

ORDINARY MEETING 20 JANUARY 2015	5.6
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QUARTERLY WATER AND WASTEWATER REPORT

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RECOMMENDATION:

It is recommended that the Quarterly Report of the Water and Wastewater branch for the period ending 31 December 2014 be received and noted.

EXECUTIVE SUMMARY:

This report documents progress on key operational and service delivery areas as well as Regulatory compliance status within the Water and Wastewater Branch for the period October to December, 2014.

Whilst the results are generally positive the areas for improvement are noted and will be the focus of the branch over the next quarter. Notable capital improvements include the completion of the upgraded Syndicate Road water main, installation of a stainless steel lining in the water race at Rex Creek Intake and the completion of the sewer relining and manhole projects.

Rex Creek Water Intake Upgrade (before and after)



Syndicate Road Water Mains Upgrade

Link to YouTube Video - <https://www.youtube.com/watch?v=EUM1RnfWLK0>

BACKGROUND:

This report is the 2nd Quarterly Report submitted by the Water and Wastewater Branch. This report highlights progress against key performance areas required by the Department of Energy and Water Supply and required compliance levels by the Department of Environment and Heritage Protection.

COMMENT:

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

The second 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.

CORPORATE/OPERATIONAL PLAN, POLICY REFERENCE:**Theme 5 Governance, Goal 2:**

To demonstrate leadership in local government through sound, transparent, accountable and equitable decision making.

Operational Plan: Water and Waste

Meeting compliance with statutory requirements and licence conditions.

Supplying drinking water and recycled water that meets customer quality requirements and agreed service standards.

Maintaining Council's Water and Waste assets to ensure maximum lifespan and output capacity in the lifecycle of those assets.

Monitoring of systems, procedures and workplace environments to ensure equipment, plant and machinery is safe to operate and work processes comply with workplace health and safety legislation and standards.

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:

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Information Provider	Advocate	Facilitator	Agent	Part Funder	Asset Owner
					<input checked="" type="checkbox"/>
					Fully Responsible
					<input checked="" type="checkbox"/>
					Regulator

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 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.

INTERNAL/EXTERNAL CONSULTATION:

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 Heritage Protection.

ATTACHMENTS:

Water and Wastewater Quarterly Report for the period ending 31 December 2014

**Attachment 1 - Water and Wastewater Quarterly Report
1 October 2014 - 31 December 2014**

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 Branch.

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

This report highlights certain aspects of the activities of the Water and Wastewater branch that are generally industry benchmark indicators as well as key performance areas and compliance monitoring parameters as required by the Department Energy Water Supply and the Department of Environment and Heritage Protection.

Water

1. Water reticulation services

General maintenance was carried out on all schemes this quarter including intake maintenance and cleaning/flushing of dead end mains. Hydrant maintenance and painting of sluice valves have been continuing in all locations throughout the Shire.

Table 1 Water Reticulation Services

Douglas Shire Reticulation (all schemes)	
Settlement meter reads	119
Water billing re-reads	36
New water services connections	15
Service repairs	117
Water mains repairs	5
Callouts and breaks	25

The Water Reticulation team also completed two major water reticulation capital projects during this period:

- Installation of a stainless steel lining of the water race at Rex Creek Intake. Timing in this project was critical in terms of levels in Creek and ability of plant to recover when water intake was blocked off during installation. All major works are now completed with minor works to be finalised. This has resulted in increased flows from the creek into the trunk mains which feed the Mossman Water Treatment Plant.
- The upgrade of the Syndicate Road mains was completed on the 19th of December 2014 and will secure water supply to this area for many years to come. A total of 3.5km of 100mm main installed and include twelve new service connections, five new hydrants and four new sluice valves.

