

## **5.6. WATER AND WASTEWATER QUARTERLY REPORT FOR THE PERIOD ENDING 30 SEPTEMBER 2021**

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<b>DEPARTMENT</b>	Water and Wastewater
<b>MANAGER</b>	Juanita Warner, Acting Chief Executive Officer

### **RECOMMENDATION**

**That Council receives and notes the progress of the Quarterly Report of the Water and Wastewater department for the period ending 30 September 2021.**

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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 department for the period 1 July to 30 September 2021.

Whilst the results are generally positive the areas for improvement are noted and will be the focus of the department over the next quarter. Notable capital improvements include the completion of the Craiglie Reservoir, the replacement of the SBR aeration blowers, digester blowers and the digester aeration system located at the Port Douglas Wastewater Treatment Plant.

### **BACKGROUND**

This report is the first Quarterly Report submitted by the Water and Wastewater department during the 2021/2022 Financial Year. This report highlights progress against key performance areas required by the Department of Regional Development, Manufacturing and Water (DRDMW) 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 department.

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 department 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 2021-2022 Actions:

**3.3.1 – Progress future water security infrastructure solution for secure water supply over the dry season to alleviate current and future water shortages. Perform feasibility analysis on all current proposed water security solutions including the alternate intake and bulk raw water**

*storage solutions to determine most viable option that provides the best outcome for capital investment and water security then progress towards shovel ready stage.*

**3.3.2 – Continue the rollout of smart water meters to move beyond Port Douglas and include Mossman and surrounding area.**

**3.4.1 – Conduct a targeted waste education program aligning with the new collection contract and the capabilities of the new Material Recycling Facility in Cairns.**

## **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:

<b>Builder/Owner</b>	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.
<b>Regulator</b>	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**

<b>Internal:</b>	Nil
<b>External:</b>	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 Regional Development, Manufacturing and Water and the Department of Environment and Science.
<b>Community:</b>	Nil

## **ATTACHMENTS**

1. Water and Wastewater Quarterly Report for the period ending 30 September 2021  
[5.6.1 - 23 pages]

## 1 July to 30 September 2021

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 Regional Development, Manufacturing and Water (DRDMW) and the Department of Environment and Science (DES).

## Water

### 1. Water Education

The vulnerable persons register has been added to the Water and Wastewater website pages to inform those in our community who are vulnerable and may require some additional aid during water supply issues such as water main breaks or water quality incidents. Flyers and posters have been distributed out into the community for awareness.



Waste, Water and Wastewater departments got together and performed interactive games and education on waste recycling, water conservation and wastewater at the 2021 Mossman Show. Game prizes were won including miniature wheelie bins, shower timers and shower heads, so there were a lot of happy customers.



*Waste, Water and Wastewater Mossman Show Stall display July 2021*

## 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 17 new water service renewals and 226 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, maintaining water quality that relates to aesthetic parameters 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.

The completed training on leak detecting instrumentation has paid off for the water reticulation unit, they are proactively finding water leaks with the new leak detector technology. Detection of water leaks was found at Newell Beach and on a major water main break in Whyanbeel

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



*Water reticulation team locating water leaks*



*Water main break in Whyanbeel*

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

<b>Douglas Shire Reticulation (all schemes)</b>	
Settlement Meter Reads	235
New Water Services Connections	11
Service Repairs	110
Water Mains Repairs	17
Water service renewals	16
Water Quality Notifications (Complaints)	0(0)
Dial before you dig	226
Flushing Events: Mossman/Port Douglas/Cooya/ Newell	14
Flushing Events: Whyanbeel/Wonga	6
Flushing Events: Daintree	15

There were no water quality notifications during this reporting period.

This reporting period is the beginning of the new financial year 2021/2022 capital works programme and most of the 2020/2021 carry over projects have been completed. The refurbishment of Craiglie reservoir has been completed with a new electro-chlorination dosing system to replace the gas chlorine system. The commissioning of the reservoir is expected to occur in following reporting period.

Water quality and reticulation projects have commenced procurement such as acquisition of quotes, project designs, and contracts for the process control renewals, UF cartridges renewals, protective roof turbidity meter cabinet, CIP filter replacement program and programming works for water main firefighting compliance.

Water Reticulation capital works project for the smart water meter program has been awarded and pre works notifications have commenced in this reporting period.

### 3. Water schemes and potable water consumption

This reporting period is the start of winter/spring season which is generally the driest period of the year. Although the Rex creek intake water level has slowly declined, the area has had bursts of rainfall events at the beginning of July, end of August and beginning of September 2021. The highest rainfall event occurred on 22 August 2021 which raised the Rex Creek intake level to 940 mm. The climate rainfall outlook forecasted by BoM is likely to be above average which may help us through the 2021 winter/spring period within our shire. Due to proficient intake levels, council has not needed to enforce any water restrictions. However, it is important for our community within Douglas Shire to commence water conservation practices prior to water restrictions being implemented.

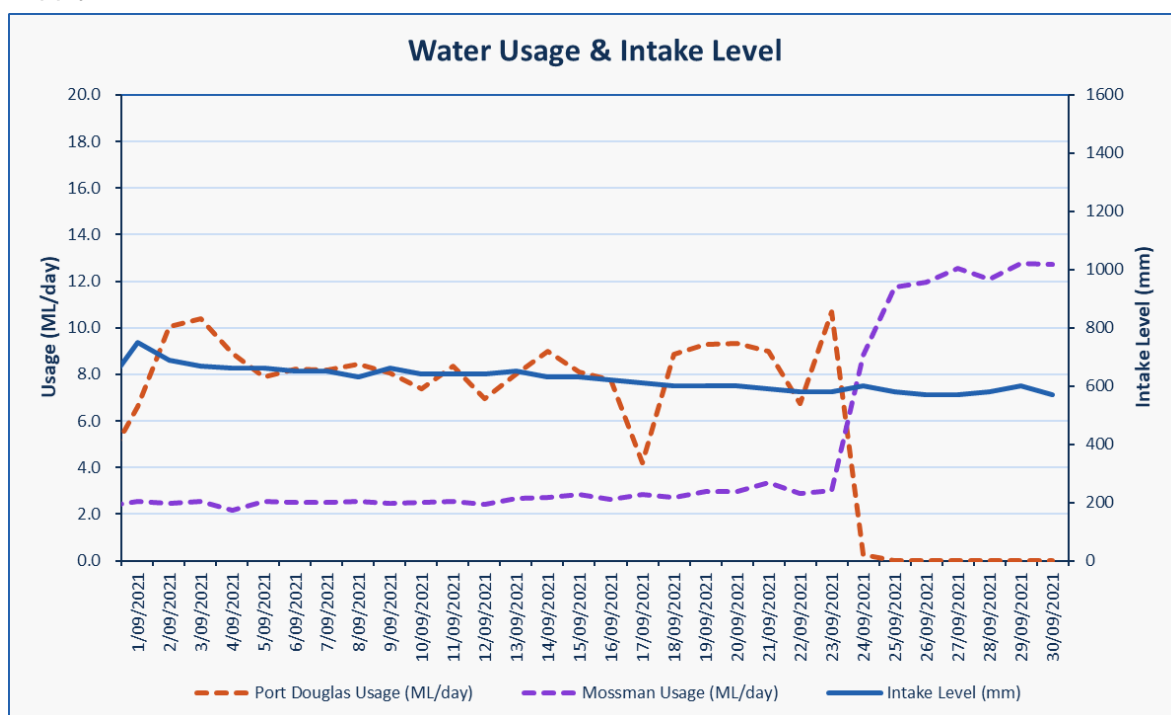


*Rex creek intake – 22 September 2021 intake levels showing good levels.*

In late September 2021 a water main leak on the raw water main at the corner of Coral Sea Drive and Mossman Gorge Road was reported. The leak was repaired; however, another leak was found on the Port Douglas treated water main in the same area. The water reticulation team reconfigured and isolated the leaking water main resulting in the delivery of treated water from the Mossman reservoir to both networks in Port Douglas and Mossman. This was a temporary solution until a specialist fitting was manufactured and repairs were undertaken. From 24 September 2021 onwards, the average water consumption graph shows Port Douglas network as **0.00 ML/day** and Mossman network as **11.81 ML/day**.

The average water consumption for the Mossman/Port Douglas scheme for the months July through to 23 September was **8.13 ML/day** for the Port Douglas network and **2.44 ML/day** for the Mossman network. The graph below displays the comparison use between Mossman and Port Douglas networks and Rex Creek intake level.

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 2021**

**4. 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. All water scheme 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 for efficient operations. Clean in place (CIP) activities were undertaken on ultrafiltration (UF) cartridges throughout the reporting period to identify leaking UF cartridges which maintains the efficiency of the filtration rack operations and maintains the UF cartridges within the integrity test limits.

**Mossman/Port Douglas Scheme**

All 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.

The water quality team have installed a chlorine and pH analyser at the Mossman Water Treatment Plant to monitor and record chlorine residual and pH of water leaving the main water reservoirs. This upgrade improves the constant monitoring of the water quality. The water quality team have installed the communications and are self-taught on the set up and operation of the monitoring equipment.





