Quarterly Drinking Water Quality Report

Potts Hill Delivery System 1 October 2024 to 31 December 2024

13 February 2025

Your water quality

Drinking water management

We supply you with high quality, safe drinking water – managed under our drinking water quality management system. Our water is among the world's best!

WaterNSW manages Sydney's catchments to provide the best quality water for us to treat. We treat your water by first filtering it, then disinfecting it. This is part of what's called the 'multiple-barrier' approach. We continuously monitor these steps to ensure our systems are working as expected.

During this quarter, our monitoring confirmed that the drinking water we delivered to you was safe and of high quality.

Testing for water quality

Our aim is to provide you with high quality, safe drinking water treated to meet the *Australian Drinking Water Guidelines*. Our Drinking Water Quality Management System applies the frameworks to manage drinking water quality and testing water quality is one part of this system.

We test your water for up to 70 different characteristics including:

- taste
- colour
- odour
- micro-organisms
- chemical content.

This report summarises a selection of health characteristics and key aesthetic (look, taste, and smell) characteristics.

We take water samples from the catchments, at the inlet and outlet of water filtration plants, from the reservoirs and from about 720 customers' front garden taps.

Our laboratories use internationally accredited methods for all our testing.

The tables in this report present water quality data from the analysis of water samples we collect at various stages of the water supply chain, from raw water sources, through treatment to the water supplied to your tap.

Our Drinking Water Quality Management System

We use a number of steps to ensure your tap water is high quality and safe to drink. Daily performance results can be found on our website.

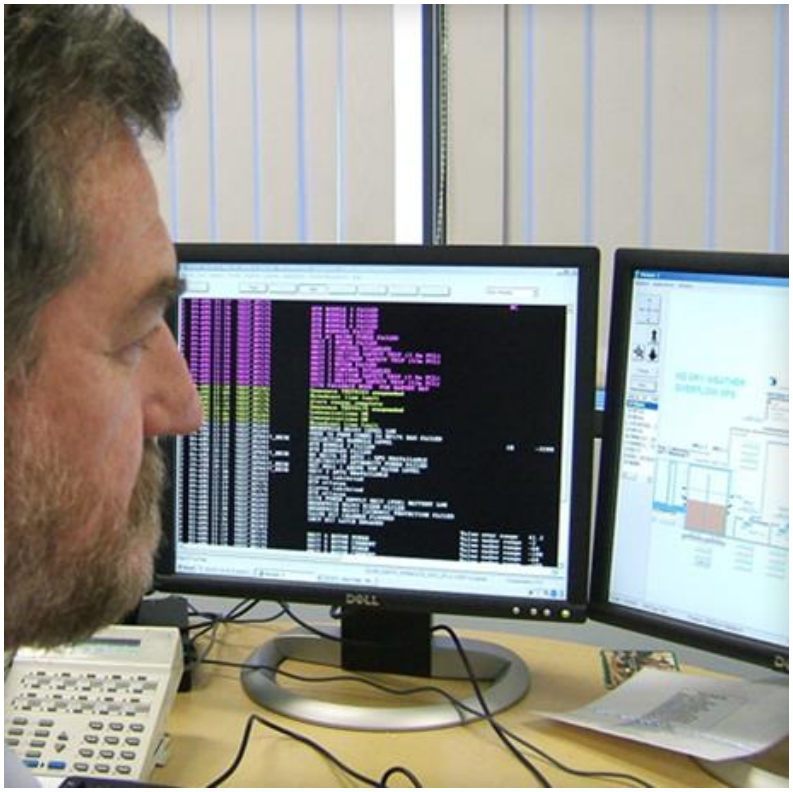
The *Australian Drinking Water Guidelines* Framework for Management of Drinking Water Quality uses a preventive risk management approach that encompasses all the steps in water production from the catchment to the customer.

Sydney Water works collaboratively with WaterNSW to ensure that the best possible water quality is supplied to our customers. Sydney Water and WaterNSW apply a multi-barrier approach to ensure the water supply is safe. Some of the step or 'barriers' we use to manage water quality are:

- Protecting water catchments (e.g. lakes, rivers and reservoirs)
- Selecting the best available source of water
- Filtering the water at water filtration plants
- Adding chlorine at our water filtration plants and in the network to ensure your water is free of harmful pathogens
- Adding fluoride to support dental health.

We monitor these different steps constantly at critical control points to ensure that your drinking water remains safe and of high quality. You can see current results for these points on our Daily Drinking Water Quality report.

We monitor water quality to verify that these barriers are working. The results in the remainder of this report are considered 'verification results.'



Water quality test results

At your tap

Most health guideline values for chemicals are based on a lifetime of exposure. The *Australian Drinking Water Guidelines* recognise that occasionally there may be health or aesthetic related test results that fall outside the guideline values and that these results are not necessarily an immediate threat to health. For most characteristics, the guidelines do not require 100% of results to fall within the guideline values.

Sydney Water has several areas it delivers water to. We call these Delivery Systems. Our compliance to the guidelines is measured for each Delivery System and is calculated over a 12-month period using the following long-term performance measures:

- For the indicator bacterium *Escherichia coli (E. coli)*, at least 98% of scheduled samples must contain no *E. coli*. In addition to continuous online monitoring of filter performance, this verifies that our filtration and disinfection processes were effective in removing bacteria from the water initially and that the system used to deliver water to your tap remains clean.
- For health-related chemical characteristics, the upper bound of the 95% confidence interval for the 95th percentile must be less than the guideline value.
- For aesthetic characteristics, the upper bound of the 95% confidence interval for the mean must be less than the guideline value.

The following tables show data for the customer supply systems that we use to measure Sydney Water's performance against the long-term health and aesthetic guideline values.

The data we present here isn't exhaustive but shows the characteristics of water which we regularly test for which the *Australian Drinking Water Guidelines* has set a health and/or aesthetic guideline value.

More data including typical ranges over a longer period can be found in the *Safe Drinking Water* and *Water Analysis* pages on the Sydney Water website.

