

# **Drinking Water Quality Management Plan (DWQMP) report**

For the financial year: 2018-2019

Scheme: LAURA

## **Cook Shire Council**

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# COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN ANNUAL REPORT

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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

# COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN ANNUAL REPORT

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## Table of Contents

1. Introduction .....	4
2. Overview of Operations .....	4
3. Actions taken to implement the DWQMP .....	5
4. Compliance with water quality criteria for drinking water .....	6
Table 1 Location of sampling sites within Laura’s water reticulation network .....	6
5. Notifications to the Regulator .....	6
6. Customer complaints related to water quality .....	6
7. DWQMP review outcomes.....	7
8. DWQMP audit findings .....	7
Appendix A – Summary of compliance with water quality criteria.....	8
Table 2A Laura Reticulation – Physical Chemical (NATA Lab) .....	8
Table 2B Laura Reticulation – Metals (NATA Lab).....	9
Table 2C Laura Reticulation – E.coli (CSC Annan WTP Lab).....	10
Table 2D Laura Reticulation – Physical Chemical (CSC Annan WTP Lab) .....	11
Table 2E Laura Reticulation – Trihalomethanes and Chlorates (NATA Lab).....	12
Table 3A Laura Treated Water Final - Physical Chemical (NATA Lab) .....	13
Table 3B Laura Treated Water Final – Metals (NATA Lab) .....	14
Table 3C Laura Treated Water Final – Free Chlorine (CSC Annan WTP Lab).....	14
Table 3D Laura Treated Water Final – E.coli monitoring (CSC Annan WTP Lab plus NATA verification) .....	15
Table 4A Laura Raw Water - Physical Chemical (NATA Analysed) .....	16
Table 4B Laura Raw Water – Metals (NATA Analysed) .....	17
Table 4C Laura Raw Water – E.coli monitoring (CSC Annan WTP Lab) .....	18
Table 5 Reticulation <i>E. coli</i> 12 Month Rolling Average.....	19

## 1. Introduction

This is the Drinking Water Quality Management Plan (DWQMP) report for Cook Shire Council for the financial year 2018-2019 for the Laura 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

Laura's Water is sourced solely from 2 bores located at the Treatment Plant Site (Lot 1 SP116188)

Bore 1 is 35m deep. Bore 1 is predominately used with Bore 2 being used as a backup

Water is pumped up from the Bores, injected with sodium hypochlorite and then goes through an aerator into a holding tank. The injection of Hypochlorite is for the oxidation process to remove Iron

Water is drawn from the holding tank, filtered through a Memcor Micro filtration plant from where it passes to a low level Clear water Reservoir.

The Bore water undertakes the following treatment processes

- Oxidation, by Sodium Hypochlorite and Aeration
- Filtration, by micro filtration
- Chlorination

The treated water is pumped to the reticulation via a bank of 4 pressure pumps. These pumps cut in / cut out as required to maintain a steady pressure within the reticulation.

Two overhead tanks provide water to the township during periods of Electricity power failures, (at a reduced pressure).

Laura currently has 48 water connections:

- Residential – 48%
- Commercial/Industrial – 6%
- Council/Institutional/Government -46%

### 3. Actions taken to implement the DWQMP

Water and Wastewater department staff meet fortnightly to discuss the department's 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 and the Team Leader.

Cook Shire Council has written a draft Drinking Water Policy in the 2018-19 financial year. This policy confirms Councils management of water quality through the on-going implementation of the DWQMP. Presentations on the DWQMP's were given to high level management and Councillors on the purpose and regulatory requirements of the 4 Cook Shire Council DWQMP's.

In the 2018-2019 financial year, Cook Shire has expanded the use of the SWIM database to incorporate the Task function. This is being used for as a program for recording calibration of equipment, safety requirements such as safety showers, maintenance of equipment such as fluoride analysers, running emergency generators and maintaining verification records for temperature for Colisure E. coli analysis.

On-going work has been done on Standard Operating Procedures. Training of staff in procedures is on-going. Individual actions taken for the Laura Water Scheme are listed in the table below.

