

Waikato River and Treated Drinking Water Comprehensive Analysis Report 2013/14

Hamilton City Council undertakes the following water quality analyses every 6 months to ensure the high Aa grade quality of Hamilton's treated drinking-water is maintained. Samples are taken at the Waikato River Water Treatment Plant Intake (Raw Water Intake) and from water leaving the Water Treatment Plant (Treated Water).

Sample Type: Aqueous	Unit	18.07.13		21.01.14	
		Raw Water Intake	Treated Water	Raw Water Intake	Treated Water
Individual Tests					
True Hazen Colour	Hazen units	< 5	< 5	<5	<5
pH	pH units	7.4	7.6	6.90	7.40
Total Alkalinity	g/m ³ as CaCO ₃	40.5	35.5	41.8	40.5
Total Hardness	g/m ³ as CaCO ₃	26.8	42.7	26.7	40.0
Electrical Conductivity (EC)	mS/m	16.4	20.3	15.6	18.9
Total Dissolved Solids (TDS)	g/m ³	132	152	119	130
Sample Temperature	°C	20	20	20.0	20.0
Dissolved Calcium	g/m ³	6.43	12.62	6.40	11.98
Total Iodine	g/m ³	0.00199	<0.0010	0.00279	<0.0010
Dissolved Iron	g/m ³	0.068	<0.02	0.022	<0.02
Dissolved Magnesium	g/m ³	2.60	2.72	2.61	2.45
Dissolved Manganese	g/m ³	0.00744	<0.0005	<0.0005	<0.0005
Dissolved Potassium	g/m ³	3.68	3.45	3.14	3.27
Dissolved Sodium	g/m ³	20.6	20.8	19.3	20.5
Bromide	g/m ³	<0.05	<0.05	0.050	<0.05
Bromate	g/m ³	<0.005	<0.005	<0.0005	<0.005
Total Cyanide	g/m ³	< 0.0010	<0.0010	<0.0010	<0.0010
Chloride	g/m ³	19.8	20.3	16.7	18.3
Chlorite	g/m ³	-	<0.005		<0.005
Chlorate	g/m ³	-	<0.10		<0.1
Total Ammoniacal-N	g/m ³	0.0151	<0.010	0.0333	<0.010
Nitrite-N	g/m ³	0.0046	<0.002	0.00380	<0.002
Nitrate-N	g/m ³	0.554	0.477	0.0870	0.138
Nitrate-N + Nitrite-N	g/m ³	0.559	0.479	0.091	0.138
Reactive Silica	g/m ³ as SiO ₂	40.80	37.51	34.30	31.64
Un-ionised hydrogen sulphide	g/m ³	<0.002	<0.002	<0.002	<0.002
Total Sulphide	g/m ³	<0.002	<0.002	<0.002	<0.002
Sulphate	g/m ³	10.63	29.0	9.10	23.0
Dissolved Organic Carbon (DOC)	g/m ³	3.39	1.34	4.46	3.51
Total Organic Carbon (TOC)	g/m ³	4.14	1.92	5.66	2.85

