CHARTERS TOWERS
REGIONAL COUNCIL

Drinking Water Quality Management Plan
Annual Report
2016/2017

Detail	Information
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Water Service Areas covered by this plan	Charters Towers, Greenvale, Ravenswood, Pentland.

Glossary of terms

ADWG 2004	Australian Drinking Water Guidelines (2004). Published by the National Health and Medical Research Council of Australia
ADWG 2011	Australian Drinking Water Guidelines (2011). Published by the National Health and Medical Research Council of Australia
CFU/100mL	Colony forming units per 100 millilitres
DWQMP	Drinking Water Quality Management Plan
E. coli	*Escherichia coli*, a bacterium which is considered to indicate the presence of faecal contamination and therefore potential health risk
HACCP	Hazard Analysis and Critical Control Points certification for protecting drinking water quality
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
MPN/100mL	Most probable number per 100 millilitres
SCADA	Supervisory Control and Data Acquisition
WTP	Water Treatment Plant
WSP	Water Service provider
<	Less than
>	Greater than

Introduction

This report documents the performance of Charters Towers Regional Council drinking water service with respect to water quality and performance in implementing the actions detailed in the Drinking Water Quality Management Plan (DWQMP) as required under the *Water Supply (Safety and Reliability) Act 2008* (the Act).

The report assists the Regulator to determine whether the approved DWQMP and any approval conditions have been complied with and provides a mechanism for providers to report publicly on their performance in managing drinking water quality.

This template has been prepared in accordance with the *Water Industry Regulatory Reform – drinking water quality management plan report factsheet* published by the Department of Energy and Water Supply, Queensland, accessible at www.dews.qld.gov.au.

1. Overview of Operations

The Charters Towers Regional Council (CTRC) has four (4) Water Service Areas (WSA) located in the region and comprises Charters Towers, Greenvale, Ravenswood and Pentland.

Charters Towers Water Service Area (WSA)

Surface water is sourced from the Burdekin River via The Burdekin Weir and pumped by the Phil Mathews pump station to the CTRC WTP. The CTRC WTP is fundamental to supply being a conventional plant which treats raw surface water. This plant utilises a process comprising coagulation, flocculation, clarification, sedimentation, filtration and disinfection. The water is then delivered to two reservoirs through a common inlet/outlet. Connected population is approximately 8520.

Greenvale WSA

Water is sourced from the Burdekin River from 6 spears. The water is then injected with chlorine (Iron/Manganese control) before being pumped to storage where further chlorine injection is implemented for disinfection, it receives minimal treatment. Connected population is approximately 190.

Ravenswood WSA

Water supply is originally sourced from the Burdekin River by Carpentaria Gold. Water is pumped to a “turkey nest” dam before Carpentaria Gold provides treated water to the township via a small treatment plant. Connected population is approximately 200.

Pentland WSA

Pentland Water supply is sourced from ground water in the Glen Houghton bore field. Two bores pump water to a small reservoir for settlement and where water is disinfected with chlorine before reticulation to the township. This scheme is a groundwater recharge system. Connected population is approximately 200.

Figure 1. Overview of the Charters Towers Regional Council - Water Service Area's (WSA)

2. Actions taken to implement the DWQMP

The following items provide a summary of progress made during 2016/17 in implementing improvement program actions: -

- General review of water quality monitoring and frequency undertaken.
- Improved environs water testing points' reliability.
- Introduced a testing regime at Ravenswood to match that at Pentland and Greenvale.
- Completed SCADA install/upgrade at Greenvale and Pentland.
- Implemented critical control point management into the SCADA system (eg auto shutdown on turbidity excursions).
- Monthly water quality management team meetings held.

2.1. Revisions made to the operational monitoring program to assist in maintaining the compliance with water quality criteria in verification monitoring

The CTRC continues to carry out operational monitoring as per the recently approved CTRC DWQMP. Ravenswood now has a testing program to match the other Townships and trihalomethane testing has now commenced.

2.2. Amendments made to the DWQMP

A new DWQMP was submitted by CTRC and approved by DEWS after some negotiation around managing turbidity events in the townships. The new DWQMP was ratified by Council at its December meeting.