Table 1 Water Quality Health Characteristics for the Potts Hill Delivery System

Characteristic	Unit of measure	ADWG health value	No. of samples 1 Jan 2024 to 31 Dec 2024	No. of exceptions	Long-term performance (assessment over 12-month period)	% of test results complying with the guideline	Met long-term performance measure
E. coli	orgs/100 mL	not detected in 100 mL sample	2388	0	At least 98% of test results <1	100%	Yes
fluoride	mg/L	1.5[2]	171	0	At least 95% of test results 0.90 to 1.50 mg/L	100%	Yes
free chlorine	mg/L	5[4]	2388	0	The 95th percentile value is less than the respective ADWG health value		Yes
monochloramine	mg/L	3	2388	0			Yes
antimony[1]	mg/L	0.003	8	0			Yes
cadmium[1]	mg/L	0.002	8	0			Yes
cyanide[1]	mg/L	0.08	2	0			Yes
copper	mg/L	2	28	0			Yes
lead	mg/L	0.01	28	0			Yes
nitrate as NO_3	mg/L	50	28	0			Yes
nitrite as NO_2	mg/L	3	28	0			Yes
nickel[1]	mg/L	0.02	8	0			Yes
sulfate[1]	mg/L	500	4	0			Yes
chromium[1]	mg/L	0.05 (as Cr(VI))[3]	8	0			Yes
manganese	mg/L	0.5	120	0			Yes

Characteristic	Unit of measure	ADWG health value	No. of samples 1 Jan 2024 to 31 Dec 2024	No. of exceptions	Long-term performance (assessment over 12-month period)	% of test results complying with the guideline	Met long-term performance measure
n-nitrosodimethylamine[1]	mg/L	0.0001	2	0			Yes
cyanogen chloride[1]	mg/L	0.08	1	0			Yes
total trihalomethanes	mg/L	0.25	84	0	The 95th percentile statistic calculated for combined customer supply system and WFP less than 0.25 mg/L		Yes

[1] Insufficient number of samples collected to calculate 95th percentile. The maximum reading will be used for assessment of long-term performance of each of these health-related chemical parameter against the ADWG values.

[2] The long-term fluoride performance for each delivery system in this table is based on both treated water from Water Filtration Plant (WFP) and customer tap data. We target a value of 1.0 mg/L. The ADWG specifies a guideline value for fluoride of <1.5 mg/L. The NSW Code of Practice for Fluoridation of Public Water Supplies sets a target that each year >95% of all routine fluoride samples (both treated water from WFPs and customer taps) fall within the concentration range of 0.90 to 1.50 mg/L.

[3] The ADWG sets a guideline value for hexavalent chromium (Cr(VI)) however Sydney Water measures total chromium which includes hexavalent chromium.

[4] 5 mg/L is the ADWG health value for total chlorine, there is no maximum health value for free chlorine.

Abbreviations: ADWG = Australian Drinking Water Guidelines; E. coli = Escherichia coli; mg/L = milligrams per litre; orgs/100 mL = organisms per 100 millilitres.

Table 2 Water Quality Aesthetic Characteristics for the Potts Hill Delivery System

Characteristic	Unit of measure	ADWG aesthetic value	No. of samples 1 Jan 2024 to 31 Dec 2024	Average result	Long-term performance (assessment over 12-month period)	Met long-term performance measure
iron	mg/L	0.3	120	0.006	Average of test results less than respective ADWG aesthetic value	Yes
aluminium	mg/L	0.2	28	0.012		Yes
manganese	mg/L	0.1	120	0.0027		Yes
copper	mg/L	1	28	0.021		Yes
zinc	mg/L	3	28	0.002		Yes
ammonia as NH_3	mg/L	0.50	28	0.270		Yes
turbidity	NTU	5	2388	0.12		Yes
true colour[1]	HU	15	28	3		Yes
dissolved oxygen	% saturation	greater than 85%	28	114.6		Yes
total dissolved solids	mg/L	600	4	147.3		Yes
sulfate	mg/L	250	4	9.4		Yes
hardness (total)	mg/L	200	28	47.7		Yes
flavour	rating[2]	acceptable	1	3	Average rating of 1, 2 or 3	Yes
odour	rating[2]	acceptable	1	2		Yes
pH	pH units	between 6.5 - 8.5	2388	7.8	Average results between 6.5 - 8.5 pH units	Yes
temperature	degrees C	no set value	2402	19.6	NA	NA

[1] True colour is measured at 400 nm wavelength.

[2] Rated by a panel on a scale from 1 to 5. Ratings of 1, 2 and 3 are generally acceptable to most people while ratings of 4 and 5 are generally not acceptable. NA = not applicable.

Abbreviations: ADWG = Australian Drinking Water Guidelines; HU = Hazen Units; mg/L = milligrams per litre; NTU = nephelometric turbidity units.

We also test for a range of other water characteristics at your tap over the course of the year. In Table 3 we've summarised the typical values for a range of characteristics for your area, noting that these values are intended to provide an approximate guide, and that all compliance-related values are provided in Table 1 and Table 2.

Table 3 Typical values for your area

Parameter	Range (10^{th} – 90^{th} Percentile) or Average	Units
Physical Characteristics		
true colour	< 2 - 5	TCU or HU
turbidity	0.08 - 0.14	NTU
total dissolved solids	107 - 184	mg/L
pH	7.67 - 7.93	pH units
conductivity	19.6 - 22.7	mS/m
total hardness	35 - 57	mg $CaCO_3$/L
calcium hardness	27 - 39	mg $CaCO_3$/L
magnesium hardness	17 - 25	mg $CaCO_3$/L
alkalinity	31.9 - 50.0	mg $CaCO_3$/L
temperature	15.2 - 24.2	degrees C
dissolved oxygen	99.4 - 130.6	% saturation
Disinfectants		
free chlorine	0.04	mg/L
monochloramine	0.92	mg/L
Disinfection by-products		
trihalomethanes	0.090	mg/L
Inorganic chemicals		
aluminium	0.009 - 0.019	mg/L
ammonia (as NH_3)	0.13 - 0.43	mg/L
arsenic	< 0.0002	mg/L
cadmium	< 0.0001	mg/L
antimony	< 0.0003	mg/L
calcium	9.78 - 14.80	mg/L
chloride	28.0 - 51.2	mg/L
chromium	< 0.0002	mg/L
copper	0.0085 - 0.0339	mg/L
cyanide	< 0.005	mg/L
fluoride	1.02	mg/L
iron	< 0.005 - 0.010	mg/L
lead	0.0001 - 0.0004	mg/L
nickel	0.0002 - 0.0007	mg/L
magnesium	1.19 - 5.55	mg/L
manganese	0.0009 - 0.0051	mg/L
mercury	< 0.00001 - 0.00003	mg/L

Parameter	Range (10th – 90th Percentile) or Average	Units
nitrate (as NO_3)	0.10 - 0.34	mg/L
nitrite (as NO_2)	0.006 - 0.158	mg/L
phosphorous	0.003 - 0.004	mg/L
potassium	1.17 - 1.85	mg/L
reactive silica (as SiO_2)	3.9 - 5.5	mg/L
selenium	< 0.0002	mg/L
silver	0.0001 - 0.0005	mg/L
sodium	10.3 - 13.8	mg/L

At the treatment plant

The water at your tap is treated at our **Prospect Water Filtration Plant** and the **Sydney Desalination Plant at Kurnell**.

