

Townsville City Council

Townsville Water

**Drinking Water Quality Management Plan
Annual Report**

2014/2015

SPID 506
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1 Executive Summary

Townsville City Council's Drinking Water Quality Management plan was approved in August 2012. Included in the approval notice was a requirement to submit an annual water quality report to outline the performance of Townsville Water against their DWQMP as required under the *Water Supply (Safety and Reliability) Act 2008*.

Townsville Water has met all requirements under its Drinking Water Quality Management Plan, the Australian Drinking Water Guidelines 2011 and *Public Health Regulation 2005* for the 2014/2015 financial year.

Overall compliance for *E.coli* for each scheme was

Drinking Water Scheme	No. of samples	% of compliance
Townsville	2786	99.9%
Paluma	79	100%
Cungulla	106	98.1%

Table 1. Percentage compliance for *E. Coli* for Townsville Water's three drinking water schemes.

* It must be noted that there was only one incident resulting in non-compliant *E.coli* samples for Cungulla for the 14/15 financial period

A boil water notice was put in effect for Paluma Water Supply in June 2015. On 10th June 2015 *Giardia* was detected in the raw water supply at Paluma Weir. As chlorination is the only treatment at Paluma, Townsville Water placed the Township on a boil water notice. After a sanitary survey and four clear resamples the boil water notice was lifted on the 10th July. Townsville Water continues to monitor for *Giardia*.

Seven notifications of non-compliance were submitted to the Regulator. Three of which were *Escherichia coli*, one for Trihalomethanes, two for chlorates and one for *Giardia*. There is no health guideline limit for chlorates under the Australian Drinking Water Quality Guidelines; instead Townsville Water set a self-reporting limit of 0.7mg/L

There were 95 water quality complaints, 8 of which were owner's side issues.

Townsville Water notified DERM of one research project currently being undertaken; *Potable Water Chlorate Investigation*.

There have been no amendments made to the DWQMP for the 2014/2015 financial year.

Townsville Water was awarded 1st and 2nd place in the North Queensland Regional Final of the 2015 Ixom Best of the Best Queensland Water Taste Test on 23rd June 2015.

2 Overview

Townsville City Council's DWQMP was submitted to the Office of the Water Supply Regulator on 21st June 2011. It was approved with conditions on 29 August 2012. The plan underwent a review from April – June 2014 and was submitted for approval to the Office of the Water Supply Regulator with Townsville City Council's Drinking Water Quality Management Plan Annual Report on December 2014.

Townsville Water services a population of 192,038 with 70,973 water meter connections, in three drinking water schemes; Townsville Drinking Water Scheme, Paluma Drinking Water Scheme and Giru/ Cungulla Drinking Water Scheme. 63,516 ML of water was produced in the financial year. Townsville Water maintains 2 dams, 23 water pumping stations, 41 reservoirs (water storage facilities) and 2,554 km of water distribution mains.



3 Actions taken to implement the DWQMP

A review of the DWQMP was undertaken mid-2014. No new amendments were made to the plan for this financial year.

There were no hazards or hazardous events that affected water quality during the financial year.

Townsville Water has a widespread yet targeted operational and verification monitoring program that is managed by the Water Treatment Engineer and the Water Quality Officer. Their role is to monitor, regulate and improve water quality for Townsville. They deal with all water quality non-compliances, water quality complaints/ queries from consumers, and monitor all Critical Control Points, the water sampling plan and the subsequent data it generates. They are part of a broader Water Quality Team which includes the Manager Water Operations, Water Operations Engineer, Commercial Compliance Officer, Bulk Water Maintenance Officer and the Water Operators.

Hunter H2O was engaged to undertake investigation and prepare a scoping (conceptual) design and technical specification in relation to Townsville Water's procurement process for the Paluma Township Water Treatment Plant.

No water infrastructure upgrades occurred at any of the Water Treatment Plants. One new reservoir was brought online, Roseneath Reservoir (0.03 ML) to meet increasing water demand and supply.



4 Research Activities

4.1 Potable Water Chlorate Investigation

Townsville Water completed a project to assess the levels of Chlorates in the Townsville system 2013/2014. Operational amendments were made throughout Townsville's Drinking Water Schemes and reductions in chlorate formation were achieved. As a result of this project Townsville Water set a reportable value for chlorates. Ongoing breaches of this value (as outlined in section 5) and subsequent investigations suggested that further review of chlorates throughout the system was required.

