

Drinking Water Quality Management Plan (DWQMP) report

For the financial year: 2017-2018

Scheme: LAKELAND

Cook Shire Council

SPID: 511

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Glossary of terms

ADWG 2011	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
<i>E. coli</i>	<i>Escherichia coli</i> , a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
mg/L	Milligrams per litre
µg/L	Micrograms per litre
NTU	Nephelometric Turbidity Units
HU	Hazen units
µS/cm	Micro Siemens per centimetre
MPN/100mL	Most probable number per 100 millilitres
CFU/100mL	Colony forming units per 100 millilitres
<	Less than
>	Greater than
NATA Lab	Accredited by the National Association of Testing Authorities of Australia. Cook Shire Council currently uses the Cairns Regional Council Laboratory as its NATA registered Lab.
CCP's	Critical Control Point
RMIP	Risk Management Improvement Program

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1. Introduction

This is the Drinking Water Quality Management Plan (DWQMP) report for Cook Shire Council for the financial year 2017-2018 for the Lakeland Water Scheme.

Cook Shire Council is a registered service provider with identification (SPID) number 511. Cook Shire Council is operating under an approved DWQMP to ensure consistent supply of safe quality drinking water in order to protect public health. This is done through proactive identification and minimisation of public health risks associated with drinking water.

The DWQMP report includes:

- The activities undertaken over the financial year in operating our drinking water service
- Drinking water quality summary
- Summary of our performance in implementing our approved DWQMP

This report is submitted to the Regulator to fulfil our regulatory requirement, and is also made available to our customers through our website or for inspection upon request at Council office.

2. Overview of Operations

Lakeland's Water was sourced from 2 bores, 1 located within the Lakeland Compound (1/RP741362) and the 2nd being Army bore which is situated on the road reserve of the Peninsular Development Road.

Water is pumped from the bores to a ground level Reservoir and is chlorinated. Three pressure pumps are used to maintain pressure within the reticulation system.

Lakeland currently has 43 water connections:

- Residential – 63%
- Commercial/Industrial – 25%
- Council/Institutional -12%

3. Actions taken to implement the DWQMP

Water and Wastewater department staff meet fortnightly to discuss the departments operational issues. This provided an opportunity to refer to the approved DWQMP and emphasise the importance of using the plan. These meetings are chaired by the Manager of Water and Wastewater, Team Leader Treatment and Team Leader of Reticulation.

During the reporting period, 5 staff members completed a Certificate III in Water and Wastewater Operations. This included 2 reticulation staff, 1 Administration/Technical Officer and 2 Water and Wastewater Treatment Plant Operators. All Water and Wastewater Treatment Plant Operators have a Certificate III. Council will continue with Certificate III training for reticulation staff as it gives them a greater understanding of the importance of drinking water quality in their roles, they are responsible for sampling the water reticulation network and they can fill in at the Water and Wastewater Treatment Plants. Recruitment into Water and Wastewater Treatment Plant Operator positions can be difficult and training all staff allows a small Council such as Cook Shire Council recruit reticulation staff into these positions.

Revisions were made to the DWQMP in the 2016-2017 years and the plan was approved on the 19/07/2018. The sampling schedule was updated in 2018 to match the DWQMP sampling commitments.