*Image: Water Quality team installing the communications of the chlorine/pH analyser*

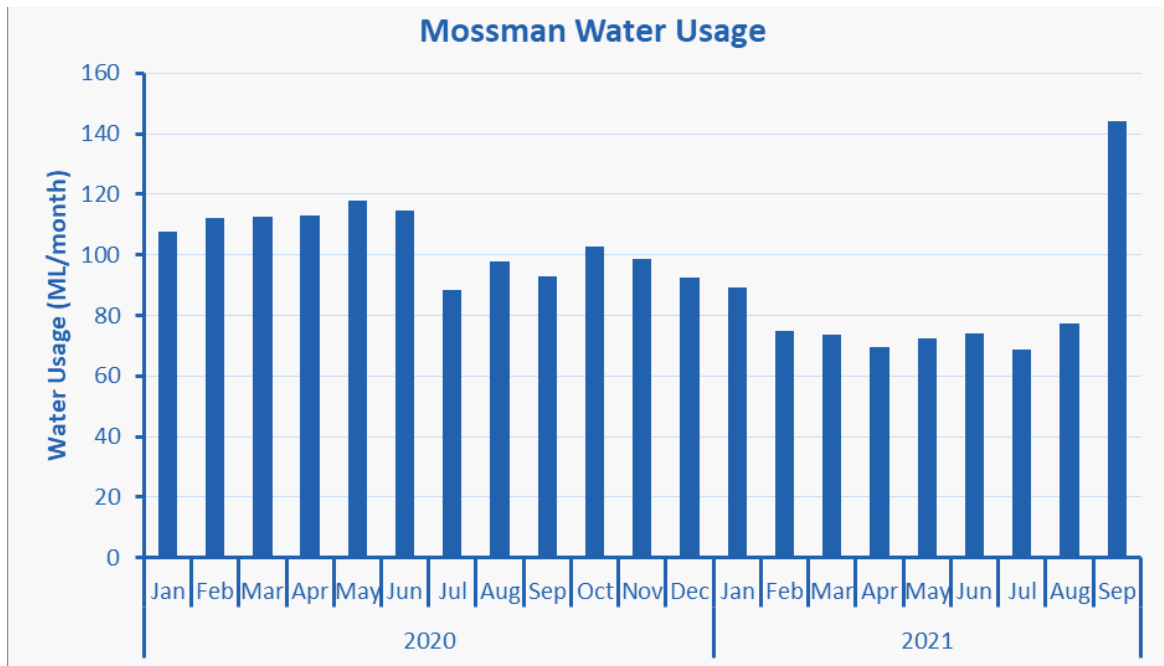
The Mossman water treatment plant was shut down on 18 August, whilst a team of contractors performed renewal pipework replacing an old elbow pipe and replaced it with a new 600 mm diameter pipe. Prior to the works, all treated water reservoirs were filled to maximum capacity to ensure there was sufficient water supply to the Mossman and Port Douglas communities. Another part of this project involved officers from the water team, workplace health and safety and project office to inspect the new raw water main pipework at Dawsons Engineering workshop. Dawsons Engineering performed testing on the proposed repair procedures for the new raw water main pipework that connects into the Mossman water treatment plant.

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. Operational SCADA processes were assessed to determine if current water operator actions are appropriate.

The refurbishment of Craiglie reservoir has been completed with a new electro-chlorination dosing system to replace the gas chlorine system. The commissioning of the reservoir is expected to occur in September 2021.

### **Mossman Water Supply**

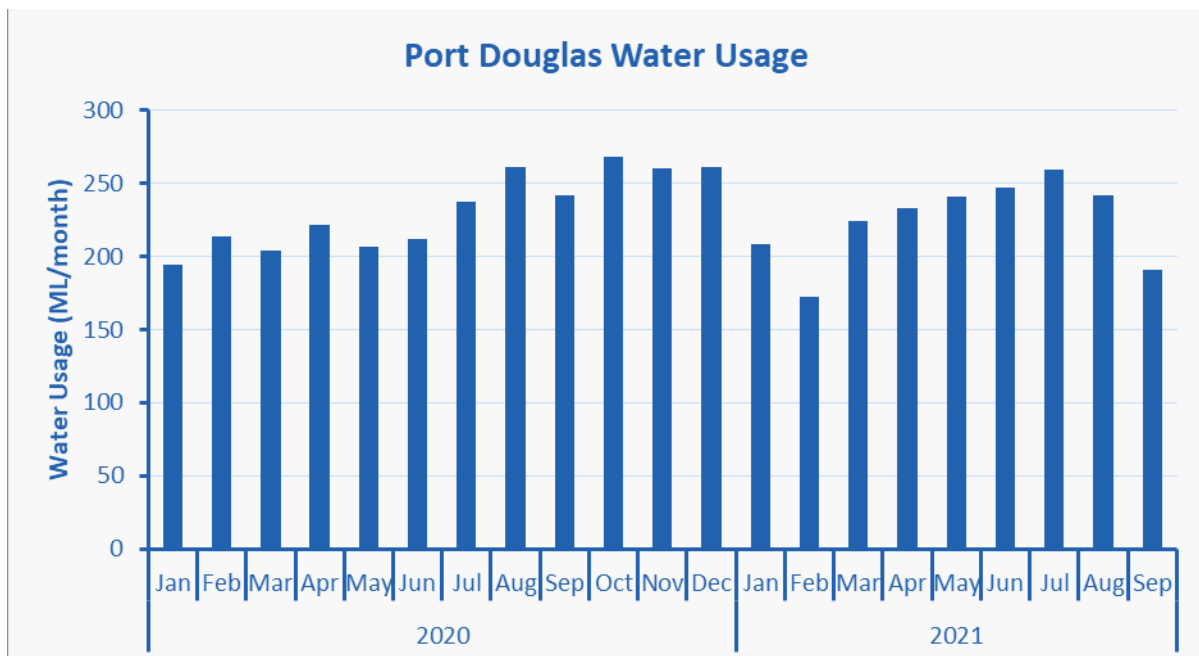
The total monthly consumption of water in Mossman, Cooya Beach and Newell Beach areas can be seen in Figure 2. Elevated consumption in September 2021 was due to a main break that resulted to a need to transfer treated water from the Mossman reservoir to both networks in Port Douglas and Mossman. Due to this, all water consumption was monitored through Mossman flow meter.



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

**Port Douglas Water Supply**

The total monthly consumption of water in Port Douglas, Craiglie and Mowbray areas can be seen in Figure 3. Reduced consumption in September 2021 was due to a main break that resulted to a need to transfer treated water from the Mossman reservoir to both networks in Port Douglas and Mossman.



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

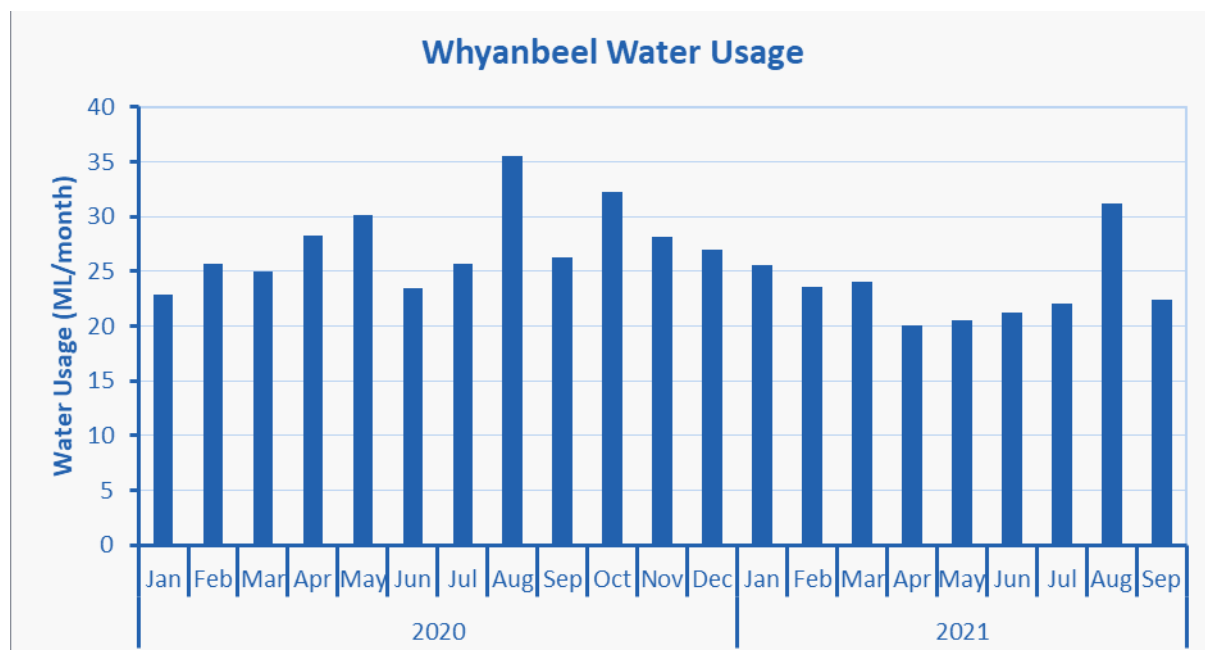
**Whyanbeel Scheme**

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 CIP operations were undertaken together with general service and maintenance works. The backwash water pH correction/treatment upgrades are in progress with new tanks and monitoring equipment installed.

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

The total monthly consumption of water in Whyanbeel, Wonga Beach, Miallo, Rocky Point, Syndicate and Bamboo can be seen in Figure 4. In August, there was a major water main break in Whyanbeel, resulting in increased water losses through the network.



**Fig 4. Whyanbeel Scheme Total Monthly Consumption Figures**

**Daintree Scheme**

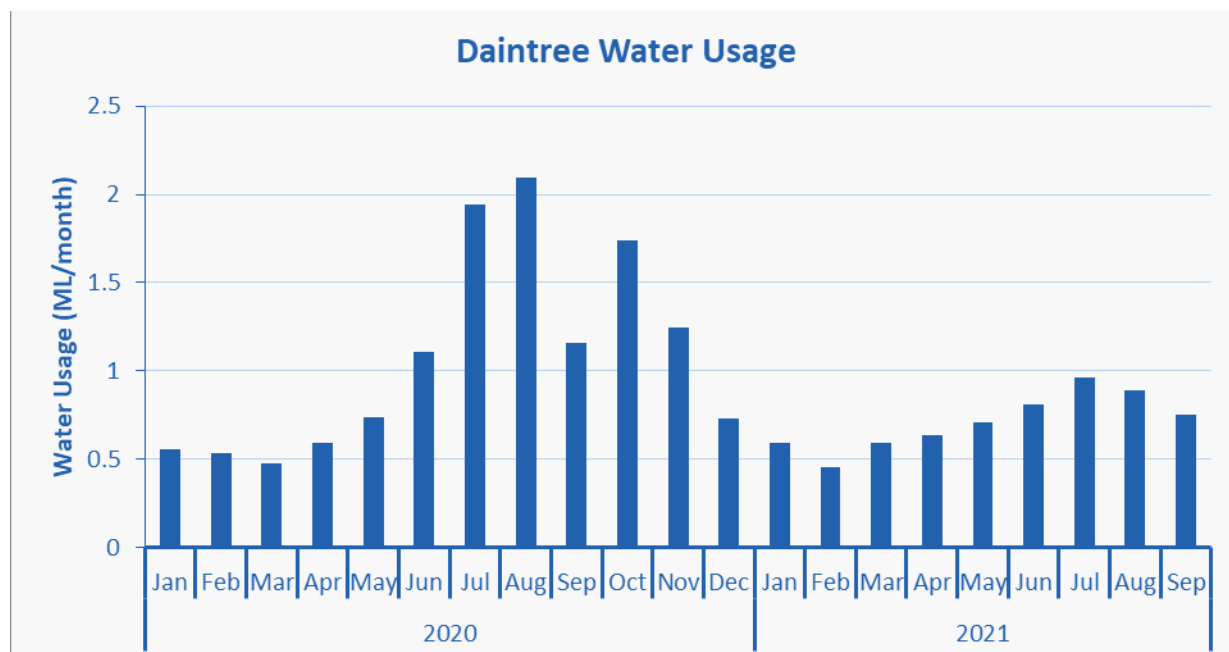
Daintree Water Treatment Plant met all demand requirements during the reporting period.