Scheme	Component	Improvement Action and Origin of Action	Target Date	Actions undertaken to date	Status and revised target date	Responsible officer
Laura	Raw Water	E.coli monitoring in raw water	30 <sup>th</sup> June 2019	Commenced E. coli monitoring in raw water.	On-going	Manager
Laura	Raw Water	Bore inspections	On-going	Bore inspections are part of hazard inspection of site and are done routinely every six months.	On-going	Manager
Laura	Final Water	Turbidity monitoring for filter breakthrough	30 <sup>th</sup> June 2019	On-line turbidity meter installed on final water	Complete	Manager
Laura	Reticulation	THM sampling	30 <sup>th</sup> June 2019	Commenced THM sampling	On-going	Manager
Laura	Reticulation	High Level Reservoirs leaking	30 <sup>th</sup> June 2019	The 2 x 48 KL High Level Reservoirs have been replaced with one 48 KL reservoir.	Complete	Manager

## 4. Compliance with water quality criteria for drinking water

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

The following results for Laura are in Appendix A:

Table 2A: Laura Reticulation – Treated Water - Physical Chemical – (NATA Lab)
Table 2B: Laura Reticulation – Treated Water - Metals – (NATA Lab)
Table 2C: Laura Reticulation – Treated Water - E.coli – (CSC Annan WTP lab & NATA Lab)
Table 2D: Laura Reticulation – Physical Chemical – (CSC Annan WTP Lab)
Table 2E: Laura Reticulation – Trihalomethanes and chlorates (NATA Lab)
Table 3A: Laura Treated Water Final – Physical Chemical (NATA Lab)
Table 3B: Laura Treated Water Final - Metals (NATA Lab)
Table 3C: Laura Treated Water Final – Free Chlorine – (On-line chlorine analyser)
Table 3D: Laura Treated Water Final – E. coli (CSC Annan WTP lab & NATA Lab)
Table 4A: Laura Raw Water - Physical Chemical (NATA Lab)
Table 4B: Laura Raw Water - Metals (NATA Lab)
Table 4C: Laura Raw Water – E.coli (CSC Annan WTP lab)
Table 5: Reticulation E. coli 12 Month Rolling Average

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

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

Sample Location Name	Street Name	Site Chosen Because	GPS Coordinates *
Laura Roadhouse	Peninsular Development Rd	End of the line.	15°33'59.10"S - 144°27'3.32"E
Telstra Hut	Terminus St	Towards the end of the line.	15°33'32.89"S - 144°26'42.73"E
Laura Library	Terminus St	Ease of access	15°33'31.15"S - 144°26'47.43"E
Laura Police Station	Gladwell Court	Centrally located	15°33'33.67"S - 144°26'47.32"E
End of George Close	George Close	Towards the end of the line.	15°33'51.48"S - 144°27'4.35"E
End of Musgrave St	Musgrave St	Towards the end of the line.	15°33'55.55"S - 144°26'43.10"E

## 5. Notifications to the Regulator

Trihalomethane sampling commenced in Laura in February 2019. The regulator was notified of the following results:

- Chlorate – 1.57mg/L in Laura Reticulation sample (Laura Roadhouse) in sample taken on the 18/02/2019
- Chlorate – 1.34mg/L in Laura Reticulation sample (Telstra hut) in sample taken on the 27/05/2019.

There were no other water quality incidents in the 2018-2019 financial year where the Regulator needed to be notified.

## 6. Customer complaints related to water quality

There were no water quality complaints in the 2018-2019 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 2018-2019 financial year. The next audit is due by 30 June 2021.

**COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN  
ANNUAL REPORT**

Appendix A – Summary of compliance with water quality criteria

Table 2A Laura Reticulation – Physical Chemical (NATA Lab)