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Scheme	Component	Improvement Action and Origin of Action	Target Date	Actions undertaken to date	Status and revised target date	Responsible officer
Lakeland	Data collection procedure	Need to strengthen the data provided to the regulator (audit report 2017)	30 th June 2018	Procedure developed for compiling annual report. Reports generated in SWIM and saved.	Completed	Manager
Lakeland	Reticulation	Develop reticulation infrastructure maintenance records (audit report 2017)	30 th June 2018	Reservoir inspections, cleaning, mains flushing, service and mains repairs etc... are all captured using the SWIM database and Council hazard inspections	Completed	Manager
Lakeland	Data collection procedure	Need to strengthen the data provided to the regulator (audit report 2017)	30 th June 2018	Procedure developed for compiling annual SWIM report. Reports generated in SWIM and saved.	Completed	Manager
Lakeland	Critical Control points	Establish, document and implement critical control points (CCPs) at the WTP (audit report 2017)	30 th June 2018	CCP's and operational procedures have been included in latest DWQMP amendments and implemented through SCADA controls and alarms through EDAC system	Completed	Manager
Lakeland	Army Bore	Possible contamination of Army bore from pesticide contamination (RMIP)	On-going	Continue to monitor army bore for pesticide contamination	On-going	Manager/ Team Leader Treatment
Lakeland	Chlorination	Dual final sodium hypochlorite pumps (RMIP)	30 th June 2018	Dual final sodium hypochlorite pumps installed with self-air bleeding heads. One pump controlled by the PLC and one by the analyser for additional backup.	Completed	Manager/Team Leader Treatment
Lakeland	Reticulation	Develop procedure to flush on low chlorine residual in reticulation (RMIP)	30 th June 2018	Procedure has been developed.	Completed	Manager
Lakeland	Procedures	Procedures for Lakeland (RMIP)	30 th June 2018	Procedures for Lakeland are complete. 14 procedures are available for Lakeland Water treatment plant and reticulation system.	Completed	Manager/Team Leader Reticulation
Lakeland	Auto-dialler	Auto-dialler installed (Capital)	30 th June 2018	EDAC installed and issues sorted. System is currently working well.	Completed	Manager

4. Compliance with water quality criteria for drinking water

All drinking water in Lakeland met the recommended values in the Australian Drinking Water Guidelines and the Public Health Regulation for E.coli.

The following results for Lakeland are in Appendix A:

Table 2A: Lakeland Reticulation – Treated Water - Physical Chemical – (NATA Lab)
Table 2B: Lakeland Reticulation – Treated Water - Metals – (NATA Lab)
Table 2C: Lakeland Reticulation – Treated Water - E.coli & Coliforms monitoring – (Annan WTP and NATA Lab verification)
Table 2D: Lakeland Reticulation – Physical Chemical including free chlorine – (CSC Annan WTP Lab)
Table 3A: Lakeland Treated Water Final – Physical Chemical (NATA Lab)
Table 3B: Lakeland Treated Water Final - Metals (NATA Lab)
Table 3C: Lakeland Treated Water Final – Free Chlorine – (CSC Annan WTP Lab and online analyser)
Table 4A: Lakeland Raw Water - Physical Chemical (NATA Lab)
Table 4B: Lakeland Raw Water - Metals (NATA Lab)
Table 5: Reticulation E. coli 12 Month Rolling Average

Note: results do not show < signs as SWIM reports do not pick them up.

Table 1 Location of sampling sites within Lakeland’s water reticulation network.

Sample Location Name	Street Name	Site Chosen Because	GPS Coordinates *
SES	Peninsular Development Road	Towards the end of the line	15°51'42.27"S - 144°51'21.53"E
MRD Depot	Cooktown Development Road	Ease of access, Central	15°51'32.22"S - 144°51'27.84"E
Lakeland Library	Sesame Street	Ease of access, Central	15°51'31.05"S - 144°51'18.66"E
Wash Down Bay	Peninsular Development Road	End of the Line	15°51'49.78"S - 144°51'28.11"E
Lakeland Lodge	Back Street	Northern end of Town	15°51'23.10"S - 144°51'19.75"E

All reticulation sampling for all parameters are collected from these fixed sites for the reasons listed.

5. Notifications to the Regulator

There were no incidents in the 2017-2018 financial year where the Regulator needed to be notified.

There were no events in the 2017-2018 financial year.

6. Customer complaints related to water quality

There were no water quality complaints in the 2017-2018 financial year.

7. DWQMP review outcomes

An internal review of the DWQMP was done in the 2017-2018 financial year. Changes were made to the plan and the plan was approved on the 19/07/2018. Next review of the plan is due by 31 March 2020.

8. DWQMP audit findings

There was no audits on the DWQMP due in the 2017-2018 financial year. The next audit is due by 30 June 2021.