We monitor the quality of the untreated (raw) water entering our filtration plants to understand how much treatment is needed and to verify the quality of treated water leaving the plant for a range of water quality characteristics.

Parameter	Range (10th – 90th Percentile) or Average	Units
sulfate	7.2 - 11.0	mg/L
zinc	< 0.001 - 0.004	mg/L
Organic compounds		
chlorinated, polynuclear aromatic, aromatic hydrocarbons	not detected	
chlorophenols	not detected	
pesticides	not detected	

Results for key water quality characteristics which we test are presented here for the **Prospect Water Filtration Plant** and the **Sydney Desalination Plant at Kurnell** (when operating and supplying treated water).

Table 4 Treated water quality characteristics at Prospect Water Filtration Plant – quarterly results

Quarter - 1 Oct 2024 to 31 Dec 2024							
Characteristics	**Unit of measure**	**ADWG value**	**No. of samples**	**Min**	**Ave**	**Max**	**% of tests meeting the guideline[3]**
E. coli	orgs/100 mL	not detected in 100 mL	13	<1	<1	<1	100%
turbidity	NTU	5	13	0.07	0.10	0.14	100%
true colour[1]	HU	15	13	<2	<2	3	100%
pH	pH units	between 6.5 - 8.5	13	7.4	7.7	7.9	100%
free chlorine	mg/L	5[4]	26	<0.04	<0.04	<0.04	100%
monochloramine	mg/L	3	26	1.60	1.77	1.92	100%
fluoride	mg/L	1.5[2]	13	0.99	1.02	1.06	100%
total trihalomethanes	mg/L	0.25	16	0.081	0.105	0.133	100%
n-nitrosodimethylamine	mg/L	0.0001	1	0.000114	0.000114	0.000114	0%[6]
cyanogen chloride	mg/L	0.08	1	<0.004	<0.004	<0.004	100%
perfluorooctane sulfonate (PFOS)	µg/L	NA[5]	3	<0.0001	0.0003	0.0007	100%
perfluorohexane sulfonate (PFHxS)	µg/L	NA[5]	3	0.0006	0.0007	0.0008	100%
sum of PFOS and PFHxS	µg/L	0.07	3	0.0006	0.0009	0.0015	100%
perfluorooctanoic acid (PFOA)	µg/L	0.56	3	0.0002	0.0004	0.0005	100%
iron	mg/L	0.3	13	<0.005	<0.005	0.010	100%

Quarter - 1 Oct 2024 to 31 Dec 2024							
aluminium	mg/L	0.2	13	0.009	0.014	0.017	100%
manganese	mg/L	0.1	13	0.001	<0.001	0.002	100%

[1] True colour is measured at 400 nm wavelength.

[2] The ADWG specifies a guideline value for fluoride of <1.5 mg/L. The NSW Code of Practice for Fluoridation of Public Water Supplies sets a target that each year >95% of all routine fluoride samples (both treated water from WFPs and customer taps) fall within the concentration range of 0.90 to 1.50 mg/L. The data in this table is the WFP data only.

[3] Water quality compliance is based on annual results and different criteria are applied to health-related targets and aesthetic targets as noted in Tables 1 and 2.

[4] 5 mg/L is the ADWG health value for total chlorine, there is no maximum health value for free chlorine.

[5] Australian Drinking Water Guideline states the sum of the concentrations of perfluorooctane sulfonate (PFOS) and perfluorohexane sulfonate (PFHxS) in drinking water should not exceed 70 nanograms per litre (ng/L), which is equivalent to 0.07 micrograms per litre (µg/L).

[6] During Q2, (1 October to 31 December 2024), one sample representing Prospect WFP collected for n-nitrosodimethylamine (NDMA) showed a result that was higher than the ADWG 2011 health value of 100 ng/L causing the delivery system to fall below the performance standard for this characteristic. A repeat sample collected had a result of <10 ng/L. The ADWG also state that action to reduce NDMA is encouraged, but must not compromise disinfection, as non-disinfected water poses significantly greater risk than NDMA. In Sydney's drinking water supply, factors that influence the formation of NDMA include the chloramine dose, the concentrations and types of organic nitrogen-containing compounds that are present, pH and detention time.

Abbreviations: ADWG = Australian Drinking Water Guidelines; Ave = average value; E. coli = Escherichia coli; HU = Hazen Units; Max = maximum value; mg/L = milligrams per litre; Min = minimum value; NTU = nephelometric turbidity units; orgs/100 mL = organisms per 100 millilitres.

Table 5 Treated water quality characteristics at Prospect Water Filtration Plant – annual results

Annual – 1 Jan 2024 to 31 Dec 2024								
Characteristics	**Unit of measure**	**ADWG value**	**No. of samples**	**Min**	**Ave**	**Max**	**% of tests meeting the guideline**	**Meets long-term performance measure**
E. coli	orgs/100 mL	not detected in 100 mL	53	<1	<1	<1	100%	Yes
turbidity	NTU	5	53	0.07	0.11	0.21	100%	Yes
true colour[1]	HU	15	53	<2	<2	4	100%	Yes
pH	pH units	between 6.5 - 8.5	53	7.4	7.7	7.9	100%	Yes
free chlorine	mg/L	5[3]	106	<0.04	<0.04	0.06	100%	Yes
monochloramine	mg/L	3	106	1.60	1.75	1.92	100%	Yes
fluoride	mg/L	1.5[2]	53	0.93	1.02	1.08	100%	Yes
total trihalomethanes	mg/L	0.25	65	0.059	0.107	0.156	100%	Yes
n-nitrosodimethylamine	mg/L	0.0001	2	<0.000010	0.000057	0.000114	50%	No[6]
cyanogen chloride	mg/L	0.08	1	<0.004	<0.004	<0.004	100%	Yes
perfluorooctane sulfonate (PFOS)[5]	µg/L	NA[4]	4	<0.0001	0.0002	0.0007	100%	Yes
perfluorohexane sulfonate (PFHxS)[5]	µg/L	NA[4]	4	0.0006	0.0007	0.0008	100%	Yes
sum of PFOS and PFHxS[5]	µg/L	0.07	4	0.0006	0.0009	0.0015	100%	Yes
perfluorooctanoic acid (PFOA)[5]	µg/L	0.56	4	<0.0001	0.0003	0.0005	100%	Yes

Annual – 1 Jan 2024 to 31 Dec 2024								
iron	mg/L	0.3	53	<0.005	<0.005	0.010	100%	Yes
aluminium	mg/L	0.2	53	0.007	0.013	0.025	100%	Yes
manganese	mg/L	0.1	53	0.001	0.004	0.020	100%	Yes

[1] True colour is measured at 400 nm wavelength.

