

Drinking Water Quality Management Plan

Annual report

2022-2023

COEN



Cook Shire Council

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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 2022-2023 for the Coen 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

Coen has three water sources:

- Lankelly Creek – The Lankelly Creek originates high in the rainforest approximately 15km to the east of the township. The catchment area of approx. 5049 ha is in pristine rainforest and due to the terrain has very limited human impact.
- Coen Dam - Coen Dam, this is a ex gold mining dam. It contains elevated levels of natural arsenic and iron, and in the past has had blue green algae blooms during the warmer months, this is not an annual event, but has happened in the years when seasonal conditions have been favourable.
- Coen Borefield - Coen borefields consists of 3 bores located in the township.

The Lankelly water is treated with:

- Coagulation, Dissolved Air Flotation, Filtration (Pressure anthracite filter), Microfiltration and chlorination.

The Coen Dam is treated with:

- Coagulation, Dissolved Air Flotation, Filtration (Pressure anthracite filter), Microfiltration and chlorination.

The Coen Borefield is treated with:

- chlorination

The treated water is pumped to the 450kL Coen Reservoir on site at the Water Treatment Plant, and then gravity feeds directly into the Coen reticulation system.

Coen currently has 120 Service connections which can be broken down to approximately:

- Residential 64%
- Commercial 12%
- Industrial 2%

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- Institutional 5%
- Council 12%
- Government 5%

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 adopted the Drinking Water Quality Policy in September 2019. This policy confirms Councils management of water quality through the on-going implementation of the DWQMP.

Individual actions taken for the Coen Water Scheme are listed in the table below.

Capital funding applications are submitted to Council each year, however are not always successful. This can cause delays in delivering Councils Risk Management Improvements. Capital funding was received in the 2022/2023 financial year. Funding was spent on renewing AC water main with PVC (blue brute) water main.

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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
Coen	Filter	Filter media needs to be replaced.	June 2024	Current WH&S practices make it impossible to replace media in filter without dismantling the WTP shed. Current Water Treatment needs to be upgraded. Investigation shows that the filter is still producing good turbidity water and is followed by membrane filtration.	Options for upgrade are being investigated and will be designed by Hunter H2O. Funding is required for installation. Revised date is dependent on funding.	Manager Water and Wastewater/Project Engineer
Coen	Disinfection	Automatic change over for dual sodium hypochlorite pumps	June 2024	To be done in conjunction with SCADA upgrade. However, was not funded. Dual disinfection pumps on-site but no automatic change over.	This is now part of the upgrade described above	Manager Water and Wastewater/Project Engineer
Coen	SCADA	SCADA upgrade required. Stage 1 finished but Stage 2 has never been funded.	June 2024	The new SCADA design is being done by Hunter H2O/Beca.	This is now part of the upgrade described above	Manager Water and Wastewater/Project Engineer
Coen	SCADA	SCADA upgrade to include Bore 10 EDAC dial out system	June 2024	Design being done by Hunter H2O/Beca	Part of upgrade described above	Manager Water and Wastewater/Project Engineer
Coen	Disinfection	Chlorate concentration in reticulation system intermittently above 0.8mg/L	On-going	Investigate options to reduce chlorate in reticulation system	Chlorate management plan has been included as part of DWQMP review	Manager Water and Wastewater
Coen	System Wide	Meter replacement program	30 th June 2023	Meters over 15 years old replaced in Coen	On-going	Manager Water and Wastewater /Team Leader
Coen	System Wide	Lightning protection	June 2024	Lightning protection has been installed to protect PLC's.	Further lightning protection to be included in the WTP/SCADA upgrade. Revised date is dependent on funding	Manager Water and Wastewater /Project Engineer

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4. Operational and Verification Monitoring – Water Quality Information and Summary.

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

The following results for Coen are in Appendix A:

Table 2A: Coen Reticulation – Physical Chemical – (NATA Lab)
Table 2B: Coen Reticulation – Metals – (NATA Lab)
Table 2C: Coen Reticulation – E.coli & Coliforms monitoring – (NATA Lab)
Table 2D: Coen Reticulation – Physical Chemical – (Coen WTP Lab)
Table 2E: Coen Reticulation – Trihalomethanes and chlorates (NATA Lab)
Table 3A: Coen Treatment Plant Final – Physical Chemical – (Coen WTP lab)
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Table 4D: Lankelly Creek Raw Water - Metals (NATA Lab)
Table 4E: Coen Dam Raw Water - Metals (NATA Lab)
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Table 4G: Coen Treatment Plant Raw – Physical/Chemical (Coen WTP Lab)
Table 5: Reticulation E. coli 12 Month Rolling Average
Table 6: Gross alpha and Gross beta activity – 40K

Table 1 shows the sampling location in Coen.