A project as acknowledged by DERM on 25th March 2015 is currently underway in which Townsville Water proposes to:

- » Identify any further contributing factors to the current chlorate levels not ascertained by the previous project.
- » Identify further opportunities to reduce chlorate levels.
- » Using this information re-assess the reportable value determined by the previous chlorate project.

A completion date of 29th Feb 2016 (depending upon data quality) has been set.

4.2 Biofilm Investigation Project

This project is ongoing. High HPC and total coliform counts show biofilm occurs in the section of pipe that was being studied (non-potable water). As the decay of chlorine along the distribution main downstream of the chlorinator is contributing to bacterial regrowth, Townsville Water will re-chlorinate the pipe at the reservoir and use the current re-chlorination point (Mt Jack Chlorinator) as a trim doing system. The scope of the project has been updated to include installing a solar powered chlorinator at the inlet of Brookhill Reservoir.

4.3 Northern Organics Risk Assessment

High levels of geosmin in late 2012 & 2013 and the corresponding customer complaints resulted in a project being undertaken to locate the source of geosmin and identify any suitable techniques for inhibiting taste and odour compound contamination in NWTP. To date the source of Geosmin has not been determined due to being hindered by the relative decline of geosmin in January 2014. This project has been put on hold until the geosmin reoccurs; with Townsville Water continuing a scaled back monitoring program.

5 Information supplied to the Regulator regarding non-compliances and/ or prescribed incidents.

There have been seven non-compliances with water quality criteria for drinking water for the 14/15 financial year. The following describes the non-compliance and how it was addressed

DWI-7-506-00031 **Cungulla Drinking Water Scheme**

Incident Description: Detection of *E.coli* at Cungulla on 30th December 2014 at both the reservoir sample and the house sample (4 org/100ml).

Corrective and Preventative actions: The Cungulla reticulation system was flushed. Sodium Hypochlorite stock was replenished. Subsequent resampling at these sites yielded negative results for *E.coli*.

DWI-7-506-00032 **Paluma Drinking Water Scheme**

Incident description: Detection of chlorates Paluma Reservoir (0.797 mg/L) and Paluma house sample (0.753mg/L) on 20th December 2014 (results received from the Lab on 2nd January 2015). It is worth noting that there is no health (or aesthetic) guideline value for chlorates in the ADWQ guidelines. Instead Townsville water has a self-imposed target value of <0.7mg/L.

Corrective and Preventative Actions: Optimisation of the chlorination system by moving the existing chlorinator to the inlet of the reservoir. This results in reduced residence time for disinfection by-product formation while still providing adequate contact time for chlorine in the reservoir itself. The sodium hypochlorite is now kept in a fridge as our research study has shown temperature has an effect on chlorate formation. Subsequent re-sampling has shown a reduction in chlorate formation.

DWI-7-506-00033 **Paluma Drinking Water Scheme**

Incident description: Detection of Trihalomethanes (THMs) (286 µg/L) in Paluma House sample on 7th January 2015. Recent high rainfall stirred up water in Paluma Weir, resulting in a higher organic load which resulted in an increased chlorine demand to maintain adequate disinfection.

Corrective and Preventative Actions: The Paluma reticulation system was flushed. As above moving the existing chlorinator to the inlet of the reservoir will result in reduced residence time for THM formation while still providing adequate contact time for chlorine in the reservoir itself. All subsequent sampling has shown THMs back within guideline limits.

DWI-7-506-00034 **Cungulla Drinking Water Scheme**

Incident description: Detection of chlorates (0.708 mg/L) on 6th January 2015 at Cungulla Reservoir. As above it is worth noting that there is no health (or aesthetic) guideline value for chlorates in the ADWQ guidelines. Instead Townsville water has a self-imposed target value of <0.7mg/L.

Corrective and Preventative Actions: The Cungulla reticulation system was flushed. Fresh hypo was restocked.

DWI-7-506-00035 **Townsville Drinking Water Scheme**

Incident description: Detection of *E.coli* (3cfu/100ml) at Roseneath Reservoir on 17th February 2015. It had residual chlorine of 0.66mg/L.

Corrective and Preventative Actions: Disinfection process was reviewed with no fault found. Sampling procedure was audited and again no fault found. The sample tap location and height was questioned by the laboratory. Improvements were made to the sampling tap location and height as per picture below. Further resamples and subsequent sampling has all shown negative results for *E.coli*.



DWI-7-506-00036 **Paluma Drinking Water Scheme**

Incident description: Detection of Giardia (1 cysts/10L) at Paluma Weir (raw water supply) on June 1st 2015. A boil water notice was put in effect due to chlorination being the only treatment at Paluma. A further positive result (3cysts/10L) was received on 13th June 2015.

