



Mucnea Water

Report to the Department of Health

for the period

1 April 2024 to 30 June 2024

Mucnea Water
PO Box 1982
West Perth WA 6872

www.mucneawater.com.au

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1.0 Water Provider Information

Water Provider Contact Details	
Company Trading Name	Muchea Water
Company Address	Level 1, 32 Ord Street, West Perth
Company Phone	08 9551 1620
Company Email	admin@mucheawater.com.au
Director	M Giles
DoH Liaison Officer	K Shackleton

1.1 System Information

Summary	
Number of connections ⁽¹⁾	81
Number of customers ⁽²⁾	102
Average water supplied (L/day)	84,966
Sources of water	100% groundwater
Treatment systems	2 stage filtration, UV disinfection, chlorination
Length of mains	Approximately 12.9 kilometres (including approximately 8.2 kilometres of distribution network)
Number of zones	1
Number of sample points	4 (Source sampling point, treated water sampling point, Estate consumer sampling point, MIP consumer sampling point)

Notes:

- (1) The number of connections refers to properties (including lots under construction) that have been connected to Muchea Water's reticulation network and are having regular meter readings taken.
- (2) The number of customers refers to customer account holders registered with Muchea Water, including vacant lots, even where they have not yet been connected to Muchea Water's network.

Operating Area

Muchea Water operates in the Shire of Chittering, 50km north-east of Perth. We provide drinking water to the Wildflower Ridge (Estate) – a residential subdivision located at Reserve Road, Chittering; and to the Muchea Industrial Park (MIP) (previously referred to as the Muchea Employment Node) – an industrial development located east of the Muchea townsite.

Muchea Water holds, and operates in accordance with, a Water Services Licence (WL51) issued by the State’s regulator, the Economic Regulation Authority of WA.

Catchment Details

Muchea Water operates one water supply system with water sourced from the Leederville–Parmelia Aquifer.

Muchea Water holds a Licence to Take Water (GWL59907(8)), issued by the Department of Water and Environmental Regulation (DWER), under the *Rights in Water and Irrigation Act 1914*.

Water is abstracted from a production bore located on a secured site on the south-west corner of the Wildflower Ridge Estate, on Reserve Road, Chittering.

Distribution System

The water extracted from the aquifer is treated at Muchea Water’s water treatment facility to remove metals and solids and disinfect and dose the treated water to comply with Australian Drinking Water Guidelines (ADWG) (version 3.7 (2022)) quality requirements. The treated water is then stored in tanks at the treatment plant for delivery by a reticulation network to customers in the adjacent Estate and a mains network pipe to the MIP. Muchea Water does not add fluoride to drinking water supplied to consumers.

2.0 Water Quality Parameters

Parameter	Description	ADWG Recommendations
Iron & Manganese	<p>Iron and Manganese in water can come from contact with containing soil or rock in the catchment.</p> <p>Iron and Manganese can both accumulate in pipe sediments and be re-suspended during periods of rapid changes to water flow patterns.</p>	<p>The ADWG recommend that based on aesthetic consideration, the concentration of Iron should not exceed 0.3 milligrams per Litre (mg/L).</p> <p>The ADWG recommend that based on aesthetic considerations, the levels of Manganese should not exceed 0.1 mg/L. Manganese is not considered a health concern unless the concentration exceeds 0.5 mg/L.</p>
pH	<p>pH is a measure of water acidity (pH 7 is neutral). pH is the measure of free hydrogen ion concentration in the water.</p>	<p>The suggested aesthetic pH target from the ADWG is 6.5 to 8.5.</p>
Turbidity (NTU)	<p>Turbidity is the cloudy appearance of water caused by the presence of suspended particulate matter.</p> <p>Turbidity of 5 NTU would appear slightly muddy or milky in a glass. Crystal clear water usually has a turbidity of less than 1 NTU.</p>	<p>The ADWG specify an aesthetic guideline of <5 Nephelometric Turbidity Units (NTU).</p> <p>If disinfection is required, then a turbidity of less than 1 NTU is desirable at the point of disinfection.</p>
True Colour	<p>True colour in water originates mainly from natural water drainage through soil and vegetation in a catchment.</p> <p>As a guide, tea has a colour of about 2500 HU, and a colour of 15 HU can be noticed in a glass of water.</p>	<p>The aesthetic value for colour is based on the colour that is noticeable in a glass. This is generally accepted as <15 HU.</p>
Total Dissolved Solids (mg/L)	<p>Total Dissolved Solids (TDS) consist of inorganic (natural) salts and small amounts of organic matter dissolved in water. TDS includes sodium, potassium, calcium, magnesium, chloride, sulfate, bicarbonate, carbonate, silica, organic matter, fluoride, iron, manganese, nitrate and phosphate.</p> <p>Water with low TDS can taste flat, while water with high TDS tastes salty and causes scaling in pipes, fittings and household appliances.</p>	<p>The ADWG provides guidance in the palatability of drinking water according to TDS concentration:</p> <p>0 to 600 mg/L – Good quality 600 to 900 mg/L – Fair quality 900 to 1200 mg/L – Poor quality >1200 mg/L – Unpalatable</p>
Microbial pathogens	<p>The most common and widespread health risk associated with drinking water is contamination by microorganisms. Organisms associated with the gut of humans and mammals when contaminating drinking water can cause the diseases. Tests are undertaken for</p>	<p>The ADWG state that thermotolerant coliforms/<i>E.coli</i> should not be present in a minimum 100mL sample of drinking water. DoH has notification protocols in place regarding exception events for pathogens. Muchea Water will immediately notify the DoH of any confirmed detection of</p>