Test	Unit	Intake 18.07.13	Treated 18.07.13	Intake 21.01.14	Treated 21.01.14
Trace Metals					
Total Aluminium	g/m ³	0.168	0.0204	0.0277	0.0276
Total Antimony	g/m ³	0.00085	0.0008	0.00057	0.00056
Total Arsenic	g/m ³	0.0196	<0.0011	0.0269	0.00218
Total Barium	g/m ³	0.0188	0.0126	0.0150	0.0141
Total Beryllium	g/m ³	< 0.00011	<0.00011	<0.00011	<0.00011
Total Boron	g/m ³	0.258	0.284	0.265	0.253
Total Cadmium	g/m ³	< 0.000053	<0.000053	<0.000053	<0.000053
Total Calcium	g/m ³	6.67	13.99	6.57	12.80
Total Chromium	g/m ³	<0.00053	<0.00053	<0.00053	<0.00053
Total Copper	g/m ³	<0.00053	0.0008	<0.00053	<0.00053
Total Iron	g/m ³	0.294	<0.021	0.149	<0.021
Total Lead	g/m ³	0.000118	0.000482	<0.00011	0.000331
Total Lithium	g/m ³	0.092	0.100	0.0814	0.0781
Total Magnesium	g/m ³	2.63	3.08	2.67	2.73
Total Manganese	g/m ³	0.0215	0.00175	0.0303	0.00097
Total Mercury	g/m ³	< 0.00008	<0.00008	<0.00008	<0.00008
Total Molybdenum	g/m ³	0.00038	0.00037	0.00044	0.00044
Total Nickel	g/m ³	<0.00053	0.00352	<0.00053	<0.00053
Total Potassium	g/m ³	3.45	3.51	3.29	3.16
Total Selenium	g/m ³	<0.0011	<0.0011	<0.0011	<0.0011
Total Silver	g/m ³	<0.00011	<0.00011	<0.00011	<0.00011
Total Sodium	g/m ³	20.5	21.0	20.8	19.5
Total Tin	g/m ³	<0.00053	<0.00053	<0.00053	<0.00053
Total Uranium	g/m ³	<0.000021	<0.000021	<0.000021	<0.000021
Total Zinc	g/m ³	0.813	0.00482	<0.0011	0.00178
Halogenated Acetic Acids					
Bromochloroacetic acid	g/m ³	<0.0005	0.0036	< 0.0005	0.0022
Dibromoacetic acid	g/m ³	<0.0005	0.00262	< 0.0005	0.0018
Dichloroacetic acid	g/m ³	<0.0005	0.00160	< 0.0005	0.0014
Monobromoacetic acid	g/m ³	<0.0005	0.00267	< 0.0005	< 0.0005
Monochloroacetic acid	g/m ³	<0.005	<0.005	< 0.005	0.023
Trichloroacetic acid	g/m ³	<0.0010	<0.0010	< 0.0010	< 0.0010
Total HAA	g/m ³	<0.010	0.010	< 0.010	0.03
Sum of HAA DWSNZ MAV ratios		<0.3	<0.3	< 0.3	1.2
Halogenated Volatile Disinfection By-Products					
Sum of Haloacetonitriles DWSNZ MAV ratios		<0.016	<0.016	< 0.016	0.023
Bromochloroacetonitrile	g/m ³	<0.00014	0.00061	< 0.00014	0.0007
Bromodichloromethane	g/m ³	<0.00007	0.0042	< 0.00007	0.0048
Bromoform (tribromomethane)	g/m ³	<0.00007	0.00179	< 0.00007	0.00134
Carbon tetrachloride	g/m ³	<0.0007	<0.0007	< 0.0007	< 0.0007
Chloral Hydrate/ Trichloroacetaldehyde	g/m ³	<0.0003	<0.0003	Not tested	Not tested
Chloroform (Trichloromethane)	g/m ³	<0.007	<0.007	< 0.007	< 0.007
Chloropicrin	g/m ³	<0.0003	<0.0003	< 0.0003	< 0.0003
1,2-Dibromo-3-chloropropane	g/m ³	<0.0003	<0.0003	< 0.0003	< 0.0003
Dibromoacetonitrile	g/m ³	<0.0003	0.00090	< 0.0003	0.0007
Dibromochloromethane	g/m ³	<0.00007	0.0062	< 0.00007	0.0061