Corrective and Preventative Actions: A sampling regime was instigated. A sanitary survey was undertaken. *E.coli* results were monitored to ascertain if a specific contamination event had occurred. These showed no specific contamination had occurred. After the receipt of four clear samples over a two and half week period the boil water notice was lifted. Further sampling has not detected Giardia

DWI-7-506-00037 Townsville Drinking Water Scheme

Incident description: Detection of *E.coli* (14cfu/100ml) at Crestbrook Park, Townsville 9th June 2015. It had a residual chlorine level of 0.93mg/L.

Corrective and Preventative Actions: Chlorine residuals and pH were adequate for disinfection and there were no *E.coli* detections elsewhere in the system. It is suspected that as the sample was taken in the rain, rainwater poured from the building roof and contaminated the sample. The sample tap was changed to a dedicated sample point. The resample and subsequent sampling has not detected *E.coli*.



6 Compliance with Water Quality Criteria for Drinking Water

All samples are taken and analysed by Townsville Laboratory services which are NATA accredited. Reports/ results are emailed to the water quality team and the team have access to Laboratory Information Management System to obtain results as required. All data is monitored and trends analysed throughout the year by the Water Quality Officer, Water Treatment Engineer and Water Treatment Graduate Engineer.

We have been largely compliant with the water quality criteria with seven water quality incidents as outlined above occurring through the year. The *Public Health Regulation 2005* that requires 98 per cent of samples taken in a 12 month period should contain no *E.coli* has been complied with for the three schemes. There have been no failures to meet sampling frequencies and all locations have been sampled.

Overall compliance for *E.coli* for each scheme was

Drinking Water Scheme	No. of samples	% Compliance
Townsville	2786	99.9
Paluma	79	100
Giru/ Cungulla	106	98.1

Table 1. Percentage compliance for *E. Coli* for Townsville Water's three drinking water schemes.

*** It must be noted that there was only one incident resulting in non-compliant *E.coli* samples for Cungulla for the 14/15 financial period**

A boil water notice was issued for Paluma Water Supply due to detection of *Giardia* in the raw water supply at Paluma Weir. As chlorination is the only treatment at Paluma, Townsville Water placed the Township on a boil water notice. The boil water notice was lifted one month later as:

- » 4 clear resamples within a two and a half week period were obtained
- » Moderate rainfall occurred which would have served to flush the weir
- » A sanitary survey of the immediate area was undertaken and no obvious sign of contamination e.g. overflowing septic was found
- » The *E.coli* results for the Paluma Raw Water were analysed and there was no trend to indicate that a specific contamination event had occurred

We continue to monitor for *Giardia*.

There were seven notifications of non-compliance to the Regulator as outlined in chapter 5.

The attached spread sheet "Water Quality Annual Report" summarises the results of the verification monitoring plan.

7 Details of complaints made to the provider about the drinking water service supplied to customers.

Townsville City Council experiences 5 main types of water quality complaint; dirty water, taste/odour, geosmin, suspected illness and owner's side issues. All Water Quality complaints as dealt with as per "The Water Quality complaints flowchart".

Type of Water Quality Complaint	Dirty Water	Taste/ Odour	Geosmin	Suspected illness	Owners Side	Calcium
Number of Complaints	57	26	0	2	7FM 1 OS	2

Table 2. Number of Water Quality Complaints for Townsville.

The majority of water quality complaints received every year are for Dirty Water/ Milky Water. Dirty water occurs when sediment becomes stirred up from the bottom of the pipe. Milky water is caused by trapped air inside pressurised water pipes converting to tiny air bubbles, which gives the appearance of milky/ white water. A plumber flushes the main and the customer is called back the following day to ensure the issue has been rectified.

We had no geosmin complaints this year. Geosmin causes periodic issues in the Northern Beaches area.

We had 8 Owners side issues, 7 caused by flick mix (FM) tap rubber degradation and 1 with internal plumbing, in this case copper corrosion. Flick Mix issues are discussed with the customer over the phone where it is advised a private plumber will be required. In the copper corrosion case a plumber was dispatched to the house to provide advice and note the urgency that a private plumber would be required. The Water Quality Officer also contacted the Customer who advised a private plumber was being engaged.

Taste and odour resulted in 26 complaints which were rectified by flushing the mains and the customer's meters. They tend to be linked to dirty water events or high/ low chlorine. Chlorine is tested onsite and samples are generally taken to Townsville Laboratory Services for testing to ensure water quality is within guideline limits. Return phone calls to customers ensures the issue is resolved.

