Northern Australia's Transport Link to the World

PORT of TOWNSVILLE

Port of Townsville Limited

Drinking Water Quality Management Plan

Report 1 July 2018 to June 2019

Service Provider Identification Number (SPID): 570

POTL Water Distribution Scheme

1. INTRODUCTION

This report documents the performance of Port of Townsville Limited's (POTL) drinking water service with respect to water quality and performance in implementing the actions detailed in its drinking water quality management plan (DWQMP- 10 December 2018) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act). POTL has been registered as a service provider under the Water Supply (Safety and Reliability) Act 2008 (the Act) since 19 January 2015.

The report has been prepared in accordance with the Drinking Water Quality Management Plan Report Guidance Note by the Department of Natural Resources, Mines and Energy, which provides a mechanism for providers to report publicly on their performance in managing drinking water quality.

2. OVERVIEW OF OPERATIONS

POTL is responsible for its on-site potable water distribution network within the Port of Townsville, namely the POTL Water Distribution Scheme, which includes the POTL owned and maintained potable water distribution mains across POTL owned lands. This distribution scheme only services POTL owned buildings, lease held lands and facilities and the port berths for visiting ship connection.

The POTL Water Distribution Scheme draws its drinking water supply from Townsville City Council's (TCC) reticulated supply through two metered supply points. POTL does not store or have the capacity to treat potable water. POTL has no influence over the quality of water distributed through its scheme and has no opportunity to treat water distributed through its scheme. POTL relies solely on the municipal potable water supplier in providing potable water that meets all necessary standards and no recycled water or alternate potable water sources are distributed by POTL within the Port of Townsville. The management of water quality until it is supplied to Port of Townsville is the responsibility of TCC. On a monthly basis, POTL requests and is supplied with a summary Certificate of Analysis on the potable water quality at the nearest reservoir to the Port to confirm compliance with the ADWG. POTL is committed to ensuring that the water scheme is managed so that the supply does not constitute a hazard to employees or the public.

Table 1 details the water source, treatment processes, disinfection processes and other infrastructure of the scheme along with the context of the supply in terms of current population and demand.

PORT of TOWNSVILLE

Table 1: Infrastructure Details

Component		Details
Name of Scheme		POTL Water Distribution Scheme
Operator		Port of Townsville Limited
Sources	Name	Townsville City Council Municipal Water Supply
	Type	Treated Water Supply
	% of supply	100%
Sourcing Infrastructure	Type (pumped/gravity/equipped bore/etc.)	Supply Mains
	Description	The POTL Water Distribution Scheme is supplied by two water mains from the TCC Municipal Water Supply. One 200mm pipeline services the Western area of the port and a second 300 mm pipeline services the Eastern area of the port.
Are there any sources that **do not** undergo treatment prior to supply?		No
Treatment Plant	Not applicable. The POTL Water Distribution Scheme has no treatment plants. All treatment is performed by the TCC Municipal Water Supply prior to water entering the POTL Water Distribution Scheme.	
Are there any sources that **do not** undergo disinfection prior to supply?		No
Disinfection	Not applicable. The POTL Water Distribution Scheme has no disinfection processes. All disinfection is performed by the TCC Municipal Water Supply prior to water entering the POTL Water Distribution Scheme.	
Distribution and Reticulation Scheme	Pipe material	Ductile Iron/Polyethylene
	Age range	15~ 50 years
	Approximate percentage % of total length	60% @ 50 year 40% @ 15 year
	Areas where potential long detention periods could be expected	N/A
	Areas where low water pressure (example < 12 m) could be expected during peak or other demand periods)	N/A
	Communities served	Port of Townsville Workplaces
	Population served	approx. 600
	Connections	106
	Demand	approx. 550 kL/d
Reservoirs	Not applicable. The POTL Water Distribution Scheme has no reservoirs. All water storage is performed by the TCC Municipal Water Supply prior to water entering the POTL Water Distribution Scheme.	
Water Quality Responsibility Changes	Upstream location	Townsville City Council – bulk supplier
	Downstream location	None

3. COMPLIANCE WITH WATER QUALITY CRITERIA FOR DRINKING WATER

Tables 3 and 4 provide a summary of the results of the operational and verification monitoring programs for the POTL Water Distribution Scheme. Both monitoring programs were carried out as per the specifications stated in the DWQMP.