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

Sample Location Name	Street Name	Site Chosen Because	GPS Coordinates *
Kindy Corner	Corner Peninsular Dev. Rd and Reservoir Rd	Water Main “Tees” at this point and close to the Kindy	13°56'38.31"S - 143°12'11.52"E
Heritage House	Regent Street	Ease of access and in the centre of the town	13°56'39.41"S - 143°11'56.84"E
Coen School	Taylor Street	Central, and close to the School	13°56'43.83"S - 143°11'59.12"E
Cultural Centre	Shephard Street	Towards the “End of Line”	13°56'58.55"S - 143°11'53.53"E
Guest House	Regent Street	Central and “Ease of Access”	13°56'39.19"S - 143°12'2.22"E
Old National Parks Office	Coleman Close	Towards the “End of Line”	13°56'23.50"S - 143°11'57.44"E
Lutheran Church	Off Port Stewart Road	Towards the “End of Line”	13°56'58.37"S - 143°12'1.14"E
CSC Depot	Lankelly Drive	Towards the “End of Line”	13°56'27.13"S - 143°12'17.21"E
Olkala Street	Olkala Street	Across bridge on the northern side of town	13°56'21.91"S - 143°12'06.84"E

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5. Notifications to the Regulator under sections 102 and 102A of the Act

There were two notification to the regulator for the Coen Water Supply for the 2022 -2023 financial year:

- E. coli detection at the National Parks sampling tap – estimated 4 CFU/100ml on the 08/02/2023. The sample taken was a verification sample. The portion of the sample tested on-site in the Coen Laboratory using Idexx did not detect any E.coli. The portion of the sample sent to Cairns Regional Council had an estimated 4 CFU/100ml. The National Parks sampling tap is on the end of the water main on the northern side of Coen. The area was flushed. Chlorine residuals before flushing were 1.01mg/L and after flushing was 1.39mg/L.
A boiled water alert was raised for Coen on the 13/02/2023. Additional samples for E. coli were taken on the 16/02/2023. No E. coli was detected at Cairns Regional Council lab or Coen WTP lab. Additional samples were taken on the 01/03/2023. No E.coli was detected in the Coen WTP lab, however an estimated 1 CFU/100ml was detected in the Cairns Regional Council lab. The chlorine residual was 1.14mg/L. Additional samples were then taken on the 06/03/2023, 13/03/2023 and 21/03/2023. These samples had <1CFU/100ml E.coli. Boiled water alert was lifted on the 17/03/2023.
- Chlorate detection at the National Parks sampling tap – 1.98mg/L on the 03/05/2023. Sampler had used old chlorine to sterile tap. Additional sample was taken on 21/05/2023 and the chlorate was 2.36mg/L. The area was flushed. Samples were taken from 4 locations around town and chlorates were 0.3mg/L. Due to the remoteness of Coen, a six month supply of chlorine is ordered in November. In future the last of the chlorine will be used at the Sewage Treatment Plant and new chlorine will be ordered for the Water treatment plant as soon as the road is open.

6. Customer complaints related to water quality

There were no water quality complaints in the 2022-2023 financial year.

7. DWQMP review outcomes

Version 4.5 was approved on the 17 June 2021. A review of the DWQMP was due in the 2021 - 2022 financial year and was submitted to the Regulator in June 2022 (Version 5). This version of the plan was approved on the 07/09/2022. Version 5 is now the current version of the plan for this Annual Report.

The Verification and Operational Monitoring changed in Version 5. Physical/chemical and metals analysis was better targeted and parameters that have not been detected for many years are no longer tested for. The tables in Appendix 1 reflect this with different requirements for sample analysis.

8. DWQMP audit findings

No audits were conducted in the 2022 – 2023 financial year. The next round of audits is due in 2024 – 2025. Coen was last audited in 2021.

