0.00047	0.01	✓		
Total Lithium	g/m ³	0.00021	2	2	0.066	0.096	0.081				
Total Magnesium	g/m ³	0.021	2	2	2.3	2.7	2.5				
Total Manganese	g/m ³	0.00053	2	1	0.0007	0.0007	0.0007	0.4	✓	0.04	✓
Total Mercury	g/m ³	0.00008	2	0	BDL	BDL	BDL	0.007	✓		
Total Molybdenum	g/m ³	0.00021	2	2	BDL	0.0004	≤0.0004	0.07	✓		
Total Nickel	g/m ³	0.00053	2	0	BDL	BDL	BDL	0.08	✓		

Comprehensive Chemical Analysis of Hamilton Water Supply 2018/2019

Test	Unit	Detection Limit	No. of Samples	No. of Detectable Results	Min.	Max.	Average	MAV	Complies	GV	Meets
Total Potassium	g/m ³	0.053	2	2	3.0	3.7	3.4				
Total Selenium	g/m ³	0.0011	2	0	BDL	BDL	BDL	0.01	✓		
Total Silver	g/m ³	0.00011	2	0	BDL	BDL	BDL				
Total Sodium	g/m ³	0.021	2	2	14.9	22.0	18.5			200	✓
Total Tin	g/m ³	0.00053	2	0	BDL	BDL	BDL				
Total Uranium	g/m ³	0.000021	2	0	BDL	BDL	BDL	0.02	✓		
Total Zinc	g/m ³	0.0011	2	2	0.0037	0.0070	0.0054			1.5	✓
Halogenated Volatile Disinfection By-Products											
Sum of Haloacetonitriles MAV ratios	ratio		2	2	0.016	0.027	0.022				
Bromochloroacetonitrile	g/m ³	0.00014	2	2	0.0005	0.0008	0.0007				
Bromodichloromethane	g/m ³	0.00007	2	2	0.0039	0.0045	0.0042	0.06	✓		
Bromoform (tribromomethane)	g/m ³	0.00007	2	2	0.00111	0.00119	0.00115	0.1	✓		
Carbon tetrachloride	g/m ³	0.0007	2	0	BDL	BDL	BDL	0.005	✓		
Chloroform (Trichloromethane)	g/m ³	0.007	2	0	BDL	BDL	BDL	0.4	✓		
Chloropicrin	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,2-Dibromo-3-chloropropane	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.001	✓		
Dibromoacetonitrile	g/m ³	0.0003	2	2	0.0005	0.0007	0.0006	0.02	✓		
Dibromochloromethane	g/m ³	0.00007	2	2	0.0045	0.0051	0.0048	0.15	✓		
1,2-Dibromoethane (ethylene dibromide, EDB)	g/m ³	0.0003	2	0	BDL	BDL	BDL	0.0004	✓		
1,1-Dichloro-2-propanone	g/m ³	0.0003	2	0	BDL	BDL	BDL				
Dichloroacetonitrile	g/m ³	0.0003	2	1	BDL	0.0004	≤0.0004	0.02	✓		
Tetrachloroethene (tetrachloroethylene)	g/m ³	0.0002	2	0	BDL	BDL	BDL	0.05	✓		
1,1,1-Trichloro-2-propanone	g/m ³	0.0003	2	1	BDL	BDL	BDL				
Trichloroacetonitrile	g/m ³	0.0003	2	0	BDL	BDL	BDL				
1,1,1-Trichloroethane	g/m ³	0.0002	2	0	BDL	BDL	BDL				
Trichloroethene (trichloroethylene)	g/m ³	0.00007	2	0	BDL	BDL	BDL	0.02	✓		
Total Trihalomethanes (THM)	g/m ³	0.007	2	2	0.009	0.012	0.011				
Chloroform MAV ratio	ratio	0.018	2	0	<0.018	<0.018	<0.018				
Bromodichloromethane MAV ratio	ratio	0.002	2	2	0.064	0.076	0.070				
Dibromochloromethane MAV ratio	ratio	0.001	2	2	0.030	0.034	0.032				