[2] The ADWG specifies a guideline value for fluoride of <1.5 mg/L. The NSW Code of Practice for Fluoridation of Public Water Supplies sets a target that each year >95% of all routine fluoride samples (both treated water from WFPs and customer taps) fall within the concentration range of 0.90 to 1.50 mg/L. The data in this table is the WFP data only.

[3] 5 mg/L is the ADWG health value for total chlorine, there is no maximum health value for free chlorine.

[4] Australian Drinking Guideline states the sum of the concentrations of perfluorooctane sulfonate (PFOS) and perfluorohexane sulfonate (PFHxS) in drinking water should not exceed 70 nanograms per litre (ng/L), which is equivalent to 0.07 micrograms per litre (µg/L).

[5] Routine PFAS sampling started from 25 June 2024.

[6]During the 12-month period from 1 January 2024 to 31 December 2024, one sample representing Prospect WFP collected for n-nitrosodimethylamine (NDMA) showed a result that was higher than the ADWG 2011 health value of 100 ng/L, causing the delivery system to fall below the performance standard for this characteristic. Two samples are collected annually for compliance at the WFP site and the maximum value (114 ng/L) is above ADWG health value. A repeat sample collected had a result of <10 ng/L. The ADWG also state that action to reduce NDMA is encouraged, but must not compromise disinfection, as non-disinfected water poses significantly greater risk than NDMA. In Sydney's drinking water supply, factors that influence the formation of NDMA include the chloramine dose, the concentrations and types of organic nitrogen-containing compounds that are present, pH and detention time.

Abbreviations: ADWG = Australian Drinking Water Guidelines; Ave = average value; E. coli = Escherichia coli; HU = Hazen Units; Max = maximum value; mg/L = milligrams per litre; Min = minimum value; NTU = nephelometric turbidity units; orgs/100 mL = organisms per 100 millilitres.

More detailed information on PFAS data can be found on Sydney Water's website PFAS monitoring results

Table 6 Untreated (raw) water quality characteristics at Prospect Water Filtration Plant

			Quarter – 1 Oct 2024 to 31 Dec 2024				Annual – 1 Jan 2024 to 31 Dec 2024			
Characteristics	**Unit of measure**	**Raw Water Supply Agreement[2]**	**No. of samples**	**Min**	**Ave**	**Max**	**No. of samples**	**Min**	**Ave**	**Max**
E. coli	orgs/100 mL	NA	13	<1	<1	2	53	<1	<1	18
Cryptosporidium	oocysts/10 L	NA	22	<1	<1	<1	98	<1	<1	6
Giardia	cysts/10 L	NA	22	<1	<1	<1	98	<1	<1	<1
turbidity	NTU	40	13	4.22	5.70	7.41	53	1.52	4.39	9.31
true colour[1]	HU	60	13	12	13	14	53	8	11	14
pH	pH units	between 6.3 - 7.9	13	6.8	7.3	7.5	53	6.5	7.3	7.7
iron	mg/L	3.500	13	0.317	0.394	0.534	53	0.123	0.304	0.553
aluminium	mg/L	2.600	13	0.168	0.268	0.547	53	0.042	0.184	0.547
manganese	mg/L	1.400	13	0.010	0.015	0.023	53	0.010	0.029	0.094

[1] True colour is measured at 400 nm wavelength.

[2] The Raw Water Supply Agreement is an agreement between WaterNSW and Sydney Water about the water quality required for the routine operation of the water filtration plants. Water quality may vary outside these ranges during disturbances of the raw water for example after heavy rain in the catchments.

Abbreviations: Ave = average value; E. coli = Escherichia coli; HU = Hazen Units; Max = maximum value; mg/L = milligrams per litre; Min = minimum value; NA = not applicable; NTU = nephelometric turbidity units; orgs/100 mL = organisms per 100 millilitres.

Table 7 Treated Water Quality Characteristics at Sydney Desalination Plant, Kurnell – quarterly results

			Quarter – 1 Oct 2024 to 31 Dec 2024					
Characteristics	**Unit of measure**	**ADWG value**	**No. of samples**	**Min**	**Ave**	**Max**	**% of test complying with the guideline**	**Meets long-term performance measure**
E. coli	orgs/100 mL	not detected in 100 mL	91	<1	<1	<1	100%	Yes
turbidity	NTU	5	3	0.06	0.07	0.08	100%	Yes
true colour[1]	HU	15	3	<2	<2	<2	100%	Yes
pH	pH units	between 6.5 - 8.5	11	7.6	7.7	7.8	100%	Yes
free chlorine	mg/L	5	22	<0.04	<0.04	<0.04	100%	Yes
monochloramine	mg/L	3	22	1.48	1.80	2.08	100%	Yes
fluoride	mg/L	1.5[2]	14	0.94	0.99	1.02	100%	Yes
total trihalomethanes	mg/L	0.25	6	<0.0005	<0.0005	<0.0005	100%	Yes
n-nitrosodimethylamine	mg/L	0.0001	2	<0.000010	<0.000010	<0.000010	100%	Yes
iron	mg/L	0.3	6	<0.005	<0.005	<0.005	100%	Yes
total aluminium	mg/L	0.2	4	<0.005	0.006	0.012	100%	Yes
manganese	mg/L	0.1	6	<0.0005	<0.0005	0.0006	100%	Yes

[1] True colour is measured at 420 nm wavelength.

[2] The ADWG specifies a guideline value for fluoride of <1.5 mg/L. The NSW Code of Practice for Fluoridation of Public Water Supplies sets a target that each year >95% of all routine fluoride samples (both treated water from WFPs and customer taps) fall within the concentration range of 0.90 to 1.50 mg/L. The data in this table is the WFP data only.

Abbreviations: ADWG = Australian Drinking Water Guidelines; Ave = average value; E. coli = Escherichia coli; HU = Hazen Units; Max = maximum value; mg/L = milligrams per litre; Min = minimum value; NTU = nephelometric turbidity units; orgs/100 mL = organisms per 100 millilitres. ; NA = not applicable, ; ND = not done.

