

### **5.3. WATER AND WASTEWATER QUARTERLY REPORT FOR THE PERIOD ENDING 30 SEPTEMBER 2020**

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**DEPARTMENT** Water and Wastewater

**MANAGER** Mark Stoermer, Chief Executive Officer

#### **RECOMMENDATION**

**It is recommended that the Quarterly Report of the Water and Wastewater branch for the period ending 30 September 2020 be received and noted.**

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#### **EXECUTIVE SUMMARY**

This report documents progress on key operational and service delivery areas as well as the Regulatory compliance status within the Water and Wastewater Branch for the period 01 July to 30 September 2020.

In this reporting period, we implemented level 1 water restrictions, even though we received intermittent showers, which topped up the intake levels but was not recharging the aquifer. Therefore, when the showers stop the intake level quickly returns to the pre showers level. There has been carry over capital work projects into this reporting from supplier and contractor delays due to COVID-19 impacts. This reporting period is the first quarter of the capital works program for the new financial year. Most projects with Water and Wastewater have commenced and are on track with procurement being finalised and purchasing of equipment required for the works.

#### **BACKGROUND**

This report is the first Quarterly Report submitted by the Water and Wastewater Department during the 2020/2021 Financial Year. This report highlights progress against key performance areas required by the Department of Natural Resources, Mines and Energy (DNRME) and required compliance levels by the Department of Environment and Science (DES).

#### **COMMENT**

This report enables Councillors and the community to obtain a strategic view of activities within the Water and Wastewater Branch.

The Quarterly Report documents progress on key operational and service delivery aspects and regulatory compliance levels.

The Water and Wastewater Quarterly Report does not include comprehensive progress reporting in terms of the Capital Works Programs, Operational Plan and financial statements as these are dealt with in separate Quarterly Reports to Council.

#### **FINANCIAL/RESOURCE IMPLICATIONS**

Failure to comply with required standards and to respond quickly and effectively to water and wastewater incidents may result in harm to the community and substantial penalties.

## RISK MANAGEMENT IMPLICATIONS

Council as a registered water service provider has a statutory obligation to ensure it is able to provide water and wastewater services to customers. Council's reputation would suffer if it is unable to maintain service levels at prescribed standards. This Quarterly Water and Wastewater report provides information on strategies implemented by the Water and Wastewater branch to minimise occupational health and safety risks and risks to Council infrastructure.

## SUSTAINABILITY IMPLICATIONS

**Economic:** It is essential to adequately maintain water and wastewater infrastructure in order to provide satisfactory services in support of economic development in the Shire.

**Environmental:** Failing to provide adequate and compliant water and wastewater services can lead to environmental harm and breaching of licence conditions.

**Social:** The Community expects fully operational and compliant water and wastewater services.

## CORPORATE/OPERATIONAL PLAN, POLICY REFERENCE

This report has been prepared in accordance with the following:

### Corporate Plan 2019-2024 Initiatives:

#### Theme 3 - Leading Environmental Stewardship

*Goal 2 - We will implement programs that reduce and offset our environmental footprint.*

*Goal 3 - We will continue to build water infrastructure so that the Douglas Shire may enjoy water security and water quality.*

*Goal 4 - We will partner with the community to educate and monitor.*

#### Theme 5 - Robust Governance and Efficient Service Delivery

*Goal 3 - We will make sound financial decisions by ensuring robust strategic planning, financial management and reporting.*

*Goal 4 – We will work with our communities to ensure they are informed, empowered and supported so that they are resilient to the impacts of disaster events. Through our leadership and capabilities we will plan, prepare, respond and recover from events so as to minimise the impact on people, property, the environment, and our economic stability.*

### Operational Plan 2020-2021 Actions:

**3.3.1** – *Progress the intake as a matter of urgency.*

**3.3.2** – *Develop options for long-term water storage capacity of at least one billion litres.*

**3.4.1 – Implement an education campaign targeting schools and residential properties within the Shire to raise awareness of water security, how it is produced, impacts on the reef and how to live a more water efficient life.**

## **COUNCIL'S ROLE**

Council can play a number of different roles in certain circumstances and it is important to be clear about which role is appropriate for a specific purpose or circumstance. The implementation of actions will be a collective effort and Council's involvement will vary from information only through to full responsibility for delivery.

The following areas outline where Council has a clear responsibility to act:

**Builder/Owner** Council makes a significant investment every year in the infrastructure that underpins the Shire through its capital works program. Council will manage its assets with appropriate frameworks and deliver its projects through robust project management.

**Regulator** Council has a number of statutory obligations detailed in numerous regulations and legislative Acts. Council also makes local laws to ensure that the Shire is well governed. In fulfilling its role as regulator, Council will utilise an outcomes based approach that balances the needs of the community with social and natural justice.

## **CONSULTATION**

**Internal:** Nil

**External:** Water and wastewater quality parameters are tested by an accredited laboratory and test results and service levels are required to be reported to the Department of Energy and Water Supply and the Department of Environment and Science.

**Community:** Nil

## **ATTACHMENTS**

1. Water and Wastewater Quarterly Report for the period ending 30 September 2020  
[5.3.1 - 21 pages]

## **1 July to 30 September 2020**

The aim of the Water and Wastewater Quarterly Report is to inform Councillors and the community on the progress of key operational and service delivery areas as well as regulatory compliance status within the Water and Wastewater Department.

The Water and Wastewater quarterly report does not include comprehensive progress reporting in terms of Capital Works or Operational Plan; these are dealt with in separate quarterly reports to Council.

This report highlights certain aspects of the activities of the Water and Wastewater Department that are industry benchmark indicators as well as key performance areas and compliance monitoring parameters as required by the Department of Natural Resources, Mines and Energy (DNRME) and the Department of Environment and Science (DES).

### **Water**

#### **1. Water Education**

As a water service provider, water education is a high priority, particularly when we are faced with changing climate conditions and reduced rainfall events within our shire. In this reporting period, we delivered a water presentation to the Mossman Elders Justice Group as part of the Life-Skills program and a professional film production of a water journey (i.e. from source to tap and tap to sea) is under way. A capital works project for this financial year is to implement a smart water meter program, which will assist in early leak detection, reduce water losses and inform consumer choice in relation to their water consumption.

#### **2. Water reticulation services**

General maintenance was carried out on all schemes for this quarter including all intakes. Hydrant and valve maintenance was performed two days each week to identify their locations, ensure accessibility and attend to any maintenance issues. The water reticulation team continued recording the number of water service renewals and Dial Before You Dig service locations (DBYD). There were 30 new water service renewals and 178 DBYD in this reporting period. Water service renewals are replacing water services which have reached their life expectancy and are at risk of failing. Providing DBYD service locations on council infrastructure assists in preventing damage and disruption to water, sewer and drainage services within the Douglas Shire. Water flushing programs were implemented due to the maintenance and functionality of hydrants, water quality complaints that related to aesthetic issues and for maintaining acceptable chlorine residuals within the schemes. Response/reaction time for all water reticulation incidents was within the customer service standards. See table 1 showing results on water reticulation maintenance activities across all schemes.

Regular reservoir and pump station checks and intake maintenance was performed on all three schemes.

**Table 1. Water reticulation services maintenance activities undertaken across all schemes**

<b>Douglas Shire Reticulation (all schemes)</b>	
Settlement Meter Reads	101
New Water Services Connections	9
Service Repairs	107
Water Mains Repairs	23
Water service renewals	30
Water Quality Notifications (Complaints)	2(0)
Dial before you dig	178
Flushing Events: Mossman/Port Douglas/Cooya/ Newell	18
Flushing Events: Whyanbeel/Wonga	6
Flushing Events: Daintree	0

There were two water quality notifications during the reporting period. All water quality notifications were handled under customer service standards. Issues were rectified by investigating the situation, testing the water quality and flushing of the reticulation system.

Water and Wastewater team views all water quality notifications and complaints seriously and endeavour to achieve outcomes where customer satisfaction is priority.

Table 2 below details the nature of the notification, how it was resolved and the response time. All water quality parameters measured were within the health guideline limits in the Australian Drinking Water Guidelines (ADWG).

**Table 2. Water Quality Notifications**

<b>Address</b>	<b>CRM No &amp; Date</b>	<b>Nature of water complaint</b>	<b>How it was resolved</b>	<b>Response Time</b>
Snapper Is Dr, Wonga Beach	87572/2020 10/08/2020	Tap water was milky	Air in water main, water main was flushed and water quality tested. Customer satisfied with the outcome.	30 mins
Esplanade Wonga Beach	87581/2020 10/08/2020	Tap water was milky	Air in water main, water main flushed. Customer was happy with the outcome.	30 mins

The new financial year 2020/2021 capital works programme is well under way and works are progressing as scheduled within water quality and reticulation. Quotes, project designs, contracts and purchasing of new assets are currently being obtained for the process control renewal and the water network service renewal programs.

### **Water schemes and potable water consumption**

This reporting period, is our winter dry season. All intake levels had been on a steady decline, approximately 10mm per day at Rex Creek intake due to the lack of rain in the catchment. Demand steadily increased throughout the reporting period as soil moisture decreased and

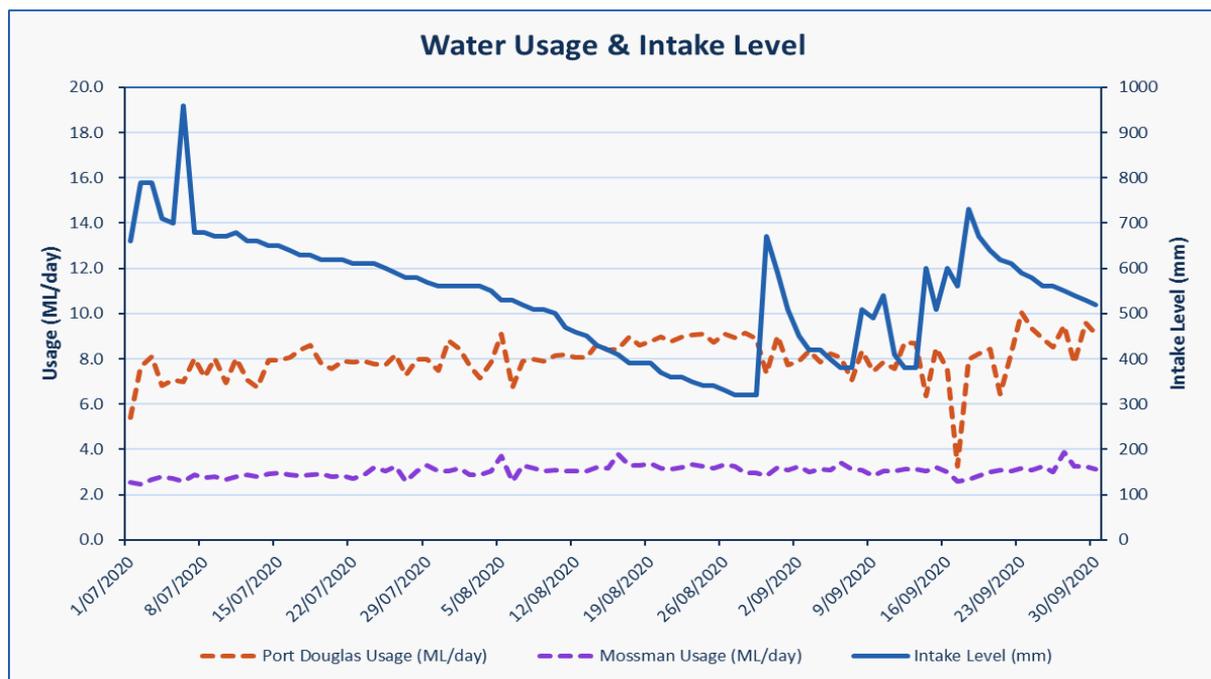
tourist numbers gradually increased as COVID restrictions were relaxed. A heavy rainfall event occurred on 6 July 2020, which supplied a boost to the water level at Rex Creek intake. The end of August 2020 delivered plenty of wind and drizzle rain which helped green up the region, which continued sporadically throughout September as forecasted by the Bureau of Metrology. On 29 September 2020 the Bureau of Meteorology declared a La Niña phase, this may offer an early reprieve to the current conditions within the region.