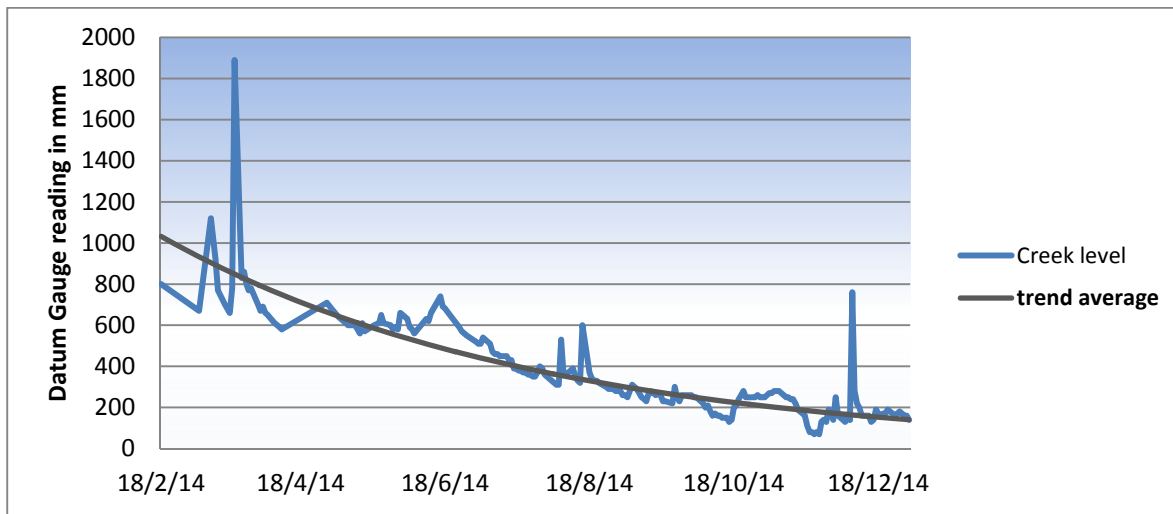
2. Water schemes and potable water consumption

Mossman/Port Douglas Schemes

Rex Creek intake level had adequate capacity to meet maximum extraction flows of 200L/s.

Council introduced Level 2 Water Restrictions throughout the Douglas Shire on the 7th of November 2014, as water reserves reached a critical level (See Creek level in Fig 1). Since the implementation of Level 2 Water Restrictions, water consumption in Port Douglas and Mossman dropped by an average of 34%. This equates to a saving of about five ML per day. The implementation of water restrictions allowed Water and Wastewater to meet consumer demand and maintain adequate storage capacity within licence conditions during the prolonged dry period.

Fig 1. Rex Creek Intake Level



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

Fig 3 shows the daily water consumption in Mossman, Cooya Beach and Newell Beach areas during December.