9. Additional sampling

The Coen bores (Bore 10, bore 5 and Shepherds Bore) were sampled separately this year. Shepherds bore was non-operational. Results for physical chemical parameters, metals and E.coli are available in section 4C below. Gross alpha and Gross beta activity 40K samples were also taken once this financial year. The results are in Table 6.

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Appendix A – Summary of compliance with water quality criteria

Table 2A: Coen Reticulation – Physical Chemical – (NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023									
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	6.5	23.0	11.4	-	-	-
Calcium	mg/L	4	4	1.3	4.8	2.8	-	-	-
Chloride	mg/L	4	4	12.0	21.0	17.0	< 250 mg/L	-	0
Colour	HU	4	4	2.0	5.7	3.1	< 15 HU	-	0
Electrical Conductance	µS/cm	4	4	83.0	140.0	110.8	-	-	-
Fluoride	mg/L	4	4	0.03	0.13	0.08	< 1.5 mg/L	0	-
Magnesium	mg/L	4	4	0.51	1.30	1.02	-	-	-
pH	pH units	4	4	6.80	7.50	7.15	6.5-8.5	-	0
Potassium	mg/L	2	2	1.40	2.00	1.70	-	-	-
Salinity	mg/L	4	4	44.0	71.0	57.3	-	-	-
Silicon	Mg/L	4	4	14.0	22.0	18.0	-	-	-
Sodium	mg/L	4	4	14.0	22.0	17.3	< 180 mg/L	-	0
Sulphate	mg/L	4	2	5.7	11.0	8.4	< 250 mg/L	0	0
Total Dissolved Solids	mg/L	2	2	62.0	78.0	70.0	< 600 mg/L	-	0
Total Hardness	mg/L as CaCO ₃	4	4	5.3	17.0	11.3	< 200 mg/L	-	0
Turbidity	NTU	4	4	0.03	0.13	0.08	< 5 NTU	-	0

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Table 2B: Coen Reticulation – Metals – (NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023									
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	0.0008	0.0022	0.0017	0.01 mg/L	0	-
Barium	mg/L	4	4	0.004	0.013	0.010	< 2 mg/L	0	-
Beryllium	mg/L	2	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	2	4	0.0005	0.0010	0.0006	< 0.05 mg/L	0	-
Cobalt	mg/L	4	4	0.0005	0.0010	0.0006	-	-	-
Copper	mg/L	4	4	0.0040	0.0470	0.0160	< 2 mg/L	0	0
Iron	mg/L	4	4	0.0150	0.0500	0.0283	< 0.3 mg/L	-	0
Lead	mg/L	2	3	0.0005	0.0005	0.0005	< 0.01 mg/L	0	-
Manganese	mg/L	4	4	0.0003	0.0025	0.0015	< 0.1 mg/L	0	0
Mercury	µg/L	2	2	0.0600	0.0600	0.0600	<1.0 µg/L		
Nickel	mg/L	4	4	0.0005	0.0010	0.0007	< 0.02 mg/L	0	-
Selenium	mg/L	2	4	0.0020	0.0100	0.0040	< 0.01 mg/L	0	-
Vanadium	mg/L	2	4	0.0001	0.0100	0.0026	-	-	-
Zinc	mg/L	2	4	0.0080	0.0250	0.0153	< 3.0 mg/L	-	0

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Table 2C: Coen Reticulation – E.coli (NATA Lab and Coen WTP Lab)

Date Sampled – 01/07/2022 – 30/06/2023						
	Parameter	Sampling Location	No of samples required to be taken	No of samples taken	No of samples with E.coli detected	No of samples exceeding Public Health Regulation
E.coli and Coliforms	E.coli – MPN/100ml	9 set Locations within the Coen Reticulation	110	110	0	0

Table 2D: Coen Reticulation – Physical/Chemical (Coen WTP lab)

Date Sampled – 01/07/2022 – 30/06/2023						
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 (Site 1)	mg/L	12	365	0.31	1.43	0.79
Free chlorine residual (Site 2)	mg/L	12	365	0.10	1.37	0.52
Alkalinity	mg/L	12	14	0.2	20.0	2.0
Colour	mg/L	12	22	0.0	13.0	3.00
Electrical Conductivity	µS/cm ²	12	22	9.6	287.0	113.7
pH	mg/L	12	22	6.60	7.56	6.97
Turbidity	mg/L	12	21	0.08	1.50	0.48
Total Dissolved Solids	mg/L	12	22	6.4	120.0	48.3