To maintain UF filter efficiency, chemical CIP operations were undertaken together with general service and maintenance works.

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

Process control improvements have continued with the handling of sodium hypochlorite at the Daintree water treatment plant.

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



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

## 5. 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 77 treated water E.Coli compliance samples were taken in the three drinking water schemes. A total of 40 E.Coli samples were tested in the Douglas water laboratory and 37 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.

In addition, raw water quality was monitored at all of the intakes and Daintree Bore site, including 16 raw water E.Coli samples. Raw water sampling assists us to understand the treatment plant needs and the health-based targets.

Craiglie Reservoir commissioning began during the reporting period. Water quality monitoring was undertaken from the Craiglie Reservoir to ensure that water quality was according to ADWG, prior to bringing the reservoir online. No water quality issues have been determined in the reservoir.

### Mossman/Port Douglas Supply Scheme

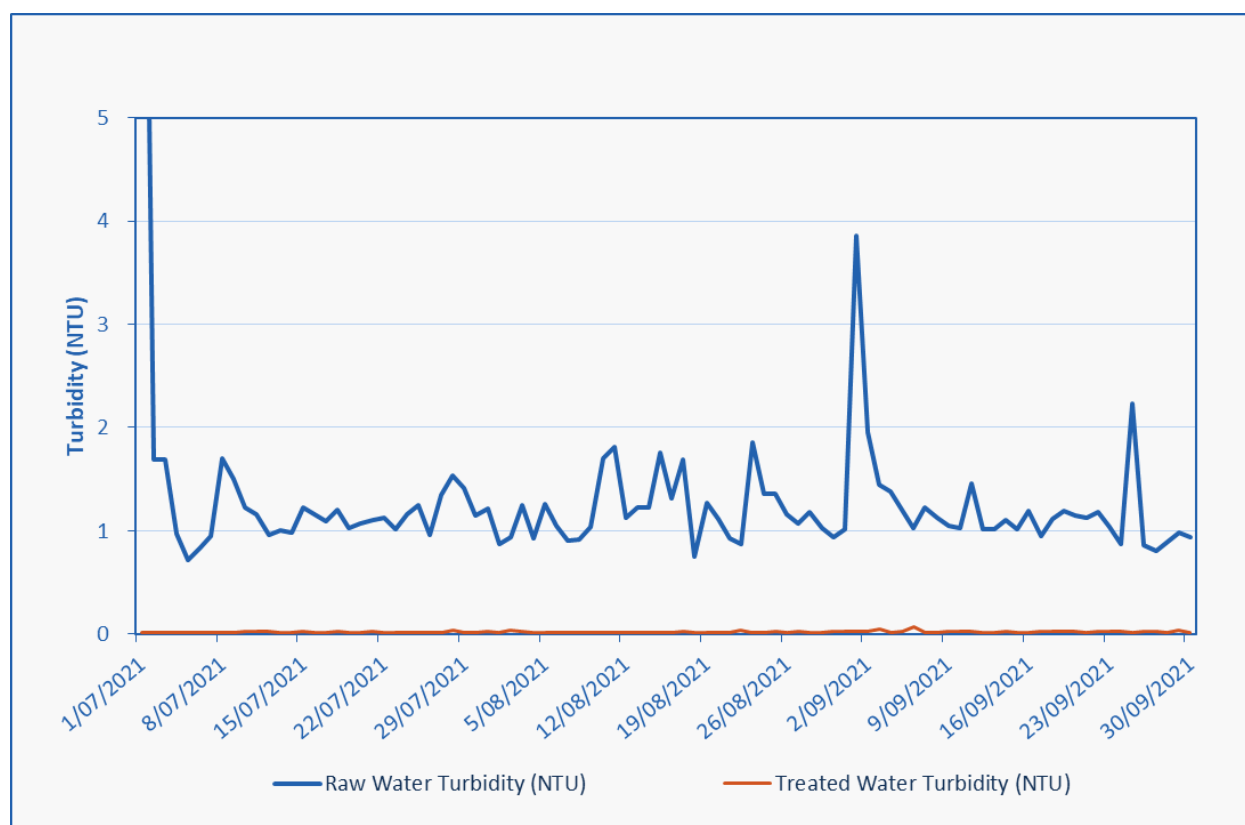
Average monthly values for key operational and compliance parameters are detailed in Tables 3 and 4 for treated water at Port Douglas Reservoirs and Port Douglas/Mossman Reticulation network respectively. Figure 6 indicates the daily turbidity trends at the intake and treated water as recorded at the Mossman Water Treatment Plant for the period July to September 2021.

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

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
July-21	7.6	24.0	9.6	1.1	1.1	<1
Aug-21	7.6	23.9	10.2	1.1	1.1	<1
Sept-21	7.5	24.8	9.5	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
July-21	7.3	24.6	1.0	1.0	<1	0.008	0.097	0.0002	<1
Aug-21	7.1	24.3	1.0	1.0	<1	0.009	<0.015	<0.0002	<1
Sept-21	7.1	25.4	0.9	0.9	<1	0.007	<0.015	<0.0002	<1



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

### Whyanbeel Supply Scheme

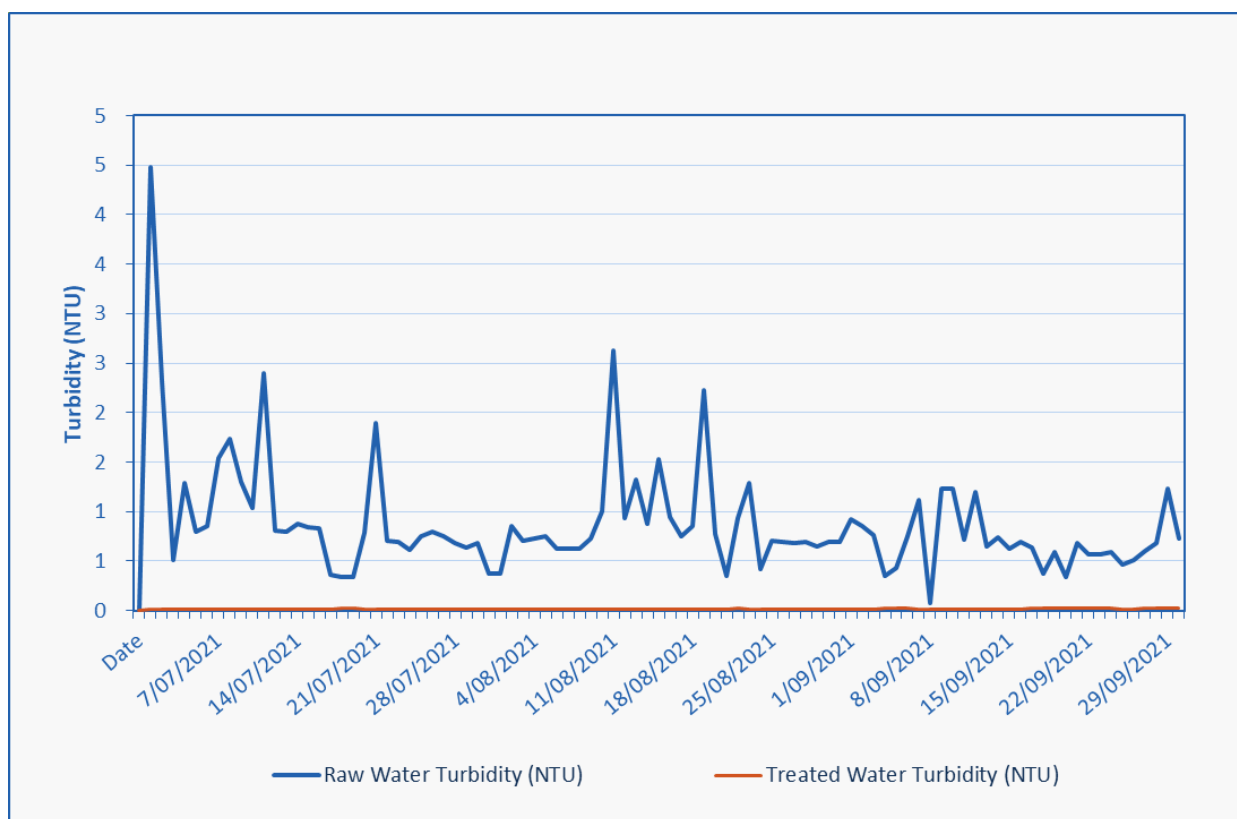
Average monthly values for key operational and compliance parameters are detailed in Tables 5 and 6 for treated water at the Whyanbeel Reservoir and Whyanbeel Reticulation Network respectively. Figure 7 indicates the daily turbidity trends at the intake and treated water as recorded at the Whyanbeel Water Treatment Plant for the period July to September 2021.