Test	Unit	Intake 18.07.13	Treated 18.07.13	Intake 21.01.14	Treated 21.01.14
Halogenated Volatile Disinfection By-Products continued					
1,2-Dibromoethane (ethylene dibromide, EDB)	g/m ³	<0.0003	<0.0003	< 0.0003	< 0.0003
1,1-Dichloro-2-propanone	g/m ³	<0.0003	<0.0003	< 0.0003	< 0.0003
Dichloroacetonitrile	g/m ³	<0.0003	<0.0003	< 0.0003	0.0003
Tetrachloroethene (tetrachloroethylene)	g/m ³	<0.00014	<0.00014	< 0.00014	< 0.00014
1,1,1-Trichloro-2-propanone	g/m ³	<0.0003	<0.0003	< 0.0003	0.0003
Trichloroacetonitrile	g/m ³	<0.0003	<0.0003	< 0.0003	< 0.0003
1,1,1-Trichloroethane	g/m ³	<0.00014	<0.00014	< 0.00014	< 0.00014
Trichloroethene (trichloroethylene)	g/m ³	<0.00007	<0.00007	< 0.00007	< 0.00007
Total Trihalomethanes (THM)	g/m ³	<0.007	0.0141	< 0.007	0.014
Chloroform MAV ratio	g/m ³	<0.018	<0.018	< 0.018	< 0.018
Bromodichloromethane MAV ratio		<0.002	0.071	< 0.002	0.08
Dibromochloromethane MAV ratio		<0.001	0.041	< 0.001	0.041
Bromoform MAV ratio		<0.001	0.018	< 0.001	0.013
Sum of THM DWSNZ MAV ratios		<0.018	0.135	< 0.018	0.139
Pesticides					
Alachlor	g/m ³	<0.00004	<0.00004	< 0.00004	< 0.00004
Aldrin	g/m ³	<0.000005	<0.000005	< 0.000005	< 0.000005
Atrazine	g/m ³	<0.00004	<0.00004	< 0.00004	< 0.00004
Atrazine-desethyl	g/m ³	<0.00004	<0.00004	< 0.00004	< 0.00004
Atrazine-desisopropyl	g/m ³	<0.00008	<0.00008	< 0.00008	< 0.00008
Azinphos-methyl	g/m ³	<0.00008	<0.00008	< 0.00008	< 0.00008
gamma-BHC (Lindane)	g/m ³	<0.000010	<0.000010	< 0.000010	< 0.000010
Bromacil	g/m ³	<0.00004	<0.00004	< 0.00004	< 0.00004
Carbofuran	g/m ³	<0.00004	<0.00004	< 0.00004	< 0.00004
cis-Chlordane	g/m ³	<0.000005	<0.000005	< 0.000005	< 0.000005
trans-Chlordane	g/m ³	<0.000005	<0.000005	< 0.000005	< 0.000005
Chlorpyrifos	g/m ³	<0.00004	<0.00004	< 0.00004	< 0.00004
Chlorpyrifos-methyl	g/m ³	<0.00004	<0.00004	< 0.00004	< 0.00004
Chlortoluron	g/m ³	<0.00008	<0.00008	< 0.00008	< 0.00008
Cyanazine	g/m ³	<0.00004	<0.00004	< 0.00004	< 0.00004
2,4'-DDD	g/m ³	<0.000010	<0.000010	< 0.000010	< 0.000010
4,4'-DDD	g/m ³	<0.000010	<0.000010	< 0.000010	< 0.000010
2,4'-DDE	g/m ³	<0.000010	<0.000010	< 0.000010	< 0.000010
4,4'-DDE	g/m ³	<0.000010	<0.000010	< 0.000010	< 0.000010
2,4'-DDT	g/m ³	<0.000010	<0.000010	< 0.000010	< 0.000010
4,4'-DDT	g/m ³	<0.000010	<0.000010	< 0.000010	< 0.000010
Diazinon	g/m ³	<0.00002	<0.00002	< 0.00002	< 0.00002
Dieldrin	g/m ³	<0.000005	<0.000005	< 0.000005	< 0.000005
Dimethoate	g/m ³	<0.00008	<0.00008	< 0.00008	< 0.00008
Diuron	g/m ³	<0.00004	<0.00004	< 0.00004	< 0.00004
Endrin	g/m ³	<0.000005	<0.000005	< 0.000005	< 0.000005
Endrin aldehyde	g/m ³	<0.000005	<0.000005	< 0.000005	< 0.000005
Endrin ketone	g/m ³	<0.000010	<0.000010	< 0.000010	< 0.000010
Heptachlor	g/m ³	<0.000005	<0.000005	< 0.000005	< 0.000005
Heptachlor epoxide	g/m ³	<0.000005	<0.000005	< 0.000005	< 0.000005
Hexachlorobenzene	g/m ³	<0.00004	<0.00004	< 0.00004	< 0.00004