Level 1 water restrictions were implemented on 31 August 2020 due to reducing intake levels, the dry season and the seasonal increase in consumption due to dry soil and seasonally increased population

The average water consumption for the Mossman/Port Douglas scheme for the months July to September was **8.04 MI/day** for the Port Douglas network and **3.03 MI/day** for the Mossman network. The graph below displays the comparison use between Mossman and Port Douglas networks and Rex Creek intake level.

In July and September 2020, there were heavy rainfall events, which created high turbidity at the Rex Creek intake, Whyanbeel intake and Daintree intake. Both the Mossman and Whyanbeel Water Treatment Plants were temporarily shut down. The disruptions to water production did not create any concerns for consumers as adequate supplies were maintained in the reservoirs throughout this reporting period

The Figure 1 displays the comparison use between Mossman and Port Douglas treated water supply and Rex Creek intake levels.



**Fig 1. Mossman and Port Douglas water usage and Rex Creek intake levels for the period 1 July to 30 September 2020**

**All Schemes**

Water quality operations within all schemes have been performing well throughout this reporting period with the raw water turbidity averaging below 1 NTU.

Throughout the water schemes, all pump stations performed well with no incidents.

During the reporting period, general maintenance works and routine service inspections were performed at all water treatment plants. Annual services were carried out on all gas chlorine plant equipment and onsite hazard and risk inspections were completed by our Work Health and Safety department.

Cert IV water industry training continued for two Water and Wastewater plant operators.

In this reporting period, nine staff within the Water and Wastewater department completed their Workplace Readiness Assessment for the Cert III in Water Industry Treatment and were evaluated as competent. Due to COVID-19, the training was delivered online and all staff participated with enthusiasm, great attention and supported each other during the course delivery. This training session was delivered by Simmonds and Bristow. See image 1 below.



*Image 1: Wastewater and Water staff performing laboratory testing training*

### **Mossman/Port Douglas Scheme**

All Ultra Filtration (UF) racks were operational and maintenance works continued with cartridge repairs to ensure compliance with UF rack integrity test limits. To maintain UF filter efficiency, clean-in-place operations were undertaken as well as all general service works, routine inspections and maintenance within the Mossman/Port Douglas Scheme.

Mossman water treatment plant met all consumer demand requirements throughout this reporting period. A flow meter has been installed at the Mossman Water Treatment backwash recovery plant. This is to capture the data of returned filtered water back to the head of the plant. The flow meter has been operational from the end of September and water flow levels are being recorded.

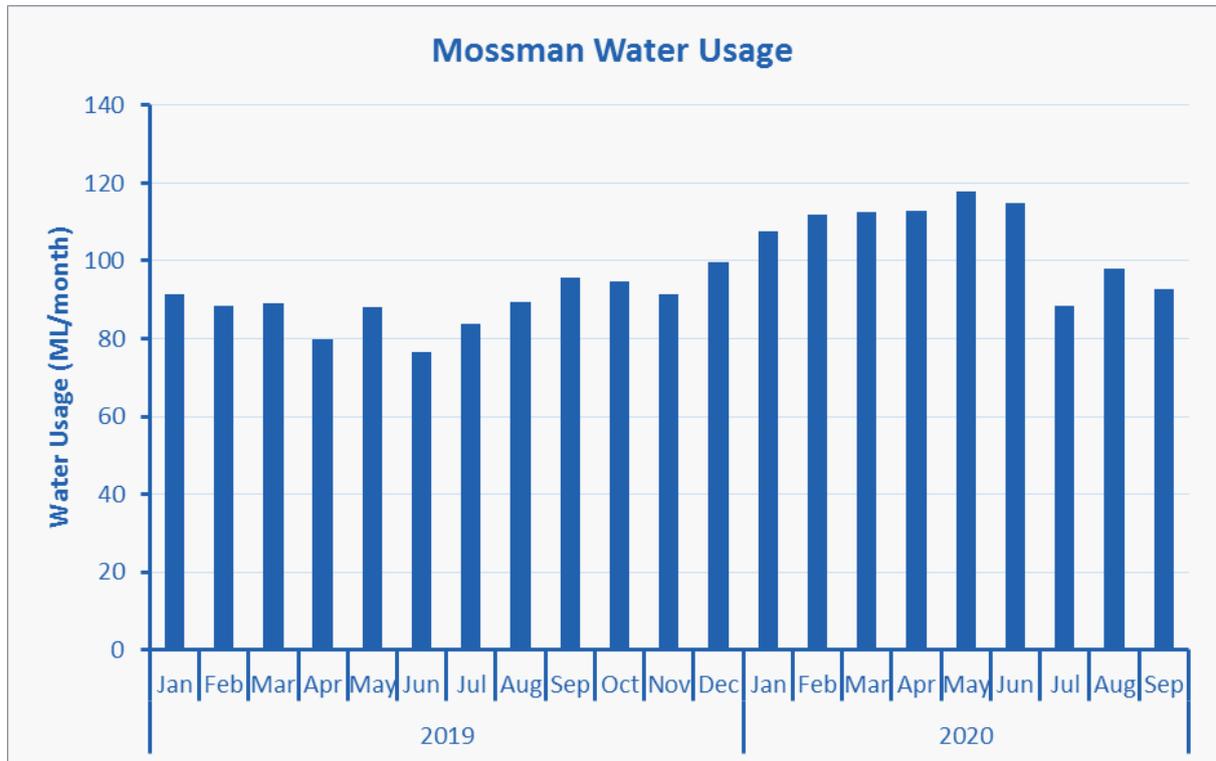
There were no water quality reportable incidents in the Mossman water scheme within this reporting period. High water levels were maintained in all reservoirs in the Mossman/Port Douglas Scheme with the exception of Craiglie reservoir, which is currently offline to allow capital project works to continue. This reservoir is expected to be back online in November 2020.

### **Mossman Water Supply**

The total monthly consumption of water in Mossman, Cooya Beach and Newell Beach areas can be seen in Figure 2.

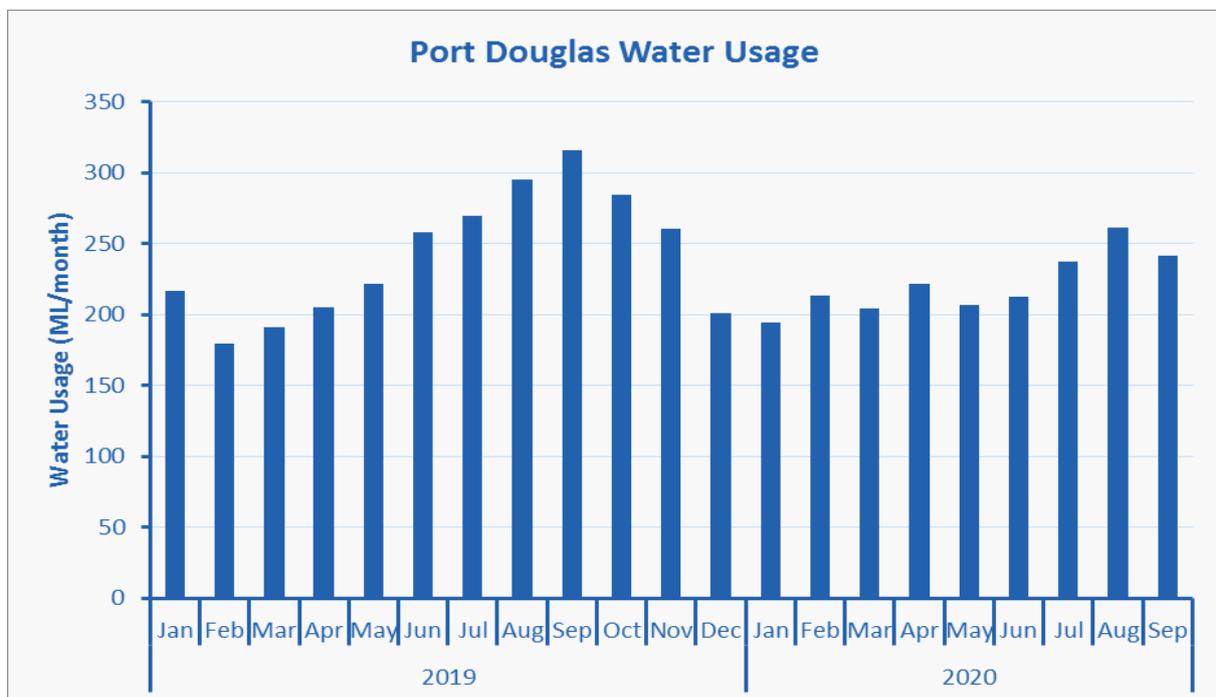
### **Port Douglas Water Supply**

The total monthly consumption of water in Port Douglas, Craiglie and Mowbray areas can be seen in Figure 3.



**Fig 2. Mossman Scheme Total Monthly Consumption Figures**

**Port Douglas Water Supply**



**Fig 3. Port Douglas Scheme Total Monthly Consumption Figures**

### Whyanbeel Scheme

Whyanbeel Water Treatment Plant met all demand requirements during the reporting period.

The UF rack was operational during the reporting period. To maintain UF filter efficiency chemical clean-in-place operations were undertaken, general service and maintenance works continued to maintain efficient operation of the plant.

There were no water quality reportable incidents in the Whyanbeel water scheme for the reporting period.

A large water mains break occurred within this reporting period on 7 August 2020, with a high flow loss of 160 L/s. A quick response from the water quality and water reticulation team repaired the break swiftly and were able to recover the reservoir water level within a two hour period. The Rocky Point reservoir was restored to its desired high level after two days of water production at Whyanbeel Water Treatment Plant.

The total monthly consumption of water in Whyanbeel, Wonga Beach, Miallo, Rocky Point, Syndicate and Bamboo can be seen in Figure 4.