3. Compliance with water quality criteria for drinking water

The results from the drinking water quality monitoring program conducted by council have been compared against the levels of the water quality criteria specified by the regulator in the Water Quality and Reporting Guideline for a drinking Water Service.

The water quality criteria are health guideline values in the most current Australian Drinking Water Guidelines, as well as the standards in the Public Health Regulation 2005.

Results of CTRC Drinking Water Quality Verification Program are provided in Appendix A – Summary of compliance with water quality criteria.

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

For the financial year 2016/17 there were six (6) instances where the Regulator was notified under sections 102 or 102A of the Act for noncompliance issues that occurred.

4.1 Non-compliances with the water quality criteria and corrective and preventive actions undertaken

I. **High Chlorine level – Greenvale Reservoir 18/10/16:** A short term high chlorine level was detected at the Greenvale reservoir, this was immediately reported to DEWS - Incident No. DWI-7-479-00013. Test results taken at the same time from the reticulation showed values below 3ppm. Subsequent testing (internal & external) showed the level had returned to below 5ppm.

II. **Mercury Detection – Pentland August 2015:** Whilst preparing last year's report it was noticed that there had been a very small detection of Mercury (0.0013mg/L – [0.001mg/L to two significant figures]) in August 2015, this was reported to DEWS 30/11/16 - Incident No. DWI-7-479-00014. All preceding and subsequent tests showed no detection at all (below threshold) and no explanation can be given for the result. The external tester has now reviewed their reporting of non-compliant results and a more thorough internal evaluation process has also been introduced.

III. **Chlorine dosing system failed – Pentland 11/1/17**: The chlorine dosing system at Pentland reservoir failed on the morning of 11/1/17, this was immediately reported to DEWS - Incident No. DWI-7-479-00015. As a precaution (based on advice from DEWS) a boiled water alert was put in place while the dosing system was repaired. Chlorine levels were closely monitored and did not drop below 0.5ppm in the town reticulation. The dosing system was repaired on the afternoon of the 12th, the boiled water alert was lifted after levels had returned to above 1ppm.

IV. **High Turbidity event – Greenvale Reservoir 17/1/17**: Due to a high rainfall event the turbidity in the Greenvale reservoir rose to 21.8NTU, DEWS were immediately notified - Incident No. DWI-7-479-00016. Whilst chlorine levels were fine and there was no indication of biological activity the Queensland Health Department recommended a boiled water alert be activated given the treatment process was incapable of addressing the turbidity. The boiled water alert was finally removed 28/4/17 once the turbidity dropped below 1NTU.

V. **High Turbidity event – Greenvale Reservoir 22/5/17**: Due to a high rainfall event the turbidity in the Greenvale reservoir rose to 8.4NTU, DEWS were immediately notified - Incident No. DWI-7-479-00017. Whilst chlorine levels were fine and there was no indication of biological activity the Queensland Health Department recommended a boiled water alert be activated given the treatment process was incapable of addressing the turbidity. The boiled water alert was finally removed 8/6/17 once the turbidity dropped below 1NTU.

VI. **Cadmium detection – Greenvale Reservoir 07/06/17:** Routine testing detected an elevated level of Cadmium in the reservoir water (.0039ppm), DEWS were immediately advised - Incident No. DWI-7-479-00018. After discussion with DEWS and Department of Health that

no action was required until further testing confirmed the presence of Cadmium. Subsequent testing showed no detectable traces of Cadmium.

Three of the above incidents required the Charters Towers Regional Council to issue a boil water alert, one at Pentland and two at Greenvale.

5. Customer complaints related to water quality

CTRC is required to report on the number of complaints, general details of complaints, and the responses undertaken. Throughout the year there was no water complaints lodged.

6. Findings and recommendations of the DWQMP auditor

No audits were required or carried out during the period covered by this report.

7. Outcome of the review of the DWQMP and how issues raised have been addressed

The next internal review of the DWQMP is due before 1st November 2018.

