

Drinking Water Quality Management Plan

Annual report

2022-2023

LAURA



Cook Shire Council

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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
DWQMP	Drinking Water Quality Management Plan
<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 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). The town is run off the overhead tanks from 11pm to 4am to ensure a daily turnover of water.

Laura currently has 48 water connections:

- Residential 63%
- Commercial 11%
- Industrial 2%
- Institutional 6%
- Council 10%
- Government 8%

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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.

Standard Operating Procedures were updated in 2021. Training of staff in procedures is on-going. Individual actions taken for the Laura 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.

Scheme	Component	Improvement Action and Origin of Action	Target Date	Actions undertaken to date	Status and revised target date	Responsible officer
Laura	Reticulation	Chlorate	On going	New chlorine shed and dosing system in place. Chlorate management plan in DWQMP.	Chlorate monitoring is ongoing. No detections in 2022/2023	Manager/Team Leader
Laura	System Wide	Meter replacement program	30 th June 2023	Meters over 15 years old replaced in Laura	Complete	Manager/Team Leader
Laura	Treated Water/Reservoirs	Ingress into reservoir	30 th June 2022	Reservoir inspection done. Reservoir roof needs repairs. Reservoir base is in fair condition.	Action to patch reservoir roof in 2023/24 FY	Manager/Team Leader
Laura	Cybersecurity	Cybersecurity Strategy	June 2023	Cybersecurity analysis of Cook Shire Councils cybersecurity related risks was undertaken. This aligned with the cybersecurity KPI's from the water supply regulator	Investigation is done. Waiting for report	Manager/IT 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.

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 overhead tanks weekly chlorine

Table 3E: 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 6: Gross alpha and Gross beta activity – 40K

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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

There were no notifications to the Regulator in the 2022-2023 financial year.

A chlorate management plan has been included in the draft Version 5 of the DWQMP submitted to the Regulator in June 2022.

Measures undertaken to control chlorate in the past 3 years include:

- Building a new chlorine shed with good ventilation and insulation
- Installing a dual dosing system to allow tanks to be cleaned out before being filled
- Use of antibacterial wipes to sterilize tanks
- Bulk chlorine received at the Annan WTP is tested for chlorine strength and pH
- Chlorine is diluted 50:50 with water when taken from the Annan to Laura WTP

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. Laura was last audited in 2021.

9. Additional sampling

Gross alpha and Gross beta activity 40K samples were also taken once this financial year. The results are in Table 6. A further sample will be taken in August 2023 and reported in the next Annual Report. If the samples indicate there is no concerns with Gross alpha and Gross beta, then sampling for these parameters will not be included in future sampling schedules.

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Appendix A – Summary of compliance with water quality criteria

Table 2A: Laura 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	2	2	69.0	69.0	69.0	-	-	-
Calcium	mg/L	4	4	4.3	4.7	4.4	-	-	-
Chloride	mg/L	2	2	19.0	21.0	20.0	< 250 mg/L	-	0
Colour	HU	4	4	1.0	1.5	1.1	< 15 HU	-	0
Electrical Conductance	µS/cm	4	4	200.0	210.0	205.0	-	-	-
Fluoride	mg/L	2	2	0.10	0.10	0.10	< 1.5 mg/L	0	-
Magnesium	mg/L	4	4	0.78	0.84	0.80	-	-	-
pH	pH units	4	4	7.70	7.90	7.75	6.5-8.5	-	0
Potassium	mg/L	2	2	2.80	2.90	2.85	-	-	-
Salinity	mg/L	4	4	98.1	101.0	99.3	-	-	-
SAR		2	2	4.40	4.40	4.40	-	-	-
Silicon	mg/L	4	4	16.0	17.0	16.3	-	-	-
Sodium	mg/L	2	2	38.0	38.0	38.0	< 180 mg/L	-	0
Sulphate	mg/L	2	2	4.2	4.4	4.3	< 250 mg/L	0	0
Total Dissolved Solids	mg/L	2	2	120.0	130.0	125.0	< 600 mg/L	-	0
Total Hardness	mg/L as CaCO ₃	4	4	14.0	15.0	14.3	< 200 mg/L	-	0
Turbidity	NTU	4	4	0.1	0.4	0.2	< 5 NTU	-	0