Test	Unit	Intake 18.07.13	Treated 18.07.13	Intake 21.01.14	Treated 21.01.14
Pesticides continued					
Hexazinone	g/m ³	<0.00002	<0.00002	<0.00002	<0.00002
Malathion	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Metalaxyl	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Methoxychlor	g/m ³	<0.000005	<0.000005	<0.000005	<0.000005
Metolachlor	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Metribuzin	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Molinate	g/m ³	<0.00008	<0.00008	<0.00008	<0.00008
Oxadiazon	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Parathion-methyl	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Pendimethalin	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Permethrin	g/m ³	<0.00002	<0.00002	<0.00002	<0.00002
Pirimiphos-methyl	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Procymidone	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Prometryn	g/m ³	<0.00002	<0.00002	<0.00002	<0.00002
Propanil	g/m ³	<0.0002	<0.0002	<0.0002	<0.0002
Propazine	g/m ³	<0.00002	<0.00002	<0.00002	<0.00002
Pyriproxyfen	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Simazine	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Terbacil	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Terbuthylazine	g/m ³	<0.00002	<0.00002	<0.00002	<0.00002
Terbuthylazine-desethyl	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Thiabendazole	g/m ³	<0.0002	<0.0002	<0.0002	<0.0002
Total Chlordane [(cis+trans)*100/42]	g/m ³	<0.00002	<0.00002	<0.00002	<0.00002
Trifluralin	g/m ³	<0.00004	<0.00004	<0.00004	<0.00004
Volatile Organic Compounds - BTEX					
Benzene	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	g/m ³	<0.0010	<0.0010	<0.0010	<0.0010
Ethylbenzene	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
m&p-Xylene	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
o-Xylene	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
Volatile Organic Compounds - Halogenated Aliphatics					
Bromomethane (Methyl Bromide)	g/m ³	<0.002	<0.002	<0.002	<0.002
Carbon tetrachloride	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
Chloroethane	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
Chloromethane	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
1,2-Dibromo-3-chloropropane	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
1,2-Dibromoethane (ethylene dibromide, EDB)	g/m ³	<0.0004	<0.0004	<0.0004	<0.0004
Dibromomethane	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
Dichlorodifluoromethane	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethane	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
1,2-Dichloroethane	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethene	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
cis-1,2-Dichloroethene	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
Dichloromethane (methylene chloride)	g/m ³	<0.010	<0.010	<0.010	<0.010
1,2-Dichloropropane	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005