Date Sampled – 01/07/2018 – 30/06/2019									
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 <sub>3</sub>	4	4	70.0	74.0	71.3	-	-	-
Calcium	mg/L	4	4	4.6	5.1	4.8	-	-	-
Chloride	mg/L	4	4	26.0	28.0	27.0	< 250 mg/L	-	0
Colour	HU	4	4	1.0	1.6	1.2	< 15 HU	-	0
Electrical Conductance	µS/cm	4	4	220.0	250.0	235.0	-	-	-
Fluoride	mg/L	4	4	0.10	0.14	0.12	< 1.5 mg/L	0	-
Magnesium	mg/L	4	4	0.83	0.92	0.86	-	-	-
pH	pH units	4	4	7.7	8.0	7.8	6.5-8.5	-	0
Potassium	mg/L	4	4	2.8	3.0	2.9	-	-	-
Salinity	mg/L	4	4	108.0	119.0	113.3	-	-	-
SAR		4	4	4.40	4.90	4.55	-	-	-
Sodium	mg/L	4	4	39.0	44.0	41.3	< 180 mg/L	-	0
Sulphate	mg/L	4	4	4.2	4.6	4.4	< 250 mg/L	0	0
Total Dissolved Solids	mg/L	4	4	130.0	150.0	135.0	< 600 mg/L	-	0
Total Hardness	mg/L as CaCO <sub>3</sub>	4	4	15.0	17.0	15.5	< 200 mg/L	-	4
Turbidity	NTU	4	4	0.1	0.4	0.2	< 5 NTU	-	0



**COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN  
ANNUAL REPORT**

**Table 2B Laura Reticulation – Metals (NATA Lab)**

Date Sampled – 01/07/2018 – 30/06/2019									
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	0.0002	0.0010	0.0004	0.01 mg/L	0	-
Barium	mg/L	4	4	0.228	0.251	0.243	< 2 mg/L	0	-
Beryllium	mg/L	4	4	0.0001	0.0010	0.0003	< 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	0.0005	0.0010	0.0006	-	-	-
Copper	mg/L	4	4	0.0110	0.0370	0.0225	< 2 mg/L	0	0
Iron	mg/L	4	4	0.0080	0.0120	0.0090	< 0.3 mg/L	-	0
Lead	mg/L	4	4	0.0005	0.0013	0.0009	< 0.01 mg/L	0	-
Manganese	mg/L	4	4	0.000	0.004	0.001	< 0.1 mg/L	0	0
Mercury	µg/L	4	4	0.060	0.060	0.060	<1.0 µg/L	0	-
Nickel	mg/L	4	4	0.0005	0.0050	0.0017	< 0.02 mg/L	0	-
Selenium	mg/L	4	4	0.0020	0.0050	0.0028	< 0.01 mg/L	0	-
Vanadium	mg/L	4	4	0.0001	0.0010	0.0003	-	-	-
Zinc	mg/L	4	4	0.0090	0.1320	0.0458	< 3.0 mg/L	-	0

**COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN  
ANNUAL REPORT**

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**Table 2C Laura Reticulation – E.coli (CSC Annan WTP Lab)**

Date Sampled – 01/07/2018 – 30/06/2019								
	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)	Laboratory
<b>E.coli and Coliforms</b>	E.coli – MPN/100ml	6 sites throughout Laura reticulation	01/07/18 – 30/06/19	52	52	0	0	Annan WTP
<b>E.coli and Coliforms</b>	E. coli cfu/100ml		01/07/18 – 30/06/19	4	4	0	0	Cairns Regional Council

**COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN  
ANNUAL REPORT**

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

<b>Date Sampled – 01/07/2018 – 30/06/2019</b>						
<b>Parameter</b>	<b>Unit</b>	<b>No of Samples required to be collected</b>	<b>No of Samples collected</b>	<b>Summary of Results</b>		
				<b>Min. Value</b>	<b>Max. Value</b>	<b>Avg. Value</b>
Free chlorine residual	<i>mg/L</i>	12	12	0.41	1.23	0.83
Colour	<i>mg/L</i>	12	12	0.00	10.0	1.17
Dissolved Oxygen	<i>mg/L</i>	12	12	5.03	6.98	6.47
Electrical Conductivity	<i>mg/L</i>	12	12	232.0	247.0	237.2
pH	<i>mg/L</i>	12	12	6.78	7.52	7.23
Total Dissolved Solids	<i>mg/L</i>	12	12	124.1	144.9	134.1
Turbidity	<i>mg/L</i>	12	12	0.06	0.98	0.23
Total Hardness	<i>mg/L</i>	12	12	16.0	21.0	18.7

**COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN  
ANNUAL REPORT**

**Table 2E Laura Reticulation – Trihalomethanes and Chlorates (NATA Lab)**

Date Sampled – 01/07/2018 – 30/06/2019									
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 or WHO	
				Min. Value	Max. Value	Avg. Value		Health	Aesthetic
Chloroform	µg/L	3	3	10	101	44	<250 µg/L	0	-
Bromodichloromethane	µg/L	3	3	14	34	23	<250 µg/L	0	-
Dibromochloromethane	µg/L	3	3	9	10	9	< 250 mg/L	0	-
Bromoform	µg/L	3	3	5	5	5	<250 µg/L	0	-
Total Trihalomethanes	µg/L	3	3	33	144	76	<250 µg/L	0	-
Chlorate	mg/L	3	3	0.600	1.570	1.170	<0.7 mg/L*	2	-

- WHO provisional guideline.

## COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN ANNUAL REPORT

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

Date Sampled – 01/07/2018 – 30/06/2019									
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 <sub>3</sub>	2	2	71.0	71.0	71.0	-	-	-
Calcium	mg/L	2	2	4.4	4.6	4.5	-	-	-
Chloride	mg/L	2	2	25.0	25.0	25.0	< 250 mg/L	-	0
Colour	HU	2	2	1.0	1.0	1.0	< 15 HU	-	0
Electrical Conductance	µS/cm	2	2	220.0	230.0	225.0	-	-	-
Fluoride	mg/L	2	2	0.11	0.13	0.12	< 1.5 mg/L	0	-
Magnesium	mg/L	2	2	0.82	0.86	0.84	-	-	-
pH	pH units	2	2	7.90	8.00	7.95	6.5-8.5	-	0
Potassium	mg/L	2	2	2.9	3.1	3.0	-	-	-
Salinity	mg/L	2	2	108.0	112.0	110.0	-	-	-
SAR		2	2	4.40	4.70	4.55	-	-	-
Sodium	mg/L	2	2	40.0	41.0	40.5	< 180 mg/L	-	0
Sulphate	mg/L	2	2	3.9	4.2	4.1	< 250 mg/L	0	0
Total Dissolved Solids	mg/L	2	2	130.0	130.0	130.0	< 600 mg/L	-	0
Total Hardness	mg/L as CaCO <sub>3</sub>	2	2	14.0	15.0	14.5	< 200 mg/L	-	4
Turbidity	NTU	2	2	0.1	0.3	0.2	< 5 NTU	-	0

## COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN ANNUAL REPORT

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

Date Sampled – 01/07/2018 – 30/06/2019									
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	3	0.0002	0.0002	0.0002	0.01 mg/L	0	-
Barium	mg/L	4	3	0.239	0.256	0.242	< 2 mg/L	0	-
Beryllium	mg/L	4	3	0.0001	0.0001	0.0001	< 0.06 mg/L	0	-
Cadmium	mg/L	4	3	0.0001	0.0001	0.0001	< 0.002 mg/L	0	-
Chromium	mg/L	4	3	0.0002	0.0003	0.0002	< 0.05 mg/L	0	-
Cobalt	mg/L	4	3	0.0005	0.0005	0.0005	-	-	-
Copper	mg/L	4	3	0.0050	0.0050	0.0050	< 2 mg/L	0	0
Iron	mg/L	4	3	0.0080	0.0080	0.0080	< 0.3 mg/L	-	0
Lead	mg/L	4	3	0.0005	0.0005	0.0005	< 0.01 mg/L	0	-
Manganese	mg/L	4	3	0.000	0.001	0.000	< 0.1 mg/L	0	0
Mercury	µg/L	4	3	0.06	0.06	0.06	<1.0 µg/L		
Nickel	mg/L	4	3	0.0005	0.0005	0.0005	< 0.02 mg/L	0	-
Selenium	mg/L	4	3	0.0020	0.0020	0.0020	< 0.01 mg/L	0	-
Vanadium	mg/L	4	3	0.0001	0.0001	0.0001	-	-	-
Zinc	mg/L	4	3	0.0080	0.0100	0.0090	< 3.0 mg/L	-	0

**Table 3C Laura Treated Water Final – Free Chlorine (CSC Annan WTP Lab)**

Date Sampled – 01/07/2018 – 30/06/2019									
Parameter	Unit	No of Samples collected	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	362	0.33	2.80	0.85	<5	0	-	