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Table 2B: Laura 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	2	2	0.0002	0.0002	0.0002	0.01 mg/L	0	-
Barium	mg/L	2	2	0.245	0.245	0.245	< 2 mg/L	0	-
Beryllium	mg/L	2	2	0.0001	0.0001	0.0001	< 0.06 mg/L	0	-
Cadmium	mg/L	2	2	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	2	2	0.0005	0.0005	0.0005	-	-	-
Copper	mg/L	2	2	0.0110	0.0220	0.0165	< 2 mg/L	0	0
Iron	mg/L	4	4	0.0020	0.0150	0.0118	< 0.3 mg/L	-	0
Lead	mg/L	2	2	0.0005	0.0021	0.0013	< 0.01 mg/L	0	-
Manganese	mg/L	4	4	0.0002	0.0005	0.0003	< 0.1 mg/L	0	0
Mercury	µg/L	2	2	0.060	0.060	0.060	<1.0 µg/L	0	-
Nickel	mg/L	2	2	0.0005	0.0005	0.0005	< 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	0.0120	0.0600	0.0360	< 3.0 mg/L	-	0

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Table 2C: Laura Reticulation – E.coli (CSC Annan 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 – MPN/100ml	6 sites throughout Laura reticulation	52	52	0	0	Annan WTP
E.coli and Coliforms	E. coli cfu/100ml		4	4	0	0	Cairns Regional Council

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Table 2D: Laura Reticulation – Physical Chemical (CSC Annan 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	12	12	0.48	0.99	0.78
Colour	mg/L	12	12	0.0	16.00	2.75
Electrical Conductivity	mg/L	12	12	207.3	247.0	220.6
pH	mg/L	12	12	6.74	7.50	7.03
Turbidity	mg/L	12	12	0.07	0.64	0.21

Table 2E: Laura 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 Health
				Min. Value	Max. Value	Avg. Value		
Chloroform	µg/L	4	4	5	10	7	<250 µg/L	0
Bromodichloromethane	µg/L	4	4	5	13	9	<250 µg/L	0
Dibromochloromethane	µg/L	4	4	5	6	5	< 250 mg/L	0
Bromoform	µg/L	4	4	5	5	5	<250 µg/L	0
Total Trihalomethanes	µg/L	4	4	5	29	17	<250 µg/L	0
Chlorate	mg/L	4	4	0.374	0.696	0.534	<0.8 mg/L*	0

- QH Provisional Guideline

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Table 3A: Laura Treated Water 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	2	2	69.0	70.0	69.5	-	-	-
Calcium	mg/L	4	4	4.3	4.7	4.5	-	-	-
Chloride	mg/L	2	2	19.0	21.0	20.0	< 250 mg/L	-	0
Colour	HU	4	4	1.0	1.0	1.0	< 15 HU	-	0
Electrical Conductance	µS/cm	4	4	200.0	210.0	202.5	-	-	-
Fluoride	mg/L	2	2	0.10	0.11	0.11	< 1.5 mg/L	0	-
Magnesium	mg/L	4	4	0.78	0.85	0.81	-	-	-
pH	pH units	4	4	7.60	7.80	7.70	6.5-8.5	-	0
Potassium	mg/L	2	2	2.9	2.9	2.9	-	-	-
Salinity	mg/L	4	4	98.1	101.0	99.1	-	-	-
SAR		2	2	4.30	4.50	4.40	-	-	-
Sodium	mg/L	2	2	38.0	39.0	38.5	< 180 mg/L	-	0
Sulphate	mg/L	2	2	4.2	4.5	4.4	< 250 mg/L	0	0
Total Dissolved Solids	mg/L	2	2	120.0	130.0	125.0	< 600 mg/L	-	0
Total Hardness	mg/L as CaCO ₃	4	4	14.0	15.0	14.5	< 200 mg/L	-	0
Turbidity	NTU	4	4	0.1	0.2	0.1	< 5 NTU	-	0