Appendix A – Summary of compliance with water quality criteria

The results from the verification monitoring program have been compared against the levels of the water quality criteria specified by the Regulator in the *Water Quality and Reporting Guideline for a Drinking Water Service*.

The reported statistics include results derived from repeat samples, or from emergency or investigative samples undertaken in response to an elevated result.

External verification monitoring samples are taken internally but processed and analysed by Townsville Laboratories and a summary of the results for critical measures is included below. Results for internal verification monitoring are also included below.

The current testing frequency is considered adequate; balancing quality, quantity and cost. Changes have been made with compliance monitoring in the last 18 months to broaden the range of parameters and increase the frequency of some tests (e.g. a full potability/metals test regime is now carried out monthly as opposed to quarterly at Charters Towers, Greenvale, Pentland and Ravenswood) and the approved DWQMP details this.

Verification monitoring results – below

Charters Towers Water Service Area – External Testing 2016/2017

Parameter	Laboratory	Units	LOR	Count	Detected	Exceeded	Min	Max	Avg
Alkalinity	Townsville Laboratory	mg CaCO3/L	1	24	24	0	48.2	315	128.03
Aluminium	Townsville Laboratory	mg/L	0.005	25	24	0	0	25.9	1.64
Ammonia as N	Townsville Laboratory	mg/L as N	0.02	39	2	0	0	0.04	0.00
Antimony	Townsville Laboratory	mg/L	0.001	25	0	0	0	0	0.00
Arsenic	Townsville Laboratory	mg/L	0.001	25	16	0	0	0.002	0.00
Barium	Townsville Laboratory	mg/L	0.001	25	25	0	0.036	0.184	0.05
Boron	Townsville Laboratory	mg/L	0.010	25	21	0	0	0.139	0.02
Cadmium	Townsville Laboratory	mg/L	0.0001	25	0	0	0	0	0.00
Calcium	Townsville Laboratory	mg/L	0.2	24	24	0	8.7	20.6	15.66
Calcium, soluble	Townsville Laboratory	mg/L	0.2	15	15	0	11.3	182	76.25
Chloride	Townsville Laboratory	mg/L	0.5	24	24	0	8.9	35.2	21.52
Chlorine, Free	Townsville Laboratory	mg/L	0.05	162	149	0	0	3.26	1.38
Chromium	Townsville Laboratory	mg/L	0.001	25	6	0	0	0.052	0.00
Colour, True	Townsville Laboratory	Pt-Co Units	1	24	13	0	0	1431	66.92
Copper	Townsville Laboratory	mg/L	0.001	25	13	0	0	0.033	0.00
E. coli MPN	Townsville Laboratory	org/100ml	1	155	0	0	0	0	0.00
Electrical Conductivity	Townsville Laboratory	µS/cm	1	24	24	0	118	419	293.29
Fluoride	Townsville Laboratory	mg/L	0.02	24	24	0	0.05	0.13	0.11
Geosmin	Townsville Laboratory	ng/L	1.0	10	5	0	0	3.6	0.98
Heterotrophic Plate Count	Townsville Laboratory	org/ml	1	160	31	0	0	300	5.23
Iron	Townsville Laboratory	mg/L	0.005	25	12	0	0	28.9	1.72
Lead	Townsville Laboratory	mg/L	0.001	25	4	0	0	0.012	0.00
Magnesium	Townsville Laboratory	mg/L	0.2	24	24	0	8.4	24.5	15.57
Magnesium, soluble	Townsville Laboratory	mg/L	0.2	15	15	0	8.1	34.7	21.61
Manganese	Townsville Laboratory	mg/L	0.001	25	13	0	0	0.66	0.07
Mercury	Townsville Laboratory	mg/L	0.0006	25	0	0	0	0	0.00
Methyl Isoborneol	Townsville Laboratory	ng/L	1.0	10	1	0	0	1	0.10
Molybdenum	Townsville Laboratory	mg/L	0.001	25	0	0	0	0	0.00
Oxidised Nitrogen as N	Townsville Laboratory	mg/L as N	0.01	24	22	0	0	0.26	0.08