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Test	Unit	Detection Limit	No. of Samples	No. of Detectable Results	Min.	Max.	Average	MAV	Complies	GV	Meets
Bromoform MAV ratio	ratio		2	2	0.011	0.012	0.012				
Sum of THM MAV ratios (DWSNZ)	ratio		2	2	0.105	0.124	0.115	1	✓		
Volatile Organic Compounds - BTEX											
Benzene	g/m ³	0.003	2	0	BDL	BDL	BDL	0.01	✓		
Toluene	g/m ³	0.005	2	0	BDL	BDL	BDL	0.8	✓	0.03	✓
Ethylbenzene	g/m ³	0.003	2	0	BDL	BDL	BDL	0.3	✓	0.002	✓
m&p-Xylene	g/m ³	0.005	2	0	BDL	BDL	BDL				
o-Xylene	g/m ³	0.003	2	0	BDL	BDL	BDL				
Volatile Organic Compounds - Halogenated Aliphatics											
Bromomethane (Methyl Bromide)	g/m ³	0.003	2	0	BDL	BDL	BDL				
Carbon tetrachloride	g/m ³	0.003	2	0	BDL	BDL	BDL	0.005	✓		
Chloroethane	g/m ³	0.003	2	0	BDL	BDL	BDL				
Chloromethane	g/m ³	0.003	2	0	BDL	BDL	BDL				
1,2-Dibromo-3-chloropropane	g/m ³	0.003	2	0	BDL	BDL	BDL	0.001	✓		
1,2-Dibromoethane (ethylene dibromide, EDB)	g/m ³	0.003	2	0	BDL	BDL	BDL	0.0004	✓		
Dibromomethane	g/m ³	0.003	2	0	BDL	BDL	BDL				
Dichlorodifluoromethane	g/m ³	0.003	2	0	BDL	BDL	BDL				
1,1-Dichloroethane	g/m ³	0.003	2	0	BDL	BDL	BDL				
1,2-Dichloroethane	g/m ³	0.003	2	0	BDL	BDL	BDL	0.03	✓		
1,1-Dichloroethene	g/m ³	0.003	2	0	BDL	BDL	BDL				
cis-1,2-Dichloroethene	g/m ³	0.003	2	0	BDL	BDL	BDL				
trans-1,2-Dichloroethene	g/m ³	0.003	2	0	BDL	BDL	BDL				
Dichloromethane (methylene chloride)	g/m ³	0.003	2	0	BDL	BDL	BDL	0.02	✓		
1,2-Dichloropropane	g/m ³	0.003	2	0	BDL	BDL	BDL	0.05	✓		
1,3-Dichloropropane	g/m ³	0.003	2	0	BDL	BDL	BDL				
1,1-Dichloropropene	g/m ³	0.003	2	0	BDL	BDL	BDL				
cis-1,3-Dichloropropene	g/m ³	0.005	2	0	BDL	BDL	BDL				
trans-1,3-Dichloropropene	g/m ³	0.005	2	0	BDL	BDL	BDL				
Hexachlorobutadiene	g/m ³	0.003	2	0	BDL	BDL	BDL	0.0007			