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

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
July-21	8.2	24.6	10	1.1	1.1	<1
Aug-21	8.3	25.3	10	1.1	1.1	<1
Sept-21	8.3	25.3	10	0.9	1.0	<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
July-21	8.0	24.4	1.1	1.1	<1	0.005	<0.015	<0.0002	<1
Aug-21	8.0	24.7	0.8	0.9	<1	0.002	<0.015	<0.0002	<1
Sept-21	8.0	24.9	0.9	0.9	<1	0.005	<0.015	<0.0002	<1



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

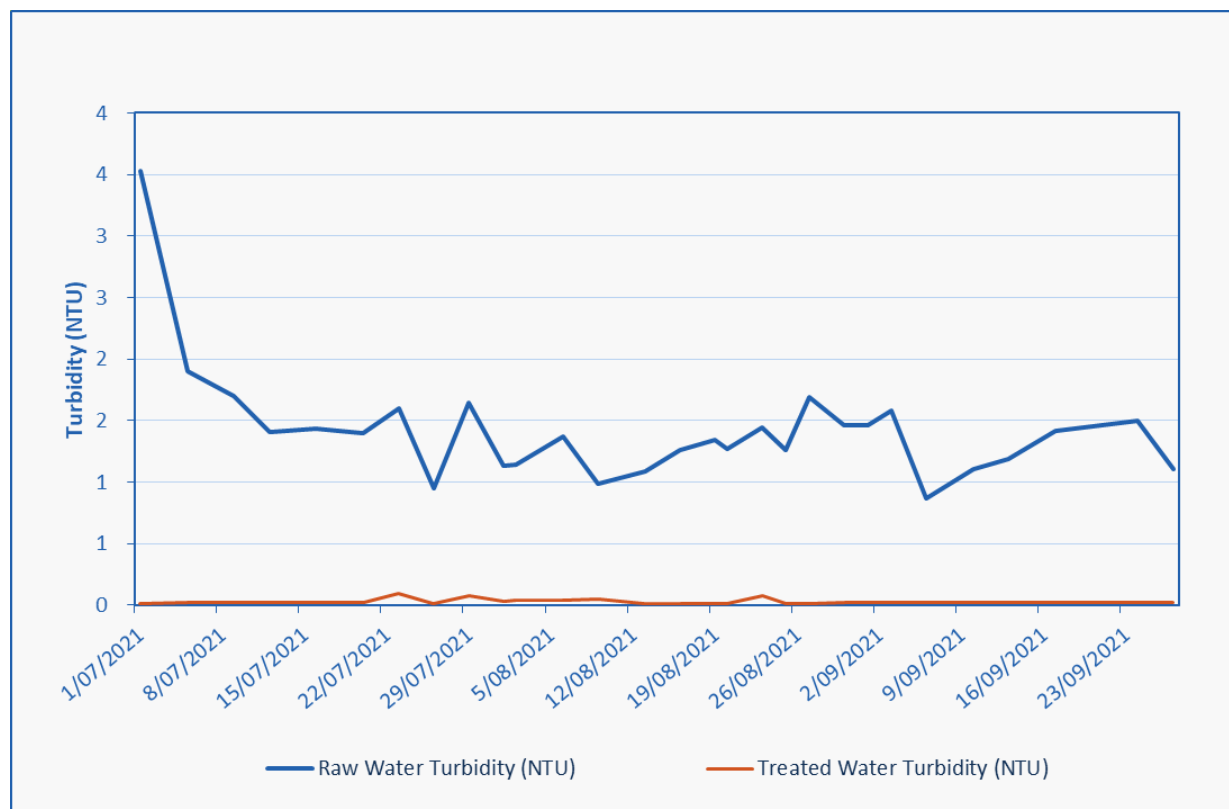
### Daintree Supply Scheme

Average monthly values for key operational and compliance parameters are detailed in Table 7 for treated water at Daintree Reticulation network. 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 2021.

The Daintree water scheme was monitored to rectify issues with low chlorine residual within the reticulation network. During the reporting period, two irrigation systems were installed within Daintree township, to encourage movement of water within the reticulation network. Additionally, operational configurations were altered. With these changes, it is believed that the issue has been rectified.

**Table 7. 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
July-21	7.5	24.2	<0.1	<0.1	1.7	0.001	<0.015	0.0002	<1
Aug-21	7.7	24.0	0.6	0.6	1.6	0.003	<0.015	<0.0002	<1
Sept-21	7.5	24.5	<0.1	<0.1	2.4	0.001	<0.015	<0.0002	<1



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

## Wastewater

### 1. Wastewater reticulation services

General maintenance programs continued within the reticulation networks and 32 pump stations in the Mossman and Port Douglas catchments. Wastewater Treatment Plants operated within license requirements throughout this period.

Completed capital work projects in this reporting period include the replacement of the SBR aeration blowers, digester blowers and the digester aeration system located at the Port Douglas Wastewater Treatment Plant.

In this reporting period, the new financial year 2021/2022 capital work projects have commenced. Port Douglas Wastewater Treatment Plant air compressor renewals project and the tertiary filters sand replacement project went through a procurement process. Letters to the residents within Cooya Beach have been sent out to advise about manhole raise and resealing program. Quotes, project designs and contracts have been procured for the L1 rising main, RTU and switchboard renewals and the odour control unit renewal.

Table 8 below shows the number of maintenance activities undertaken across all schemes.

**Table 8. Wastewater Reticulation Services**

	Port Douglas Catchment	Mossman Catchment
Pump Blockages	3	3
Sewer Chokes	3	0
Sewer Main Breaks	0	0
HCB Repairs (House Connection Branch)	8	0
Odour Complaints	0	0
Public Complaints	0	0
Reportable Incidents	0	0

### 2. Influent and irrigation flows

#### Port Douglas Wastewater Treatment Plant

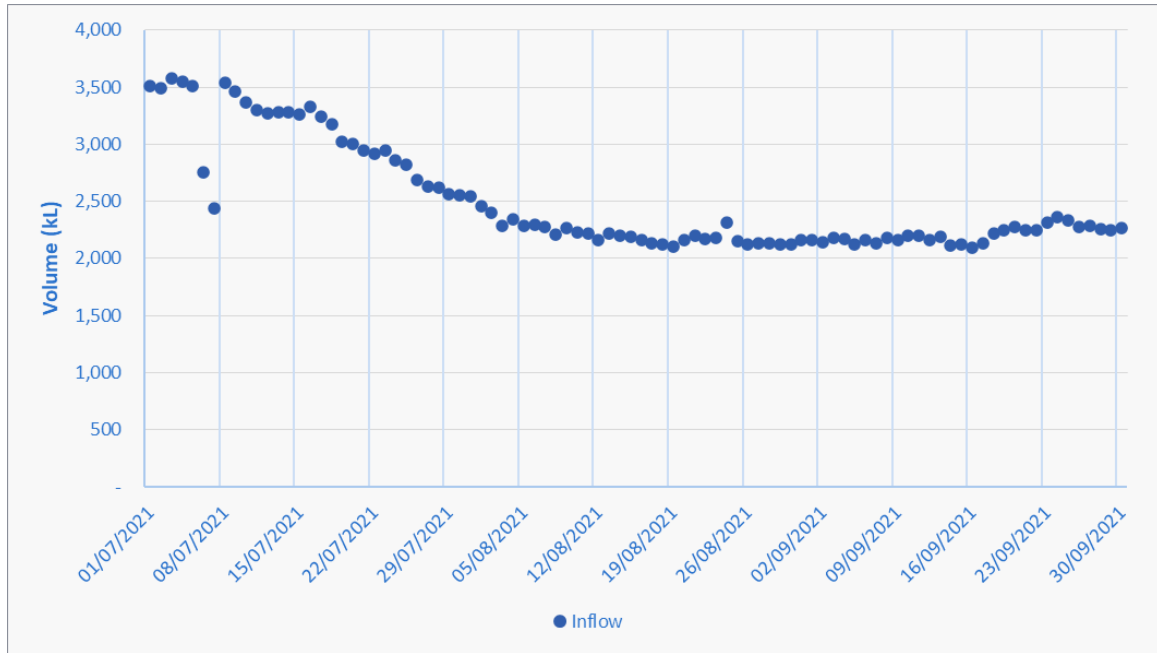
A total of 230,203 kL of influent entered the Port Douglas Wastewater Treatment Plant during the reporting period. The average daily flow was 2,502 kL/day. Tanker truck contractors delivered 667 kL of septage to the plant and 2,283 kL of Leachate from the Killaloe Landfill and Transfer Station. Influent is treated in a Sequencing Batch Reactor (SBR) which produced compliant effluent during the reporting period. A total of 60% 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 90,351 kL and Palmer Sea Reef received 64,559 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 103 mm. On 1 July 2021, the highest rainfall on a day recorded was 50 mm at Port Douglas WWTP Digital rain gauge.

From December 2020, Queensland Health have commenced a state-wide wastewater surveillance program for COVID-19. The program is expected to run until end of 2021 and has strong support from the Chief Health Officer.

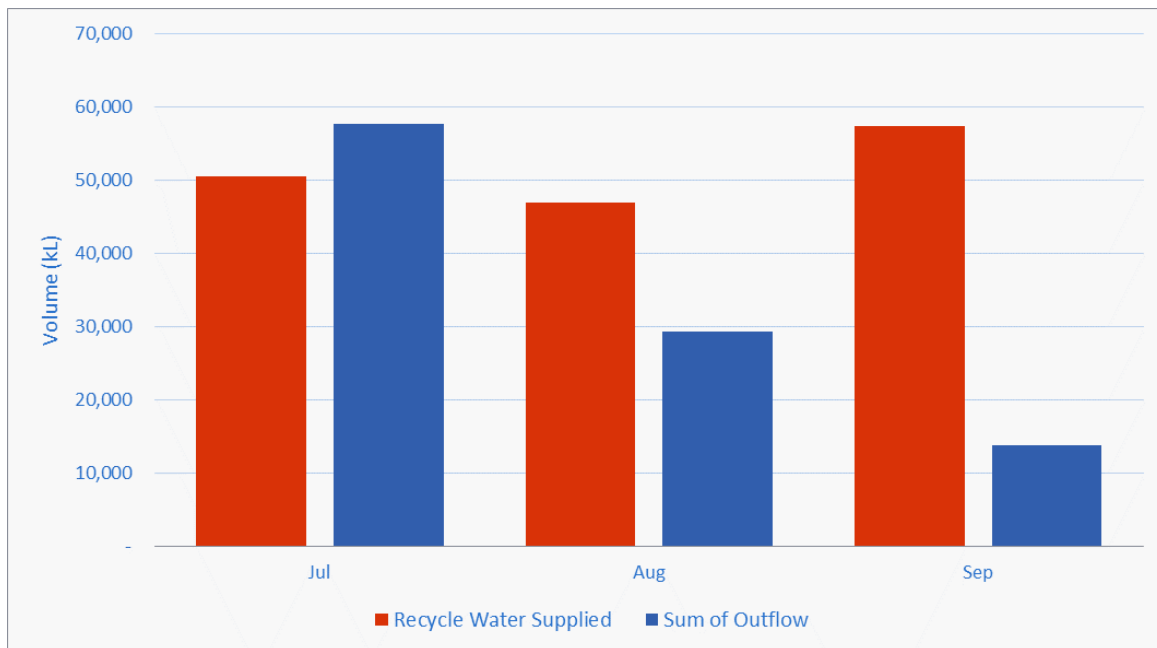


The Wastewater team will be assisting Queensland Health by conducting weekly wastewater sampling from the Port Douglas Wastewater Treatment Plant. Results from the testing will be used within Queensland Health to inform public health efforts. COVID-19 was not detected at the Port Douglas Wastewater Treatment Plant since December and within this reporting period.