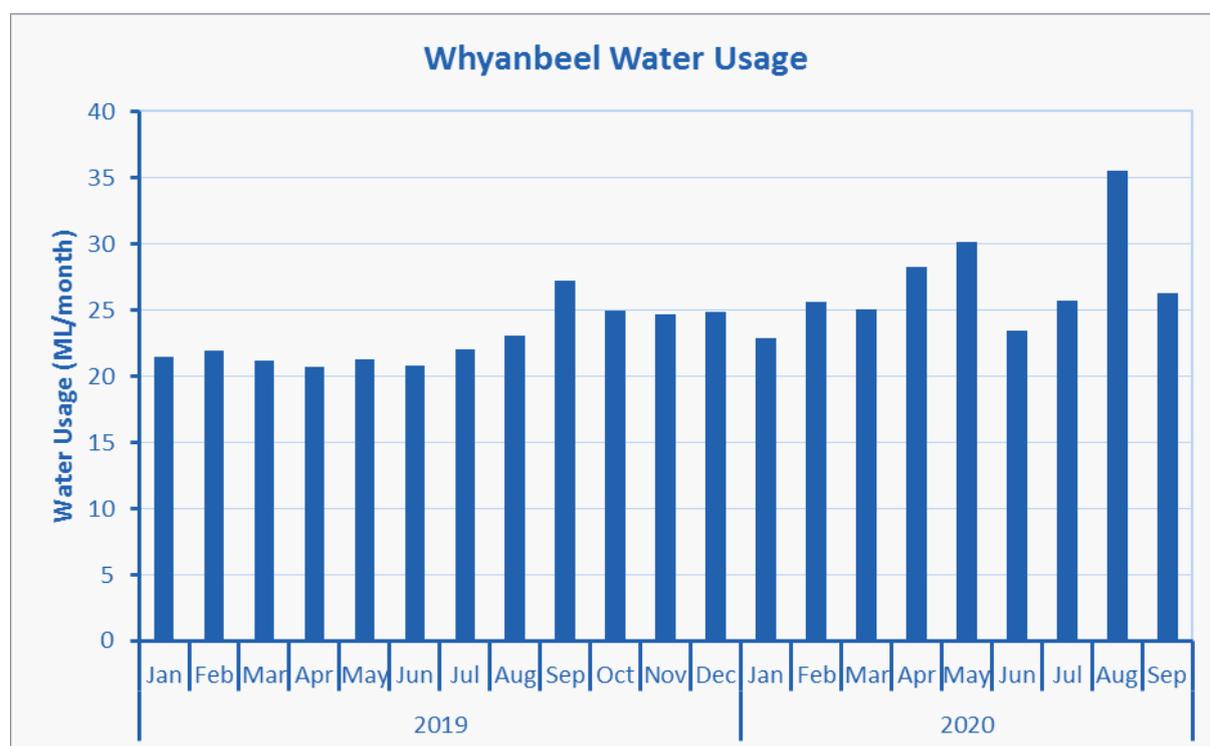


Fig 4. Whyanbeel Scheme Total Monthly Consumption Figures

### Daintree Scheme

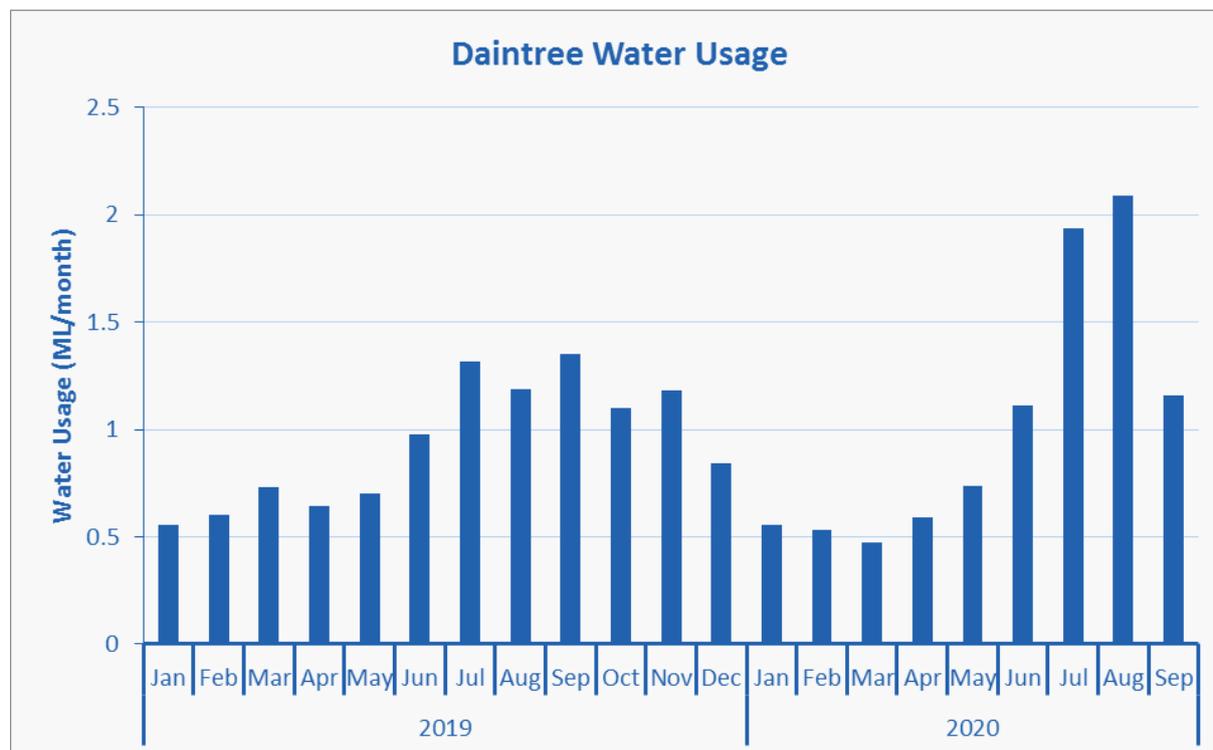
Daintree Water Treatment Plant met all demand requirements during the reporting period.

To maintain UF filter efficiency chemical clean-in-place operations were undertaken and general maintenance and service works continued to maintain efficient operation of the plant.

There were no water quality reportable incidents in the Daintree water scheme for the reporting period.

The graph below displays high water consumption during the months July and August. The high water usage was from a water service leak in the Daintree Township however due to the small nature of the leak and ground conditions the leak wasn't easily detectable. Multiple network reconfigurations and after hours flow rate monitoring efforts were performed with the leak being found and repaired. Leak detection equipment has now been ordered which will allow the Water Reticulation team to perform routine monitoring of the water networks and facilitate much faster locating of hard to find leaks. Water is also being used for a rejuvenation tree planning program in Daintree which has increased consumption in the scheme.

The total monthly consumption of water in Daintree can be seen in Figure 5.



**Fig 5. Daintree Scheme Total Monthly Consumption Figures**

### 3. Water quality monitoring and results

Drinking water sampling occurs at intakes, reservoirs and in the reticulation network to ensure compliance with the ADWG.

Water quality verification monitoring includes regular testing of individual reticulation zones with monthly sampling at the reservoirs. Supporting programs for the verification of drinking water quality include;

- Water treatment plants and reservoirs that have SCADA alarms for action and critical limits and are operated under critical control points;
- Reservoir inspections that are done regularly to ensure that the reservoirs are intact and that any points of ingress are repaired; and
- Network operations that have a flushing program that ensures the chlorine residual is above 0.2 mg/L.

For the reporting period, a total of 82 treated water E.coli compliance samples were taken in the three drinking water schemes. A total of 25 E.coli samples were tested in the Douglas water laboratory and 57 in a NATA accredited laboratory. Other parameters monitored allow the Water and Wastewater Department to observe trends in water quality through the schemes. All tested parameters in drinking water samples during the reporting period were compliant with ADWG health guideline values and standards required by the Water Supply Regulator and Queensland Health.

Our state-wide water information management (SWIM) report was submitted to the water regulator on 30 September 2020. This report required assistance to compile critical information for the state regulator from numerous departments within council.

In addition, raw water quality was monitored at all of the intakes and Daintree Bore site, including 14 raw water E.coli samples. Raw water sampling assists us to understand the treatment plant needs and the health based targets.

### Mossman/Port Douglas Supply Scheme

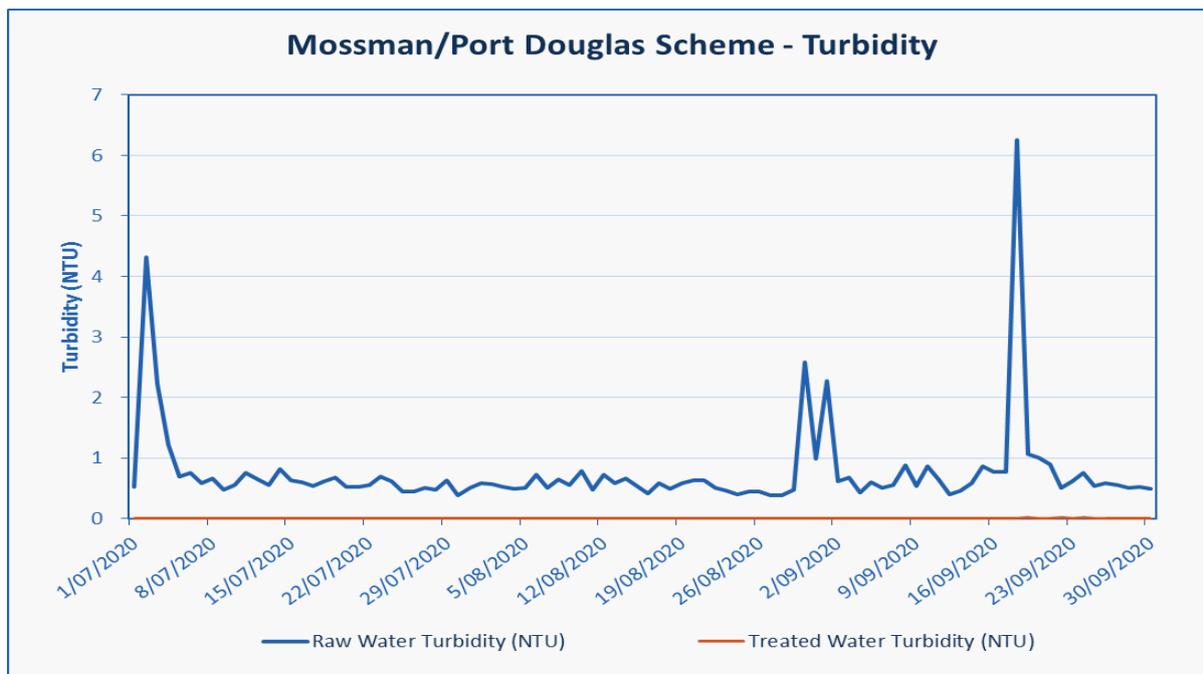
Average monthly values for key operational and compliance parameters are detailed in Tables 3 and 4 for treated water at Port Douglas Reservoirs and Port Douglas/Mossman Reticulation network respectively. Figure 6 indicates the daily turbidity trends at the intake and treated water as recorded at the Mossman Water Treatment Plant for the period July to September 2020.