Test	Unit	Intake 14.01.13	Treated 14.01.13	Intake 21.01.14	Treated 21.01.14
1,3-Dichloropropane	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
Volatile Organic Compounds - Halogenated Aliphatics continued					
1,1-Dichloropropene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
cis-1,3-Dichloropropene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
trans-1,3-Dichloropropene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
Hexachlorobutadiene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,1,1,2-Tetrachloroethane	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,1,2,2-Tetrachloroethane	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
Tetrachloroethene (tetrachloroethylene)	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,1,1-Trichloroethane	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,1,2-Trichloroethane	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
Trichloroethene (trichloroethylene)	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
Trichlorofluoromethane	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,2,3-Trichloropropane	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,1,2-Trichlorotrifluoroethane (Freon113)	g/m ³	<0.004	<0.004	< 0.004	< 0.004
Vinyl chloride	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
Volatile Organic Compounds - Halogenated Aromatics					
Bromobenzene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
Chlorobenzene (monochlorobenzene)	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
2-Chlorotoluene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
4-Chlorotoluene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,2-Dichlorobenzene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,3-Dichlorobenzene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,4-Dichlorobenzene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,2,3-Trichlorobenzene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,2,4-Trichlorobenzene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,3,5-Trichlorobenzene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
Volatile Organic Compounds - Monoaromatic Hydrocarbons					
n-Butylbenzene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
tert-Butylbenzene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
Isopropylbenzene (Cumene)	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
4-Isopropyltoluene (p-Cymene)	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
n-Propylbenzene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
sec-Butylbenzene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
Styrene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,2,4-Trimethylbenzene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
1,3,5-Trimethylbenzene	g/m ³	<0.0005	<0.0005	< 0.0005	< 0.0005
Volatile Organic Compounds - Ketones					
Acetone	g/m ³	<0.05	<0.05	< 0.05	< 0.05
2-Butanone (MEK)	g/m ³	<0.005	<0.005	< 0.005	< 0.005
Methyl tert-butylether (MTBE)	g/m ³	<0.005	<0.005	< 0.005	< 0.005
4-Methylpentan-2-one (MIBK)	g/m ³	<0.005	<0.005	< 0.005	< 0.005
Volatile Organic Compounds - Trihalomethanes					
Bromodichloromethane	g/m ³	<0.0005	0.0041	< 0.0005	0.0043
Bromoform (tribromomethane)	g/m ³	<0.0005	0.0012	< 0.0005	0.0009
Chloroform (Trichloromethane)	g/m ³	<0.0005	0.0023	< 0.0005	0.0026
Dibromochloromethane	g/m ³	<0.0005	0.0056	< 0.0005	0.0049

Test	Unit	Intake 18.07.13	Treated 18.07.13	Intake 21.01.14	Treated 21.01.14
Other Volatile Organic Compounds					
Carbon disulphide	g/m ³	<0.005	<0.005	<0.005	<0.005
Naphthalene	g/m ³	<0.0005	<0.0005	<0.0005	<0.0005
System monitoring Compounds for VOC					
4-Bromofluorobenzene	% Recovery	100	102	96	94
Toluene-d8	% Recovery	99	98	98	98

SUMMARY OF METHODS

These analyses were undertaken for Hamilton City Council by RJ Hill Laboratories Ltd (www.hill-labs.co.nz).

The following table 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.