Parameter	Description	ADWG Recommendations
	<p><i>Escherichia coli</i> (<i>E. coli</i>) as an indicator of microbial contamination.</p> <p>Thermophilic <i>Naegleria</i> refers to a group of amoebae which includes <i>Naegleria fowleri</i>, the organism that causes the waterborne disease primary amoebic meningoencephalitis. <i>Naegleria fowleri</i> is an environmental pathogen which naturally lives in fresh warm water.</p>	<p>thermotolerant coliforms, <i>E.coli</i> or thermophilic <i>Naegleria</i> species in any sample for microbiological analysis.</p>
Radiological	<p>There are natural levels of radiation within the environment, and groundwater sources such as that sourced from the Leederville aquifer can have higher background levels than that of surface water systems.</p>	<p>Testing is undertaken for gross alpha and gross beta radioactivity, where screening levels can be determined. The ADWG recommend a screening level of 0.5 Becquerel per litre (Bq/L).</p>
THMs	<p>Trihalomethanes (THMs) may be present in drinking water as a by-product of disinfection by chlorination.</p> <p>Muchea Water regularly monitor the drinking water to ensure that THM concentration remains below guideline levels</p>	<p>The ADWG health guideline for total THM is 0.25 mg/L.</p>
Pesticides	<p>Muchea Water regularly monitor the drinking water to ensure that no pesticide or other synthetic organic compound exceeds the respective guideline level.</p>	<p>The ADWG provides health related guidelines for an extensive range of pesticides and industrial chemicals.</p>

Note: 1. Milligram per litre (mg/L) is the commonly used unit for concentration, the mass of a constituent dissolved in 1 litre of water, generally synonymous with “parts per million” (ppm).

3.0 Performance Summary

Water Quality Meeting the Australian Drinking Water Guidelines / Minister of Health's Directions				
Microbiological Quality	Number Assessed ⁽¹⁾	Number. Within Guidelines	Variance ⁽²⁾	% Compliance
<i>E.coli</i>	24	24	0	100%
Thermophilic <i>Naegleria</i>	12	12	0	100%
Chemical Quality ⁽³⁾				
Chemical – Health related ⁽⁴⁾	56	56	0	100%
Chemical – Non-Health related (Aesthetic) ⁽⁵⁾	101	90	11	89%
Radiological ⁽⁶⁾	2	2	0	100%

Notes:

- (1) Number of samples taken for the quarter from the treated water sampling point and the 2 consumer sampling points (total 3 sampling points).
- (2) Number of samples that do not comply with the drinking water guidelines (ADWG).
- (3) Chemical performance is based on the results of the quarter.
- (4) Parameters with an ADWG health guideline value.
- (5) Parameters without an ADWG health guideline value, ie aesthetic guideline only, at treated water and consumer sampling points only.
- (6) Not a scheduled test in every quarter.