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Table 3B: Laura Treated Water 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	2	2	0.0002	0.0002	0.0002	0.01 mg/L	0	-
Barium	mg/L	2	2	0.236	0.240	0.238	< 2 mg/L	0	-
Beryllium	mg/L	2	2	0.0001	0.0001	0.0001	< 0.06 mg/L	0	-
Cadmium	mg/L	2	2	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	2	2	0.0005	0.0005	0.0005	-	-	-
Copper	mg/L	2	2	0.0070	0.0080	0.0075	< 2 mg/L	0	0
Iron	mg/L	4	4	0.0020	0.0150	0.0118	< 0.3 mg/L	-	0
Lead	mg/L	2	2	0.0005	0.0010	0.0008	< 0.01 mg/L	0	-
Manganese	mg/L	4	4	0.0002	0.0005	0.0003	< 0.1 mg/L	0	0
Mercury	µg/L	2	2	0.0600	0.0600	0.0600	<1.0 µg/L		
Nickel	mg/L	2	2	0.0005	0.0007	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	0.0002	0.0002	-	-	-
Zinc	mg/L	2	2	0.0100	0.0150	0.0125	< 3.0 mg/L	-	0

Table 3C: Laura Treated Water Final – Free Chlorine

Date Sampled – 01/07/2022 – 30/06/2023								
Parameter	Unit	Number of Samples required	No of Samples collected	Summary of Results			ADWQ Guidelines Value (2011)	No of Samples exceeding ADWG
				Min. Value	Max. Value	Avg. Value		
Free Chlorine Residual	mg/L	365	365	0.37	1.61	0.95	<5	0

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Table 3D: Laura Treated Water Final – Overhead tanks weekly Free Chlorine (CSC Staff hand held colorimeter)

Date Sampled – 01/07/2022 – 30/06/2023								
Parameter	Unit	Number of Samples required	No of Samples collected	Summary of Results			ADWQ Guidelines Value (2011)	No of Samples exceeding ADWG
				Min. Value	Max. Value	Avg. Value		
Free Chlorine Residual	mg/L	52	52	0.33	1.61	0.89	<5	0

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

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 – MPN/100ml	6 sites throughout Laura reticulation	52	52	0	0	Annan WTP
E.coli and Coliforms	E. coli cfu/100ml		4	4	0	0	Cairns Regional Council

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

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	66.0	69.0	67.5
Calcium	mg/L	2	4	3.5	4.0	3.7
Chloride	mg/L	2	2	15.0	16.0	15.5
Colour	HU	4	4	24.0	45.0	34.0
Electrical Conductance	µS/cm	4	4	180.0	190.0	185.0
Fluoride	mg/L	2	2	0.09	0.10	0.10
Magnesium	mg/L	2	4	0.71	0.77	0.75
pH	pH units	4	4	6.5	7.00	6.70
Potassium	mg/L	2	2	2.90	2.90	2.90
Salinity	mg/L	4	4	89.6	94.3	91.9
SAR		2	2	4.20	4.40	4.30
Silicon	mg/L	4	4	14.0	15.0	14.5
Sodium	mg/L	2	2	35.0	35.0	35.0
Sulphate	mg/L	2	2	4.0	4.1	4.1
Total Dissolved Solids	mg/L	2	2	110.0	110.0	110.0
Total Hardness	mg/L as CaCO ₃	2	4	12.0	13.0	12.5
Turbidity	NTU	4	4	1.6	12.0	4.7

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

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	0.0002	0.0002	0.0002
Barium	mg/L	2	2	0.224	0.256	0.240
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	0.0050	0.0030
Iron	mg/L	4	4	0.84	2.15	1.43
Lead	mg/L	2	2	0.0005	0.0005	0.0005
Manganese	mg/L	4	4	0.0503	0.0748	0.0578
Mercury	mg/L	2	2	0.0600	0.0600	0.0600
Nickel	mg/L	2	2	0.0005	0.0006	0.0006
Selenium	mg/L	2	2	0.0020	0.0020	0.0020
Vanadium	mg/L	2	2	0.0001	0.0001	0.0001
Zinc	mg/L	2	2	0.0080	0.0170	0.0125

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

Date Sampled – 01/07/2022 – 30/06/2023							
	Parameter	Sampling Location	Number of samples taken	Minimum	Maximum	Average	Laboratory
E.coli and Coliforms	E.coli – MPN/100ml	Laura Bores	50	0	2	0	Annan WTP

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

Laura												
Year	2022/2023											
Month	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
No. of samples collected	4	5	4	5	4	4	5	4	4	4	5	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	51	51	51	51	52	51	51	52	52	52	52	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

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

Date Sampled – 06/02/2023			
Sample point	Unit	Parameter	Result
Laura Roadhouse	Bq/L	Gross alpha	<0.05
Laura Roadhouse	Bq/L	Gross beta activity – 40K	<0.10