Comprehensive Chemical Analysis of Hamilton Water Supply 2018/2019

Test	Unit	Detection Limit	No. of Samples	No. of Detectable Results	Min.	Max.	Average	MAV	Complies	GV	Meets
1,1,1,2-Tetrachloroethane	g/m ³	0.003	2	0	BDL	BDL	BDL				
1,1,2,2-Tetrachloroethane	g/m ³	0.003	2	0	BDL	BDL	BDL				
Tetrachloroethene (tetrachloroethylene)	g/m ³	0.003	2	0	BDL	BDL	BDL	0.05	✓		
1,1,1-Trichloroethane	g/m ³	0.003	2	0	BDL	BDL	BDL				
1,1,2-Trichloroethane	g/m ³	0.003	2	0	BDL	BDL	BDL				
Trichloroethene (trichloroethylene)	g/m ³	0.003	2	0	BDL	BDL	BDL	0.02	✓		
Trichlorofluoromethane	g/m ³	0.003	2	0	BDL	BDL	BDL				
1,2,3-Trichloropropane	g/m ³	0.003	2	0	BDL	BDL	BDL				
1,1,2-Trichlorotrifluoroethane (Freon 113)	g/m ³	0.003	2	0	BDL	BDL	BDL				
Vinyl chloride	g/m ³	0.003	2	0	BDL	BDL	BDL	0.0003			
Volatile Organic Compounds - Halogenated Aromatics											
Bromobenzene	g/m ³	0.003	2	0	BDL	BDL	BDL				
Chlorobenzene (monochlorobenzene)	g/m ³	0.003	2	0	BDL	BDL	BDL			0.01	✓
2-Chlorotoluene	g/m ³	0.003	2	0	BDL	BDL	BDL				
4-Chlorotoluene	g/m ³	0.003	2	0	BDL	BDL	BDL				
1,2-Dichlorobenzene	g/m ³	0.003	2	0	BDL	BDL	BDL	1.5	✓	0.001	✓
1,3-Dichlorobenzene	g/m ³	0.003	2	0	BDL	BDL	BDL				
1,4-Dichlorobenzene	g/m ³	0.003	2	0	BDL	BDL	BDL	0.4	✓	0.0003	✓
1,2,3-Trichlorobenzene	g/m ³	0.003	2	0	BDL	BDL	BDL			0.01	✓
1,2,4-Trichlorobenzene	g/m ³	0.003	2	0	BDL	BDL	BDL			0.005	✓
1,3,5-Trichlorobenzene	g/m ³	0.003	2	0	BDL	BDL	BDL			0.05	✓
Volatile Organic Compounds - Monoaromatic Hydrocarbons											
n-Butylbenzene	g/m ³	0.005	2	0	BDL	BDL	BDL				
tert-Butylbenzene	g/m ³	0.003	2	0	BDL	BDL	BDL				
Isopropylbenzene (Cumene)	g/m ³	0.005	2	0	BDL	BDL	BDL				
4-Isopropyltoluene (p-Cymene)	g/m ³	0.003	2	0	BDL	BDL	BDL				
n-Propylbenzene	g/m ³	0.005	2	0	BDL	BDL	BDL				
sec-Butylbenzene	g/m ³	0.003	2	0	BDL	BDL	BDL				
Styrene	g/m ³	0.005	2	0	BDL	BDL	BDL	0.03	✓	0.004	✓

Comprehensive Chemical Analysis of Hamilton Water Supply 2018/2019

Test	Unit	Detection Limit	No. of Samples	No. of Detectable Results	Min.	Max.	Average	MAV	Complies	GV	Meets
1,2,4-Trimethylbenzene	g/m ³	0.003	2	0	BDL	BDL	BDL				
1,3,5-Trimethylbenzene	g/m ³	0.003	2	0	BDL	BDL	BDL				
Volatile Organic Compounds - Ketones											
Acetone	g/m ³	0.5	2	0	BDL	BDL	BDL				
2-Butanone (MEK)	g/m ³	0.5	2	0	BDL	BDL	BDL				
Methyl tert-butylether (MTBE)	g/m ³	0.003	2	0	BDL	BDL	BDL				
4-Methylpentan-2-one (MIBK)	g/m ³	0.10	2	0	BDL	BDL	BDL				
Volatile Organic Compounds - Trihalomethanes											
Bromodichloromethane	g/m ³	0.005	2	2	0.005	0.005	0.005	0.06	✓		
Bromoform (tribromomethane)	g/m ³	0.003	2	0	BDL	BDL	BDL	0.1	✓		
Chloroform (trichloromethane)	g/m ³	0.003	2	1	BDL	BDL	BDL	0.4	✓		
Dibromochloromethane	g/m ³	0.005	2	2	0.006	0.006	0.006	0.15	✓		
Other Volatile Organic Compounds											
Carbon disulphide	g/m ³	0.005	2	0	BDL	BDL	BDL				
Naphthalene	g/m ³	0.005	2	0	BDL	BDL	BDL				

Comprehensive Chemical Analysis of Taitua Arboretum Water Supply 2018/2019

The Guideline Values (GVs) and Maximum Acceptable Values (MAVs) are defined in the Ministry of Health Drinking-water Standards for New Zealand 2005 (Revised 2008). MAVs relate to parameters of health significance and should not be exceeded. GVs are the limits for aesthetic determinands that, if exceeded, may make the water unattractive to consumers.