Charters Towers Water Service Area – External Testing 2016/2017									
pH	Townsville Laboratory	pH units	1	168	168	0	6.99	8.17	7.69
Phosphate as P	Townsville Laboratory	mg/L as P	0.01	39	20	0	0	0.6	0.10
Potassium	Townsville Laboratory	mg/L	0.2	39	39	0	2.3	13.1	4.58
Pseudomonas aeruginosa	Townsville Laboratory	org/100mL	1	16	0	0	0	0	0.00
Selenium	Townsville Laboratory	mg/L	0.001	25	0	0	0	0	0.00
Silica as SiO2	Townsville Laboratory	mg/L	0.1	24	24	0	14	31.5	20.25
Silver	Townsville Laboratory	mg/L	0.003	25	0	0	0	0	0.00
Sodium	Townsville Laboratory	mg/L	0.2	24	24	0	6.9	32.2	19.81
Sulphate	Townsville Laboratory	mg/L	0.5	33	33	0	0.6	6.2	2.35
Thermotolerant Coliforms	Townsville Laboratory	org/100ml	1	160	0	0	0	0	0.00
Total Coliform	Townsville Laboratory	org/100ml	1	158	3	0	0	5	0.04
Total Hardness	Townsville Laboratory	mg CaCO3/L	1	15	15	0	61.5	571.1	279.46
Total Phosphorus	Townsville Laboratory	mg/L as P	0.1	15	8	0	0	0.78	0.35
Turbidity	Townsville Laboratory	NTU	0.1	24	24	0	0.1	1030	59.86
Uranium	Townsville Laboratory	mg/L	0.001	25	4	0	0	0.001	0.00
Zinc	Townsville Laboratory	mg/L	0.005	25	4	0	0	0.062	0.00

Greenvale Water Service Area – External Testing 2016/2017									
Parameter	Laboratory	Units	LOR	Count	Detected	Exceeded	Min	Max	Avg
Alkalinity	Townsville Laboratory	mg CaCO3/L	1	18	18	0	162	337	237.2
Aluminium	Townsville Laboratory	mg/L	0.005	18	11	0	0	0.407	0.1
Ammonia as N	Townsville Laboratory	mg/L as N	0.02	18	0	0	0	0	0.0
Antimony	Townsville Laboratory	mg/L	0.001	18	0	0	0	0	0.0
Arsenic	Townsville Laboratory	mg/L	0.001	18	17	0	0	0.002	0.0
Barium	Townsville Laboratory	mg/L	0.001	18	18	0	0.037	0.094	0.1
Boron	Townsville Laboratory	mg/L	0.010	18	15	0	0	0.03	0.0
Cadmium	Townsville Laboratory	mg/L	0.0001	18	1	1	0	0.004	0.0
Calcium	Townsville Laboratory	mg/L	0.2	18	18	0	7.8	29.7	19.9
Chloride	Townsville Laboratory	mg/L	0.5	18	18	0	31	51.1	39.0
Chlorine, Free	Townsville Laboratory	mg/L	0.05	47	44	1	0	5.18	2.1
Chromium	Townsville Laboratory	mg/L	0.001	18	3	0	0	0.002	0.0
Colour, True	Townsville Laboratory	Pt-Co Units	1	18	11	0	0	4	1.4
Copper	Townsville Laboratory	mg/L	0.001	18	1	0	0	0.011	0.0
E. coli MPN	Townsville Laboratory	org/100ml	1	47	0	0	0	0	0.0
Electrical Conductivity	Townsville Laboratory	µS/cm	1	18	18	0	435	676	540.2
Fluoride	Townsville Laboratory	mg/L	0.02	18	17	0	0	0.29	0.1
Geosmin	Townsville Laboratory	ng/L	1.0	3	3	0	1	3.1	1.9
Heterotrophic Plate Count,	Townsville Laboratory	cfu/ml	1	47	17	0	0	300	37.3