**Table 3. Average monthly values for key operational and compliance parameters in the Port Douglas Reservoirs.**

Month	pH	Temp °C	Total Alkalinity mg CaCO <sub>3</sub> /L	Free Cl mg/L	Total Cl mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0 - 200	0.2 - 5.0	0.2 - 5.0	<1
Jul-20	7	23.1	7.9	1.2	1.2	<1
Aug-20	7.2	23	5.4	1.1	1.1	<1
Sep-20	7.1	24.1	6.9	1.1	1.1	<1

**Table 4. Average monthly values for key operational and compliance parameters in the Mossman/Port Douglas Reticulation Network.**

Month	pH	Temp °C	Free Cl mg/L	Total Cl mg/L	Colour PCU	Cu mg/L	Fe mg/L	Mn mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0.2 - 5.0	0.2 - 5.0	<15	<1	<0.3	<0.1	<1
Jul-20	7	23.5	1.0	1	<1	0.01	<0.008	<0.0002	<1
Aug-20	7.2	23.8	0.9	1	1.8	0.007	0.06	0.0009	<1
Sep-20	7.2	25	0.8	0.9	1.3	0.01	0.02	0.0003	<1



**Fig 6. Turbidity trends at the Rex Creek intake and treated water at the Mossman Water Treatment Plant**

**Whyanbeel Supply Scheme**

Average monthly values for key operational and compliance parameters are detailed in Tables 5 and 6 for treated water at the Whyanbeel Reservoir and Whyanbeel Reticulation Network respectively. Figure 7 indicates the daily turbidity trends at the intake and treated water as recorded at the Whyanbeel Water Treatment Plant for the period July to September 2020.

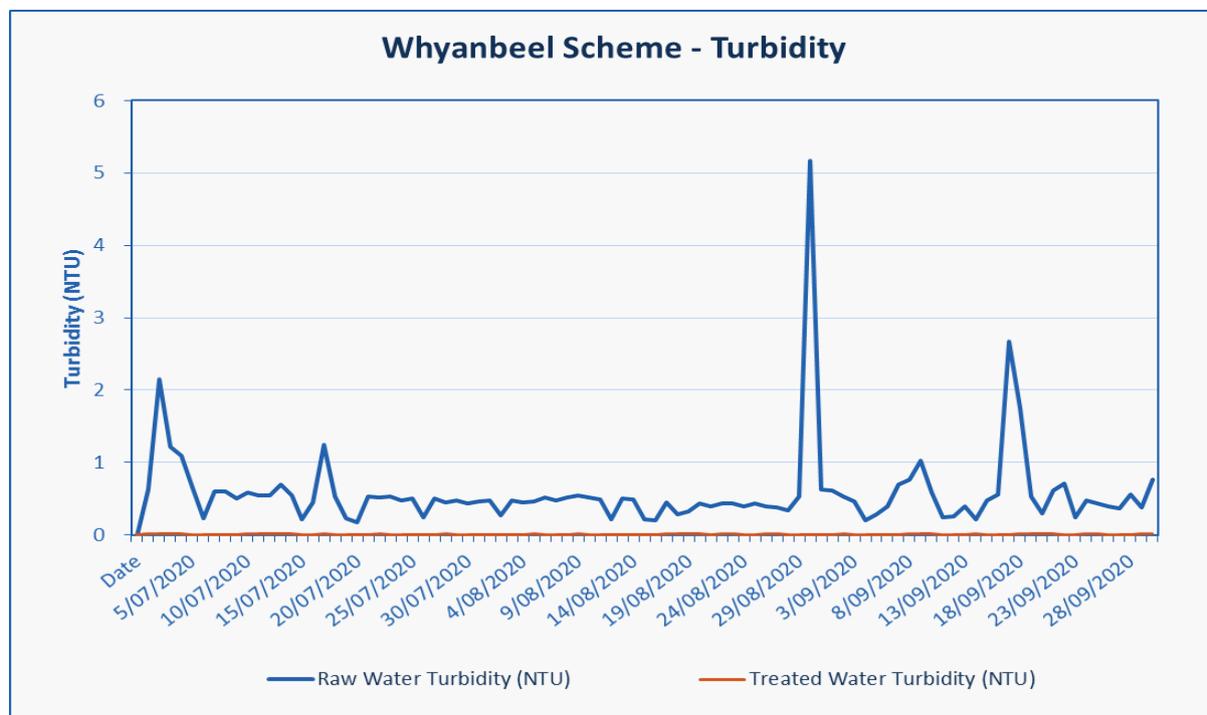
**Table 5. Average monthly values for key operational and compliance parameters in the Whyanbeel Reservoir.**

Month	pH	Temp °C	Total Alkalinity mg CaCO3/L	Free Cl mg/L	Total Cl mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0 - 200	0.2 - 5.0	0.2 - 5.0	<1
Jul-20	8.1	23.8	10	1.1	1.1	<1
Aug-20	8	23.5	8.2	0.9	0.9	<1
Sep-20	7.9	25.3	9.8	0.9	1.1	<1

**Table 6. Average monthly values for key operational and compliance parameters in the Whyanbeel Reticulation Network.**

Month	pH	Temp °C	Free Cl mg/L	Total Cl mg/L	Colour PCU	Cu mg/L	Fe mg/L	Mn mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0.2 - 5.0	0.2 - 5.0	<15	<1	<0.3	<0.1	<1
Jul-20	7.8	24.4	1	1	<1	0.002	0.01	0.0002	<1
Aug-20	7.6	24.5	0.9	1	<1	0.002	0.01	0.0002	<1
Sep-20	7.9	25.3	0.8	0.9	<1	0.002	0.01	0.0003	<1

**Fig 7. Turbidity trends at the Little Falls Creek intake and treated water at the Whyanbeel Water Treatment Plant.**

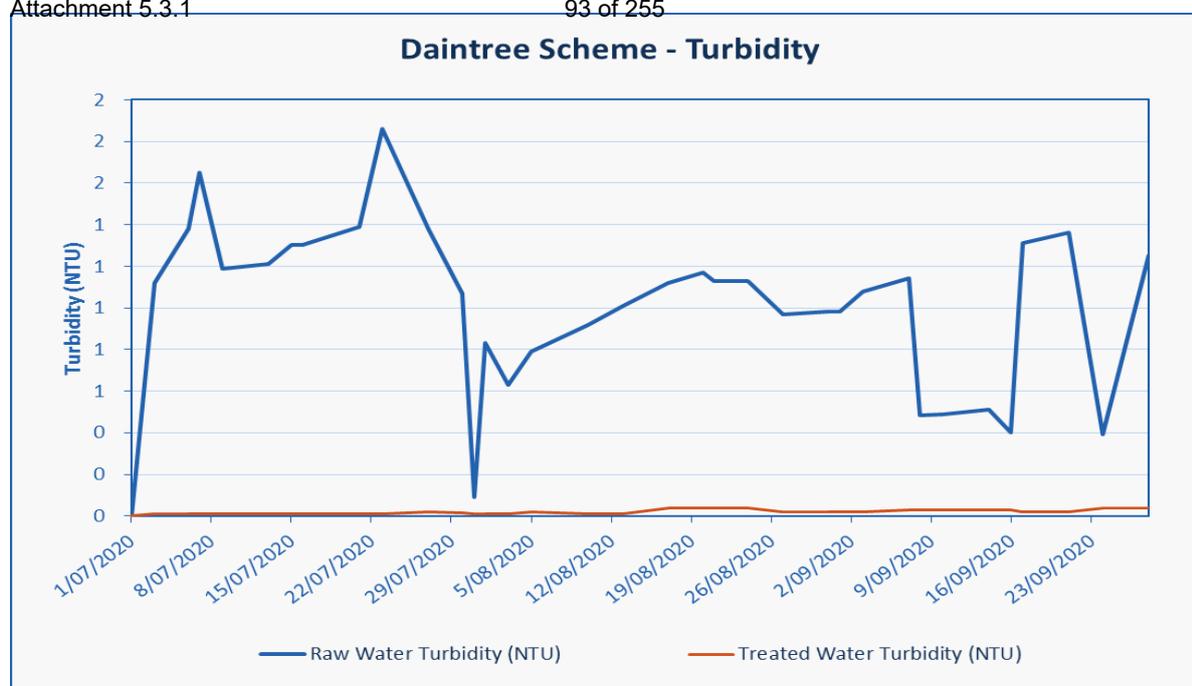


**Daintree Supply Scheme**

Average monthly values for key operational and compliance parameters are detailed in Table 7 for treated water at Daintree Reticulation network. Daintree reticulation network experienced some low chlorine events due to low water usage within the network. Low chlorine results initiated a flushing program, which reduce water age and elevated the chlorine concentration to prescribed levels. Figure 8 indicates the daily turbidity trends at the intake and treated water as recorded at the Daintree water treatment plant for the period July to September 2020.

**Table 8. Average monthly values for key operational and compliance parameters in the Daintree Reticulation Network.**

Month	pH	Temp °C	Free Cl mg/L	Total Cl mg/L	Colour PCU	Cu mg/L	Fe mg/L	Mn mg/L	E.coli MPN
Standard	6.5 - 8.5	10 - 30	0.2 - 5.0	0.2 - 5.0	<15	<1	<0.3	<0.1	<1
Jul-20	7.9	23	0.1	0.1	<1	0.003	<0.008	<0.0002	<1
Aug-20	7.7	23.5	0.2	0.2	<1	0.004	<0.008	0.002	<1
Sep-20	7.3	24.4	0.1	0.1	<1	0.005	0.016	0.002	<1



**Fig 8. Turbidity trends at the Intake/Martin Creek intake and treated water at the Daintree Water Treatment Plant.**

## Wastewater

### 4. Wastewater reticulation services

General maintenance programs continued on the reticulation networks and 32 pump stations in the Mossman and Port Douglas catchments. Wastewater Treatment Plants operated within license requirements throughout this period. In this reporting period, capital work projects for the new financial year commenced within Wastewater. Such as the manhole raise and reseal program and the manhole refurbishment and condition assessment. Quotes, project designs, contracts and purchasing of new pumps are being ordered due to poor pump performance.

The Mossman Wastewater Treatment Plant lime dosing equipment and shed project has continued throughout this reporting period. It has been delayed due to COVID-19, it is expected to be completed by the end of October 2020. The lime dosing shed will protect the supplies from the elements with a stand installed for easy forklift access to limit manual handling. Table 8 below shows the number of maintenance activities undertaken across all schemes.

	Port Douglas Catchment	Mossman Catchment
Pump Blockages	9	4
Sewer Chokes	1	3
Sewer Main Breaks	0	0
HCB Repairs (House Connection Branch)	4	2
Odour Notifications	0	0
Wastewater Complaints	0	0

**Table 8. Wastewater Reticulation Services**

Ordinary Council Meeting - 27 October 2020

## Influent and irrigation flows

### Port Douglas Wastewater Treatment Plant

A total of 196,383 kl of influent entered the Port Douglas Wastewater Treatment Plant during the reporting period. The average daily flow was 2,135 kL/day. Tanker truck contractors delivered 596 kl of septage to the plant and 41 kl of Leachate from the Killaloe Landfill and Transfer Station. Influent is treated in a Sequencing Batch Reactor (SBR) which produced compliant effluent during the reporting period. A total of 84% of the treated effluent was pumped to two resort golf courses for irrigation purposes and the remaining discharged into the Dickson Inlet. The Sheraton Mirage received 97,324 kL and Palmer Sea Reef received 81,522 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 81.5 mm. On 2 July 2020, the highest rainfall on a day recorded was 15 mm at the Port Douglas Wastewater Treatment Plant.