Daily inflows, outflows and recycled water supplied for the reporting period are presented in Fig 9 and 10 respectively.



**Fig 9. Port Douglas Daily Inflow**



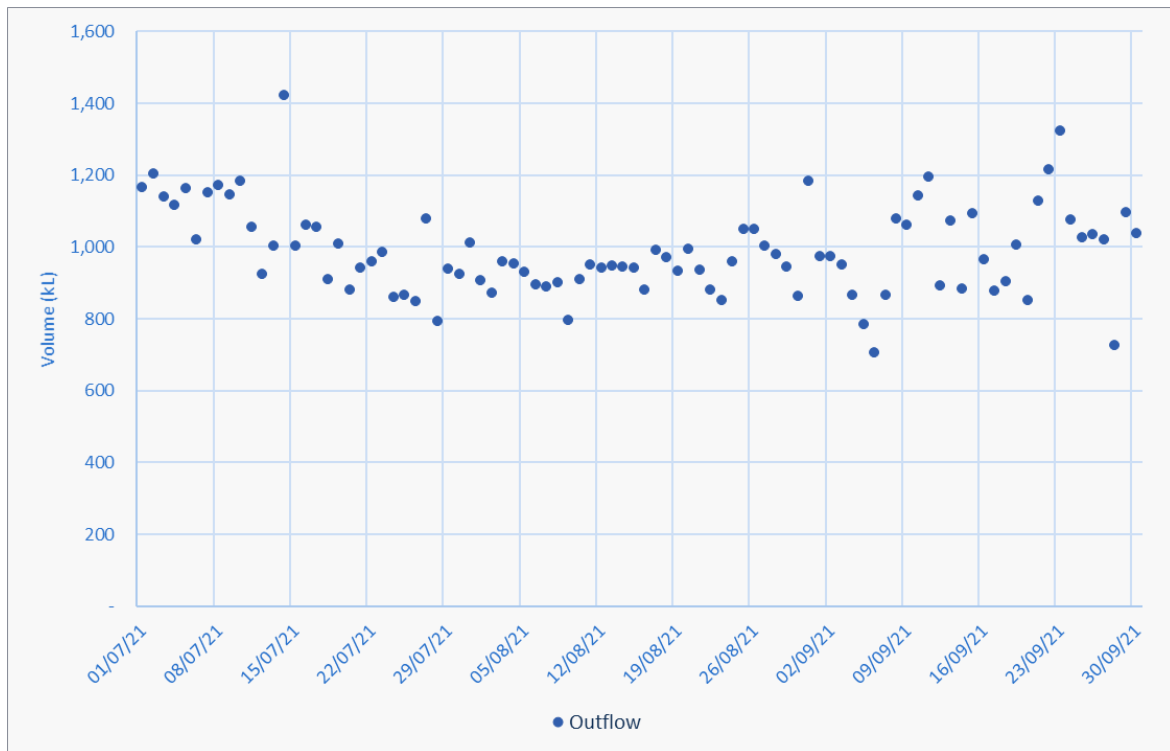
**Fig 10. Port Douglas Total Monthly Outflow**

### Mossman Wastewater Treatment Plant

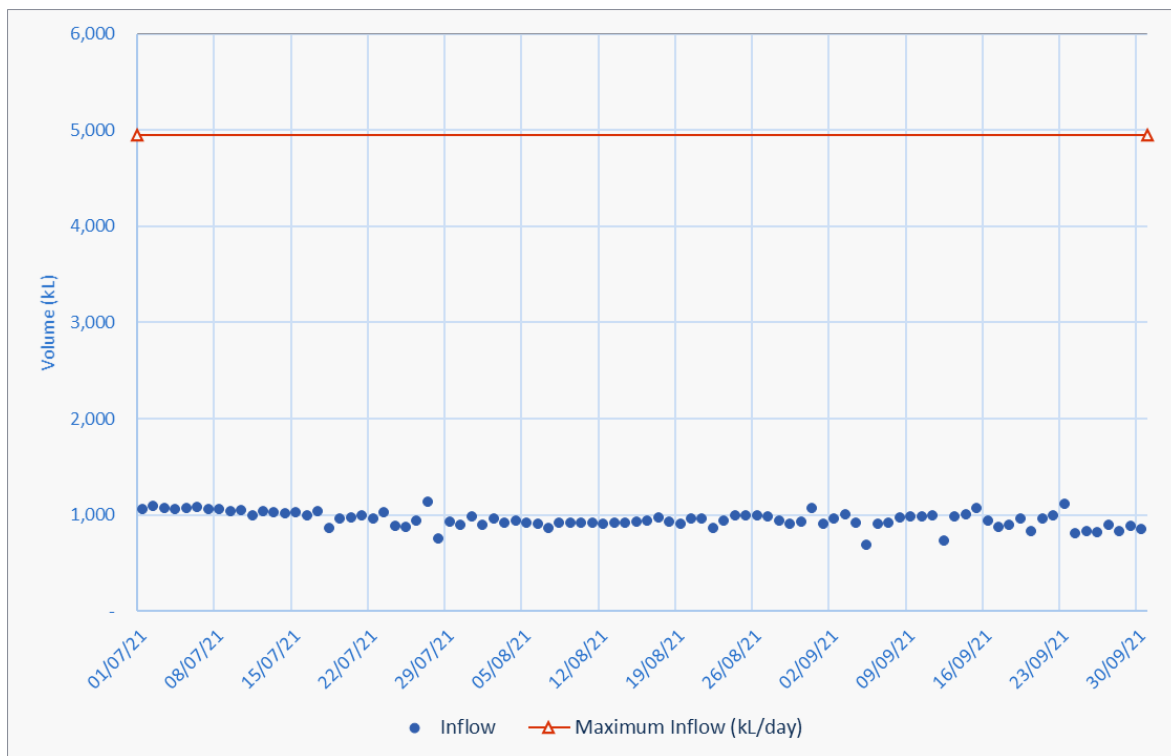
The Mossman Wastewater Treatment Plant received a total influent flow of 87,151 kL during the reporting period. The average daily flow was 947 kL/day. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged into the Mossman River.

A total of 165.5 mm of rain fell on site for the reporting period with the highest daily rainfall measured at 48 mm on 1 July 2021 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**

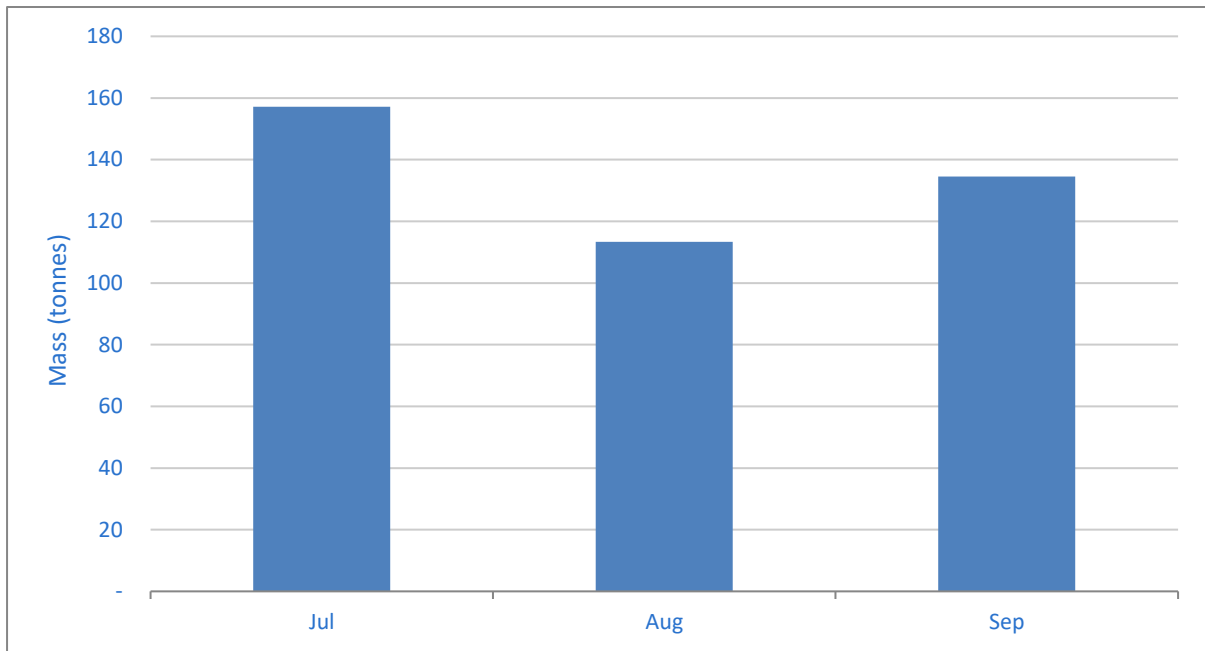
### 3. Bio-solids Production

Bio-solids were produced by the dewatering plants at Port Douglas Wastewater Treatment Plant (12% solids) and Mossman Wastewater Treatment Plant (10% solids) this quarter. 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, 408.37 tonnes of wet bio-solids were produced during the reporting period and sent to farms for beneficial reuse. This quantity of wet bio-solids equates to 49 dry tonnes.