Two complaints of suspected illness were received last year. In these instances we analyse samples at Townsville Laboratory Services and liaise one on one with the customer. In both instances it was shown reticulated water supply was fully compliant with our standards.

8 Outcome of Review and findings/ recommendations of Audit

The DWQMP was reviewed mid-2014, the next review is due mid-2016.

The first regular audit of the plan must be conducted by 1 August 2016, with further audits required to be completed every four years from that date.



Townsville City Councils (SPID 506)
ANNUAL WATER QUALITY REPORT
for the reporting period
1st July 2014 - 30 June 2015



TOWNSVILLE DRINKING WATER SCHEME

Drinking Water Service Provider: Townsville City Council
SPID: 506
Drinking Water Scheme: Townsville Drinking Water Scheme
Names of Towns, communities or regions serviced by this scheme: Townsville
Population Serviced by this scheme: 192,038

Reporting Year: July 2014- June 2015
Laboratory Name: Townsville Laboratory Services

Reporting Year: July 2014- June 2015
Laboratory Name: Townsville Laboratory Services

Scheme Name	Name place	Scheme Component	Parameter Category	Parameter	Unit of Measure	Limit of Reporting (LOR)	Count	# of Samples Detected	# DW Guidelines Value	Min Value	Max Value	Avg Value	95th %tile	Comments
Townsville DWS	Townsville	Source Water Ross River Dam	Thermotolerant Coliforms	Total Coliforms	org/100ml	1	36	36	0	801	15400	5945.58	15100	
			Thermotolerant Coliforms	Thermotolerant Coliforms	org/100ml	1	82	82	0	2	1700	54.67	98.25	
			Turbidity	Turbidity	NTU	0.1	211	211	0	2.1	20.8	5.15	9.55	
			pH	pH	pH Units	2	269	269	0	7.11	8.14	7.64	8.01	
			Metals	Iron, Total	mg/L	0.005	220	220	0	0.07	1.30	0.19	0.34	
			Metals	Manganese, Total	mg/L	0.001	220	220	0	0.01	0.59	0.03	0.08	
			Anions	Nitrate	mg/L	0.01	211	33	0	<0.01	0.07	0.00	0.01	
		Source Water Paluma Dam	Thermotolerant Coliforms	Thermotolerant Coliforms	org/100ml	1	23	23	0	2	130	21.47	86	
			Turbidity	Turbidity	NTU	0.1	142	142	0	0.80	11.40	2.56	4.3	
			pH	pH	pH Units	1	142	142	0	5.64	7.42	6.40	7.11	
			Metals	Iron, Total	mg/L	0.005	140	140	0	0.16	6.70	0.88	2.71	
			Metals	Manganese, Total	mg/L	0.001	140	140	0	0.002	0.17	0.03	0.06	
			Anions	Nitrate	mg/L	0.01	104	7	0	<0.01	0.04	0	0.01	
		Water Treatment Plant Douglas WTP Raw Water	Thermotolerant Coliforms	Total Coliforms	org/100ml	1	53	52	0	0.00	6970.00	1266.90	4938	
			Thermotolerant Coliforms	E.coli	MPN/100ml	1	53	5	0	0	50	1.377	3	
			Turbidity	Turbidity	NTU	0.1	365	365	0	1.17	9.41	3.40	5.87	
			pH	pH	pH Units	2	365	365	0	7.29	8.06	7.65	7.86	
			Anions	Sulphate	mg/L	0.5	12	10	0	<0.5	1.80	1.02	1.58	
			Metals	Iron, Total	mg/L	0.005	53	53	0	0.03	0.35	0.12	0.22	
			Metals	Manganese, Total	mg/L	0.001	53	52	0	<0.001	0.04	0.02	0.03	
			Geosmin/ MIB	Geosmin	ng/L	1	12	7	0	<1	3.00	1.11	2.84	
			Geosmin/ MIB	MIB	ng/L	1	12	12	0	1.4	9.80	4.47	8.26	
			Fluoride	Fluoride	mg/L	0.02	52	49	0	<0.02	0.20	0.10	0.15	
			Metals	Arsenic	mg/L	0.001	4	2	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Selenium	mg/L	0.001	4	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Mercury	mg/L	0.006	4	0	0	<0.006	<0.006	<0.006	<0.006	
			Metals	Cadmium	mg/L	0.001	4	1	0	<0.001	0.001	<0.001	<0.001	
			Metals	Nickel	mg/L	0.001	4	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Chromium	mg/L	0.002	4	0	0	<0.002	<0.002	<0.002	<0.002	
			Giardia	Giardia	cysts/100ml	1	4	0	0	0	0	0	0	
			Cryptosporidium	Cryptosporidium	oocysts/10L	1	4	0	0	0	0	0	0	