BDL = Below Detection Limit

Test	Unit	Detection Limit	Result	MAV	Complies	GV	Meets
Individual Tests							
True Hazen Colour	Hazen units	10	10			10	✓
pH	pH units	0.1	6.7			7.0-8.5	✓
Total Alkalinity	g/m ³ as CaCO ₃	1.0	24				
Total Hardness	g/m ³ as CaCO ₃	1.0	10.5			100-300	✓
Electrical Conductivity (EC)	mS/m	0.1	10.4				
Total Dissolved Solids (TDS)	g/m ³	10	152			1000	✓
Dissolved Calcium	g/m ³	0.05	2.4				
Total Iodine	g/m ³	0.001	0.0033				
Dissolved Iron	g/m ³	0.02	BDL				
Dissolved Magnesium	g/m ³	0.02	1.07				
Dissolved Manganese	g/m ³	0.0005	0.0015				
Dissolved Potassium	g/m ³	0.05	3.3				
Dissolved Sodium	g/m ³	0.02	15.0				
Bromide	g/m ³	0.05	0.07				
Bromate	g/m ³	0.005	BDL	0.01	✓		
Total Cyanide	g/m ³	0.002	BDL	0.6	✓		
Chloride	g/m ³	0.5	13.8			250	✓
Chlorite	g/m ³	0.005	BDL	0.8	✓		
Chlorate	g/m ³	0.005	BDL	0.8	✓		
Total Ammoniacal-N	g/m ³	0.01	BDL				
Nitrite-N	g/m ³	0.002	BDL	0.2	✓		
Nitrate-N	g/m ³	0.001	0.117	50	✓		
Nitrate-N + Nitrite-N	g/m ³	0.002	0.118				

Comprehensive Chemical Analysis of Taitua Arboretum Water Supply 2018/2019

Test	Unit	Detection Limit	Result	MAV	Complies	GV	Meets
Reactive Silica	g/m ³ as SiO ₂	0.1	92				
Un-ionised hydrogen sulphide	g/m ³	0.002	BDL				
Total Sulphide	g/m ³	0.05	BDL				
Sulphate	g/m ³	0.5	3.1			250	✓
Dissolved Organic Carbon (DOC)	g/m ³	0.5	0.7				
Total Organic Carbon (TOC)	g/m ³	0.5	BDL				
Fluoride	g/m ³	0.05	0.05	1.5	✓		
Trace Metals							
Total Aluminium	g/m ³	0.0032	0.0040			0.1	✓
Total Antimony	g/m ³	0.00021	BDL	0.02	✓		
Total Arsenic	g/m ³	0.0011	0.0022	0.01	✓		
Total Barium	g/m ³	0.0053	0.080	0.7	✓		
Total Beryllium	g/m ³	0.00011	BDL				
Total Boron	g/m ³	0.0053	0.0123	1.4	✓		
Total Cadmium	g/m ³	0.000053	BDL	0.004	✓		
Total Calcium	g/m ³	0.053	2.3				
Total Chromium	g/m ³	0.00053	BDL	0.05	✓		
Total Copper	g/m ³	0.00053	0.0084	2.0	✓	1	✓
Total Iron	g/m ³	0.021	BDL			0.2	✓
Total Lead	g/m ³	0.00011	0.00027	0.01	✓		
Total Lithium	g/m ³	0.00021	0.0049				
Total Magnesium	g/m ³	0.021	0.98				
Total Manganese	g/m ³	0.00053	0.00139	0.4	✓	0.04	✓
Total Mercury	g/m ³	0.00008	BDL	0.007	✓		
Total Molybdenum	g/m ³	0.00021	BDL	0.07	✓		
Total Nickel	g/m ³	0.00053	BDL	0.08	✓		
Total Potassium	g/m ³	0.053	3.3				
Total Selenium	g/m ³	0.0011	BDL				
Total Silver	g/m ³	0.00011	BDL				
Total Sodium	g/m ³	0.021	14.6			200	✓