Table 8 Treated Water Quality Characteristics at Sydney Desalination Plant, Kurnell – annual results

Annual – 1 Jan 2024 to 31 Dec 2024								
Characteristics	**Unit of measure**	**ADWG value**	**No. of samples**	**Min**	**Ave**	**Max**	**% of test complying with the guideline**	**Meets long-term performance measure**
E. coli	orgs/100 mL	not detected in 100 mL	379	<1	<1	<1	100%	Yes
turbidity	NTU	5	12	0.06	0.08	0.13	100%	Yes
true colour[1]	HU	15	12	<2	<2	<2	100%	Yes
pH	pH units	between 6.5 - 8.5	46	7.4	7.7	7.9	100%	Yes
free chlorine	mg/L	5	92	<0.04	<0.04	<0.04	100%	Yes
monochloramine	mg/L	3	92	1.48	1.80	2.08	100%	Yes
fluoride	mg/L	1.5[2]	58	0.94	1.00	1.02	100%	Yes
total trihalomethanes	mg/L	0.25	24	<0.0005	<0.0005	0.0006	100%	Yes
n-nitrosodimethylamine	mg/L	0.0001	8	<0.000010	<0.000010	<0.000010	100%	Yes
iron	mg/L	0.3	27	<0.005	<0.005	0.016	100%	Yes
aluminium	mg/L	0.2	19	<0.005	0.007	0.014	100%	Yes
manganese	mg/L	0.1	24	<0.0005	0.0008	0.0050	100%	Yes

[1] True colour is measured at 420 nm wavelength.

[2] The ADWG specifies a guideline value for fluoride of <1.5 mg/L. The NSW Code of Practice for Fluoridation of Public Water Supplies sets a target that each year >95% of all routine fluoride samples (both treated water from WFPs and customer taps) fall within the concentration range of 0.90 to 1.50 mg/L. The data in this table is the WFP data only.

Abbreviations: ADWG = Australian Drinking Water Guidelines; Ave = average value; E. coli = Escherichia coli; HU = Hazen Units; Max = maximum value; mg/L = milligrams per litre; Min = minimum value; NTU = nephelometric turbidity units; orgs/100 mL = organisms per 100 millilitres.

What else do we test for?

We monitor for all the characteristics found in tables 9-13. If detected, results are below the *Australian Drinking Water Guidelines* value, wherever a guideline value exists.

A range of potential chemical contaminants (metals, organic chemicals and radionuclides) are monitored in the raw water at the inlet to each water filtration plant. A few are also monitored in the treated water at the plant outlet and at the customer tap. Risk assessments for these chemicals take into consideration the physical and chemical properties of the various compounds and usage within the catchment areas.

For most of these chemicals, intensive monitoring was initially carried out to establish if they were likely to be present in the supply. This historical data was used along with risk assessments to determine the range of potential contaminants and the frequency of analysis for the current monitoring program. Some chemicals are measured every five years, to verifty they are still not present in the water.

Monitoring for additional chemicals may be done from time to time for investigative or other operational purposes but results are not shown here for one or more of the following reasons:

- because of the infrequency of monitoring
- the lack of direct influence on drinking water quality
- no guideline values exist to compare test results to in order to assess risk.

The following tables only show the ADWG health value, the analytical limit of detection, and the frequency of analysis for each chemical. Results are not shown because analysis is infrequent, and most of these chemicals are only rarely detected and at very low levels.

Table 9 Potts Hill Delivery System – other characteristics

Characteristic	Analyte name	ADWG health/aesthetic value (mg/L)	Detection limit (mg/L)	Monitoring frequency*	Most recent result complies with ADWG value
Inorganic chemicals	cyanogen chloride	0.08	0.004	2024-25, 2 samples per delivery system	Yes
	chloral hydrate	0.1	0.001	2022-23, 1 sample per delivery system	Yes
	hydrogen sulfide	0.05	0.002	2023-24 2 samples per delivery system per month	Yes
Organic chemicals	benzo-(a)-pyrene (PAHs)	0.00001	0.00001	2021-22, 2 samples per delivery system	Yes

Characteristic	Analyte name	ADWG health/aesthetic value (mg/L)	Detection limit (mg/L)	Monitoring frequency*	Most recent result complies with ADWG value
	di(2-ethylhexly) phthalate (DEHP)	0.01	0.01	2022-23, 1 sample per delivery system	Yes
	toluene	0.8	0.0003	2023-24, 1 sample per delivery system	Yes
	xylene	0.6	0.0004	2022-23, 1 sample per delivery system	Yes
Chloroacetic acids	chloroacetic acid	0.15	0.001	2023-24, 1 sample per delivery system	Yes
	dichloroacetic acid	0.1	0.001		Yes
	trichloroacetic acid	0.1	0.001		Yes
Chlorophenols	2-chlorophenol	0.3	0.0001	2023-24, 1 sample per delivery system	Yes
	2,4-dichlorophenol	0.2	0.0001		Yes
	2,4,6-trichlorophenol	0.02	0.0001		Yes

mg/L = milligrams per litre.

** Monitored on a five-yearly rotational basis – year indicates most recent test performed.*

Table 10 Treated water at Prospect Water Filtration Plant – other characteristics

Characteristic	Analyte name	ADWG health/aesthetic value (mg/L)	Detection limit (mg/L)	Monitoring frequency – Prospect Water Filtration Plant	Most recent result complies with ADWG value
Inorganic chemicals	antimony	0.003	0.0003	NA[1]	Yes
	cadmium	0.002	0.0001	NA[1]	Yes
	copper	2	0.0005	NA[1]	Yes
	chromium (as Cr(VI))	0.05	0.0002	NA[1]	Yes
	cyanide	0.08	0.005	NA[1]	Yes
	lead	0.01	0.0001	NA[1]	Yes
	nickel	0.02	0.0002	NA[1]	Yes
	sulfate	500	0.10	quarterly	Yes
	total dissolved solids	600	calculation	quarterly	Yes
	chloride	250	0.10	5-yearly[3]	Yes
	sodium	180	0.05	5-yearly[3]	Yes
Organic chemicals	acrylamide	0.0002	0.0002	5-yearly[2]	Yes
	carbon tetrachloride	0.003	0.0003	5-yearly[3]	Yes

NA = Not Applicable; mg/L = milligrams per litre; ADWG = Australian Drinking Water Guidelines.