The effects of COVID-19 created cost savings for the council within the operational process at the Port Douglas Wastewater Treatment Plant. The plant averaged 933 kL less sewer inflow per day during this reporting period. With less sewer inflow creates less growth of bacteria, which significantly reduces biosolids production. The plant produced 370.88 tonne less biosolids during the reporting period compared to the same period in 2019. The power usage at the plant reduced by an average of 734 Kw per day plus the cost savings of \$27,919.84 for carting biosolids to farms for reuse.

Daily inflows and total monthly flows for the reporting period are presented in Fig 9 and 10 respectively.

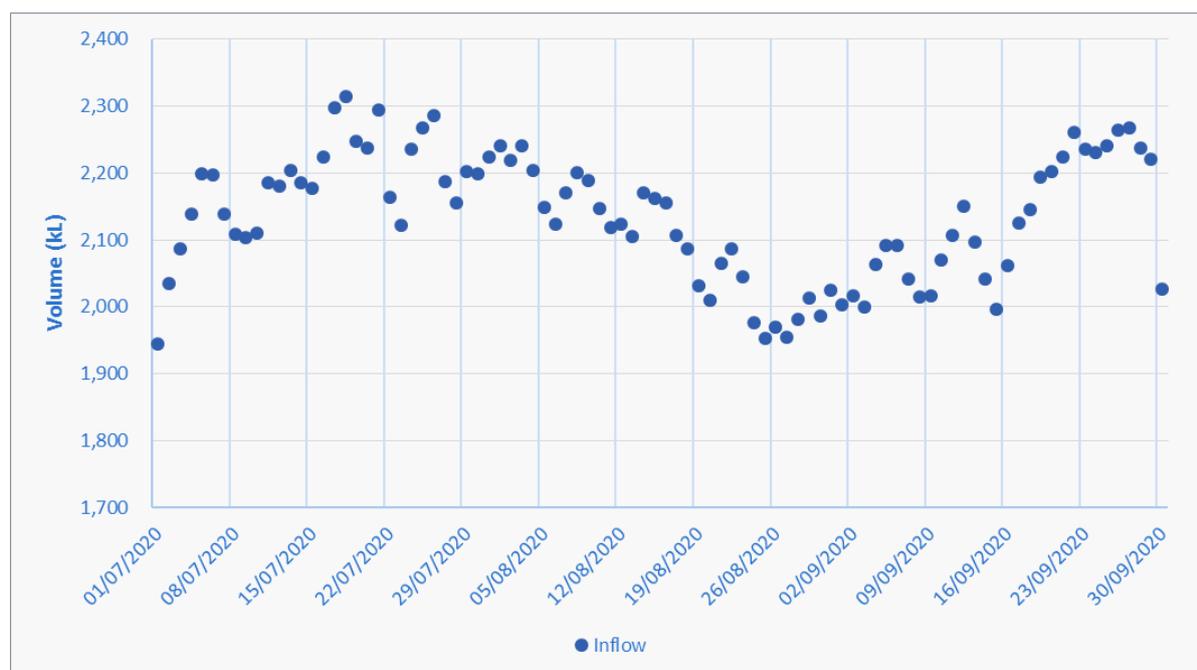
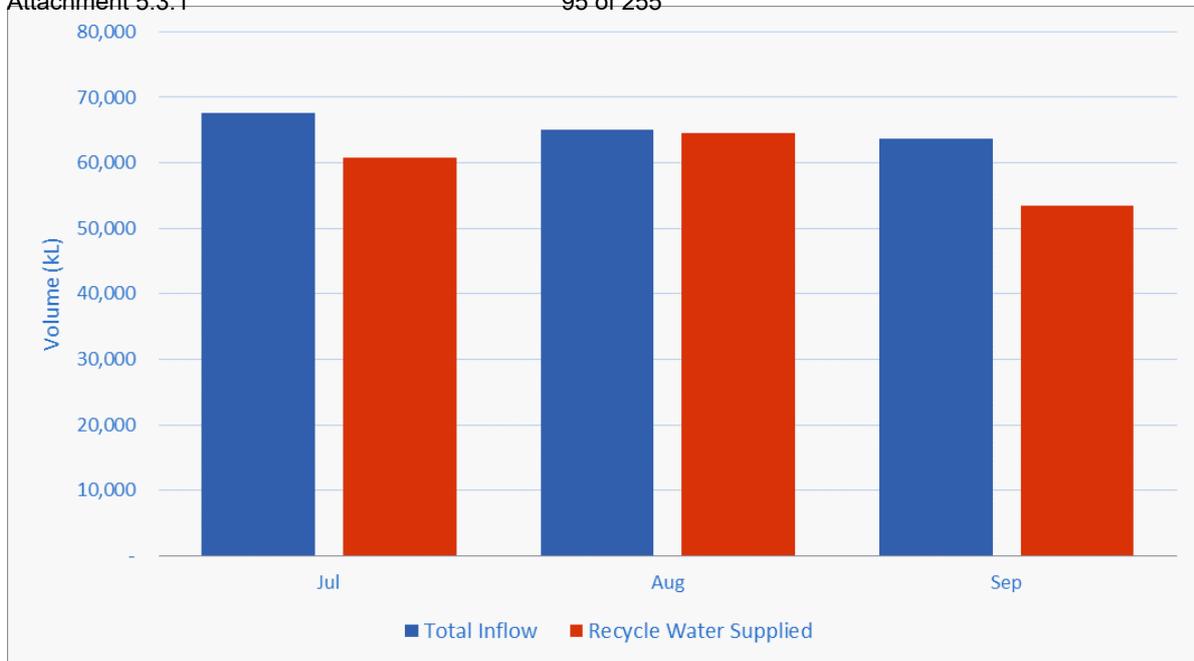


Fig 9. Port Douglas Daily Inflow



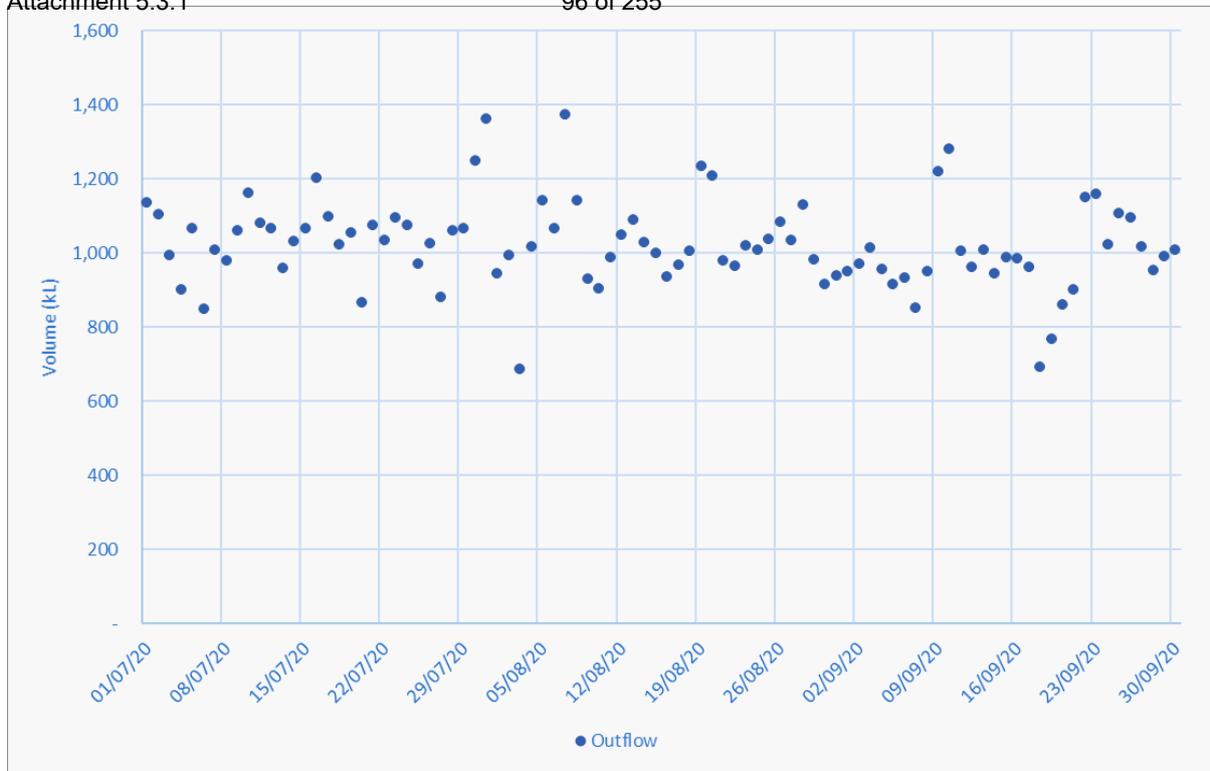
**Fig 10. Port Douglas Total Monthly Flow 2020**

### **Mossman Wastewater Treatment Plant**

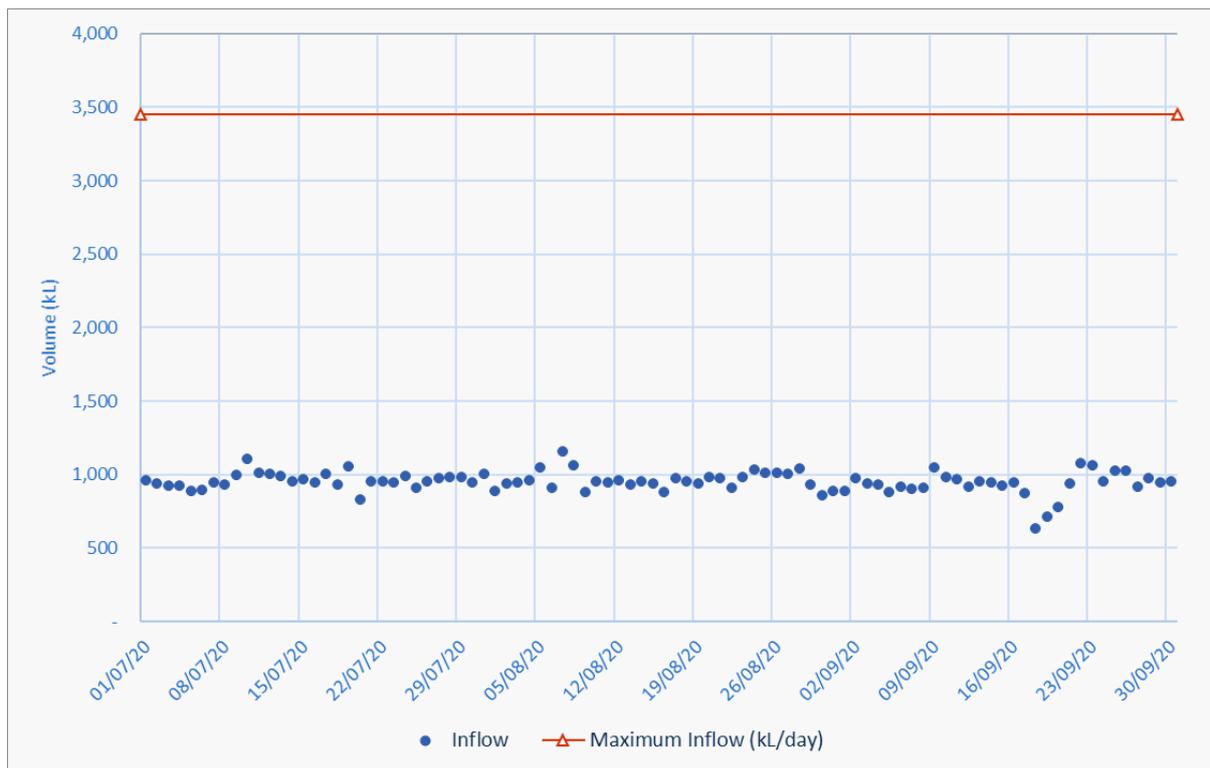
The Mossman Wastewater Treatment Plant received a total influent flow of 87,370 kL during the reporting period. The average daily flow was 950 kL/day. COVID-19 has not impacted the Mossman sewer network, the flow has increased by 23 kL per day on average compared to the same quarter in 2019.