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

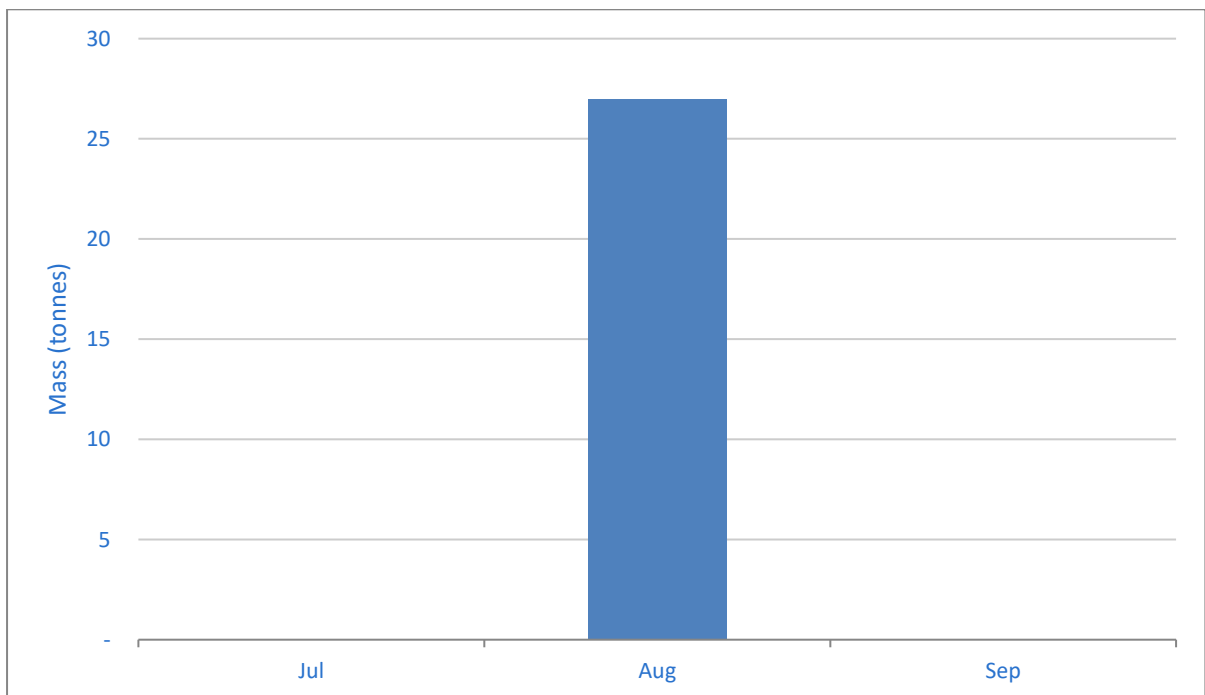


**Fig 13. Port Douglas Wastewater Treatment Plant monthly bio-solids production 2021**

**Mossman Wastewater Treatment Plant**

At Mossman Wastewater Treatment Plant, 22.6 tonnes of wet bio-solids were produced during the reporting period and sent to farms for beneficial reuse. This quantity of wet bio-solids equates to 2.26 dry tonnes.

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



**Fig 14. Mossman Wastewater Treatment Plant monthly bio-solids production (nil production in July and September 2021)**

### 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**

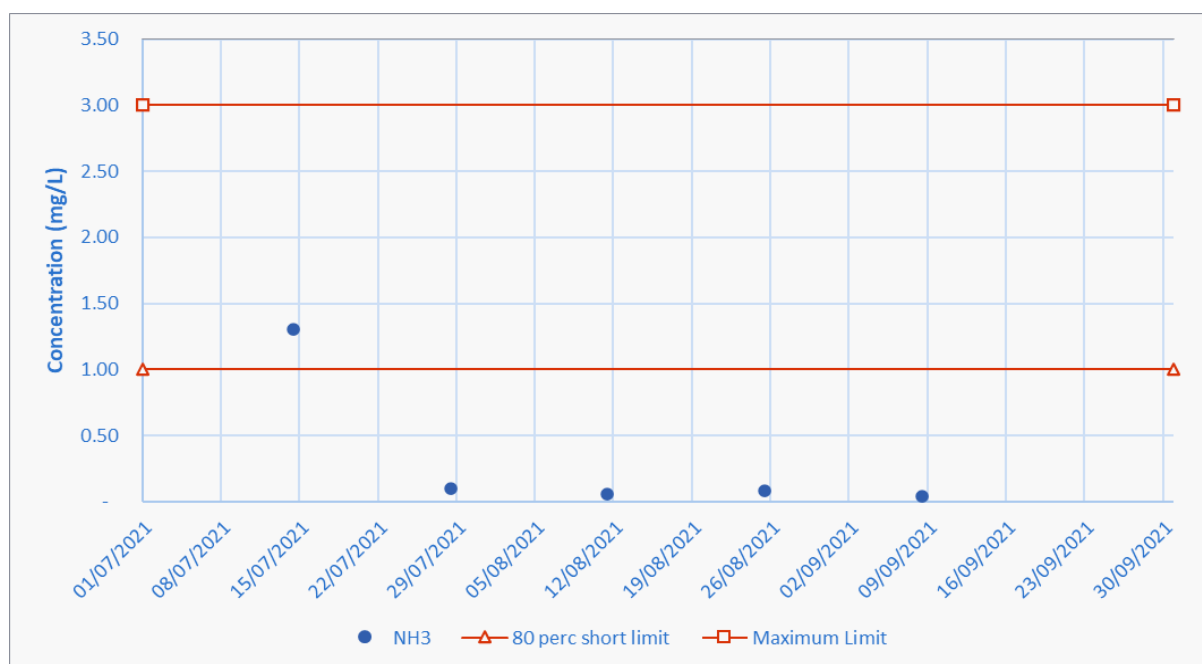
Characteristics Determination	PDWWTP Frequency	MWWTP Frequency
5-day Biochemical Oxygen Demand	weekly	fortnightly
Suspended Solids	weekly	fortnightly
pH	weekly	weekly
Dissolved Oxygen	weekly	weekly
Ammonia Nitrogen	fortnightly	fortnightly
Total Nitrogen	fortnightly	fortnightly
Total Phosphorus as P	fortnightly	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.

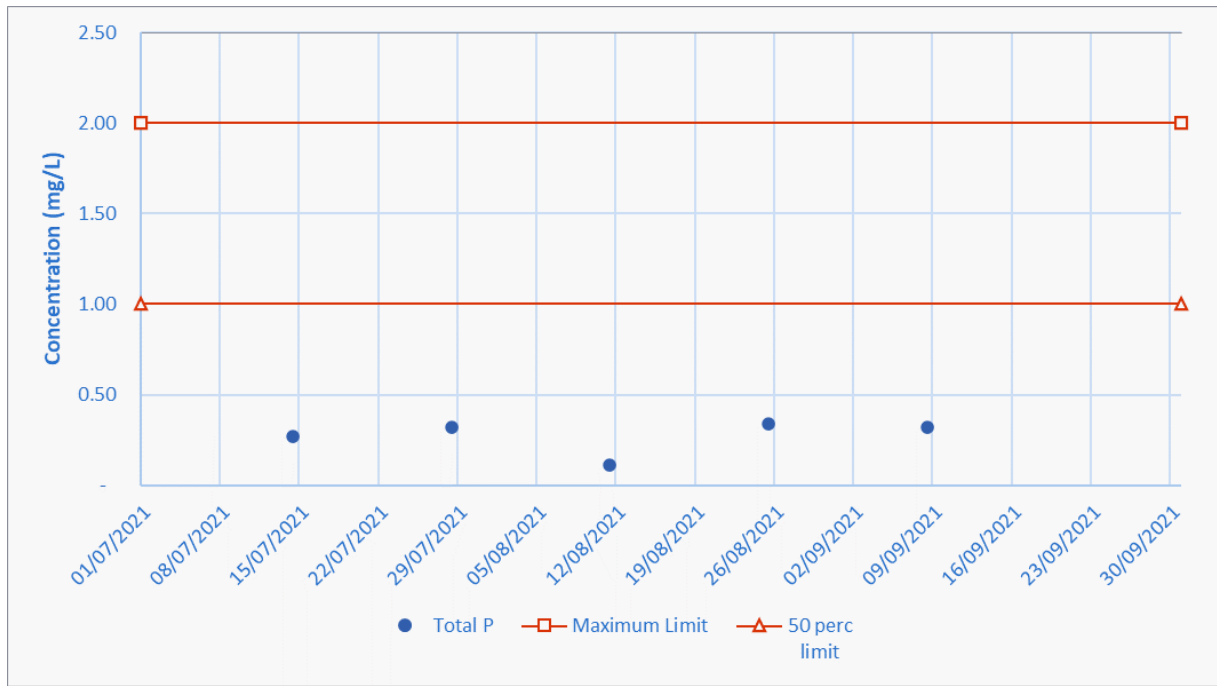
Treatment process and compliance monitoring is carried out each day by in-house analyses of samples at the wastewater treatment plants. Process settings, effluent quality, flow rates, pump stations performance and maintenance aspects are monitored and controlled with SCADA Citect via an extensive Telemetry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

### Port Douglas Wastewater Treatment Plant

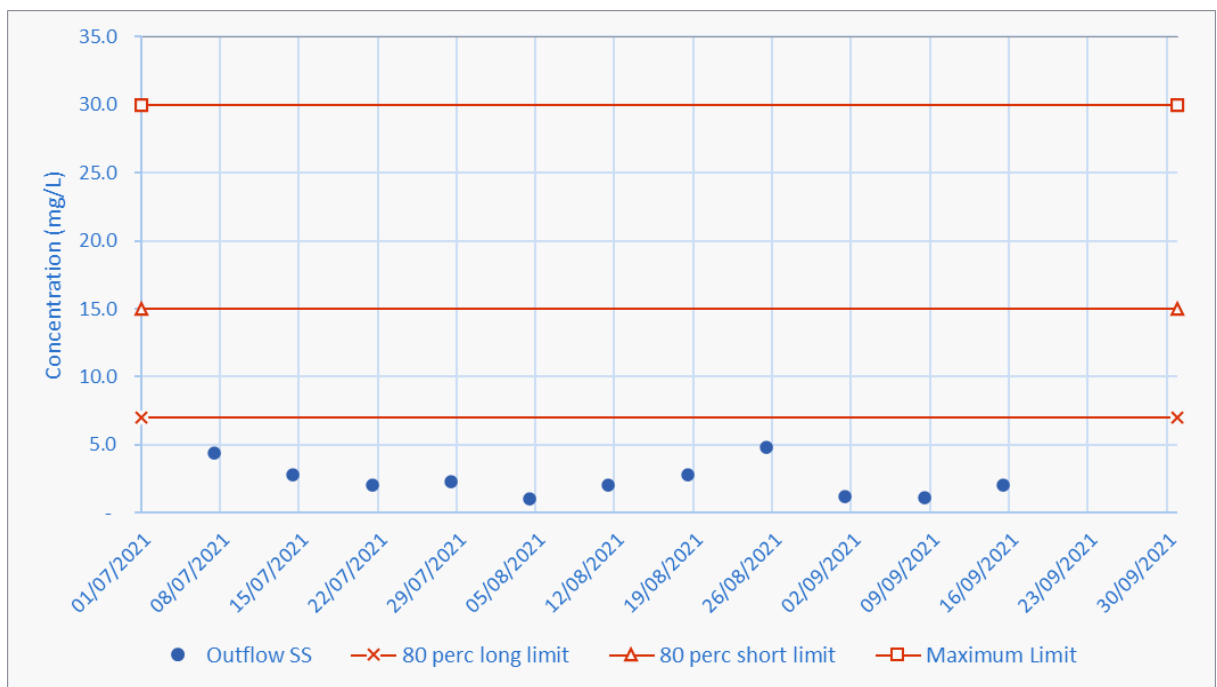
The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, Total Suspended Solids, BOD<sub>5</sub> & Total Nitrogen) are shown in Figure 15, 16, 17, 18 & 19.