## *COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN ANNUAL REPORT*

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Table 3D Laura Treated Water Final – E.coli monitoring (CSC Annan WTP Lab plus NATA verification)

Date Sampled – 01/07/2018 – 30/06/2019								
	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)	Laboratory
<b>E.coli and Coliforms</b>	E.coli – MPN/100ml	Laura Water Treatment Plant	01/07/18 – 30/06/19	52	47	0	0	Annan WTP
<b>E.coli and Coliforms</b>	E. coli cfu/100ml	Laura Water Treatment Plant	01/07/18 – 30/06/19	4	3	0	0	Cairns Regional Council

## COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN ANNUAL REPORT

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

Date Sampled – 01/07/2018 – 30/06/2019						
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 <sub>3</sub>	4	4	68.0	76.0	71.8
Calcium	mg/L	4	4	3.3	4.7	4.0
Chloride	mg/L	4	4	15.0	22.0	19.3
Colour	HU	4	4	7.5	23.0	16.1
Electrical Conductance	µS/cm	4	4	190.0	220.0	212.5
Fluoride	mg/L	4	4	0.09	0.15	0.12
Magnesium	mg/L	4	4	0.69	0.90	0.79
pH	pH units	4	4	7.10	7.40	7.25
Potassium	mg/L	4	4	2.9	3.1	3.0
Salinity	mg/L	4	4	93.2	108.0	103.1
SAR		4	4	4.2	4.8	4.4
Sodium	mg/L	4	4	32.0	39.0	36.8
Sulphate	mg/L	4	4	3.8	4.5	4.1
Total Dissolved Solids	mg/L	4	4	110.0	140.0	125.0
Total Hardness	mg/L as CaCO <sub>3</sub>	4	4	11.0	15.0	13.0
Turbidity	NTU	4	4	1.1	4.9	3.0



**COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN  
ANNUAL REPORT**

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**Table 4B Laura Raw Water – Metals (NATA Analysed)**

Date Sampled – 01/07/2018 – 30/06/2019						
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	4	4	0.0002	0.0010	0.0004
Barium	mg/L	4	4	0.224	0.266	0.241
Beryllium	mg/L	4	4	0.0001	0.0010	0.0003
Cadmium	mg/L	4	4	0.0001	0.0001	0.0001
Chromium	mg/L	4	4	0.0002	0.0010	0.0004
Cobalt	mg/L	4	4	0.0005	0.0010	0.0006
Copper	mg/L	4	4	0.0010	0.0180	0.0063
Iron	mg/L	4	4	0.0080	2.6200	1.0410
Lead	mg/L	4	4	0.0005	0.0011	0.0008
Manganese	mg/L	4	4	0.011	0.080	0.043
Mercury	mg/L	4		0.0600	0.0600	0.0600
Nickel	mg/L	4	4	0.0005	0.0010	0.0006
Selenium	mg/L	4	4	0.0020	0.0050	0.0028
Vanadium	mg/L	4	4	0.0001	0.0010	0.0003
Zinc	mg/L	4	4	0.0170	0.0220	0.0195

**COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN  
ANNUAL REPORT**

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Table 4C Laura Raw Water – E.coli monitoring (CSC Annan WTP Lab)

Date Sampled – 01/07/2018 – 30/06/2019								
	Parameter	Sampling Location	Time Period	Minimum	Maximum	Average	Number of samples taken	Laboratory
<b>E.coli and Coliforms</b>	E.coli – MPN/100ml	Laura Bores	01/07/18 – 30/06/19	0	8	0	24	Annan WTP

## COOK SHIRE COUNCIL - DRINKING WATER QUALITY MANAGEMENT PLAN ANNUAL REPORT

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

Drinking water scheme:		Cook Shire Council - Laura Water											
Year	2018/2019												
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	
No. of samples collected	5	4	4	5	4	4	5	4	4	5	4	4	
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	62	62	62	62	62	62	62	31	35	39	44	52	
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	
<b><u>CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE</u></b>													
<p>The <i>Public Health Regulation 2005</i> (the regulation) requires that 98 per cent of samples taken in a 12 month period should contain no <i>E. Coli</i>. This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.</p>													
<p>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).</p>													