Scheme Name	Name place	Scheme Component	Parameter Category	Parameter	Unit of Measure	Limit of Reporting (LOR)	Count	# of Samples Detected	# DW Guidelines Value	Min Value	Max Value	Avg Value	95th %tile	Comments
Townsville DWS	Townsville	Water Treatment Plant Douglas WTP Treated Water	Thermotolerant Coliforms	Total Coliforms	org/100ml	1	106	11	0	0	21	1	2	
			Thermotolerant Coliforms	E.coli	MPN/100ml	1	105	0	0	0	0	0	0	
			Disinfection By-product	Chlorine, free	mg/L	0.05	724	724	0	2	3.2	2.66	3.1	
			Turbidity	Turbidity	NTU	0.1	730	730	0	0.055	0.19	0.108	0.14	
			pH	pH	pH Units	2	730	730	0	7.43	7.68	7.56	7.64	
			Anions	Sulphate	mg/L	0.5	24	22	0	<0.5	1.7	1.08	1.66	
			Anions	Nitrate	mg/L	0.01	24	24	0	0.02	0.11	0.0579	0.08	
			Metals	Iron, Total	mg/L	0.005	210	6	0	<0.005	0.01	0.000271	<0.005	
			Metals	Manganese, Total	mg/L	0.001	105	15	0	<0.001	0.006	0.000429	0.003	
			Metals	Aluminium	mg/L	0.002	711	647	0	<0.002	0.16	0.012	0.017	
			Fluoride	Fluoride	mg/L	0.02	730	730	0	0.639	0.763	0.695	0.73	
			Metals	Copper	mg/L	0.001	24	8	0	<0.001	0.003	0.001	0.002	
			Metals	Zinc	mg/L	0.005	24	1	0	<0.005	0.005	<0.005	<0.005	
			Metals	Arsenic	mg/L	0.001	4	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Selenium	mg/L	0.001	4	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Mercury	mg/L	0.006	4	0	0	<0.006	<0.006	<0.006	<0.006	
			Metals	Cadmium	mg/L	0.001	4	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Nickel	mg/L	0.001	4	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Chromium	mg/L	0.001	4	0	0	<0.001	<0.001	<0.001	<0.001	
			Disinfection By-product	Trihalomethanes	ug/L	2	103	103	0	23	81	40.340	66.2	
		Water Treatment Plant Northern WTP Raw Water	Thermotolerant Coliforms	Total Coliforms	org/100ml	1	53	29	0	<1	300.000	21.774	57.6	
			Thermotolerant Coliforms	E.coli	MPN/100ml	1	53	3	0	<1	10.000	0.245	0.4	
			Turbidity	Turbidity	NTU	0.1	364	364	0	0.338	16.400	1.115	1.9	
			pH	pH	pH Units	2	364	364	0	10.06	11.50	10.59	10.85	
			Anions	Sulphate	mg/L	0.5	12	9	0	<0.5	0.900	0.538	0.89	
			Metals	Iron, Total	mg/L	0.001	53	53	0	0.030	0.330	0.161	0.304	
			Metals	Manganese, Total	mg/L	0.001	53	49	0	<0.001	0.010	0.004	0.12	
			Geosmin/ MIB	Geosmin	ng/L	2	15	11	0	<2	14	4.927	11.2	
			Geosmin/ MIB	MIB	ng/L	2	15	4	0	<2	4	1	3.76	
			Fluoride	Fluoride	mg/L	0.002	47	28	0	<0.002	0.008	0.022	0.05	
			Metals	Arsenic	mg/L	0.001	4	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Selenium	mg/L	0.001	4	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Mercury	mg/L	0.006	4	0	0	<0.006	<0.006	<0.006	<0.006	
			Metals	Cadmium	mg/L	0.001	4	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Nickel	mg/L	0.001	4	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Chromium	mg/L	0.001	4	0	0	<0.001	<0.001	<0.001	<0.001	
			Giardia	Giardia	cysts/100ml	1	1	0	0	0	0	0	0	
			Cryptosporidium	Cryptosporidium	oocysts/10L	1	1	0	0	0	0	0	0	
		Water Treatment Plant Northern WTP Treated Water	Thermotolerant Coliforms	Total Coliforms	org/100ml	1	53	0	0	0	0	0	0	
			Thermotolerant Coliforms	E.coli	MPN/100ml	1	53	0	0	0	0	0	0	
			Turbidity	Turbidity	NTU	0.1	365	365	0	0.023	0.520	0.045	0.072	
			pH	pH	pH Units	2	365	365	0	7.44	7.67	0.67	7.63	
			Anions	Sulphate	mg/L	0.5	12	12	0	0.56	2.20	0.93	1.6	
			Anions	Nitrate	mg/L	0.01	14	13	0	<0.01	0.08	0.044	0.074	
			Metals	Manganese, Total	mg/L	0.001	53	41	0	<0.001	0.009	0.002132	0.006	
			Metals	Iron, Total	mg/L	0.001	105	13	0	<0.001	0.030	0.001438	0	
			Metals	Aluminium	mg/L	0.002	365	293	0	<0.005	0.144	0.0097	0.01	
			Fluoride	Fluoride	mg/L	0.02								
							351	351	0	0.623	0.761	0.698	0.733	Fluoride Dosing system was off for routine maintenance for 2 weeks. A notice of period of Non operation was sent to Queensland Health.