[1] Monitored monthly/quarterly in the customer supply systems rather than in the treated water from the WFP.

[2] Monitored on a 5-year rotational basis. Last sampled in 2020-21, 1 sample for each WFP in each quarter.

[3] Monitored on a 5-year rotational basis. Last sampled in 2021-22, 1 sample for each WFP in each quarter.

Table 11 Untreated (raw) water at Prospect WFP intake – other characteristics

Characteristic	Analyte name	ADWG health value (mg/L)	Detection limit (mg/L)	Monitoring frequency – Prospect Water Filtration Plant	Most recent result complies with ADWG value
Inorganic chemicals	cadmium	0.002	0.0001	quarterly	Yes
	arsenic	0.01	0.001	quarterly	Yes
	barium	2	0.001	yearly	Yes
	boron	4	0.02	yearly	Yes
	iodide	0.5	0.010	yearly	Yes
	beryllium	0.06	0.001	yearly	Yes
	uranium	0.017	0.001	yearly	Yes
	mercury	0.001	0.0001	quarterly	Yes
	molybdenum	0.05	0.001	yearly	Yes
	selenium	0.01	0.0010	quarterly	Yes
	silver	0.1	0.001	yearly	Yes
	tin	NA	0.001	yearly	NA
	fluoride	1.5	0.010	quarterly	Yes
	nitrate	50	0.002	quarterly	Yes
Organic chemicals	benzene	0.001	0.00010	quarterly^	Yes
	vinyl chloride	0.0003	0.0003	quarterly^	Yes

NA = Not Applicable; mg/L = milligrams per litre; ADWG = Australian Drinking Water Guidelines.
^ Event trigger for organics if wet weather intrusion impacts on raw water supply.

Table 12 Untreated (raw) water at Prospect WFP intake – pesticides and herbicides

Characteristic	Analyte name	ADWG health value (mg/L)	Detection limit (mg/L)	^Monitoring frequency – Prospect Water Filtration Plant	Most recent result complies with ADWG value
Pesticides/ Herbicides	atrazine	0.02	0.000005	quarterly	Yes
	chlorfenvinphos	0.002	0.00002	quarterly	Yes
	flupropanate	0.009	0.002	quarterly	Yes
	MCPA (2-methyl-4-clorophenoxyacetic acid)	0.04	0.00001	quarterly	Yes
	picloram	0.3	0.00005	quarterly	Yes
	simazine	0.02	0.000005	quarterly	Yes
	chlorpyrifos	0.01	0.000005	quarterly	Yes
	2,4-D	0.03	0.00001	quarterly	Yes
	diuron	0.02	0.000005	quarterly	Yes
	glyphosate	1	0.001	quarterly	Yes
	hexazinone	0.4	0.000005	quarterly	Yes
	triclopyr	0.02	0.00001	quarterly	Yes

NA = Not Applicable; mg/L = milligrams per litre; ADWG = Australian Drinking Water Guidelines.

^ Event trigger for pesticides if wet weather intrusion impacts on raw water supply.

Table 13 Untreated (raw) water at Prospect WFP intake – radionuclides

Characteristic	Analyte name	ADWG health value (Bq/L)	Detection limit (Bq/L)	Monitoring frequency – Prospect Water Filtration Plant	Most recent result complies with ADWG value
Radiological	gross alpha	NA[1]	0.05	every 3 years	Yes
	gross beta	NA[1]	0.10	every 3 years	Yes
	total radionuclides	0.5	0.02	every 3 years	Yes

NA = Not Applicable. ADWG = Australian Drinking Water Guidelines.

[1] The sum of gross alpha and gross beta (total radionuclides) should not exceed 0.5 Bq/L (becquerels per litre). If the screening test for gross alpha or gross beta activity was to trigger further analysis of radionuclides, the specific radionuclides would be identified and assessed in consultation with NSW Health. These would likely be radium-226 (limit of detection is 0.01 Bq/L) and radium-228 (limit of detection is 0.08 Bq/L) as this is recommended in the ADWG.

Water in the catchments

We report some information about water quality in WaterNSW's catchments. **Water in your area is sourced from Lake Burragorang at Warragamba Dam, Prospect Lake, and the Upper Canal** (which conveys water from Nepean and Avon Dams).

Information about untreated (raw) water in these catchments is provided below.

For more information about quantities of water in the catchment areas, please visit the WaterNSW website.

Table 14 Lake Burragorang, 500 metres upstream of the dam wall, quarterly results

		Quarterly Results – 1 Oct 2024 to 31 Dec 2024					
Characteristics		Unit of measure	WaterNSW Reference levels[2]	No. of samples	Min	Ave	Max
Microbiological	*E. coli*	orgs/100 mL	NA	60	<1	1	9
	Cryptosporidium[3]	oocysts/10 L	NA	0	NA	NA	NA
	Giardia[3]	cysts/10 L	NA	0	NA	NA	NA
Physical / chemical	turbidity	NTU	NA	917	0.07	6.07	21.35
	true colour[1]	HU	NA	59	15	21	26
	chlorophyll - *a*	µg/L	2-10	42	0.5	4.0	23.8
	iron	mg/L	<1	60	<0.010	0.277	0.520
	aluminium	mg/L	<0.1	60	0.020	0.208	0.450
	manganese	mg/L	0.5	60	0.001	0.012	0.084

[1] True colour is measured at 400 nm wavelength.

[2] Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2000). These guidelines list water quality levels consistent with acceptable medium to long-term environmental water quality. Water quality may vary outside these ranges during disturbances of the raw water for example after heavy rain in the catchments. During these occurrences, Sydney Water can treat the raw water and continued to provide safe drinking water that met all long-term health and aesthetic guidelines under the Australian Drinking Water Guidelines.

[3] Cryptosporidium & Giardia are monitored at irregular frequencies and in response to events.

Abbreviations:Ave = average value; E. coli = Escherichia coli; HU = Hazen Units; Max = maximum value; mg/L = milligrams per litre; Min = minimum value; NTU = nephelometric turbidity units; orgs/100 mL = organisms per 100 millilitres; cysts/10 L = Giardia cysts per 10 litres; oocysts/10 L = Cryptosporidium oocysts per 10 litres; NA = not applicable.