Greenvale Water Service Area – External Testing 2016/2017									
Iron	Townsville Laboratory	mg/L	0.005	18	18	0	0.04	0.32	0.2
Lead	Townsville Laboratory	mg/L	0.001	18	0	0	0	0	0.0
Magnesium	Townsville Laboratory	mg/L	0.2	18	18	0	16.8	47.5	31.9
Manganese	Townsville Laboratory	mg/L	0.001	18	18	0	0.008	0.08	0.0
Mercury	Townsville Laboratory	mg/L	0.0006	18	0	0	0	0	0.0
Methyl Isoborneol	Townsville Laboratory	ng/L	1.0	3	0	0	0	0	0.0
Molybdenum	Townsville Laboratory	mg/L	0.001	18	5	0	0	0.017	0.0
Oxidised Nitrogen as NOx-N	Townsville Laboratory	mg/L as N	0.01	18	17	0	0	0.04	0.0
pH	Townsville Laboratory	pH units	1	47	47	0	7.86	8.57	8.2
Phosphate as P	Townsville Laboratory	mg/L as P	0.01	18	17	0	0	0.2	0.1
Potassium	Townsville Laboratory	mg/L	0.2	18	18	0	4.1	6.6	5.1
Selenium	Townsville Laboratory	mg/L	0.001	18	0	0	0	0	0.0
Silica as SiO2	Townsville Laboratory	mg/L	0.1	18	18	0	28.4	43.8	33.8
Silver	Townsville Laboratory	mg/L	0.003	18	0	0	0	0	0.0
Sodium	Townsville Laboratory	mg/L	0.2	18	18	0	29.5	52.8	40.4
Sulphate	Townsville Laboratory	mg/L	0.5	18	14	0	0	3.6	1.3
Thermotolerant Coliforms	Townsville Laboratory	org/100ml	1	47	0	0	0	0	0.0
Total Coliform	Townsville Laboratory	org/100ml	1	47	2	0	0	1	0.0
Trihalomethanes, Total	Townsville Laboratory	µg/L	5	4	4	0	66	159	109.3
Turbidity	Townsville Laboratory	NTU	0.1	18	18	0	0.4	21.8	3.0
Uranium	Townsville Laboratory	mg/L	0.001	18	0	0	0	0	0.0

Greenvale Water Service Area – External Testing 2016/2017									
Zinc	Townsville Laboratory	mg/L	0.005	18	0	0	0	0	0.0

Pentland Water Service Area - External Testing 2016/2017									
Parameter	*Laboratory*	*Units*	*LOR*	*Count*	*Detected*	*Exceeded*	*Min*	*Max*	*Avg*
Alkalinity	*Townsville Laboratory*	*mg CaCO3/L*	*1*	*11*	*0*	*0*	*116.0*	*122.0*	*119.0*
Aluminium	*Townsville Laboratory*	*mg/L*	*0.005*	*11*	*0*	*0*	*0.0*	*0.0*	*0.0*
Ammonia as N	*Townsville Laboratory*	*mg/L as N*	*0.02*	*11*	*10*	*0*	*0.0*	*0.0*	*0.0*
Antimony	*Townsville Laboratory*	*mg/L*	*0.001*	*11*	*0*	*0*	*0.0*	*0.0*	*0.0*
Arsenic	*Townsville Laboratory*	*mg/L*	*0.001*	*11*	*34*	*0*	*0.0*	*0.0*	*0.0*
Barium	*Townsville Laboratory*	*mg/L*	*0.001*	*11*	*34*	*0*	*0.0*	*0.0*	*0.0*
Beryllium	*Townsville Laboratory*	*mg/L*	*0.001*	*4*	*11*	*0*	*0.0*	*0.0*	*0.0*
Bismuth	*Townsville Laboratory*	*mg/L*	*0.001*	*4*	*11*	*0*	*0.0*	*0.0*	*0.0*
Boron	*Townsville Laboratory*	*mg/L*	*0.010*	*11*	*0*	*0*	*0.0*	*0.0*	*0.0*
Cadmium	*Townsville Laboratory*	*mg/L*	*0.0001*	*11*	*11*	*0*	*0.0*	*0.0*	*0.0*
Calcium	*Townsville Laboratory*	*mg/L*	*0.2*	*11*	*11*	*0*	*14.8*	*23.6*	*21.0*
Chloride	*Townsville Laboratory*	*mg/L*	*0.5*	*11*	*11*	*0*	*16.9*	*22.0*	*18.7*
Chlorine, Free	*Townsville Laboratory*	*mg/L*	*0.05*	*34*	*11*	*0*	*0.4*	*2.2*	*1.4*
Chlorine, Total	*Townsville Laboratory*	*mg/L*	*0.05*	*3*	*11*	*0*	*1.2*	*1.5*	*1.3*
Chromium	*Townsville Laboratory*	*mg/L*	*0.001*	*11*	*1*	*0*	*0.0*	*0.0*	*0.0*
Cobalt	*Townsville Laboratory*	*mg/L*	*0.001*	*4*	*8*	*0*	*0.0*	*0.0*	*0.0*