The results from the operational and verification monitoring programs have been compared against the levels of the water quality criteria specified by the Regulator in the *Water Quality and Reporting Guideline for a Drinking Water Service*. The water quality criteria means the health guideline values in the most current Australian Drinking Water Guidelines (ADWG), as well as the standards in the Public Health Regulation 2005.

The water quality results met the recommended values in the *E. coli* and fluoride standards and health guidelines in the ADWG.

It should be noted that the laboratory limit of reporting for Selenium is the same as the guideline limit.

3.1 Appropriateness of Operational Monitoring Program

POTL does not store or treat water in its Water Distribution Scheme. The only operational parameter under POTL's control is residence time of water in its distribution scheme. Long residence times in the POTL scheme may result in low disinfectant residuals, microbial growth or regrowth and high concentrations of contaminants due to leaching or corrosion of system materials. Residual chlorine remains a useful measure of the potential for microbial growth and residence time of water in a system.

In the DWQMP Operational Limits for Residual Chlorine are assigned as between 0.2 to 0.5 mg/L. During 2018/19 there were 15 results below 0.2 mg/L with 8 of these results occurring at sampling site PW01 (Berth 1). This site is at the end of the reticulation system and there is limited demand for potable water at this location. A non-potable water sign has been placed at this location and this point will continue to be monitored monthly.

3.2 Appropriateness of Verification Monitoring Program

All parameters tested as part of the verification monitoring program met the ADWG. POTL will continue to review the scope of testing and/or the frequency of testing for particular parameters

as continual improvement and knowledge of risks improve through monitoring and understanding of POTL water distribution scheme.

POTL has monitored Polynuclear Aromatic Hydrocarbons since 2016 and the results during this period remain below the limit of reporting. However, it is noted that only one parameter (Benzo(a)pyrene) has applicable drinking water guidelines. Previously testing was undertaken with the standard level analysis limit of reporting for Benzo(a)pyrene (2 ug/l), which is higher than the guideline limit (0.01 ug/l). In 2018/19 POTL identified a low-level laboratory test able to undertake analysis with a lower LOR (0.005 ug/l) which should enable comparison to the guideline limit of 0.01 ug/l. POTL undertook this low-level analysis during 2018/19 period (2 sample events) and showed that PAH's were not present to this low concentration. POTL will continue to test PAH using this low-level laboratory test in 2019/20 and then review whether to retain PAH analysis or not in the verification program in the next review of the DWQMP.

3.3 Berth monitoring (action 8 of the RMIP)

As per action 8 of the Risk Management Improvement Plan in the DWQMP, POTL carried out additional Berth monitoring during 2018/19. In May 2019, Berth monitoring was carried out at Berths 10, 9, 8, 5, 4 and 3 with and without the hose that provides water to the vessels. This sampling occurred directly from the outlet and then from the hose (attached to the outlet) following a short period of flushing. The results from the outlets and hoses met the ADWG guidelines for all parameters tested, including total metals, fluoride, nitrite, nitrate and E-coli. Residual chlorine results were all within the range 0.2 to 0.5mg/L. The indicates that the transfer of drinking water to ships (on request from the vessel) using existing Berth infrastructure and following a period of initial flushing, is appropriate to manage the potential hazard identified in the RMIP.

Annual verification testing of potable water on the Berths is proposed in 2019/20 until the next review of the DWQMP.

3.4 PFAS (Per- and poly-fluoroalkyl substances)

The ADWG (amended August 2018) now includes health guidance values for PFOS (0.07 ug/l) and PFOA (0.56 ug/l). POTL undertook PFAS sampling in November 2018 at the Operational monitoring sites under the DWQMP. Results showed that, for standard and TOPA analysis, that PFOS and PFOA was not detectable in any of the sites. The results indicate that PFOS/PFOA is not present in the incoming water from TCC. No further testing of PFAS is proposed at this time.