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Appendix A – Summary of compliance with water quality criteria

Table 2A Lakeland Reticulation – Treated Water – Physical Chemical (NATA Lab)

Date Sampled – 01/07/2017 – 30/06/2018									
Parameter	Unit	No of samples required to be collected	No of Samples collected	Summary of Results			ADWQ Guidelines Value (2011)	No of Samples exceeding ADWG	
				Min. Value	Max. Value	Avg. Value		Health	Aesthetic
Alkalinity	mg/L as CaCO ₃	4	4	220.0	250.0	235.0	-	-	-
Calcium	mg/L	4	4	30.0	38.0	34.0	-	-	-
Chloride	mg/L	4	4	67.0	95.0	78.5	< 250 mg/L	-	0
Colour	HU	4	4	1.0	2.2	1.4	< 15 HU	-	0
Electrical Conductance	µS/cm	4	4	730.0	780.0	760.0	-	-	-
Fluoride	mg/L	4	4	0.23	0.24	0.23	< 1.5 mg/L	0	-
Magnesium	mg/L	4	4	35.0	42.0	38.8	-	-	-
pH	pH units		4	7.90	8.00	7.98	6.5-8.5	-	0
Potassium	mg/L	4	4	1.7	2.0	1.9	-	-	-
Salinity	mg/L	4	4	355	382	371	-	-	-
SAR		4	4	1.90	2.10	1.98	-	-	-
Sodium	mg/L	4	4	64.0	80.0	71.5	< 180 mg/L	-	0
Sulphate	mg/L	4	4	3.4	4.4	3.8	< 250 mg/L	0	0
Total Dissolved Solids	mg/L	4	4	410	460	445	< 600 mg/L	-	0
Total Hardness	mg/L as CaCO ₃	4	4	220.0	270.0	245.0	< 200 mg/L	-	4
Turbidity	NTU	4	4	0.1	0.7	0.4	< 5 NTU	-	0

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Table 2B Lakeland Reticulation – Treated Water – Metals (NATA Lab)

Date Sampled – 01/07/2017 – 30/06/2018									
Parameter	Unit	No of Samples required to be collected	No of Samples collected	Summary of Results			ADWQ Guidelines Value (2011)	No of Samples exceeding ADWG	
				Min. Value	Max. Value	Avg. Value		Health	Aesthetic
Arsenic	mg/L	4	4	0.001	0.001	0.001	0.01 mg/L	0	-
Barium	mg/L	4	4	0.011	0.022	0.015	< 2 mg/L	0	-
Beryllium	mg/L	4	4	0.0010	0.0010	0.0010	< 0.06 mg/L	0	-
Cadmium	mg/L	4	4	0.0001	0.0001	0.0001	< 0.002 mg/L	0	-
Chromium	mg/L	4	4	0.0010	0.0010	0.0010	< 0.05 mg/L	0	-
Cobalt	mg/L	4	4	0.001	0.001	0.001	-	-	-
Copper	mg/L	4	4	0.010	0.034	0.024	< 2 mg/L	0	0
Iron	mg/L	4	4	0.010	0.010	0.010	< 0.3 mg/L	-	0
Lead	mg/L	4	4	0.001	0.001	0.001	< 0.01 mg/L	0	-
Manganese	mg/L	4	4	0.001	0.002	0.002	< 0.1 mg/L	0	0
Mercury	µg/L	4	4	0.06	0.10	0.07	<1.0 µg/L	0	-
Nickel	mg/L	4	4	0.001	0.001	0.001	< 0.02 mg/L	0	-
Selenium	mg/L	4	4	0.005	0.005	0.005	< 0.01 mg/L	0	-
Vanadium	mg/L	4	4	0.019	0.020	0.019	-	-	-
Zinc	mg/L	4	4	0.006	0.022	0.016	< 3.0 mg/L	-	0

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Table 2C Lakeland Reticulation – Treated Water – E.coli monitoring (CSC Annan WTP Lab plus NATA verification)

Date Sampled – 01/07/2017 – 30/06/2018							
	Parameter	Sampling Location	Time Period	No of samples required to be taken	No of samples taken	No of samples with E.coli detected	Public Health Regulation standard (2018)
E.coli and Coliforms	E.coli – MPN/100ml	Various set Locations within the Lakeland Reticulation	01/07/17 – 30/06/18	52	62	0	0