Pentland Water Service Area - External Testing 2016/2017									
Colour, True	Townsville Laboratory	Pt-Co Units	1	11	0	0	0.0	0.0	0.0
Copper	Townsville Laboratory	mg/L	0.001	11	11	0	0.0	0.0	0.0
E. coli MPN	Townsville Laboratory	org/100ml	1	34	11	0	0.0	0.0	0.0
Electrical Conductivity	Townsville Laboratory	µS/cm	1	11	0	0	290.0	306.0	295.5
Fluoride	Townsville Laboratory	mg/L	0.02	11	0	0	0.3	0.5	0.3
Geosmin	Townsville Laboratory	ng/L	1.0	4	11	0	0.0	3.0	1.0
Heterotrophic Plate Count, 36C	Townsville Laboratory	cfu/ml	1	34	10	0	0.0	17.0	1.4
Iron	Townsville Laboratory	mg/L	0.005	11	1	0	0.0	0.0	0.0
Lead	Townsville Laboratory	mg/L	0.001	11	2	0	0.0	0.0	0.0
Lithium	Townsville Laboratory	mg/L	0.001	4	0	0	0.0	0.0	0.0
Magnesium	Townsville Laboratory	mg/L	0.2	11	0	0	6.1	9.9	8.1
Manganese	Townsville Laboratory	mg/L	0.001	11	5	0	0.0	0.0	0.0
Mercury	Townsville Laboratory	mg/L	0.0006	11	0	0	0.0	0.0	0.0
Methyl Isoborneol	Townsville Laboratory	ng/L	1.0	4	0	0	0.0	0.0	0.0
Molybdenum	Townsville Laboratory	mg/L	0.001	11	1	0	0.0	0.0	0.0
Nickel	Townsville Laboratory	mg/L	0.001	4	0	0	0.0	0.0	0.0
Oxidised Nitrogen as NOx-N	Townsville Laboratory	mg/L as N	0.01	11	11	0	0.1	0.1	0.1
pH	Townsville Laboratory	pH units	1	34	11	0	6.9	7.7	7.2
Phosphate as P	Townsville Laboratory	mg/L as P	0.01	11	11	0	0.1	0.3	0.1
Potassium	Townsville Laboratory	mg/L	0.2	11	11	0	1.8	2.5	2.1
Rubidium	Townsville Laboratory	mg/L	0.001	4	11	0	0.0	0.0	0.0