Table 2: PFAS analysis

	No. of samples Collected		No. of samples collected in which PFOS/PFOA is detected	% of samples that comply
Operational Monitoring	PFOS	5	0	100
	PFOA	5	0	100

3.5 Incidents and complaints

No incidents that affected water supply occurred in 2018/19.

No complaints were received about potable water during 2018/19.

4. DWQMP REVIEW AND AUDIT

A review of the DWQMP occurred in 2018 and a summary of the review outcomes was presented in the 2017/2018 annual report. Following the review, a revision to the DWQMP occurred with minor administrative amendments. A copy of the revised DWQMP can be found on the POTL website. An audit on the DWQMP is required by September 2020.

PORT of TOWNSVILLE

Table 3: Operational E. coli Monitoring Results

Scheme Name	POTL Water Distribution Scheme											
Scheme Component	Distribution											
Year	2018/2019											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	5	5	5	5	5	5	5	5	5	5	5	5
No. of samples collected in which E. coli is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100	100	100	100	100	100	100	100	100	100	100	100
Compliance with 98% annual value	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Laboratory	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS
Unit	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml	CFU/100 ml
Limit of reporting	1	1	1	1	1	1	1	1	1	1	1	1

Table 4: Operational Residual Chlorine Monitoring Results and Verification Program Monitoring Results

Scheme Name		POTL Water Distribution Scheme									
Scheme Component		Distribution									
Parameter	Units	Limit of reporting	Frequency of sampling	No. samples required to be collected (as per approved DWQMP)	Total No. samples collected	Water Quality criteria (ADWG health guideline)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
Residual Chlorine	mg/L	0.02	monthly	60	60	-	N/A	<0.02	1.24	0.54	ALS
pH	pH unit	0.01	six-monthly	10	10	-	0	7.29	7.9	7.59	ALS
Turbidity	NTU	0.1	six-monthly	10	10	-	0	0.1	4.2	0.62	ALS
Fluoride	mg/L	0.1	six-monthly	10	10	1.5	0	0.3	0.6	0.45	ALS
Sulphate	mg/L	1	six-monthly	10	10	-	0	1	2	1.25	ALS
Chloride	mg/L	1	six-monthly	10	10	-	0	9	23	15.7	ALS
Calcium	mg/L	1	six-monthly	10	10	-	N/A	8	13	9	ALS
Magnesium	mg/L	1	six-monthly	10	10	-	N/A	1	3	1.8	ALS
Potassium	mg/L	1	six-monthly	10	10	-	N/A	1	3	2.4	ALS
Sodium	mg/L	1	six-monthly	10	10	-	0	10	19	14.6	ALS
Nitrite	mg/L	0.01	six-monthly	10	10	3	0	<0.01	<0.01	<0.01	ALS

Scheme Name		POTL Water Distribution Scheme
Scheme Component		Distribution

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Nitrate	mg/L	0.01	six-monthly	10	10	50	0	0.05	0.88	0.14	ALS
Aluminium (Total)	mg/L	0.01	six-monthly	10	10	-	N/A	0.02	0.04	0.026	ALS
Antimony (Total)	mg/L	0.001	six-monthly	10	10	0.003	0	<0.001	<0.001	<0.001	ALS
Arsenic (Total)	mg/L	0.001	six-monthly	10	10	0.01	0	<0.001	<0.001	<0.001	ALS
Barium (Total)	mg/L	0.001	six-monthly	10	10	2	0	0.018	0.039	0.02	ALS
Boron (Total)	mg/L	0.05	six-monthly	10	10	4	0	<0.05	<0.05	<0.05	ALS
Cadmium (Total)	mg/L	0.0001	six-monthly	10	10	0.002	0	<0.0001	<0.0001	<0.0001	ALS
Chromium (Total)	mg/L	0.001	six-monthly	10	10	0.05	0	<0.001	<0.001	<0.001	ALS
Copper (Total)	mg/L	0.001	six-monthly	10	10	2	0	0.002	0.178	0.03	ALS
Iron (Total)	mg/L	0.05	six-monthly	10	10	-	N/A	<0.05	1.58*	<0.05	ALS
Lead (Total)	mg/L	0.001	six-monthly	10	10	0.01	0	<0.001	0.002	0.0015	ALS