Scheme Name	Name place	Scheme Component	Parameter Category	Parameter	Unit of Measure	Limit of Reporting (LOR)	Count	# of Samples Detected	# DW Guidelines Value	Min Value	Max Value	Avg Value	95th %tile	Comments
Townsville DWS	Townsville	Water Treatment Plant Northern WTP Treated Water	Metals	Copper	mg/L	0.002	12	11	0	<0.002	0.006	0.002833	0.005	
			Metals	Zinc	mg/L	0.005	13	1	0	<0.005	<0.005	<0.005	<0.005	
			Metals	Arsenic	mg/L	0.001	2	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Selenium	mg/L	0.001	2	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Mercury	mg/L	0.006	2	0	0	<0.006	<0.006	<0.006	<0.006	
			Metals	Cadmium	mg/L	0.001	2	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Nickel	mg/L	0.001	2	0	0	<0.001	<0.001	<0.001	<0.001	
			Metals	Chromium	mg/L	0.001	2	0	0	<0.001	<0.001	<0.001	<0.001	
			Disinfection By-product	Trihalomethanes	ug/L	2	52	52	0	10	53	29	48	
		Transmission Reservoirs	Thermotolerant Coliforms	Total Coliforms	org/100ml	1	990	15	0	0	200	0.540	0	
			Thermotolerant Coliforms	E.coli	MPN/100ml	1	990	1	1	0	3	0	0	DWI-7-506-00035
			Disinfection residual	Chlorine, free	mg/L	0.05	954	952	0	0	2.8	1.22	1.9	
			Disinfection residual	Chlorine, total	mg/L	0.05	953	953	0	0.17	3.31	1.58	2.3	
			Turbidity	Turbidity	NTU	0.1	951	821	0	0	4	0.29	0.8	
			pH	pH	pH Units	2	951	951	0	6.47	8.46	7.65	7.98	
			Metals	Iron, Total	mg/L	0.005	932	321	0	<0.005	1.5	0.0078	0.03	
			Metals	Manganese, Total	mg/L	0.001	932	266	0	<0.001	0.05	0.0011	0.006	
			Disinfection By-product	Trihalomethanes	µg/L	2	926	926	0	5	199	77.58	129	
		Reticulation Houses	Disinfection By-product	Chlorates	µg/L	15	114	114	0	5	973	179.9	399.2	
			Thermotolerant Coliforms	Total Coliforms	org/100ml	1	2118	44	0	0	88	0.183	0	
			Thermotolerant Coliforms	E.coli	MPN/100ml	1	2121	1	1	0	14	0.0066	0	DWI-7-506- 00038
			Disinfection residual	Chlorine, free	mg/L	0.05	2099	2098	0	<0.05	3.27	1.06	1.7	
			Disinfection residual	Chlorine, total	mg/L	0.05	2094	2094	0	0.1	4.03	1.4	2.15	
			Turbidity	Turbidity	NTU	0.1	596	540	0	0	13.8	0.335	0.7	
			pH	pH	pH Units	1	2118	2118	0	6.07	8.37	7.56	7.97	
			Metals	Iron, Total	mg/L	0.005	379	114	0	0	0.16	0.004	0.06	
			Metals	Manganese, Total	mg/L	0.001	117	117	0	0.001	0.07	0.0053	0.02	
			Fluoride	Fluoride	mg/L	0.02	375	375	0	0.48	0.76	0.70	0.74	
			Disinfection By-product	Trihalomethanes	µg/L	2	371	371	0	13	154	77.008	119	
			Disinfection By-product	Chlorates	µg/L	15	54	54	0	<15	670	183.3889	405.8	