Pentland Water Service Area - External Testing 2016/2017									
Selenium	Townsville Laboratory	mg/L	0.001	11	11	0	0.0	0.0	0.0
Silica as SiO2	Townsville Laboratory	mg/L	0.1	11	0	0	52.1	74.8	58.1
Silver	Townsville Laboratory	mg/L	0.003	11	0	0	0.0	0.0	0.0
Sodium	Townsville Laboratory	mg/L	0.2	11	0	0	17.3	30.9	23.9
Strontium	Townsville Laboratory	mg/L	0.001	4	3	0	0.2	0.3	0.2
Sulphate	Townsville Laboratory	mg/L	0.5	11	0	0	6.0	9.5	7.7
Thallium	Townsville Laboratory	mg/L	0.001	4	0	0	0.0	0.0	0.0
Thermotolerant Coliforms	Townsville Laboratory	org/100ml	1	34	4	0	0.0	0.0	0.0
Tin	Townsville Laboratory	mg/L	0.001	4	0	0	0.0	0.0	0.0
Titanium	Townsville Laboratory	mg/L	0.001	4	0	0	0.0	0.0	0.0
Total Coliform	Townsville Laboratory	org/100ml	1	34	2	0	0.0	0.0	0.0
Trihalomethanes, Total	Townsville Laboratory	µg/L	5	4	4	0	10.0	12.0	11.3
Turbidity	Townsville Laboratory	NTU	0.1	11	0	0	0.1	0.4	0.2
Uranium	Townsville Laboratory	mg/L	0.001	11	2	0	0.0	0.0	0.0
Vanadium	Townsville Laboratory	mg/L	0.001	4	4	0	0.0	0.0	0.0
Zinc	Townsville Laboratory	mg/L	0.005	11	3	0	0.0	0.0	0.0

Ravenswood Water Service Area – Internal and External Testing 2016/2017									
Parameter	Laboratory	Units	LOR	Count	Detected	Exceeded	Min	Max	Avg
E. coli	Envirocheck- Townsville	cfu/100ml	1	75	0	0	0.0	0.0	0.0
Faecal other than Ecoli	Envirocheck - Townsville	cfu/100ml	1	75	0	0	0.0	0.0	0.0
Total Coliforms	Envirocheck - Townsville	cfu/100ml	1	75	1	0	0.0	9.0	0.1
HPC	Envirocheck - Townsville	cfu/100ml	10	75	19	0	0.0	120.0	6.8
Field pH	Envirocheck - Townsville	pH units	1	75	75	0	7.4	8.6	8.0
Free Chlorine	Envirocheck - Townsville	mg/L	0.05	75	75	0	0.2	4.0	1.6
Chlorine (free)	Carpentary Gold (internal)	mg/L	0	375	375	0	0.4	5.0	2.3
pH	Carpentary Gold (internal)	pH Units	0	356	356	0	6.8	8.6	7.6

Charters Towers Regional Council – Internal Testing 2016/2017										
Water Service Area	*Parameter*	*Laboratory*	*Units*	*LOR*	*Count*	*Detected*	*Exceeded*	*Min*	*Max*	*Avg*
Charters Towers (Hospital)	*Chlorine (free)*	*Internal*	*mg/L*	*0.01*	*314*	*314*	*0*	*0.41*	*4.04*	*2.25*
Charters Towers (Hospital)	*pH*	*Internal*	*pH Units*	*0.01*	*314*	*314*	*0*	*6.75*	*8.15*	*7.59*
Charters Towers (Hospital)	*Turbidity*	*Internal*	*NTU*	*0.01*	*294*	*293*	*0*	*0*	*0.93*	*0.35*
Charters Towers (Reservoir)	*Chlorine (free)*	*Internal*	*mg/L*	*0.01*	*310*	*308*	*0*	*0.02*	*2.92*	*1.13*
Charters Towers (Reservoir)	*pH*	*Internal*	*pH Units*	*0.01*	*309*	*309*	*0*	*6.59*	*8.13*	*7.61*
Greenvale	*Chlorine (free)*	*Internal*	*mg/L*	*0.01*	*240*	*240*	*0*	*0.37*	*3.29*	*1.20*
Pentland	*Chlorine (free)*	*Internal*	*mg/L*	*0.01*	*48*	*48*	*0*	*0.27*	*48*	*3.60*

Note:

1) Reservoir minimum free chlorine level (<0.5ppm) was during peak summer when the reservoir was effectively a “dead end”, reticulation monitoring coupled with flushing ensured that 0.41ppm was the lowest value in the town reticulation.
2) Greenvale minimum free chlorine level (0.5ppm) occurred 6 times out of 240 samples and were isolated events with results taken before and after showing levels >0.5ppm.
3) Pentland minimum free chlorine level (<0.5ppm) was a one off, results taken at the same time in surrounding reticulation all showed levels >0.5ppm. It should be noted also that the reduced amount of internal testing at Pentland was due to issues with the then Township Officer and his subsequent resignation leading to a period of staff from Charters Towers having to travel to Pentland hence the reduced frequency.