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Test	Unit	Detection Limit	Result	MAV	Complies	GV	Meets
Total Tin	g/m ³	0.00053	BDL				
Total Uranium	g/m ³	0.000021	0.000032				
Total Zinc	g/m ³	0.0011	0.031			1.5	✓
Halogenated Acetic Acids							
Bromochloroacetic acid	g/m ³	0.004	BDL				
Dibromoacetic acid	g/m ³	0.004	BDL				
Dichloroacetic acid	g/m ³	0.004	BDL	0.05	✓		
Monobromoacetic acid	g/m ³	0.004	BDL				
Monochloroacetic acid	g/m ³	0.005	BDL	0.02	✓		
Trichloroacetic acid	g/m ³	0.004	BDL	0.2	✓		
Total HAA	g/m ³	0.03	BDL				
Sum of HAA DWSNZ MAV ratios			<0.3				
Halogenated Volatile Disinfection By-Products							
Bromochloroacetonitrile	g/m ³	0.0004	BDL				
Bromodichloromethane	g/m ³	0.0004	BDL	0.06	✓		
Bromoform (tribromomethane)	g/m ³	0.0004	BDL	0.1	✓		
Carbon tetrachloride	g/m ³	0.0007	BDL	0.005	✓		
Chloroform (Trichloromethane)	g/m ³	0.007	BDL	0.4	✓		
Chloropicrin	g/m ³	0.0004	BDL				
1,2-Dibromo-3-chloropropane	g/m ³	0.0004	BDL	0.001	✓		
Dibromoacetonitrile	g/m ³	0.0004	BDL	0.08	✓		
Dibromochloromethane	g/m ³	0.0004	BDL	0.15	✓		
1,2-Dibromoethane (ethylene dibromide, EDB)	g/m ³	0.0003	BDL	0.0004	✓		
1,1-Dichloro-2-propanone	g/m ³	0.0004	BDL				
Dichloroacetonitrile	g/m ³	0.0004	BDL	0.02	✓		
Tetrachloroethene (tetrachloroethylene)	g/m ³	0.0004	BDL	0.05	✓		
1,1,1-Trichloro-2-propanone	g/m ³	0.0004	BDL				
Trichloroacetonitrile	g/m ³	0.0004	BDL				
1,1,1-Trichloroethane	g/m ³	0.0004	BDL				

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Test	Unit	Detection Limit	Result	MAV	Complies	GV	Meets
Trichloroethene (trichloroethylene)	g/m ³	0.0004	BDL	0.02	✓		
Total Trihalomethanes (THM)	g/m ³	0.007	BDL				
Chloroform MAV ratio	g/m ³	0.018	BDL				
Bromodichloromethane MAV ratio			<0.007				
Dibromochloromethane MAV ratio			<0.003				
Bromoform MAV ratio			<0.004				
Sum of THM DWSNZ MAV ratios			<0.02	1	✓		
Sum of Haloacetonitriles DWSNZ MAV ratios			<0.03				
Pesticides							
Alachlor	g/m ³	0.00004	BDL	0.02	✓		
Aldrin	g/m ³	0.000005	BDL				
Atrazine	g/m ³	0.00004	BDL	0.002	✓		
Atrazine-desethyl	g/m ³	0.00004	BDL				
Atrazine-desisopropyl	g/m ³	0.00008	BDL				
Azinphos-methyl	g/m ³	0.00008	BDL	0.004	✓		
gamma-BHC (Lindane)	g/m ³	0.00001	BDL	0.002	✓		
Bromacil	g/m ³	0.00004	BDL	0.4	✓		
Carbofuran	g/m ³	0.00004	BDL	0.008	✓		
cis-Chlordane	g/m ³	0.000005	BDL				
trans-Chlordane	g/m ³	0.000005	BDL				
Chlorpyrifos	g/m ³	0.00004	BDL	0.04	✓		
Chlorpyrifos-methyl	g/m ³	0.00004	BDL				
Chlortoluron	g/m ³	0.00008	BDL	0.04	✓		
Cyanazine	g/m ³	0.00004	BDL	0.0007	✓		
2,4'-DDD	g/m ³	0.00001	BDL				
4,4'-DDD	g/m ³	0.00001	BDL				
2,4'-DDE	g/m ³	0.00001	BDL				
4,4'-DDE	g/m ³	0.00001	BDL				