Fig 2. Mossman Scheme Monthly Consumption figures

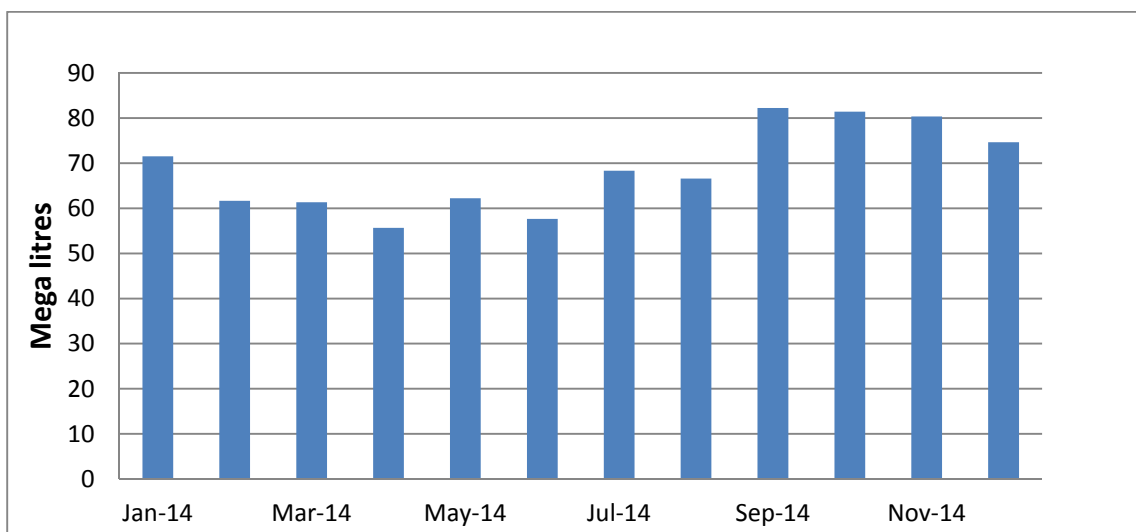
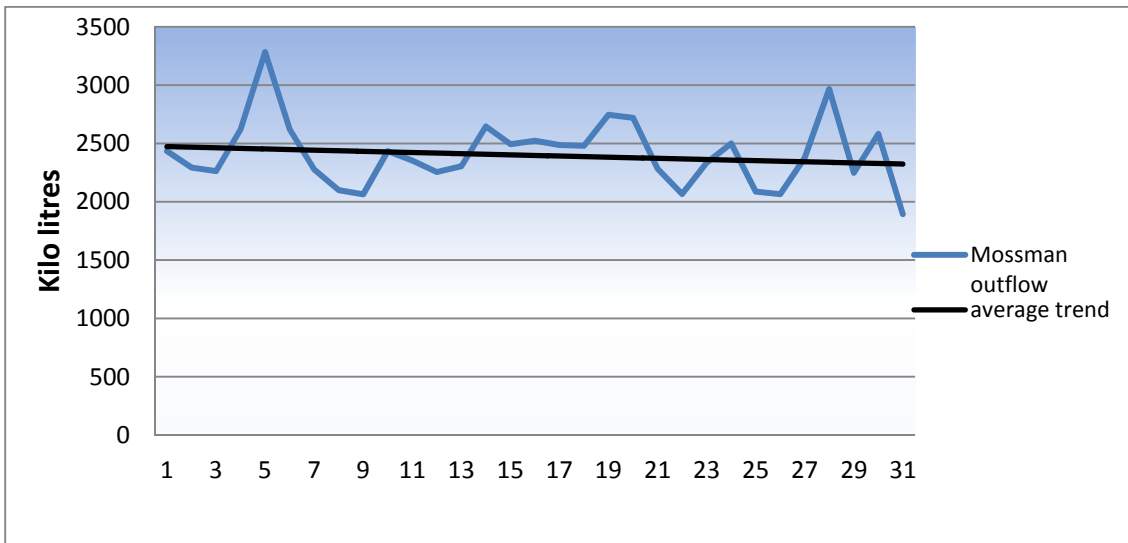


Fig 3. Mossman Scheme Daily Consumption during December



Mossman/Port Douglas Schemes

The total monthly consumption of water in Port Douglas can be seen in Fig 4.

Fig 5 shows the daily water consumption in the Port Douglas scheme during December.