Townsville City Councils (SPID 506)
ANNUAL WATER QUALITY REPORT
for the reporting period
1st July 2014 - 30 June 2015



PALUMA DRINKING WATER SCHEME

Drinking Water Service Provider

SPID

Drinking Water Scheme

Names of Towns, communities or regions serviced by this scheme

Population Serviced by this scheme

Townsville City Council

506

Paluma Drinking Water Scheme

Paluma

25-140

Reporting Year

Laboratory Name

July 2014- June 2015

Townsville Laboratory Services

Scheme Name	Name place	Scheme Component	Parameter Category	Parameter	Unit of Measure	Limit of Reporting (LOR)	Count	# of Samples Detected	# DW Guidelines Value	Min Value	Max Value	Avg Value	95th %tile	Comments
Paluma DWS	Paluma	Source Water Paluma Weir	Thermotolerant Coliforms	E.coli	MPN/100ml	1	13	13	13	20	1600	419.69	1325	
			pH	pH	pH Units	1	13	13	0	5.91	7.4	6.5	7.2	
			Metals	Iron	mg/L	0.005	21	21	0	0.34	2	0.86	1.4	
			Metals	Manganese	mg/L	0.001	21	21	0	0.001	0.07	0.02	0.05	
			Turbidity	Turbidity	NTU	0.1	13	13	0	3.8	16.2	6.29	10.74	
			Cryptosporidium	Cryptosporidium	cells/10 Li	1	6	0	0	0	0	0	0	
			Giardia	Giardia	cells/10 Li	1	6	2	2	0	3	0.667	2.5	After the detection of Giardia in June a boil water notice was put in place for Paluma for a month until four clear samples were returned.
		Transmission Paluma Reservoir	Thermotolerant Coliforms	Total Coliform	org/100ml	1	20	1	0	0	1	0.05	0	
			Thermotolerant Coliforms	E.coli	MPN/100ml	1	20	0	0	0	0	0	0	
			Disinfection Residual	Chlorine (free)	mg/L	0.05	7	7	0	0.17	2.93	1.58	2.3	
			Disinfection Residual	Chlorine (total)	mg/L	0.05	94	94	0	1.31	2.72	1.96	2.53	
			pH	pH	pH Units	1	7	7	0	5.68	7.85	6.81	7.6	
			Turbidity	Turbidity	NTU	0.1	7	7	0	0.1	9.1	4.6	8.98	
			Disinfection By-product	Chlorates	µg/L	15	17	17	0	254	1745	870.76	1620.7	As per Chlorate project proposal submitted 16/2/2015 , explanation contained in the Annual report
			Disinfection By-product	Trihalomethanes	µg/L	2	11	11	0	36	189	95	184	
		Reticulation Paluma Houses	Thermotolerant Coliforms	Total Coliform	org/100ml	1	24	1	1	0	25	1.04	0	
			Thermotolerant Coliforms	E.coli	MPN/100ml	1	24	0	0	0	0	0	0	
			Disinfection Residual	Chlorine (free)	mg/L	0.05	13	13	0	0.1	2.09	1.10	2.05	
			Disinfection Residual	Chlorine (total)	mg/L	0.05	13	13	0	0.41	2.28	1.34	2.25	
			pH	pH	pH Units	2	24	24	0	6.48	8.94	7.40	7.35	
			Turbidity	Turbidity	NTU	0.1	24	24	0	0.1	14.2	5.17	11.14	
			Metals	Iron	mg/L	0.005	24	24	0	0.36	1.7	1.04	1.69	
			Metals	Manganese	mg/L	0.001	24	24	0	0.004	0.06	0.017	0.04	
			Metals	Aluminium	mg/L	0.005	24	24	0	0.072	0.432	0.258	0.4158	
			Fluoride	Fluoride (naturally)	mg/L	0.02	24	24	0	0.03	0.11	0.0866	0.1085	
			Disinfection By-product	Chlorates	µg/L	15	32	32	0	251	1778	898.41	1703.50	As per Chlorate project proposal submitted 16/2/2015 , explanation contained in the Annual report
			Disinfection By-product	Trihalomethanes	µg/L	2	42	42	1	42	286	118.41	230.70	As per incident report DWI-7-506-00033

Townsville City Councils (SPID 506)
ANNUAL WATER QUALITY REPORT
for the reporting period
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GIRU/ CUNGULLA DRINKING WATER SCHEME

Drinking Water Service Provider Townsville City Council
SPID 506
Drinking Water Scheme Giru/ Cungulla Drinking Water Scheme
Names of Towns, communities or regions serviced by this scheme Cungulla
Population Serviced by this scheme 288