Influent is treated in an Oxidation Ditch system and compliant effluent is discharged into the Mossman River. A total of 124.5 mm of rain fell on site for the reporting period with the highest daily rainfall measured at 32 mm on 2 July 2020 at Mossman Wastewater Treatment Plant.

Outflow and Inflow data for the reporting period are shown in Fig 11 and 12 respectively.



**Fig 11. Mossman Wastewater Treatment Plant Daily Outflow**



**Fig 12. Mossman Wastewater Treatment Plant Total Daily Inflow 2020**

### 5. Bio-solids Production

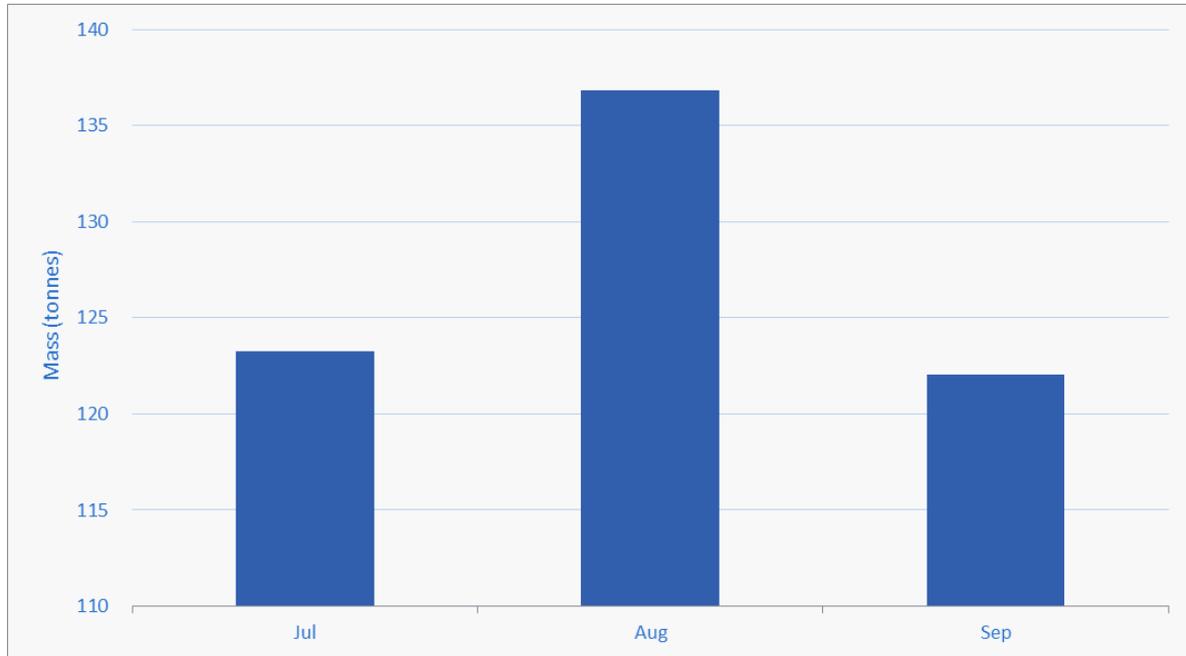
Bio-solids were only produced at the dewatering plants at Port Douglas Wastewater Treatment Plant (12.2% solids) this quarter and Mossman Wastewater Plant (11.3% solids). Bio-solids were transported by Arkwood Organics to Edmonton Farms, Tablelands Regional Farms and

Spring Mount Waste Facility for further treatment and beneficial land application as organic fertiliser and soil conditioner.

**Port Douglas Wastewater Treatment Plant**

At Port Douglas Wastewater Treatment Plant, 382.11 tonnes of wet bio-solids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet bio-solids equates to 46.48 dry tonnes.

The monthly bio-solids production trends can be seen in Figure 13.

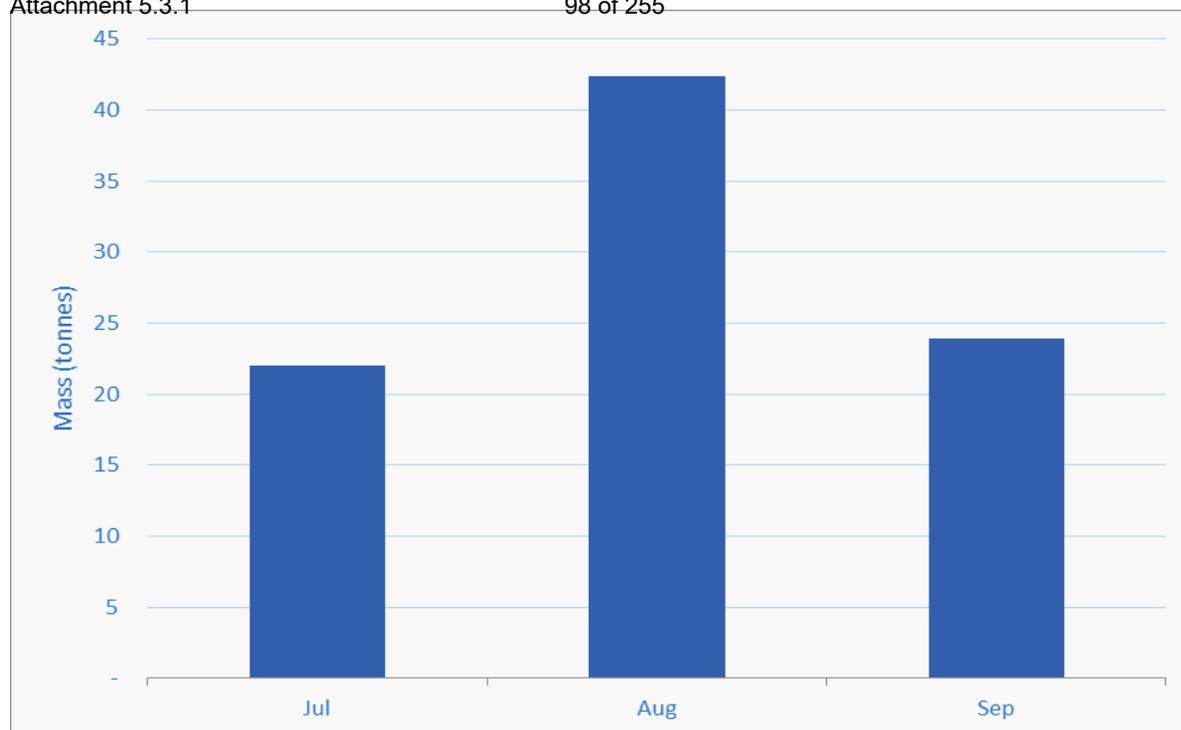


**Fig 13. Port Douglas Wastewater Treatment Plant monthly bio-solids production 2020**

**Mossman Wastewater Treatment Plant**

At Mossman Wastewater Treatment Plant, 88.24 tonnes of wet bio-solids was produced during the reporting period and sent to farms for beneficial reuse. This amount of wet bio-solids equates to 9.95 dry tonnes.

The monthly bio-solids production trends can be seen in Figure 14.



**Fig 14. Mossman Wastewater Treatment Plant monthly bio-solids production 2020**

### Effluent quality and compliance

During the reporting period compliance sampling was performed as per EPPR01790513 license conditions, see Table 9.

**Table 9. Monitoring of contaminant releases to waters as per Environmental Authority EPPR01790513**

Characteristics Determination	PDWWTP Frequency	MWWTP Frequency
5-day Biochemical Oxygen Demand	weekly	fortnightly
Suspended Solids	weekly	fortnightly
pH	weekly	weekly
Dissolved Oxygen	weekly	weekly
Ammonia Nitrogen	fortnightly	fortnightly
Total Nitrogen	fortnightly	fortnightly
Total Phosphorus as P	fortnightly	fortnightly
Oil and Grease	fortnightly	fortnightly
Faecal Coliforms (Organisms/100ml)	fortnightly	fortnightly
Free residual chlorine	-	fortnightly

Additionally, more samples are taken from the treatment processes, bio-solids, receiving waters and bores. Samples are tested by a NATA accredited laboratory for physical, chemical and microbiological parameters. All parameters tested during the reporting period from the Port Douglas and Mossman wastewater treatment plants were compliant.

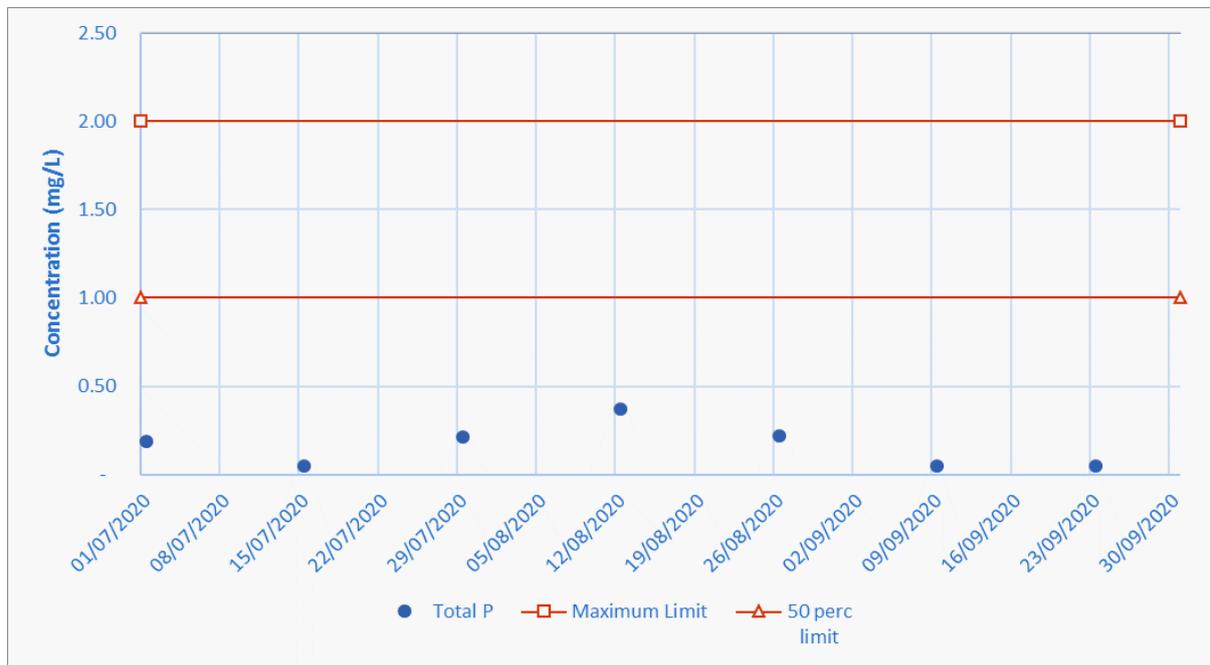
The process and compliance is monitored each day by in-house analyses of samples at the wastewater treatment plants. Process settings, effluent quality, flow rates, pump stations performance and maintenance aspects are monitored and controlled with SCADA Citect via an extensive Telemetry network.