Fig 4. Port Douglas Scheme Monthly Consumption figures

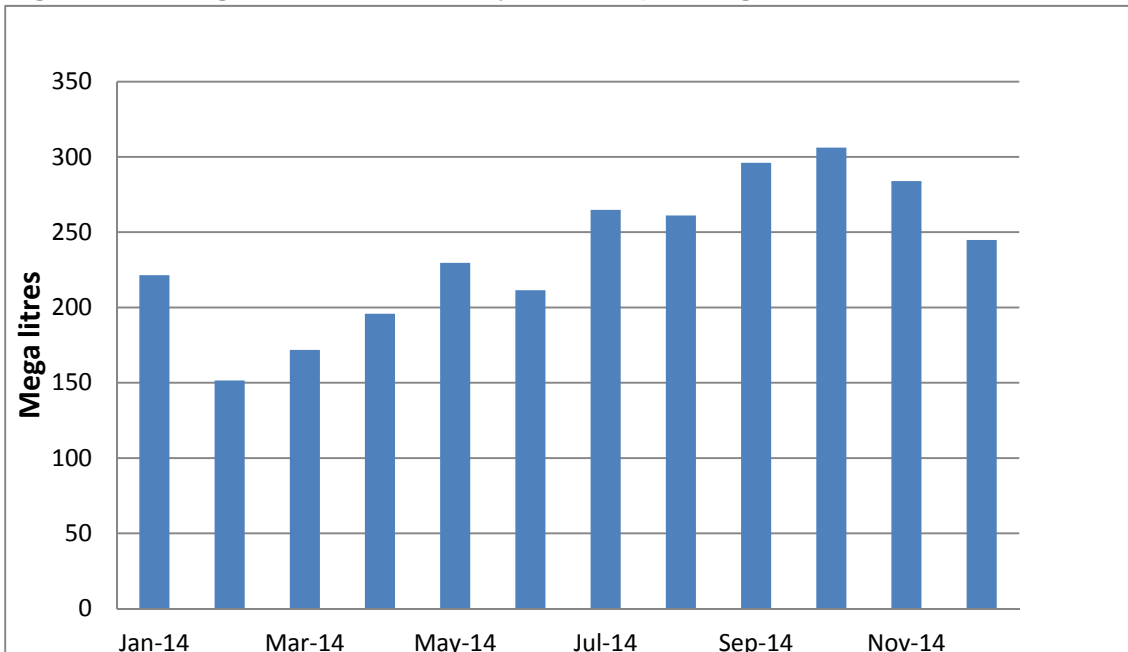
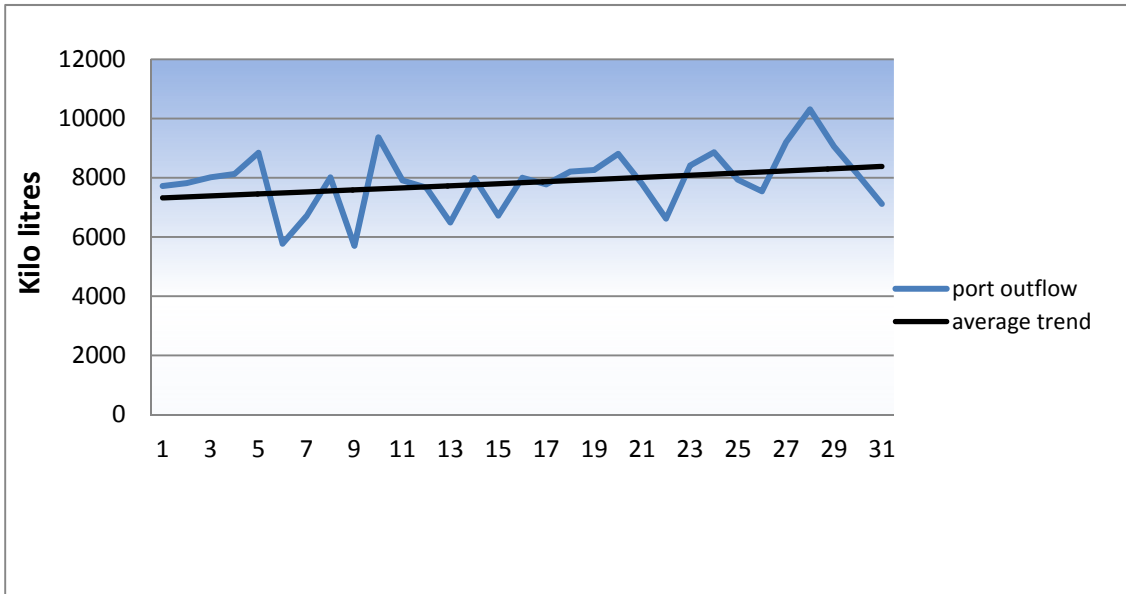


Fig 5. Port Douglas Scheme Daily Consumption during December



Whyanbeel Scheme

Whyanbeel plant is operating and meeting demand. Intake levels at Little Falls Creek have increased with rains and are adequate for full plant production capacity.

From October 2014 to December 2014 the total consumption for the Whyanbeel scheme has decreased by 7.33ML (20.8%).

The total monthly consumption of water in the Whyanbeel Scheme can be seen in Fig 6 and Fig 7 shows the daily water consumption in the Whyanbeel Scheme during December.