Scheme Name		POTL Water Distribution Scheme
Scheme Component		Distribution

Parameter	Units	Limit of reporting	Frequency of sampling	No. samples required to be collected (as per approved DWQMP)	Total No. samples collected	Water Quality criteria (ADWG health guideline)	No. of samples exceeding water quality criteria	Min	Max	Average (Mean)	Laboratory name
Manganese (Total)	mg/L	0.001	six-monthly	10	10	0.5	0	<0.001	0.003	0.002	ALS
Molybdenum (Total)	mg/L	0.001	six-monthly	10	10	0.05	0	<0.001	<0.001	<0.001	ALS
Nickel (Total)	mg/L	0.001	six-monthly	10	10	0.02	0	<0.001	<0.001	<0.001	ALS
Selenium (Total)	mg/L	0.01	six-monthly	10	10	0.01	0	<0.01	<0.01	<0.01	ALS
Silver (Total)	mg/L	0.001	six-monthly	10	10	0.1	0	<0.001	<0.001	<0.001	ALS
Uranium (Total)	mg/L	0.001	six-monthly	10	10	0.017	0	<0.001	<0.001	<0.001	ALS
Zinc (Total)	mg/L	0.005	six-monthly	10	10	-	0	<0.005	0.012	0.008	ALS
Mercury (Total)	mg/L	0.0001	six-monthly	10	10	0.001	0	<0.0001	<0.0001	<0.0001	ALS
Acenaphthene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS
Acenaphthylene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS
Anthracene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS

Scheme Name		POTL Water Distribution Scheme
Scheme Component		Distribution

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Benz(a)anthracene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS
Benzo(a)pyrene	µg/L	0.005	six-monthly	10	10	0.01	0	<0.005	<0.005	<0.005	ALS
Benzo(a)pyrene TEQ (zero)	µg/L	0.005	six-monthly	10	10	-	N/A	<0.005	<0.005	<0.005	ALS
Benzo(b+j) & Benzo(k)fluoranthene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS
Benzo(g.h.i)perylene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS
Chrysene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS
Dibenz(a.h)anthracene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS
Fluoranthene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS
Fluorene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS
Indeno(1.2.3.cd)pyrene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS

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Scheme Component		Distribution									
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Naphthalene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS
Phenanthrene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS
Pyrene	µg/L	0.02	six-monthly	10	10	-	N/A	<0.02	<0.02	<0.02	ALS
Sum of polycyclic aromatic hydrocarbons	µg/L	0.005	six-monthly	10	10	-	N/A	<0.005	<0.005	<0.005	ALS
2-Fluorobiphenyl	µg/L	surrogate	six-monthly	10	10	-	N/A	0.24	0.3	0.26	ALS
4-Terphenyl-d14	µg/L	surrogate	six-monthly	10	10	-	N/A	0.24	0.28	0.25	ALS
Anthracene-d10	µg/L	surrogate	six-monthly	10	10	-	N/A	0.23	0.29	0.26	ALS

Note: - indicates that no guideline value is specified. * One result for iron was recorded above the aesthetic guideline at one location during the period. No health guideline is applicable for iron. This location was monitored and met the guideline value at the next verification monitoring round.

5. ACRONYMS AND GLOSSARY

ALS	Australian Laboratory Services
CFU/100ml	Colony forming units per 100 millilitres
E. coli	*Escherichia coli*, a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
POTL	Port of Townsville Limited
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
org/100ml	Organisms per 100 millilitres
TCC	Townsville City Council
<	Less than