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

Date Sampled – 01/07/2022 – 30/06/2023								
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		
Chloroform	µg/L	4	4	16	79	47	<250 µg/L	0
Bromodichloromethane	µg/L	4	4	9	16	12	<250 µg/L	0
Dibromochloromethane	µg/L	4	4	5	5	5	< 250 mg/L	0
Bromoform	µg/L	4	4	5	5	5	<250 µg/L	0
Total Trihalomethanes	µg/L	4	4	26	95	59	<250 µg/L	0
Chlorate	mg/L	4	4	0.302	2.360	1.096	<0.80 mg/L*	2

- QH provisional guideline.

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Table 3A: Coen Treatment Plant Final – Physical Chemical (Coen WTP lab)

Date Sampled – 01/07/2022 - 30/06/2023						
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	365	365	0.40	1.47	0.98
Alkalinity	mg/L	52	54	0.1	4.0	1.3
Aluminium	mg/L	52	53	0.00	0.200	0.032
Colour	mg/L	365	365	0.000	15.0	0.87
Electrical Conductivity	µS/cm ²	52	53	81.4	226.0	120.5
pH	mg/L	365	365	6.50	7.91	7.00
Turbidity	mg/L	365	365	0.00	0.98	0.31

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Table 3B: Coen Treatment Plant Final - Physical/Chemical (NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023									
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	6.1	22.0	10.7	-	-	-
Calcium	mg/L	4	4	0.8	3.9	2.3	-	-	-
Chloride	mg/L	4	4	12.0	21.0	17.0	< 250 mg/L	-	0
Colour	HU	4	4	1.0	1.9	1.7	< 15 HU	-	0
Electrical Conductance	µS/cm	4	4	81.0	140.0	110.0	-	-	-
Fluoride	mg/L	4	4	0.03	0.12	0.07	< 1.5 mg/L	0	-
Magnesium	mg/L	4	4	0.79	1.60	1.19	-	-	-
pH	pH units	4	4	6.90	7.50	7.15	6.5-8.5	-	0
Potassium	mg/L	2	2	1.00	2.00	1.50	-	-	-
Salinity	mg/L	4	4	42.7	69.7	56.1	-	-	-
Silicon	mg/L	4	4	14.0	22.0	18.0	-	-	-
Sodium	mg/L	4	4	13.0	22.0	16.8	< 180 mg/L	-	0
Sulphate	mg/L	2	2	7.4	13.0	10.5	< 250 mg/L	0	0
Total Dissolved Solids	mg/L	2	2	65.0	760	70.5	< 600 mg/L	-	0
Total Hardness	mg/L as CaCO ₃	4	4	5.3	16.0	10.3	< 200 mg/L	-	0
Turbidity	NTU	4	4	0.1	0.3	0.2	<5 NTU	0	0

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Table 3C: Coen Treatment Plant Final - Metals (NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023									
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	0.0003	0.0029	0.0017	0.01 mg/L	0	-
Barium	mg/L	4	4	0.007	0.023	0.013	< 2 mg/L	0	-
Beryllium	mg/L	2	2	0.0001	0.0001	0.0001	< 0.06 mg/L	0	-
Cadmium	mg/L	4	4	0.0001	0.0001	0.0001	< 0.002 mg/L	0	-
Chromium	mg/L	2	2	0.0005	0.0005	0.0005	< 0.05 mg/L	0	-
Cobalt	mg/L	4	4	0.0005	0.0010	0.0006	-	-	-
Copper	mg/L	4	4	0.0010	0.0040	0.0030	< 2 mg/L	0	0
Iron	mg/L	4	4	0.0150	0.0500	0.0238	< 0.3 mg/L	-	0
Lead	mg/L	2	2	0.0005	0.0005	0.0005	< 0.01 mg/L	0	-
Manganese	mg/L	4	4	0.0002	0.0094	0.0031	< 0.1 mg/L	0	0
Mercury	µg/L	4	4	0.0600	0.0600	0.0600	<1.0 µg/L	0	-
Nickel	mg/L	4	4	0.0005	0.0010	0.0006	< 0.02 mg/L	0	-
Selenium	mg/L	2	2	0.0020	0.0020	0.0020	< 0.01 mg/L	0	-
Vanadium	mg/L	2	2	0.0001	0.0001	0.0001	-	-	-
Zinc	mg/L	2	2	0.0080	0.0080	0.0080	< 3.0 mg/L	-	0