Test	Method Description	Default Detection Limit
Individual Tests		
Sum of Haloacetonitriles MAV ratios (NZ DW Stds)	Calculated as the sum of the individual haloacetonitriles specified in the DWSNZ (dibromoacetonitrile & dichloroacetonitrile) to their respective MAVs.	0
TMAH Digestion*	Tetramethylammonium hydroxide micro digestion, 90°C for 1 hour, filtration. Analysis performed at Hill Laboratories - Food & Bioanalytical Division, Waikato Innovation Park, Ruakura Lane, Hamilton. P.A.Fecher, I.Goldman and A.Nagengast. Journal of Analytical Atomic Spectrometry, 1998, 13 , 977-982.	-
Total Digestion	Boiling nitric acid digestion. APHA 3030 E 22nd ed. 2012 (modified).	-
Total acid digest for Silver analysis	Boiling nitric / hydrochloric acid digestion (5:1 ratio). APHA 3030 F (modified) 22nd ed. 2012.	-
Total Cyanide Distillation	Distillation following the addition of sulphuric acid, alkaline trapping solution. APHA 4500-CN- C 22nd ed. 2012.	-
True Hazen Colour	Removal of suspended matter by filtration or centrifugation, determination by Lovibond colorimeter. APHA 2120 B 22nd ed. 2012.	5 Hazen units
pH	pH meter. APHA 4500-H+ B 22nd ed. 2012.	0.1 pH Units
Total Alkalinity	Titration to pH 4.5 (M-alkalinity), autotitrator. APHA 2320 B (Modified for alk <20) 22nd ed. 2012.	1.0 g/m ³ as CaCO ₃
Total Hardness	Calculation from Calcium and Magnesium. APHA 2340 B 22nd ed. 2012.	1.0 g/m ³ as CaCO ₃
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B 22nd ed. 2012.	0.1 mS/m
Total Dissolved Solids (TDS)	Filtration through GF/C (1.2 µm), gravimetric. APHA 2540 C (modified; drying temperature of 103 - 105°C used rather than 180 ± 2°C) 22nd ed. 2012.	10 g/m ³
Sample Temperature*	Supplied by customer, otherwise 20°C.	0.10 °C
Filtration for dissolved metals analysis	Sample filtration through 0.45µm membrane filter and preservation with nitric acid. APHA 3030 B 22nd ed. 2012.	-
Dissolved Calcium	Filtered sample, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.05 g/m ³
Total Iodine	Sample digestion with aqueous TMAH at 90°C. ICP-MS determination. APHA 3125 B 22nd ed. 2012.	0.0010 g/m ³
Dissolved Iron	Filtered sample, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.02 g/m ³
Dissolved Magnesium	Filtered sample, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.02 g/m ³
Dissolved Manganese	Filtered sample, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.0005 g/ m ³

Test	Method Description	Default Detection Limit
Dissolved Potassium	Filtered sample, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.05 g/ m ³
Dissolved Sodium	Filtered sample, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.02 g/ m ³
Bromide	Filtered sample. Ion Chromatography. APHA 4110 B 22nd ed. 2012.	0.05 g/ m ³
Bromate	Sample analysed as received, filtered if required. Ion Chromatography. US EPA Method 300.1 Part B.	0.005 g/ m ³
Total Cyanide	Distillation, colorimetry. APHA 4500-CN- E 22nd ed. 2012 (modified).	0.0010 g/ m ³
Chloride	Filtered sample. Ferric thiocyanate colorimetry. Discrete Analyser. APHA 4500 Cl- E (modified from continuous flow analysis) 22nd ed. 2012.	0.5 g/ m ³
Chlorite	Sample analysed as received, filtered if required. Ion Chromatography. US EPA Method 300.1 Part B.	0.005 g/ m ³
Chlorate Screen level	Sample analysed as received, filtered if required. Ion Chromatography. Screen level. US EPA Method 300.1 Part B.	0.10 g/ m ³
Total Ammoniacal-N	Filtered sample. Phenol/hypochlorite colorimetry. Discrete Analyser. (NH ₄ -N = NH ₄ ⁺ -N + NH ₃ -N). APHA 4500-NH ₃ F (modified from manual analysis) 22nd ed. 2012.	0.010 g/ m ³
Nitrite-N	Automated Azo dye colorimetry, Flow injection analyser. APHA 4500-NO ₂ -I 22nd ed. 2012..	0.002 g/m ³
Nitrate-N	Calculation: (Nitrate-N + Nitrite-N) – NO ₂ -N. In-house.	0.002 g/m ³
Nitrate-N + Nitrite-N	Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NO ₃ -I 22nd ed. 2012.	0.002 g/m ³
Reactive Silica	Filtered sample. Heteropoly blue colorimetry. Discrete analyser. APHA 4500-SiO ₂ F (modified from flow injection analysis) 22nd ed. 2012.	0.10 g/m ³ as SiO ₂
Un-ionised hydrogen sulphide	Calculation from Total Sulphide, Electrical Conductivity, pH and Temperature*. *Note: For accurate calculation of the un-ionised Hydrogen Sulphide the sample temperature should be taken using a calibrated thermometer at the time of sampling and recorded on the paperwork submitted with the sample. If a sample temperature is not supplied, a nominal temperature of 20°C will show in the results table above and be used in the calculation. In this case, please interpret the un-ionised Hydrogen Sulphide result with caution. APHA 4500-S2- H (modified) 22nd ed. 2012.	0.002g/m ³
Sulphide Distillation	Acid distillation of sample into alkaline trapping solution using Simple Distillation system. APHA 4500-S2- I 22nd ed. 2012.	-
Total Sulphide	Sulphide distillation. Automated methylene blue colorimetry, discrete analyser. APHA 4500-S2- I (modified) 22nd ed. 2012.	0.002 g/ m ³
Sulphate	Filtered sample. Ion Chromatography. APHA 4110 B 22nd ed. 2012.	0.5 g/ m ³
Dissolved Organic Carbon (DOC)	Filtered sample, catalytic oxidation, IR detection, for Total Dissolved C. Acidification, purging for Dissolved Inorganic C. DOC = TDC - DIC. APHA 5310 B 22nd ed. 2012.	0.5 g/ m ³
Total Organic Carbon (TOC)	Catalytic oxidation, IR detection, for Total C. Acidification, purging for Total Inorganic C. TOC = TC -TIC. APHA 5310 B 22nd ed. 2012.	0.5 g/m ³
Sum of HAA DWSNZ MAV ratios	Calculated as the sum of the individual haloacetic acids specified in DWSNZ (monochloroacetic acid, dichloroacetic acid and trichloroacetic acid) to their respective MAVs. Drinking-water Standards for New Zealand 2005 (Revised 2008), Section 8.2.1.1.	0.001