Reticulation *E. coli* verification monitoring

Charters Towers Water Service Area												
Year	2016/2017											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	13	15	14	12	14	11	14	10	14	12	14	12
No. of samples collected in which E.coli is detected	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 months	14	12	12	15	10	12	14	19	18	12	14	12
No. of failures for previous 12 month period	0	0	0	0	0	0	0	0	0	0	0	0
% of samples that comply	98.78%	98.80%	98.81%	98.79%	98.82%	98.81%	98.81%	98.74%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Greenvale Water Service Area												
Year	2016/2017											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	2	3	3	3	3	3	5	6	3	3	6	7
No. of samples collected in which E.coli is detected	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 months	3	3	3	3	2	3	3	3	5	3	4	3
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Pentland Water Service Area												
Year	2016/2017											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	3	3	3	3	3	3	3	3	3	2	2	3
No. of samples collected in which E.coli is detected	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 months	3	3	3	3	3	3	3	3	3	3	3	3
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Ravenswood Water Service Area												
Year	2016/2017											
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. of samples collected	4	4	4	4	8	7	7	7	8	7	8	7
No. of samples collected in which E.coli is detected	0	0	0	0	0	0	0	0	0	0	0	0
No. of samples collected in previous 12 months	3	2	3	1	3	3	3	4	3	3	3	3
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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Compliance with 98% annual value	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Appendix B – Implementation of the DWQMP Risk Management Improvement Program

All Schemes Risk Management Improvement Program

Develop and implement Critical Control Point procedures

This has been completed with auto shutdown built into the CT WTP SCADA operations and alarm points set in the newly installed SCADA at Greenvale and Pentland.

Mains break operational procedures

This is currently being investigated in line with looking at National accreditation for water related skills.

Re-establish flushing program

Data is currently being gathered (Chlorine levels) from areas identified as a risk of being dead ends in the current reticulation network, this data will then be used to establish an effective flushing program.

Consider National Certification Framework Training for Operators

This is currently being investigated with the assistance of the Queensland Water Directorate.

Consider formalising reservoir inspection program

Once the current program of water asset refurbishment is completed ongoing inspection processes will be reviewed. Greenvale reservoir was recently cleaned.

Charters Towers Risk Management Improvement Program

Implement Water Infrastructure Upgrade Program (WIUP)

This is well underway and work is programmed to commence early next year (2018) on the WTP upgrade.

Change turbidity and chlorine alarms to ensure faster response

Completed

Investigate auto shutdown on high turbidity and critical chlorine level exceedances

Implemented

Disconnect bypass from raw water to clear water tank

To be carried out as part of the WIUP

Remove or plate off clarifier bypass

To be carried out as part of the WIUP

Ravenswood Risk Management Improvement Program

Renegotiate operating agreement with Carpentaria Gold to include provisions in the DWQMP

Discussions have begun on developing a new agreement.

Request implementation of the CCP's for Ravenswood with Carpentaria Gold

The CCP's have been adopted by Carpentaria Gold.

Require more frequent reporting of operational and verification monitoring

Implemented with a program of independent testing by CTRC.

Consider year-round permanganate dosing

Yet to be discussed with Carpentaria Gold

Consider implementing alarms for turbidity and chlorine

Still in discussion with Carpentaria Gold to integrate elements of their SCADA system with CTRC's

Pentland Risk Management Improvement Program

Upgrade SCADA and install online meters to allow better understanding of water quality issues

Implemented

Increase operational monitoring (manual) monitoring to every 2 days until SCADA is implemented

SCADA is now online at Pentland

Investigate removal of raw water tanks to minimise contamination risks

Yet to be investigated, once SCADA is better understood this will inform the investigation.

Greenvale Risk Management Improvement Program

Upgrade SCADA and install online meters to allow better understanding of water quality issues

Implemented