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Test	Unit	Detection Limit	Result	MAV	Complies	GV	Meets
2,4'-DDT	g/m ³	0.00001	BDL				
4,4'-DDT	g/m ³	0.00001	BDL				
Diazinon	g/m ³	0.00002	BDL				
Dieldrin	g/m ³	0.000005	BDL				
Dimethoate	g/m ³	0.00008	BDL	0.008	✓		
Diuron	g/m ³	0.00004	BDL	0.02	✓		
Endrin	g/m ³	0.000005	BDL	0.001	✓		
Endrin aldehyde	g/m ³	0.000005	BDL				
Endrin ketone	g/m ³	0.00001	BDL				
Heptachlor	g/m ³	0.000005	BDL				
Heptachlor epoxide	g/m ³	0.000005	BDL				
Hexachlorobenzene	g/m ³	0.00004	BDL				
Hexazinone	g/m ³	0.00002	BDL	0.4	✓		
Malathion	g/m ³	0.00004	BDL				
Metalaxyl	g/m ³	0.00004	BDL	0.1	✓		
Methoxychlor	g/m ³	0.000005	BDL	0.02	✓		
Metolachlor	g/m ³	0.00004	BDL	0.01	✓		
Metribuzin	g/m ³	0.00004	BDL	0.07	✓		
Molinate	g/m ³	0.00008	BDL	0.007	✓		
Oxadiazon	g/m ³	0.00004	BDL	0.2	✓		
Parathion-methyl	g/m ³	0.00004	BDL				
Pendimethalin	g/m ³	0.00004	BDL	0.02	✓		
Permethrin	g/m ³	0.00002	BDL				
Pirimiphos-methyl	g/m ³	0.00004	BDL	0.1	✓		
Procymidone	g/m ³	0.00004	BDL	0.7	✓		
Prometryn	g/m ³	0.00002	BDL				
Propanil	g/m ³	0.0002	BDL				
Propazine	g/m ³	0.00002	BDL	0.07	✓		

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Test	Unit	Detection Limit	Result	MAV	Complies	GV	Meets
Pyriproxyfen	g/m ³	0.00004	BDL	0.4	✓		
Simazine	g/m ³	0.00004	BDL	0.002	✓		
Terbacil	g/m ³	0.00004	BDL	0.04	✓		
Terbuthylazine	g/m ³	0.00002	BDL	0.008	✓		
Terbuthylazine-desethyl	g/m ³	0.00004	BDL				
Thiabendazole	g/m ³	0.0002	BDL	0.4	✓		
Total Chlordane [(cis+trans)*100/42]	g/m ³	0.00002	BDL				
Trifluralin	g/m ³	0.00004	BDL	0.03	✓		
Volatile Organic Compounds - BTEX							
Benzene	g/m ³	0.0003	BDL	0.01	✓		
Toluene	g/m ³	0.0003	BDL	0.8	✓	0.03	✓
Ethylbenzene	g/m ³	0.0005	BDL	0.3	✓	0.002	✓
m&p-Xylene	g/m ³	0.0005	BDL				
o-Xylene	g/m ³	0.0003	BDL				
Volatile Organic Compounds - Halogenated Aliphatics							
Bromomethane (Methyl Bromide)	g/m ³	0.0003	BDL				
Carbon tetrachloride	g/m ³	0.0003	BDL	0.005	✓		
Chloroethane	g/m ³	0.0003	BDL				
Chloromethane	g/m ³	0.0003	BDL				
1,2-Dibromo-3-chloropropane	g/m ³	0.0003	BDL	0.001	✓		
1,2-Dibromoethane (ethylene dibromide, EDB)	g/m ³	0.0003	BDL	0.0004	✓		
Dibromomethane	g/m ³	0.0003	BDL				
Dichlorodifluoromethane	g/m ³	0.0003	BDL				
1,1-Dichloroethane	g/m ³	0.0003	BDL				
1,2-Dichloroethane	g/m ³	0.0003	BDL	0.03	✓		
1,1-Dichloroethene	g/m ³	0.0003	BDL				
cis-1,2-Dichloroethene	g/m ³	0.0003	BDL				
trans-1,2-Dichloroethene	g/m ³	0.0003	BDL				