Table 15 Lake Burragorang, 500 metres upstream of the dam wall, annual results

		Annual Results – 1 Jan 2024 to 31 Dec 2024					
Characteristics		Unit of measure	WaterNSW Reference levels[2]	No. of samples	Min	Ave	Max
Microbiological	*E. coli*	orgs/100 mL	NA	250	<1	2	62
	Cryptosporidium[3]	oocysts/10 L	NA	0	NA	NA	NA
	Giardia[3]	cysts/10 L	NA	0	NA	NA	NA
Physical / chemical	turbidity	NTU	NA	4507	0.07	11.18	54.98
	true colour[1]	HU	NA	249	9	20	59
	chlorophyll - *a*	µg/L	2-10	165	<0.2	4.0	23.8
	iron	mg/L	<1	252	<0.010	0.297	2.100
	aluminium	mg/L	<0.1	250	<0.010	0.234	2.300
	manganese	mg/L	0.5	252	0.001	0.035	0.445

[1] True colour is measured at 400 nm wavelength.

[2] Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2000). These guidelines list water quality levels consistent with acceptable medium to long-term environmental water quality. Water quality may vary outside these ranges during disturbances of the raw water for example after heavy rain in the catchments. During these occurrences, Sydney Water can treat the raw water and continued to provide safe drinking water that met all long-term health and aesthetic guidelines under the Australian Drinking Water Guidelines.

[3] Cryptosporidium & Giardia are monitored at irregular frequencies and in response to events.

Abbreviations:Ave = average value; E. coli = Escherichia coli; HU = Hazen Units; Max = maximum value; mg/L = milligrams per litre; Min = minimum value; NTU = nephelometric turbidity units; orgs/100 mL = organisms per 100 millilitres; cysts/10 L = Giardia cysts per 10 litres; oocysts/10 L = Cryptosporidium oocysts per 10 litres; NA = not applicable.

Table 16 Upper Canal, quarterly results

Characteristics		Unit of measure	WaterNSW Reference levels[2]	Quarterly Results – 1 Oct 2024 to 31 Dec 2024 No. of samples	Min	Ave	Max
Microbiological	*E. coli*	orgs/100 mL	NA	4	2	36	91
	Cryptosporidium[3]	oocysts/10 L	NA	0	NA	NA	NA
	Giardia[3]	cysts/10 L	NA	0	NA	NA	NA
Physical / chemical	turbidity	NTU	NA	4	0.30	0.77	1.07
	true colour[1]	HU	NA	4	10	11	12
	chlorophyll - *a*	µg/L	NA	4	0.3	0.5	0.9
	iron	mg/L	<1	4	0.300	0.320	0.330
	aluminium	mg/L	<0.1	4	0.070	0.080	0.100
	manganese	mg/L	NA	4	0.007	0.010	0.012

[1] True colour is measured at 400 nm wavelength.

[2] Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2000). These guidelines list water quality levels consistent with acceptable medium to long-term environmental water quality. Water quality may vary outside these ranges during disturbances of the raw water for example after heavy rain in the catchments. During these occurrences, Sydney Water can treat the raw water and continued to provide safe drinking water that met all long-term health and aesthetic guidelines under the Australian Drinking Water Guidelines.

[3] Cryptosporidium & Giardia are monitored at irregular frequencies and in response to events.

Abbreviations: Ave = average value; E. coli = Escherichia coli; HU = Hazen units; Max = maximum value; mg/L = milligrams per litre; Min = minimum value; NTU = nephelometric turbidity units; orgs/100 mL = organisms per 100 millilitres; cysts/10 L = Giardia cysts per 10 litres; oocysts/10 L = Cryptosporidium oocysts per 10 litres; NA = not applicable.

Table 17 Upper Canal, annual results

			Annual Results – 1 Jan 2024 to 31 Dec 2024				
Characteristics		Unit of measure	WaterNSW Reference levels[2]	No. of samples	Min	Ave	Max
Microbiological	*E. coli*	orgs/100 mL	NA	19	<1	31	120
	Cryptosporidium[3]	oocysts/10 L	NA	0	NA	NA	NA
	Giardia[3]	cysts/10 L	NA	0	NA	NA	NA
Physical / chemical	turbidity	NTU	NA	19	0.30	1.84	3.46
	true colour[1]	HU	NA	19	9	14	19
	chlorophyll - *a*	µg/L	NA	19	0.2	0.5	1.1
	iron	mg/L	<1	19	0.300	0.416	0.670
	aluminium	mg/L	<0.1	19	0.050	0.146	0.300
	manganese	mg/L	NA	19	0.007	0.014	0.036

[1] True colour is measured at 400 nm wavelength.

[2] Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2000). These guidelines list water quality levels consistent with acceptable medium to long-term environmental water quality. Water quality may vary outside these ranges during disturbances of the raw water for example after heavy rain in the catchments. During these occurrences, Sydney Water can treat the raw water and continued to provide safe drinking water that met all long-term health and aesthetic guidelines under the Australian Drinking Water Guidelines.

[3] Cryptosporidium & Giardia are monitored at irregular frequencies and in response to events.

Abbreviations: Ave = average value; E. coli = Escherichia coli; HU = Hazen Units; Max = maximum value; mg/L = milligrams per litre; Min = minimum value; NTU = nephelometric turbidity units; orgs/100 mL = organisms per 100 millilitres; cysts/10 L = Giardia cysts per 10 litres; oocysts/10 L = Cryptosporidium oocysts per 10 litres, NA = not applicable.

Table 18 Prospect Reservoir/Prospect Lake, quarterly results

		Quarterly Results – 1 Oct 2024 to 31 Dec 2024					
Characteristics		Unit of measure	WaterNSW Reference levels[2]	No. of samples	Min	Ave	Max
Microbiological	*E. coli*	orgs/100 mL	NA	2	3	3	3
	Cryptosporidium[3]	oocysts/10 L	NA	0	NA	NA	NA
	Giardia[3]	cysts/10 L	NA	0	NA	NA	NA
Physical / chemical	turbidity	NTU	NA	197	0.78	2.03	6.06
	true colour[1]	HU	NA	2	6	6	6
	chlorophyll - *a*	µg/L	2-10	2	4.4	4.8	5.3
	iron	mg/L	<1	2	0.120	0.125	0.130
	aluminium	mg/L	<0.1	2	0.070	0.070	0.070
	manganese	mg/L	0.5	2	0.010	0.011	0.011

[1] True colour is measured at 400 nm wavelength.

[2] Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2000). These guidelines list water quality levels consistent with acceptable medium to long-term environmental water quality. Water quality may vary outside these ranges during disturbances of the raw water for example after heavy rain in the catchments. During these occurrences, Sydney Water can treat the raw water and continued to provide safe drinking water that met all long-term health and aesthetic guidelines under the Australian Drinking Water Guidelines.