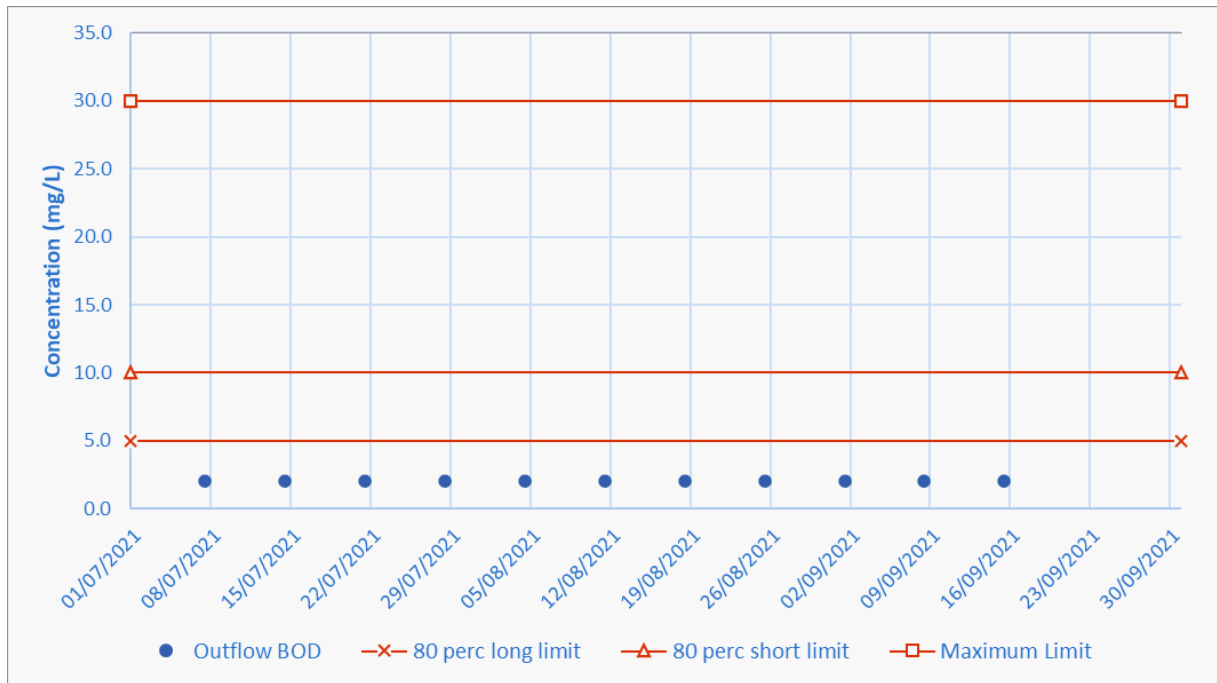
**Fig 15. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Ammonia**



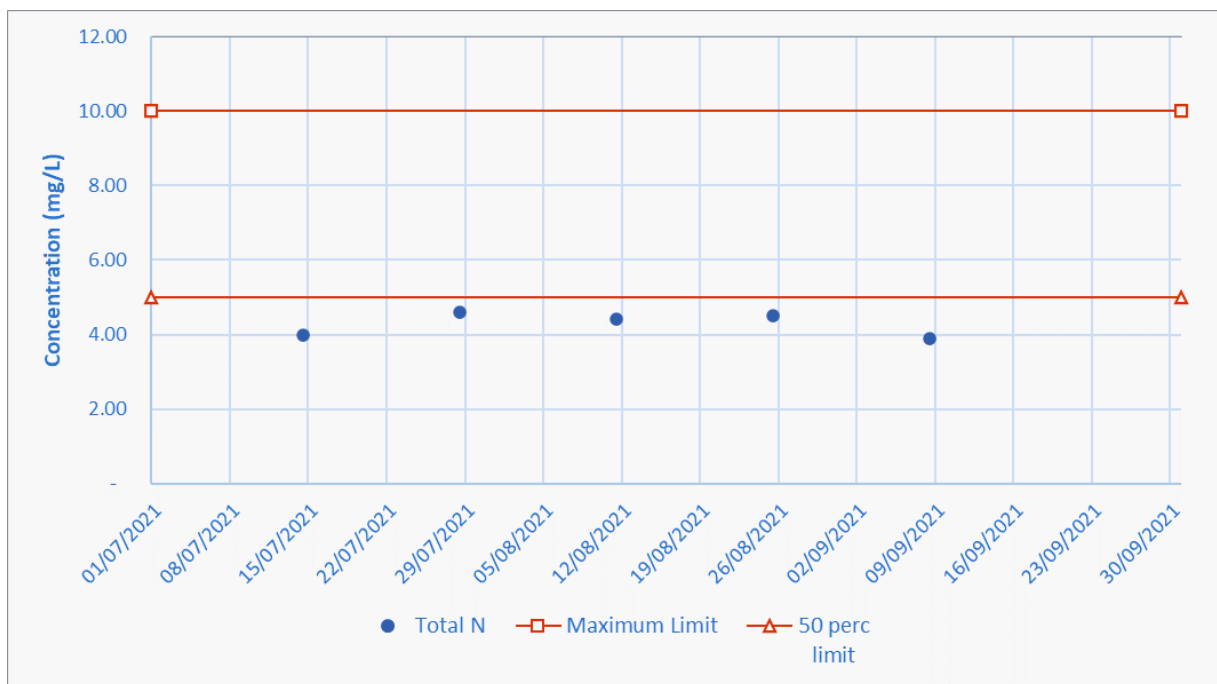
**Fig 16. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Phosphorus**



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



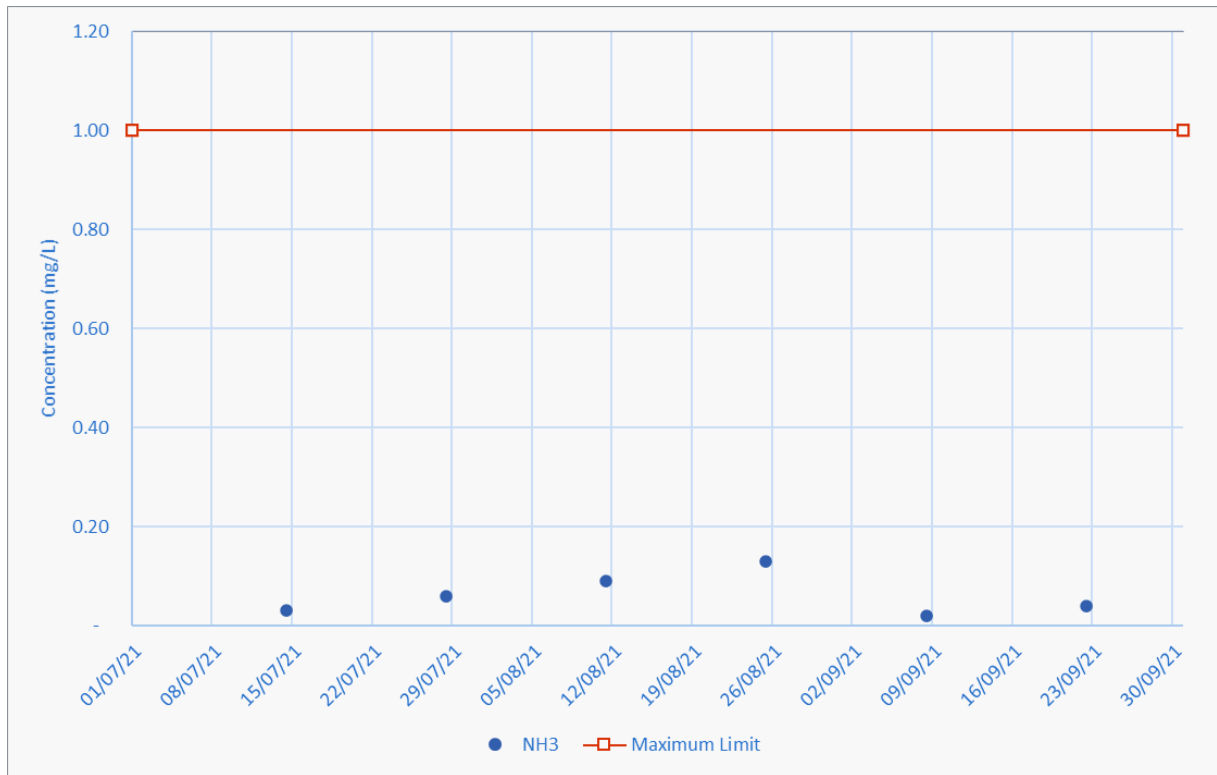
**Fig 18. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for BOD<sub>5</sub> (Biochemical Oxygen Demand)**