Table 2D Lakeland Reticulation – Physical Chemical – (CSC Annan WTP Lab)

Date Sampled – 01/07/2017 – 30/06/2018						
Parameter	Unit	No of samples required to be collected	No of Samples collected	Summary of Results		
				Min. Value	Max. Value	Avg. Value
Free chlorine residual	mg/L	12	12	0.52	1.40	0.71
Colour	mg/L	12	12	0	0	0
Dissolved Oxygen	mg/L	12	12	5.79	7.19	6.23
Electrical Conductivity	mg/L	12	12	637.0	810.0	721.50
pH	mg/L	12	12	6.83	7.36	7.13
Turbidity	mg/L	12	13	0.07	0.36	0.14
Total Hardness	mg/L	12	12	190.0	243.0	211.42

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Table 3A Lakeland Treated Water Final - Physical Chemical (NATA Lab)

Date Sampled – 01/07/2017 – 30/06/2018									
Parameter	Unit	No of Samples required to be collected	No of Samples collected	Summary of Results			ADWQ Guidelines Value (2011)	No of Samples exceeding ADWG	
				Min. Value	Max. Value	Avg. Value		Health	Aesthetic
Alkalinity	mg/L as CaCO ₃	4	4	210.0	250.0	227.5	-	-	-
Calcium	mg/L	4	4	2.7	38.0	25.4	-	-	-
Chloride	mg/L	4	4	70.0	96.0	84.3	< 250 mg/L	-	0
Colour	HU	4	4	1.0	2.2	1.3	< 15 HU	-	0
Electrical Conductance	µS/cm	4	4	650.0	770.0	732.5	-	-	-
Fluoride	mg/L	4	3	0.19	0.24	0.22	< 1.5 mg/L	0	-
Magnesium	mg/L	4	4	1.7	42.0	27.9	-	-	-
pH	pH units	4	4	7.80	8.10	8.00	6.5-8.5	-	0
Potassium	mg/L	4	4	0.8	2.0	1.6	-	-	-
Salinity	psu	4	3	314.0	377.0	350.3	-	-	-
SAR	SAR units	4	4	0.65	2.10	1.61	-	-	-
Sodium	mg/L	4	4	5.5	80.0	52.4	< 180 mg/L	-	0
Sulphate	mg/L	4	3	3.2	4.0	3.6	< 250 mg/L	0	0
Total Dissolved Solids	mg/L	4	4	390.0	460.0	427.5	< 600 mg/L	-	0
Total Hardness	mg/L as CaCO ₃	4	4	14.0	270.0	178.5	< 200 mg/L	-	4
Turbidity	NTU	4	4	0.1	0.5	0.2	< 5 - NTU	-	0

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Table 3B Lakeland Treated Water Final – Metals – (NATA Lab)

Date Sampled – 01/07/2017 – 30/06/2018									
Parameter	Unit	No of Samples required to be collected	No of Samples collected	Summary of Results			ADWQ Guidelines Value (2011)	No of Samples exceeding ADWG	
				Min. Value	Max. Value	Avg. Value		Health	Aesthetic
Arsenic	mg/L	3	3	0.001	0.001	0.001	0.01 mg/L	0	-
Barium	mg/L	3	3	0.012	0.014	0.013	< 2 mg/L	0	-
Beryllium	mg/L	3	3	0.0010	0.0130	0.0050	< 0.06 mg/L	0	-
Cadmium	mg/L	3	3	0.0001	0.0010	0.0004	< 0.002 mg/L	0	-
Chromium	mg/L	3	3	0.0001	0.0010	0.0007	< 0.05 mg/L	0	-
Cobalt	mg/L	3	3	0.001	0.001	0.001	-	-	-
Copper	mg/L	3	3	0.001	0.017	0.010	< 2 mg/L	0	0
Iron	mg/L	3	3	0.010	0.012	0.011	< 0.3 mg/L	-	0
Lead	mg/L	3	3	0.001	0.001	0.001	< 0.01 mg/L	0	-
Manganese	mg/L	3	3	0.001	0.001	0.001	< 0.1 mg/L	0	0
Mercury	µg/L	3	3	0.06	0.06	0.06	<1.0 µg/L		
Nickel	mg/L	3	3	0.001	0.001	0.001	< 0.02 mg/L	0	-
Selenium	mg/L	3	3	0.005	0.005	0.005	< 0.01 mg/L	0	-
Vanadium	mg/L	3	3	0.018	0.020	0.019	-	-	-
Zinc	mg/L	3	3	0.002	0.086	0.031	< 3.0 mg/L	-	0