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Table 3D: Coen Treatment Plant Final – E. coli (Coen WTP Lab)

Date Sampled – 01/07/2022 – 30/06/2023							
	Parameter	Sampling Location	No of samples required to be taken	No of samples taken	No of samples with E.coli detected	Public Health Regulation standard (2018)	Laboratory
E.coli and Coliforms	E. coli cfu/100ml	Coen Water Treatment Plant	52	52	0	0	Coen WTP Lab (Colisure)

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Table 4A: Lankelly Creek Raw Water - Physical Chemical (NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023						
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	2	2	6.8	10.0	8.4
Calcium	mg/L	2	2	0.7	1.4	1.0
Chloride	mg/L	2	2	14.0	16.0	15.0
Colour	HU	2	2	15.0	44.0	29.5
Electrical Conductance	µS/cm	2	2	62.0	83.0	72.5
Fluoride	mg/L	2	2	0.04	0.04	0.04
Magnesium	mg/L	2	2	0.84	1.30	1.07
pH	pH units	2	2	7.00	7.00	7.00
Potassium	mg/L	2	2	1.10	1.80	1.45
Salinity	mg/L	2	2	34.5	43.8	39.2
Sodium	mg/L	2	2	9.7	12.0	10.9
Sulphate	mg/L	2	2	1.3	2.0	1.7
Total Dissolved Solids	mg/L	2	2	49.0	64.0	56.5
Total Hardness	mg/L as CaCO ₃	2	2	5.2	8.8	7.0
Turbidity	NTU	2	2	1.7	2.3	2.0

Note: Lankelly used from July to start of December 2023.

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Table 4B: Coen Dam Raw Water - Physical Chemical (NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023						
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	2	2	19.0	28.0	23.5
Calcium	mg/L	2	2	2.6	3.9	3.3
Chloride	mg/L	2	2	8.0	12.0	10.0
Colour	HU	2	2	39.0	61.0	50.0
Electrical Conductance	µS/cm	2	2	73.0	95.0	84.0
Fluoride	mg/L	0	0	ND	ND	ND
Magnesium	mg/L	2	2	1.00	1.60	1.30
pH	pH units	2	2	7.00	7.60	7.30
Potassium	mg/L	0	0	ND	ND	ND
SAR	SAR units	0	0	ND	ND	ND
Sodium	mg/L	2	2	10.0	14.0	12.0
Sulphate	mg/L	0	0	ND	ND	ND
Total Dissolved Solids	mg/L	0	0	ND	ND	ND
Total Hardness	mg/L as CaCO ₃	2	2	11.0	16.0	13.5
Turbidity	NTU	2	2	3.5	6.2	4.9

Note: DWQMP Version 5 does not require the sampling of potassium, total dissolved solids, sulphate, SAR and fluoride. Coen Dam used December 2022 to end of June 2023. New sampling regime aligned to Version 5 of the Coen DWQMP started 01/01/2023.

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Table 4C: Coen Bores Raw Water - Physical Chemical (NATA Lab)

Raw water sampling did not coincide with the Borefields being used as the raw water source for Coen. Bores used for 7 days in the 2022 – 2023 financial year. The bores were sampled individually and the results are below. Shepherds Bore was non-operational at the time of sampling.

Bore 5



Client: Cook Shire Council

Project No: 121856
Report ID: 56135
Date Issued: 22-May-2023
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Coen Retic - Verification Monitoring - E.coli, Metals, THMs, Chlorate; Raw Water/Treated Water