**Port Douglas Wastewater Treatment Plant**

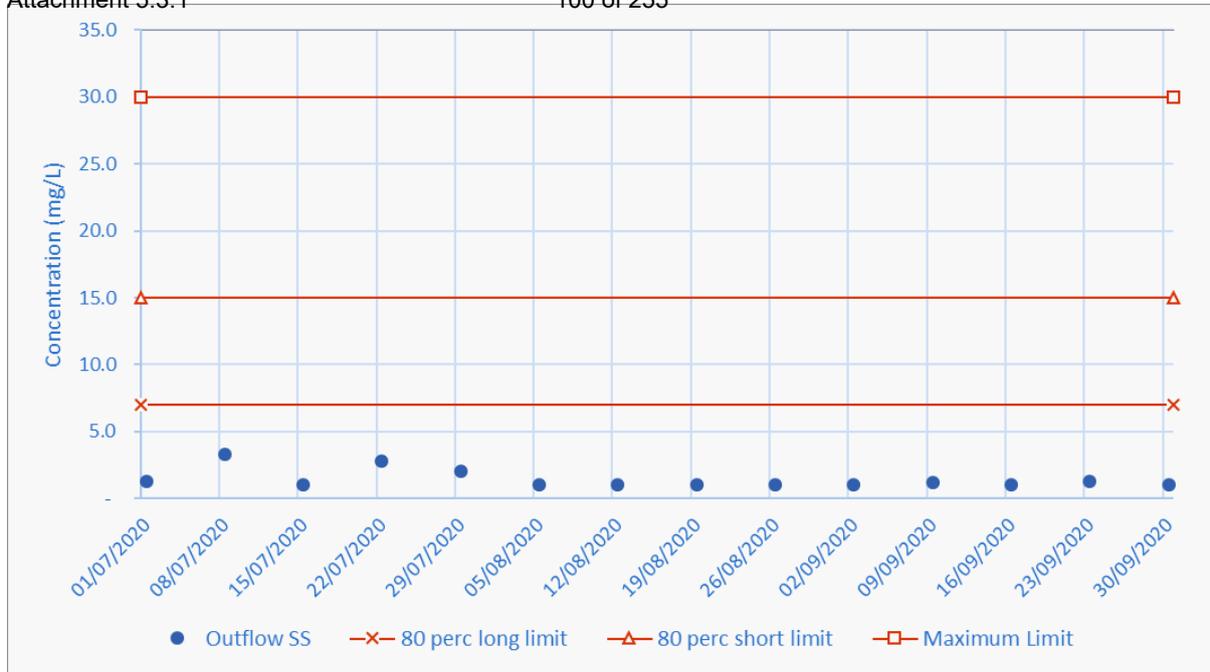
The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, Total Suspended Solids, BOD<sub>5</sub> & Total Nitrogen) are shown in Figure 15, 16, 17, 18 & 19.



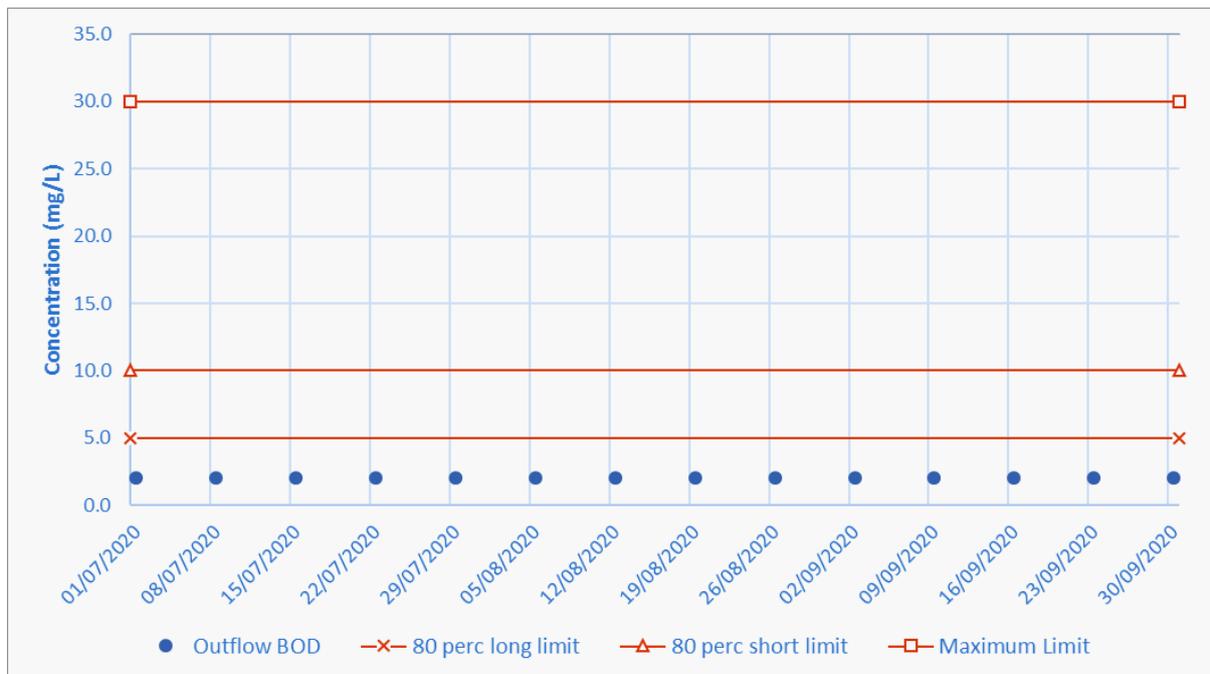
**Fig 15. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Ammonia**



**Fig 16. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Phosphorous**



**Fig 17. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Suspended Solids**



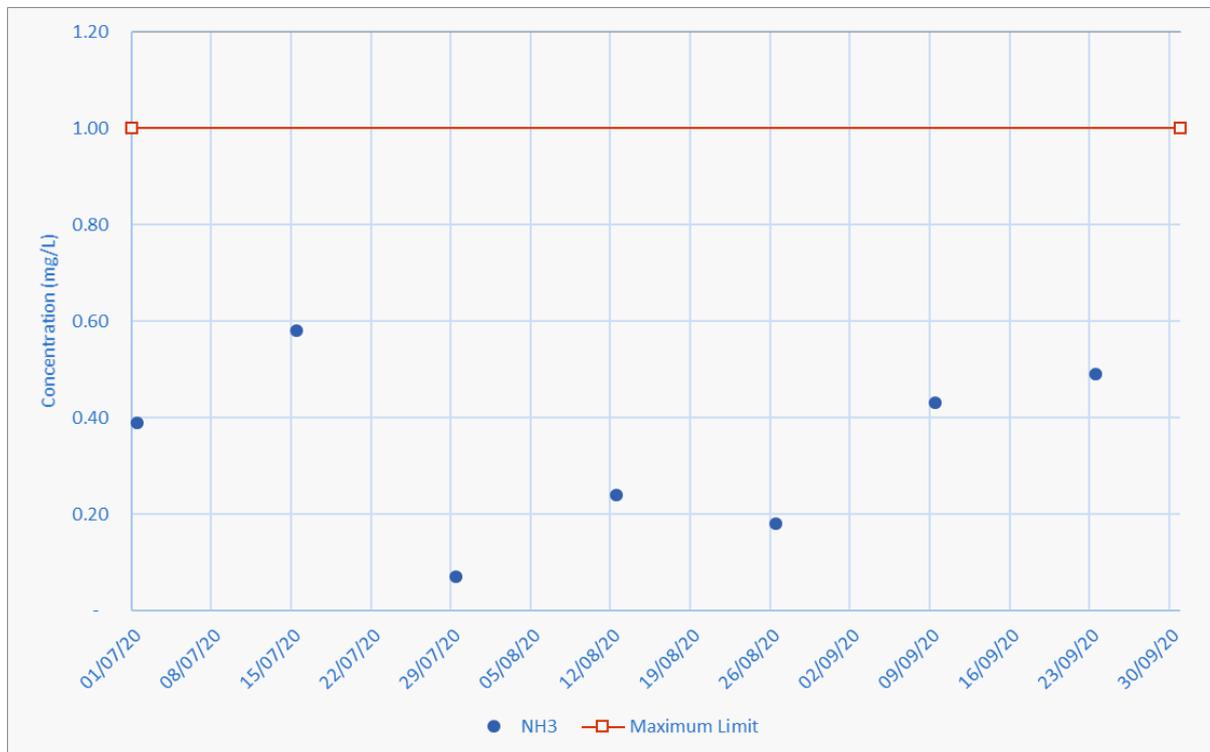
**Fig 18. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for BOD<sub>5</sub> (Biochemical Oxygen Demand)**