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Test	Unit	Detection Limit	Result	MAV	Complies	GV	Meets
Dichloromethane (methylene chloride)	g/m ³	0.010	BDL	0.02	✓		
1,2-Dichloropropane	g/m ³	0.0003	BDL	0.05	✓		
1,3-Dichloropropane	g/m ³	0.0003	BDL				
1,1-Dichloropropene	g/m ³	0.0003	BDL				
cis-1,3-Dichloropropene	g/m ³	0.0005	BDL				
trans-1,3-Dichloropropene	g/m ³	0.0005	BDL				
Hexachlorobutadiene	g/m ³	0.0003	BDL	0.0007	✓		
1,1,1,2-Tetrachloroethane	g/m ³	0.0003	BDL				
1,1,2,2-Tetrachloroethane	g/m ³	0.0003	BDL				
Tetrachloroethene (tetrachloroethylene)	g/m ³	0.0003	BDL	0.05	✓		
1,1,1-Trichloroethane	g/m ³	0.0003	BDL				
1,1,2-Trichloroethane	g/m ³	0.0003	BDL				
Trichloroethene (trichloroethylene)	g/m ³	0.0003	BDL	0.02	✓		
Trichlorofluoromethane	g/m ³	0.0003	BDL				
1,2,3-Trichloropropane	g/m ³	0.0003	BDL				
1,1,2-Trichlorotrifluoroethane (Freon113)	g/m ³	0.0003	BDL				
Vinyl chloride	g/m ³	0.0003	BDL	0.0003	✓		
Volatile Organic Compounds - Halogenated Aromatics							
Bromobenzene	g/m ³	0.0003	BDL				
Chlorobenzene (monochlorobenzene)	g/m ³	0.0003	BDL				
2-Chlorotoluene	g/m ³	0.0003	BDL				
4-Chlorotoluene	g/m ³	0.0003	BDL				
1,2-Dichlorobenzene	g/m ³	0.0003	BDL	1.5	✓	0.001	✓
1,3-Dichlorobenzene	g/m ³	0.0003	BDL				
1,4-Dichlorobenzene	g/m ³	0.0003	BDL	0.4	✓	0.0003	✓
1,2,3-Trichlorobenzene	g/m ³	0.0003	BDL			0.01	✓
1,2,4-Trichlorobenzene	g/m ³	0.0003	BDL			0.005	✓
1,3,5-Trichlorobenzene	g/m ³	0.0003	BDL			0.05	✓

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Test	Unit	Detection Limit	Result	MAV	Complies	GV	Meets
Volatile Organic Compounds - Monoaromatic Hydrocarbons							
n-Butylbenzene	g/m ³	0.0005	BDL				
tert-Butylbenzene	g/m ³	0.0003	BDL				
Isopropylbenzene (Cumene)	g/m ³	0.0003	BDL				
4-Isopropyltoluene (p-Cymene)	g/m ³	0.0005	BDL				
n-Propylbenzene	g/m ³	0.0005	BDL				
sec-Butylbenzene	g/m ³	0.0003	BDL				
Styrene	g/m ³	0.0005	BDL	0.03	✓	0.004	✓
1,2,4-Trimethylbenzene	g/m ³	0.0003	BDL				
1,3,5-Trimethylbenzene	g/m ³	0.0003	BDL				
Volatile Organic Compounds - Ketones							
Acetone	g/m ³	0.05	BDL				
2-Butanone (MEK)	g/m ³	0.05	BDL				
Methyl tert-butylether (MTBE)	g/m ³	0.0003	BDL				
4-Methylpentan-2-one (MIBK)	g/m ³	0.010	BDL				
Volatile Organic Compounds - Trihalomethanes							
Bromodichloromethane	g/m ³	0.0003	BDL	0.06	✓		
Bromoform (tribromomethane)	g/m ³	0.0003	BDL	0.1	✓		
Chloroform (Trichloromethane)	g/m ³	0.0003	BDL	0.4	✓		
Dibromochloromethane	g/m ³	0.0003	BDL				
Other Volatile Organic Compounds							
Carbon disulphide	g/m ³	0.0005	BDL				
Naphthalene	g/m ³	0.0005	BDL				