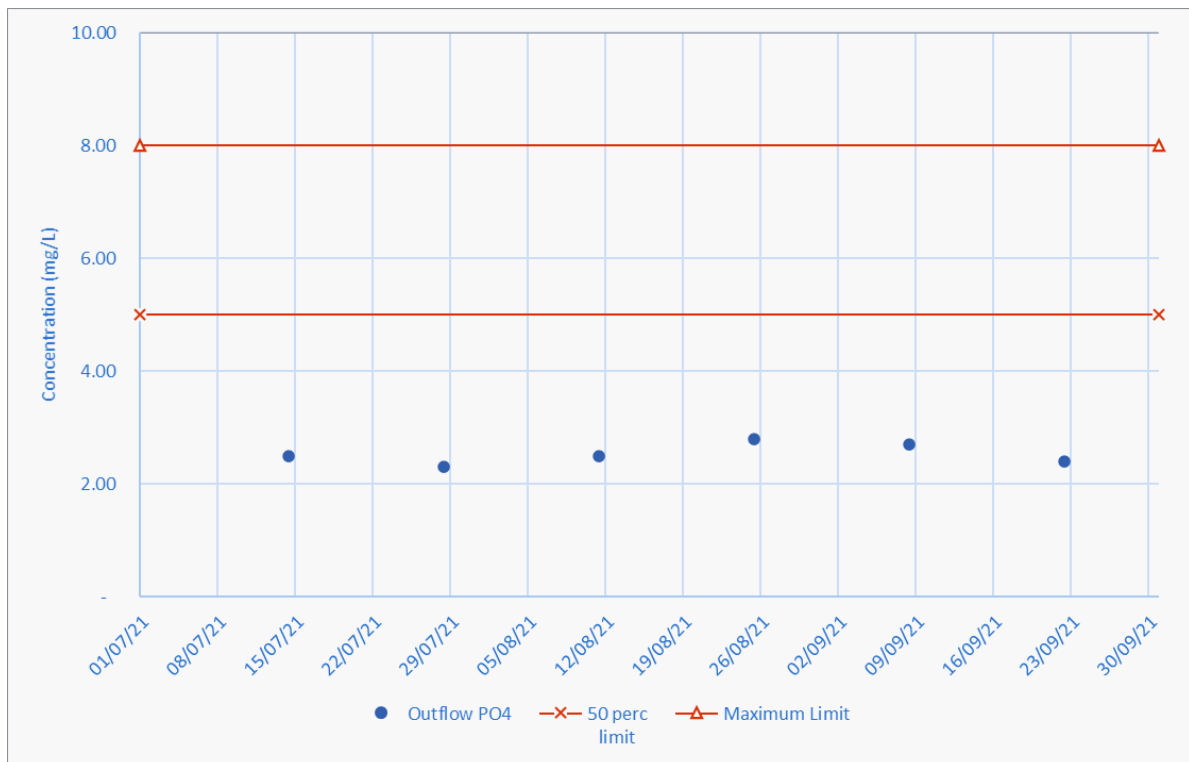
**Fig 19. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Nitrogen**

**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.

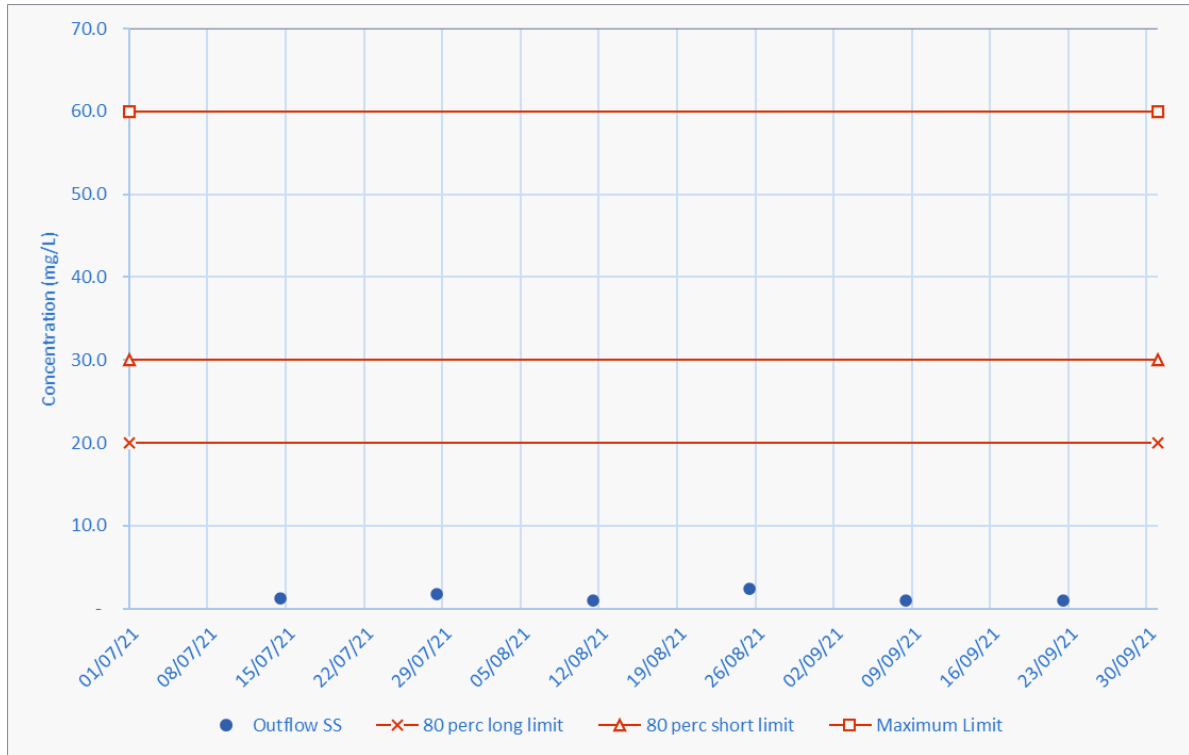


**Fig 20. Mossman Wastewater Treatment Plant Final Effluent Test Results for Ammonia**

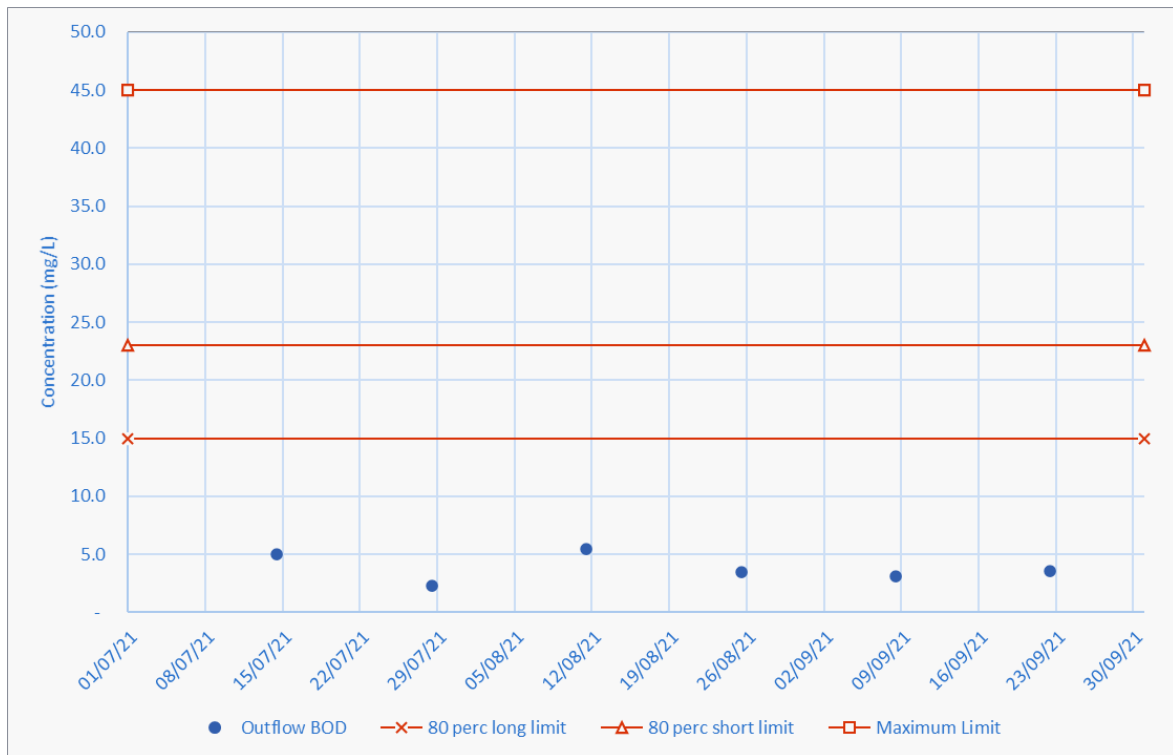


**Fig 21. Mossman WWTP Final Effluent Test Results for Total Phosphorous**

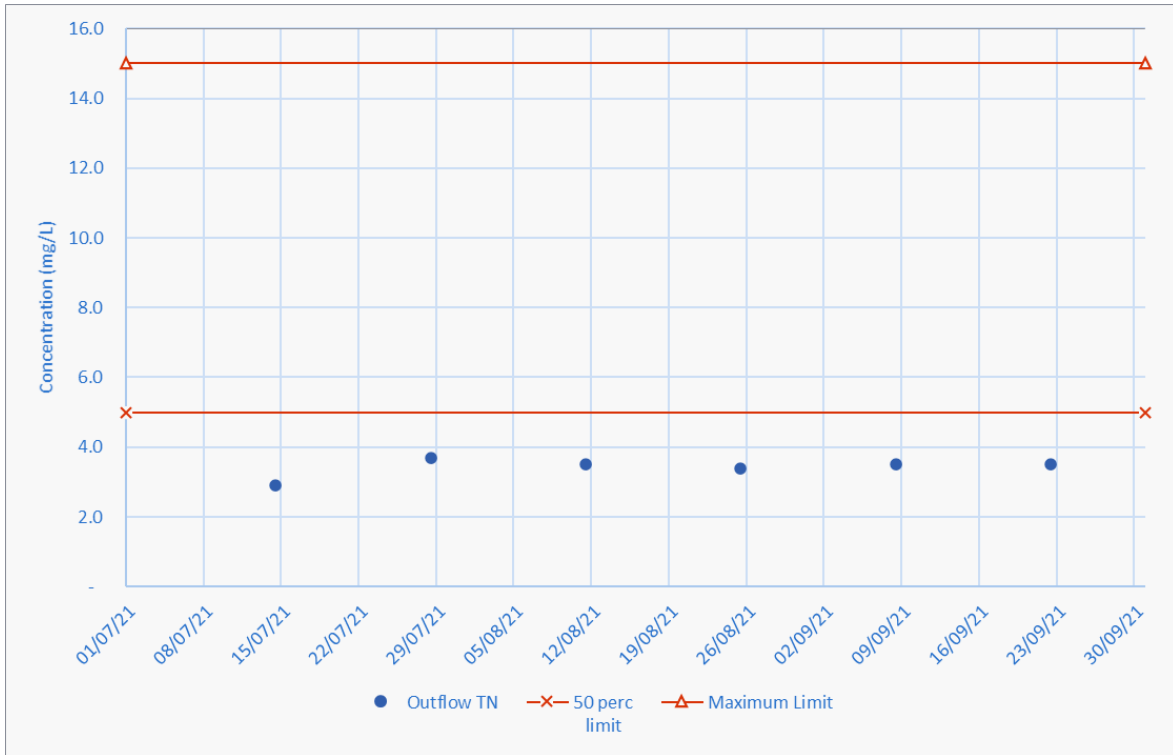




**Fig 22. Mossman WWTP Final Effluent Test Results for Total Suspended Solids**



**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**