Test	Method Description	Default Detection Limit
Halogenated Acetic Acids in Water by GC-MS*	Solvent extraction, methylation, GC-MS SIM analysis.	-
Halogenated Volatile Disinfection By-Products in Water by GCMS	Solvent extraction, GC-MS SIM analysis	-
Organochlorine/Organonitro & phosphorus Pesticides Drinking Water	Liquid/Liquid extraction, GPC (if required), GC-MS FS analysis	-
Volatile Organic Compounds Trace in Water by Purge & Trap	Purge & Trap, GC-MS FS analysis [KBIs:28233,2694]	-
Drinking water metals suite, totals, trace		
Total Aluminium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8.	0.0032 g/m ³
Total Antimony	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8.	0.00021 g/m ³
Total Arsenic	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8.	0.0011 g/m ³
Total Barium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8.	0.00011 g/m ³
Total Beryllium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8.	0.00011 g/m ³
Total Boron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.0053 g/m ³
Total Cadmium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8.	0.000053 g/m ³
Total Calcium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.053 g/m ³
Total Chromium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8.	0.00053 g/m ³
Total Copper	Nitric acid digestion, ICP-MS, trace level. APHA 3125 22nd ed. 2012 / US EPA 200.8.	0.00053 g/m ³
Total Iron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.021 g/m ³
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 22nd ed. 2012 / US EPA 200.8.	0.00011 g/m ³
Total Lithium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.00021 g/m ³
Total Magnesium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.021 g/m ³
Total Manganese	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8.	0.00053 g/m ³
Total Mercury	Bromine Oxidation followed by Atomic Fluorescence. US EPA Method 245.7, Feb 2005.	0.00008 g/m ³
Total Molybdenum	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8.	0.00021g/m ³
Total Nickel	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8.	0.00053 g/m ³
Total Potassium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.053 g/m ³
Total Selenium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8.	0.0011 g/m ³
Total Silver	Boiling nitric / hydrochloric acid digestion (5:1 ratio), ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.00011 g/m ³
Total Sodium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.021 g/m ³
Total Tin	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012.	0.00053 g/m ³

Test	Method Description	Default Detection Limit
Total Uranium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8.	0.000021 g/m ³
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 22nd ed. 2012 / US EPA 200.8.	0.0011 g/m ³