LRN: 1204102

Date Sampled: 03-05-2023 9:25am

Coen - Bore 5

Received at Lab: 04-05-2023 08:46am

Method	Analyte	Result	LOR	Date Started
Microbiology				
1204105 Coliforms	E. coli	<10 CFU/100mL	<10	04-05-2023
Coliforms	Total coliforms	<10 CFU/100mL	<10	04-05-2023
Metals				
1204103 ICPOES Metals - Total	ICPOES Silicon	41 mg/ L SiO2	<0.2	04-05-2023
ICPOES Metals - Total	Calcium	96 mg/L	<0.2	04-05-2023
ICPOES Metals - Total	Magnesium	31 mg/L	<0.05	04-05-2023
ICPOES Metals - Total	Sodium	67 mg/L	<0.15	04-05-2023
ICPOES Metals - Total	Total Hardness	370 mg CaCO3 / L	<1	04-05-2023
1204104 Total Metals	Arsenic (dissolved)	0.011 mg/L		
Total Metals	Barium (dissolved)	0.009 mg/L		
Total Metals	Cadmium (dissolved)	<0.0001 mg/L		
Total Metals	Cobalt (dissolved)	<0.001 mg/L		
Total Metals	Copper (dissolved)	<0.001 mg/L		
Total Metals	Manganese (dissolved)	0.438 mg/L		
Total Metals	Nickel (dissolved)	0.001 mg/L		
Total Metals	Iron (dissolved)	0.47 mg/L		
General Chemistry				
1204102 Salinity		0.519 psu		
Physical Properties				
1204103 Colour	Apparent Colour	16 Pt/Co units	<1	04-05-2023
1204103 EC, pH, Alkalinity, Turbidity	Electrical Conductance	1100 µS/cm	<2	04-05-2023
EC, pH, Alkalinity, Turbidity	pH	7.2	<0.1	04-05-2023
EC, pH, Alkalinity, Turbidity	Total Alkalinity	280 mg CaCO3 / L	<1.5	04-05-2023
EC, pH, Alkalinity, Turbidity	Turbidity	4.1 NTU	<0.1	04-05-2023
Nutrients and Anions				
1204103 Anions - Fluoride	Fluoride	0.69 mg/L	<0.02	05-05-2023
1204103 Anions	Chloride	170 mg/L	<1	08-05-2023

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Bore 10



Client: Cook Shire Council

Project No: 121856
Report ID: 56135
Date Issued: 22-May-2023
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Coen Retic - Verification Monitoring - E.coli, Metals, THMs, Chlorate; Raw Water/Treated Water

LRN: 1204106

Date Sampled: 03-05-2023 9:40am

Coen - Bore 10

Received at Lab: 04-05-2023 08:46am

Method	Analyte	Result	LOR	Date Started
Microbiology				
1204109 Coliforms	E. coli	<10 CFU/100mL	<10	04-05-2023
Coliforms	Total coliforms	est 50 CFU/100mL	<10	04-05-2023
Metals				
1204107 ICPOES Metals - Total	ICPOES Silicon	41 mg/ L SiO2	<0.2	04-05-2023
ICPOES Metals - Total	Calcium	36 mg/L	<0.2	04-05-2023
ICPOES Metals - Total	Magnesium	16 mg/L	<0.05	04-05-2023
ICPOES Metals - Total	Sodium	53 mg/L	<0.15	04-05-2023
ICPOES Metals - Total	Total Hardness	160 mg CaCO3 / L	<1	04-05-2023
1204108 Total Metals	Arsenic (dissolved)	0.004 mg/L		
Total Metals	Barium (dissolved)	0.016 mg/L		
Total Metals	Cadmium (dissolved)	<0.0001 mg/L		
Total Metals	Cobalt (dissolved)	<0.001 mg/L		
Total Metals	Copper (dissolved)	0.001 mg/L		
Total Metals	Manganese (dissolved)	0.045 mg/L		
Total Metals	Nickel (dissolved)	<0.001 mg/L		
Total Metals	Iron (dissolved)	0.06 mg/L		
General Chemistry				
1204106 Salinity		0.269 psu		
Physical Properties				
1204107 Colour	Apparent Colour	14 Pt/Co units	<1	04-05-2023
1204107 EC, pH, Alkalinity, Turbidity	Electrical Conductance	560 µS/cm	<2	04-05-2023
EC, pH, Alkalinity, Turbidity	pH	7.1	<0.1	04-05-2023
EC, pH, Alkalinity, Turbidity	Total Alkalinity	130 mg CaCO3 / L	<1.5	04-05-2023
EC, pH, Alkalinity, Turbidity	Turbidity	2.8 NTU	<0.1	04-05-2023
Nutrients and Anions				
1204107 Anions - Fluoride	Fluoride	0.39 mg/L	<0.02	05-05-2023
1204107 Anions	Chloride	92 mg/L	<1	08-05-2023