Reporting Year July 2014- June 2015
Laboratory Name Townsville Laboratory Services

Scheme Name	Name place	Scheme Component	Parameter Category	Parameter	Unit of Measure	Limit of Reporting (LOR)	Count	# of Samples Detected	# DW Guidelines Value	Min Value	Max Value	Avg Value	95th %tile	Comments
Giru/Cungulla DWS	Giru	Source Water Giru Raw Water (Haughton River)	Thermotolerant Coliforms	Total Coliform	org/100ml	1	9	9	0	10	890	174.22	630	
			Thermotolerant Coliforms	Thermotolerant Coliforms	org/100ml	1	36	36	0	2	10	4.666	10	
			Thermotolerant Coliforms	E.coli	MPN/100ml	1	12	8	8	0	10	3.166	10	
			Turbidity	Turbidity	NTU	0.1	43	43	0	0.2	42	4.5	13.62	
			pH	pH	pH Units	1	44	44	0	4.31	8.84	7.83	8.655	
			Metals	Iron, Total	mg/L	0.005	44	44	0	0.006	1.1	0.094	0.224	
			Metals	Manganese, Total	mg/L	0.001	42	42	0	0	0.09	0.014	0.03	
			Cryptosporidium	Cryptosporidium	cells/10 Li	1	1	0	0	0	0	0	0	
			Giardia	Giardia	cells/10 Li	1	1	0	0	0	0	0	0	
		Water Treatment Plant Giru Clear Water Storage	Thermotolerant Coliforms	Total Coliform	org/100ml	1	45	7	0	0	200	8.66	10.6	
			Thermotolerant Coliforms	E.coli	MPN/100ml	1	45	1	1	0	1	0.022	0	Non-Potable Water
			Turbidity	Turbidity	NTU	0.1	44	43	0	0	2.2	0.36	1.28	
			pH	pH	pH Units	1	44	44	0	6.55	7.92	7.38	7.75	
			Metals	Iron, Total	mg/L	0.005	44	13	0	<0.005	0.17	<0.006	<0.01	
			Metals	Manganese, Total	mg/L	0.001	44	16	0	<0.001	0.005	<0.0009	<0.005	
	Cungulla	Transmission Cungulla Reservoir	Thermotolerant Coliforms	Total Coliform	org/100ml	1	54	1	0	0	165	3.06	0.00	
			Thermotolerant Coliforms	E.coli	MPN/100ml	1	54	1	1	0	4	0.07	0	As per incident DWI-7-506-00031
			Turbidity	Turbidity	NTU	0.1	53	49	0	<0.1	2.1	0.34	0.80	
			pH	pH	pH Units	2	53	53	0	6.58	8.09	7.61	8.00	
			Metals	Iron, Total	mg/L	0.005	52	5	0	<0.005	0.03	0.00125	0.01	
			Metals	Manganese, Total	mg/L	0.001	54	18	0	<0.001	0.02	0.00125	0.005	
			Disinfection Residual	Chlorine (free)	mg/L	0.05	52	52	0	0.15	2.00	1.41	1.80	
			Disinfection Residual	Chlorine (Total)	mg/L	0.05	52	52	0	0.42	2.91	1.79	2.50	
			Disinfection By products	Chlorates	µg/L	15	14	14	0	<50	1200.00	358.00	880.00	As per chlorate project brief. Further explanation contained in the Annual Report
			Disinfection By products	Trihalomethanes	µg/L	2	51	51	0	15.00	130.00	50.55	79.50	
		Reticulation Cungulla Houses	Thermotolerant Coliforms	Total Coliform	org/100ml	1	54	2	0	0	165	3.074	0	
			Thermotolerant Coliforms	E.coli	MPN/100ml	1	54	1	0	0	4	0.07	0	As per incident DWI-7-506-00031
			Turbidity	Turbidity	NTU	0.1	53	49	0	0.00	0.80	0.28	0.60	
			pH	pH	pH Units	1	53	53	0	6.76	8.11	7.62	7.96	
			Metals	Iron, Total	mg/L	0.005	52	12	0	<0.005	0.11	0.004	0.02	
			Metals	Manganese, Total	mg/L	0.001	52	17	0	<0.001	0.02	0.001	0.007	
			Disinfection Residual	Chlorine (free)	mg/L	0.05	52	52	0	0.16	1.99	1.19	1.76	
			Disinfection Residual	Chlorine (Total)	mg/L	0.05	52	52	0	0.26	2.75	1.52	2.39	