4.0 Microbial Performance

4.1 Microbiological – Exception Notifications

Number of microbiological incidents resulting in exception notification	0
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4.2 Microbiological – Consumer Sample Points (Summary)

Characteristic	Sampling point	No. of Analyses	Unit	No. of samples not meeting ADWG limit	% Compliance
<i>E. coli</i>	Consumer and treated water	24	CFU / 100 mL	0	100%
Thermophilic <i>Naegleria</i>	Consumer	12	org / 250 mL	0	100%
<i>Naegleria Fowleri</i> ⁽¹⁾	Consumer	0	org / 250 mL	0	n/a

Note:

(1) Analysis for *Naegleria Fowleri* is only undertaken if Thermophilic *Naegleria* is detected.

5.0 Chemical – Health Related Performance

5.1 Chemical – Health Related – Exception Notifications

Number of chemical, health related, incidents resulting in exception notification	0
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5.2 Chemical – Health Related – Performance

a) Summary of chemical – health related – analyses at Treated Water sampling point and Consumer sampling points

Parameter	No. of Samples Analysed	Unit	ADWG Limit (Health)	Maximum Value	No. of samples not meeting ADWG limit	% Compliance
Free Chlorine	21	mg/L	5	0.90	0	100%
Antimony (Total)	3	mg/L	0.003	<0.0002	0	100%
Cadmium (Total)	3	mg/L	0.002	<0.0005	0	100%
Chromium (hexavalent)	3	mg/L	0.05	<0.01	0	100%
Copper (Total)	3	mg/L	2	0.02	0	100%
Fluoride ⁽¹⁾	1	mg/L	1.5	0.30	0	100%
Lead (Total)	3	mg/L	0.01	0.0004	0	100%
Manganese (Total)	3	mg/L	0.5	0.004	0	100%
Nickel (Total)	3	mg/L	0.02	<0.0005	0	100%
Perfluorooctanoic acid (PFOA)	1	ug/L	0.56	<0.0005	0	100%
Sum of perfluorooctane sulfonate (PFOS) and perfluorohexane sulfonate (PFHxS)	1	ug/L	0.07	0.0026	0	100%

Note:

- (1) Muchea Water does not add fluoride to water. The naturally occurring fluoride levels from extracted water is expected to vary over time.
- (2) In total here were 30 individual poly- and per-fluorinated alkyl substances (PFAS) analysed of which only 1 (PFOS) was detected.

b) Summary of chemical – health related – analyses at Source sampling point

Parameter	No. of Samples Analysed	Unit	ADWG Limit (Health)	Maximum Value	No. of samples not meeting ADWG limit	% Compliance
Arsenic (Total)	1	mg/L	0.01	<0.0002	0	100%
Barium (Total)	1	mg/L	2	0.05	0	100%
Beryllium (Total)	1	mg/L	0.06	<0.0001	0	100%
Boron (Total)	1	mg/L	4	0.05	0	100%
Manganese (Total)	1	mg/L	0.5	0.08	0	100%
Mercury (Total)	1	mg/L	0.001	<0.0001	0	100%
Uranium (Total)	1	mg/L	0.02	<0.00005	0	100%
Perfluorooctanoic acid (PFOA)	2	ug/L	0.56	<0.0005	0	100%
Sum of perfluorooctane sulfonate (PFOS) and perfluorohexane sulfonate (PFHxS)	2	ug/L	0.07	0.0003	0	100%

6.0 Chemical – Aesthetic Performance

6.1 Chemical – Aesthetic – Exception Notifications

Number of chemical, aesthetic, incidents resulting in exception notification	0
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6.2 Chemical – Aesthetic Performance

a) Summary of aesthetic related analyses at Treated Water and Consumer sampling points

Parameter	No. of Samples Analysed	Unit	ADWG Limit (Aesthetic) ⁽³⁾	Maximum Value	No. of samples not meeting ADWG limit	% Compliance
pH	21	pH Unit	6.5–8.5	8.2	0	100%
Free Chlorine ⁽¹⁾	21	mg/L	0.6	0.90	8	62% ⁽¹⁾
Total Dissolved Solids @180°C	2	mg/L	600	326	0	100%
Colour (True)	2	HU	15	3	0	100%
Turbidity	2	NTU	5	1	0	100%
Total Hardness as CaCO ₃	2	mg/L CaCO ₃	200	38	0	100%
Hydroxide Alkalinity as CaCO ₃	2	mg/L CaCO ₃	NG	<1	0	NA
Carbonate Alkalinity as CaCO ₃	2	mg/L CaCO ₃	NG	<1	0	NA
Bicarbonate Alkalinity as CaCO ₃	2	mg/L CaCO ₃	NG	80	0	NA
Total Alkalinity as CaCO ₃	2	mg/L CaCO ₃	NG	80	0	NA
Sulfate as SO ₄ - Turbidimetric	3	mg/L	250	12	0	100%
Ammonium as NH ₃	2	mg/L NH ₃	NG	<0.012	0	NA
Ammonia as NH ₃	2	mg/L NH ₃	0.5	<0.012	0	100%
Sodium	3	mg/L	180	104	0	100%