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Table 4D: Lankelly Creek Raw Water - Metals (NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023						
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	2	2	0.0007	0.0045	0.0026
Barium	mg/L	2	2	0.009	0.014	0.012
Beryllium	mg/L	2	2	0.0001	0.0001	0.0001
Cadmium	mg/L	2	2	0.0001	0.0001	0.0001
Chromium	mg/L	2	2	0.0005	0.0005	0.0005
Cobalt	mg/L	2	2	0.0005	0.0005	0.0005
Copper	mg/L	2	2	0.0010	0.0030	0.0020
Iron	mg/L	2	2	0.0850	0.3230	0.2040
Lead	mg/L	2	2	0.0005	0.0005	0.0005
Manganese	mg/L	2	2	0.0029	0.0075	0.0052
Mercury	mg/L	2	2	0.00006	0.00006	0.00006
Nickel	mg/L	2	2	0.0005	0.0005	0.0005
Selenium	mg/L	2	2	0.0020	0.0020	0.0020
Vanadium	mg/L	2	2	0.0001	0.0002	0.0002
Zinc	mg/L	2	2	0.0080	0.0100	0.0090

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Table 4E: Coen Dam Raw Water - Metals (NATA Lab)

Date Sampled – 01/07/2022 – 30/06/2023						
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	2	2	0.0130	0.0173	0.0152
Barium	mg/L	2	2	0.004	0.029	0.017
Beryllium	mg/L	0	0	ND	ND	ND
Cadmium	mg/L	2	2	0.0001	0.0001	0.0001
Chromium	mg/L	0	0	ND	ND	ND
Cobalt	mg/L	2	2	0.0005	0.0010	0.0008
Copper	mg/L	2	2	0.0020	0.0020	0.0020
Iron	mg/L	2	2	0.1670	0.1670	0.1670
Lead	mg/L	0	0	ND	ND	NF
Manganese	mg/L	2	2	0.0020	0.0648	0.0334
Nickel	mg/L	2	2	0.0005	0.0010	0.0008
Selenium	mg/L	0	0	ND	ND	ND
Silicon	mg/L	2	1	25.0	25.0	25.0
Vanadium	mg/L	0	0	ND	ND	ND
Zinc	mg/L	0	0	ND	ND	ND

Note: DWQMP Version 5 does not require the sampling of silicon, beryllium, chromium, lead, selenium, vanadium and zinc . Coen Dam used December 2022 to end of June 2023. New sampling regime aligned to Version 5 of the Coen DWQMP started 01/01/2023.

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Table 4F: Coen Bores Raw Water - Metals (NATA Lab)

Raw water sampling did not coincide with the Borefields being used as the raw water source for Coen. Bores used for 12 days in the 2022 – 2023 financial year. See results under 4C for metals.

Table 4G: Coen Treatment Plant Raw – Physical Chemical (Coen WTP Lab)

Date Sampled – 01/07/2022 – 30/06/2023						
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	52	50*	0.1	16.0	1.7
Colour	mg/L	365	353*	0.0	529	101
Electrical Conductivity	µS/cm ²	52	52	3.5	784.0	87.1
pH	mg/L	365	352*	5.83	9.74	6.74
Turbidity	mg/L	365	355*	0.0	75.0	6.8

*Raw water samples not taken when the bores are running as bore water is not treated through the treatment plant.

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

Coen												
Year	2022/2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	8	10	8	10	8	4	10	9	15	8	10	10
No. of samples collected in which <i>E. coli</i> is detected (i.e. a failure)	0	0	0	0	0	0	0	1	1	0	0	0
No. of samples collected in previous 12 month period	106	104	106	104	106	104	100	102	101	108	108	110
No. of failures for previous 12 month period	0	0	0	0	0	0	0	1	2	2	2	2
% of samples that comply	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.0%	98.0%	98.1%	98.1%	98.2%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

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Table 6: Gross Alpha and Gross beta activity – 40 K

Date Sampled – 08/02/2023			
Sample point	Unit	Parameter	Result
Coen School	Bq/L	Gross alpha	<0.05
Coen School	Bq/L	Gross beta activity – 40K	<0.10