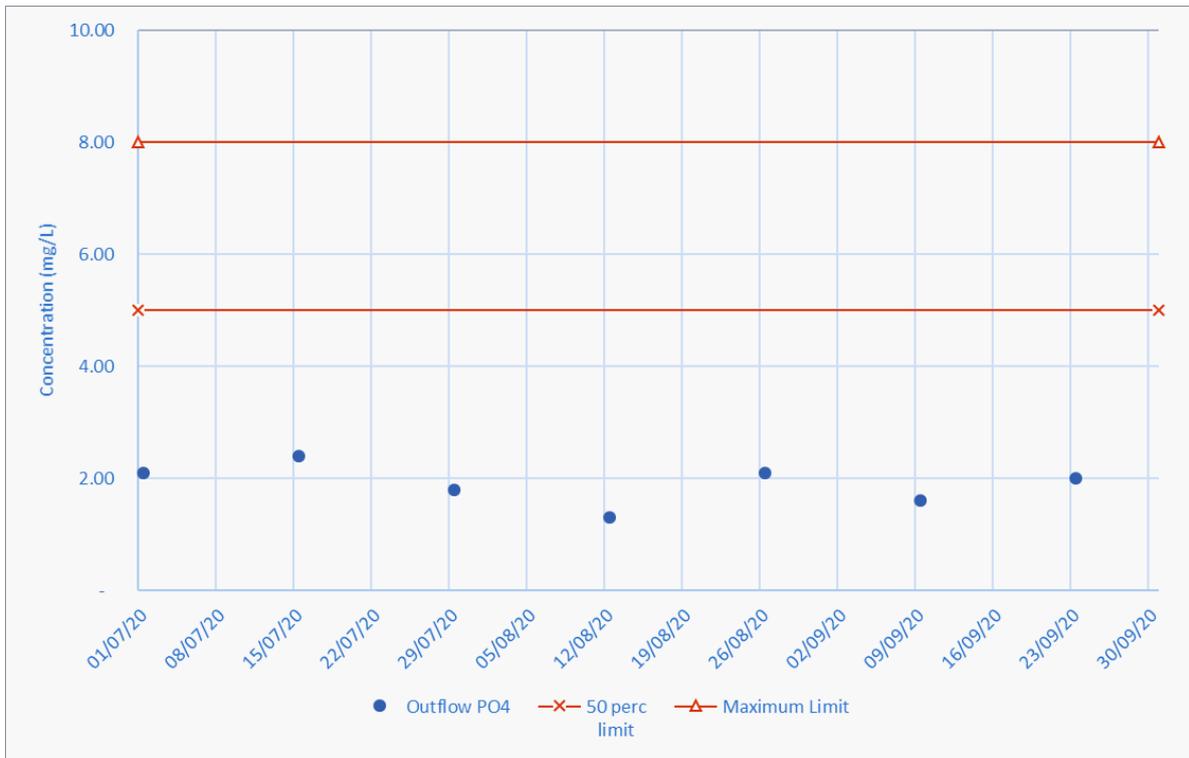
**Fig 19. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for total Nitrogen**

**Mossman Wastewater Treatment Plant**

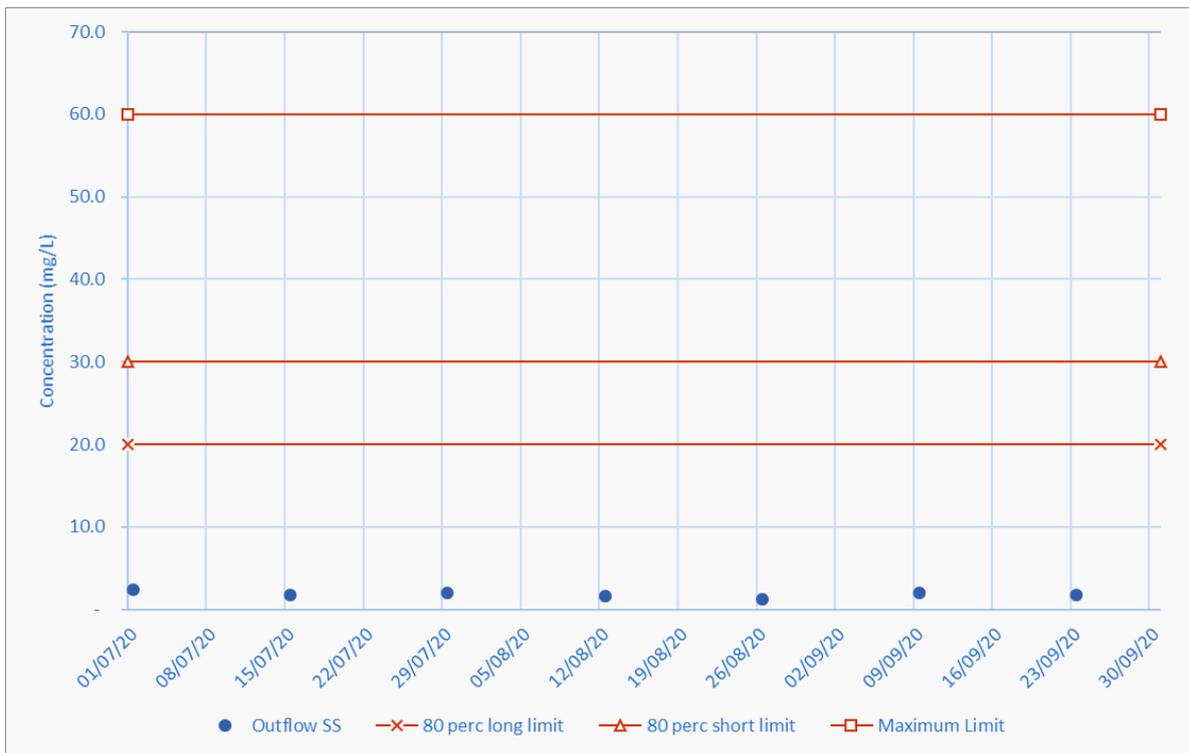
The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, Total Suspended Solids, BOD<sub>5</sub> & Total Nitrogen) are shown in Figures 20, 21, 22, 23 & 24.



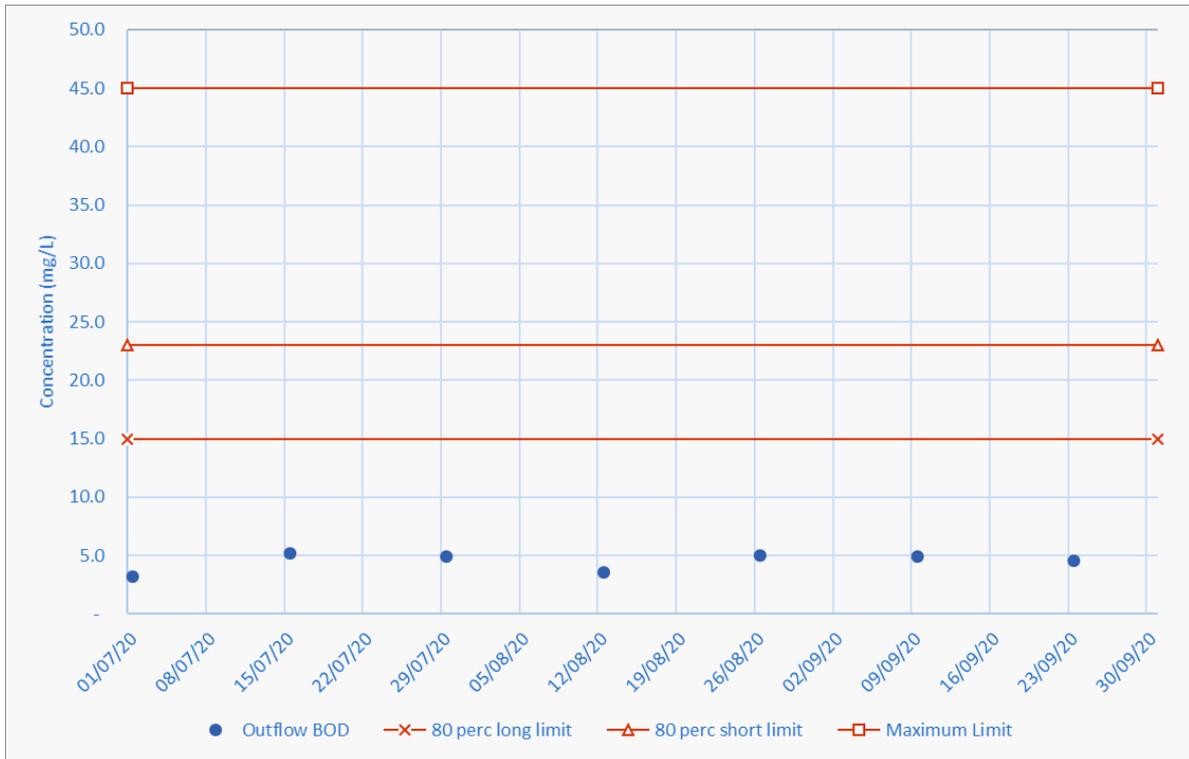
**Fig 20. Mossman Wastewater Treatment Plant Final Effluent Test Results for Ammonia**



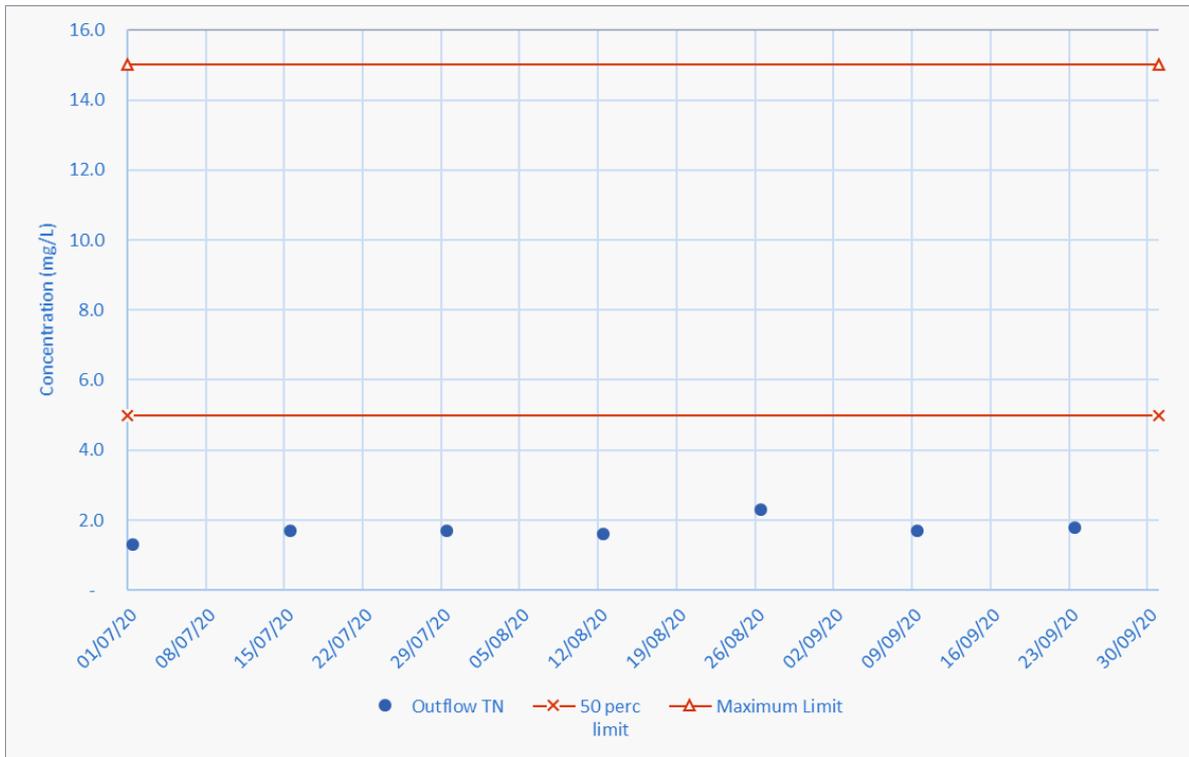
**Fig 21. Mossman WWTP Final Effluent Test Results for Total Phosphorous**



**Fig 22. Mossman WWTP Final Effluent Test Results for Total Suspended Solids**



**Fig 23. Mossman Wastewater Treatment Plant Final Effluent Test Results for BOD<sub>5</sub> (Biochemical Oxygen Demand)**



**Fig 24. Mossman Wastewater Treatment Plant Final Effluent Test Results for total Nitrogen**