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Summary of aesthetic related analyses at Treated Water and Consumer sampling points – *Continued*

Parameter	No. of Samples Analysed	Unit	ADWG Limit (Aesthetic) ⁽³⁾	Maximum Value	No. of samples not meeting ADWG limit	% Compliance
Aluminium (Acid Soluble)	2	mg/L	0.2	<0.01	0	100%
Aluminium (Total)	3	mg/L	NG	<0.005	0	NA
Iron (Total)	3	mg/L	0.3	0.6	3	0% ⁽²⁾
Zinc (Total)	3	mg/L	3	0	0	100%

Notes re Aesthetic related analyses at Treated Water and Consumer sampling points:

- (1) Muchea Water operates the water system with a target chlorine level at the treated water sample point slightly above the aesthetic guideline value of 0.6 mg/L to ensure adequate disinfection through the entire distribution system.
- (2) Muchea Water continuously monitors iron concentration in bore and treated water and has an ongoing process improvement program to lower the level of iron in water through the water treatment plant. During the quarter three samples for total iron were greater than the ADWG aesthetic limit of 0.3 mg/L total iron. However, twenty three routine field samples for dissolved iron recorded levels below ADWG limits which indicates that some of the total iron measured at the sample points is in a precipitated form which does not contribute to incidence of water staining.
- (3) Parameters with no ADWG guideline are denoted as NG (no guideline).

b) Summary of aesthetic related analyses at Source water sampling point

Source water parameters are monitored for information purposes though source water is subsequently treated to ensure parameters outside ADWG aesthetic related values are addressed. Where parameters are not reported as part of the treated water and consumer sampling points, they will be separately identified and reported. During the quarter all measured source water parameters have been covered in the treated water and consumer sampling point data above.

7.0 Radiological Performance

7.1 Radiological Performance – Exception Notifications

Number of radiological water quality incidents resulting in exception notification	0
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7.2 Radiological Performance

Summary of radiological related analyses at Source water sampling point

Parameter	No. of Samples Analysed	Unit	AWDG Limit (Aesthetic)	Maximum Value	Number of samples not meeting AWDG limit	% Compliance this Quarter
Gross alpha	1	Bq/L	0.5	0.07	0	100%
Gross beta activity - 40K	1	Bq/L	0.5	<0.1	0	100%

8.0 Planned Sample Summary

Characteristic	Sampling point	Planned	Taken	% Taken
Microbiological	Treated water and Consumer sampling points	32	36 ⁽¹⁾	100%
Chemical	Treated water and Consumer sampling points	124	124	100%
	Source sampling point	29	33 ⁽¹⁾	100%
Radiological	Source sampling point	2	2	n/a

Note:

- (1) In addition to the tests planned for the quarter, following a review of its testing regime Muchea Water has increased the frequency of testing of some parameters. This led to additional tests being undertaken in the quarter.

9.0 General Notes / Other

Regular checks of pH and chlorine using handheld instrumentation at the Water Treatment Plant (source and treated water sampling points), and at the Estate and MIP sampling points, are carried out by Muchea Water personnel on a fortnightly basis.

Laboratory testing is conducted on water samples by a testing services organisation accredited by NATA for the analyses performed.

9.1 Glossary

ADWG	Australian Drinking Water Guidelines
Bq/L	Becquerels per litre
CFU	Colony forming units
Deg C	Degrees Celsius
DoH	Department of Health, Western Australia
Estate	Wildflower Ridge Estate, a residential development located in Chittering
HU	Hazen units, used in assessing colour shades in water and other liquids
km	Kilometres
L	Litre
MIP	Muchea Industrial Park (previously referred to as the Muchea Employment Node or MEN), an industrial development located east of the Muchea townsite
mg/L	Milligram per Litre
mL	Millilitres
µg/L	Micrograms per litre
n/a or NA	Not applicable, typically as not a relevant data point and/or no calculation applied
NATA	National Association of Testing Authorities, Australia
NG	No Guideline
NTU	Nephelometric turbidity units
TDS	Total Dissolved Solids