[3] Cryptosporidium & Giardia are monitored at irregular frequencies and in response to events.

Abbreviations: Ave = average value; E. coli = Escherichia coli; HU = Hazen Units; Max = maximum value; mg/L = milligrams per litre; Min = minimum value; NTU = nephelometric turbidity units; orgs/100 mL = organisms per 100 millilitres; cysts/10 L = Giardia cysts per 10 litres; oocysts/10 L = Cryptosporidium oocysts per 10 litres; NA = not applicable.

Table 19 Prospect Reservoir/Prospect Lake, annual results

		Annual Results – 1 Jan 2024 to 31 Dec 2024					
Characteristics		Unit of measure	WaterNSW Reference levels[2]	No. of samples	Min	Ave	Max
Microbiological	*E. coli*	orgs/100 mL	NA	12	<1	2	6
	Cryptosporidium[3]	oocysts/10 L	NA	5	<1	<1	<1
	Giardia[3]	cysts/10 L	NA	5	<1	<1	<1
Physical / chemical	turbidity	NTU	NA	846	0.78	2.25	8.80
	true colour[1]	HU	NA	12	6	7	11
	chlorophyll - *a*	µg/L	2-10	17	2.0	5.7	10.7
	iron	mg/L	<1	12	0.070	0.134	0.260
	aluminium	mg/L	<0.1	12	0.040	0.093	0.190
	manganese	mg/L	0.5	12	0.008	0.017	0.033

[1] True colour is measured at 400 nm wavelength.

[2] Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2000). These guidelines list water quality levels consistent with acceptable medium to long-term environmental water quality. Water quality may vary outside these ranges during disturbances of the raw water for example after heavy rain in the catchments. During these occurrences, Sydney Water can treat the raw water and continued to provide safe drinking water that met all long-term health and aesthetic guidelines under the Australian Drinking Water Guidelines.

[3] Cryptosporidium & Giardia are monitored at irregular frequencies and in response to events.

Abbreviations: Ave = average value; E. coli = Escherichia coli; HU = Hazen Units; Max = maximum value; mg/L = milligrams per litre; Min = minimum value; NTU = nephelometric turbidity units; orgs/100 mL = organisms per 100 millilitres; cysts/10 L = Giardia cysts per 10 litres; oocysts/10 L = Cryptosporidium oocysts per 10 litres; NA = not applicable.

Review of drinking water literature

Every quarter, we review a topic from the latest water quality research from around the world.

Managing opportunistic pathogens

When we consider microbial risk and control of drinking water supplies, often our focus is on enteric pathogens. These include protozoa like *Cryptosporidium* and *Giardia*, bacteria like *Campylobacter* or viruses like norovirus or rotavirus. These pathogens do not grow in drinking water. They multiply in the intestines of people or animals and can be transmitted through the contamination of drinking water with animal or human waste, that is via a faecal-oral exposure pathway. They can cause disease, like gastroenteritis, in anyone. We filter and treat our source water to remove and kill these pathogens.

However, tap water is not sterile and some microorganisms can live in drinking water. Their presence alone does not necessarily indicate an issue as they can be normal inhabitants of surface waters. In certain conditions, some microorganisms may be able to multiply to levels that are harmful to humans. These organisms can impact people with weak or supressed immune systems like elderly or immunocompromised people or those with other underlying risk factors. These are known as opportunistic pathogens. The controls we use to manage enteric pathogens also assist to remove opportunistic pathogens, but an extra focus on the drinking water distribution network to prevent the proliferation of these microorganisms is also necessary.

A recent review by Le Chevallier et al (2024), and as highlighted in Water Research Australia's Health Stream (Issue 112, 2024), has summarised the current state of understanding on opportunistic pathogens in drinking water distribution systems. It looked at data for a variety of opportunistic pathogens and found that most outbreaks were associated with growth within building plumbing systems rather than drinking water distribution system and 56% of outbreaks in the United States of America were in healthcare facilities, 16% in tourist accommodation and just 3% in private residences. Ninety eight percent of outbreaks due to opportunistic pathogens were related to *Legionella* species.

Legionella pneumophilia remains the most likely opportunistic pathogen to cause an outbreak. Legionnaire's disease may occur if *Legionella* infects the lungs following inhalation of water aerosols that contain high numbers of the bacteria. *Legionella* can survive and multiply in the natural environment and in man-made equipment that uses or carries water such as air conditioning cooling towers, spas, shower heads, humidifiers and misters. It can survive long periods inside the cysts of some amoebae and in the biofilms or slime that can coat pipes or other surfaces. Key risk factors for the growth of *Legionella* (and other opportunistic pathogens) include water stagnation and warm water temperatures. The growth of *Legionella* is encouraged when the water temperature rises above 20°C.

As a water provider Sydney Water works to ensure that there is adequate treatment, including disinfection, of the source water and that conditions within our distribution network do not encourage the growth of opportunistic pathogens. We do this in accordance with the framework for the management of drinking water in the Australian Drinking Water Guidelines, our Drinking Water Management System and advice from other sources on best practice.

The main control mechanisms that we employ to reduce the risk of *Legionella* growing to dangerous levels in drinking water systems are to:

- disinfect drinking water with chlorine or chloramine and then maintain an adequate disinfectant residual in the drinking water network
- maintain clean pipes and minimise corrosion
- inspect and clean reservoirs to ensure integrity and remove accumulation of sediments
- avoid creating areas of stagnant water in the system as the disinfectant level can drop in such areas
- maintain water pressure to prevent ingress of contaminants
- where possible, design and manage systems to minimise increases in water temperature.

We monitor the drinking water network water temperatures and disinfectant levels that may promote their growth, particularly during summer, to ensure that this risk is adequately managed.

We will continue to look at how climate change may influence the growth of opportunistic pathogens due to warmer average water temperatures in both our source water and the drinking water network, as well as how water management practices by users resulting from warmer weather may increase risk (LeChevallier et al 2024, O'Keeffe 2022).

It is also important for customers to manage risk in their own private plumbing, fittings and devices, particularly for commercial and industrial properties. We publish best practice guidelines for cooling towers in commercial buildings on our website. In your home it is a good idea to flush taps and fittings with some fresh, cold water if you have been away for an extended period of time to get rid of any warm, stagnant water. NSW Health have a variety of resources regarding Legionnaire's disease and Legionella control on their website.

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Contact us

If you have any questions or concerns about the information in this report, contact us on our website. For issues about water quality, call 13 20 90, available 24/7.

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