Table 3C Lakeland Treated Water Final – Free Chlorine – (On-line chlorine analyser)

Date Sampled – 01/07/2017 – 30/06/2018								
Parameter	Unit	No of Samples	Summary of Results			ADWQ Guidelines Value (2011)	No of Samples exceeding ADWG	
			Min. Value	Max. Value	Avg. Value		Health	Aesthetic
Free Chlorine Residual	mg/L	360	0.28	1.50	0.64	<5	0	-

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Table 4A Lakeland Raw Water - Physical Chemical (NATA Analysed)

Date Sampled – 01/07/2017 – 30/06/2018						
Parameter	Unit	No of Samples required to be collected	No of Samples collected	Summary of Results		
				Min. Value	Max. Value	Avg. Value
Alkalinity	mg/L as CaCO ₃	4	4	230.0	250.0	237.5
Calcium	mg/L	4	4	30.0	33.0	31.8
Chloride	mg/L	4	3	63.0	100.0	86.3
Colour	HU	4	4	1.0	31.0	9.0
Electrical Conductance	µS/cm	4	4	700.0	770.0	742.5
Fluoride	mg/L	4	3	0.23	0.26	0.24
Magnesium	mg/L	4	4	35.0	39.0	37.8
pH	pH units	4	4	7.40	8.10	7.83
Potassium	mg/L	4	4	1.6	2.0	1.8
Salinity	psu	4	3	314.0	375.0	361.7
SAR	SAR units	4	4	1.80	1.90	1.85
Sodium	mg/L	4	4	61.0	67.0	65.0
Sulphate	mg/L	4	3	3.5	4.8	4.3
Total Dissolved Solids	mg/L	4	3	420.0	450.0	437.5
Total Hardness	mg/L as CaCO ₃	4	4	220.0	240.0	235.0
Turbidity	NTU	4	4	0.2	19.0	5.2

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Table 4B Lakeland Raw Water – Metals (NATA Analysed)

Date Sampled – 01/07/2017 – 30/06/2018						
Parameter	Unit	No of Samples required to be collected	No of Samples collected	Summary of Results		
				Min. Value	Max. Value	Avg. Value
Arsenic	mg/L	3	3	0.001	0.001	0.001
Barium	mg/L	3	3	0.012	0.014	0.013
Beryllium	mg/L	3	3	0.0010	0.0010	0.0010
Cadmium	mg/L	3	3	0.0001	0.0001	0.0001
Chromium	mg/L	3	3	0.0010	0.0010	0.0010
Cobalt	mg/L	3	3	0.001	0.001	0.001
Copper	mg/L	3	3	0.005	0.020	0.010
Iron	mg/L	3	3	0.010	0.010	0.010
Lead	mg/L	3	3	0.001	0.001	0.001
Manganese	mg/L	3	3	0.001	0.019	0.007
Mercury	mg/L	3	3	0.06	0.10	0.07
Nickel	mg/L	3	3	0.001	0.001	0.001
Selenium	mg/L	3	3	0.005	0.005	0.005
Vanadium	mg/L	3	3	0.017	0.020	0.018
Zinc	mg/L	3	3	0.007	0.018	0.013

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Table 5 Reticulation *E. coli* 12 Month Rolling Average

Drinking water scheme: Cook Shire Council - Lakeland Water

Year	2017/2018											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	5	5	4	5	4	4	5	6	7	4	5	8
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 month period	52	53	52	52	52	52	52	53	55	58	58	62
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE

The *Public Health Regulation 2005* (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no *E. Coli*. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.

This requirement comes into effect once you have 12 months data and should be assessed every month based on the previous 12 months data (so that it is a 'rolling' assessment).