Fig 6. Whyanbeel Scheme Monthly Consumption figures

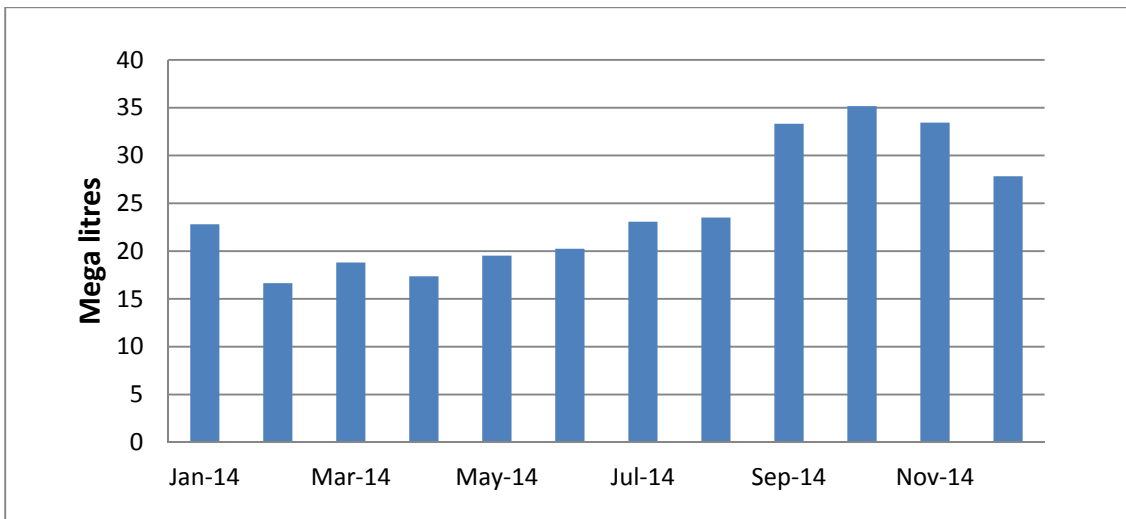
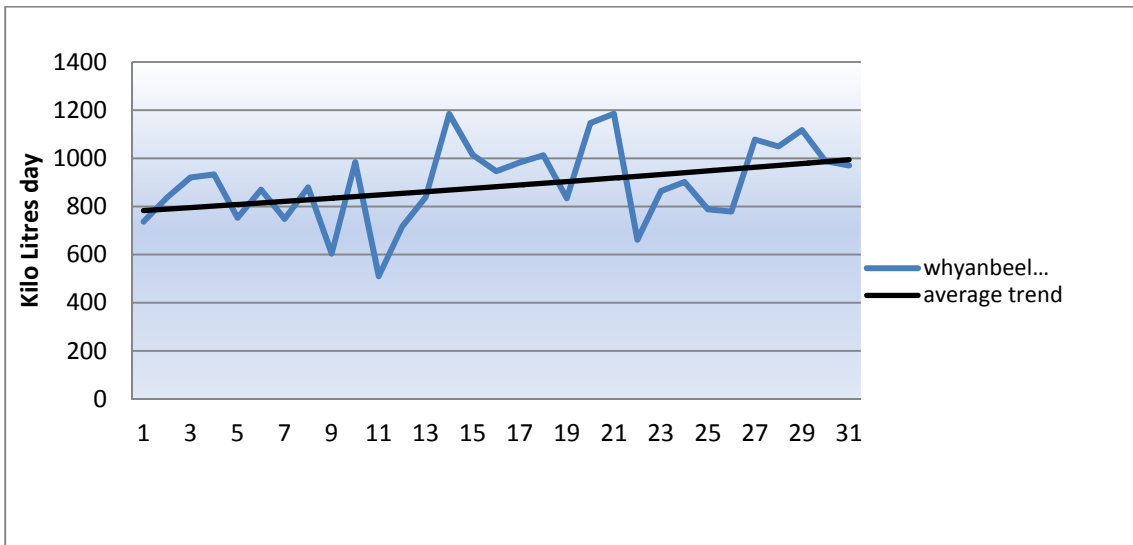


Fig 7. Whyanbeel Daily Consumption during December



Daintree Scheme

Daintree plant is operating and meeting demand. Intake levels at Intake Creek were reduced but still adequate for full plant production capacity. Consumption for this scheme fluctuated with a total consumption of 3.919 ML during this quarter.

The total monthly consumption of water in the Daintree Scheme can be seen in Fig 8 and Fig 9 shows the daily water consumption in the Daintree Scheme during December.

Fig 8. Daintree Scheme Monthly Consumption figures

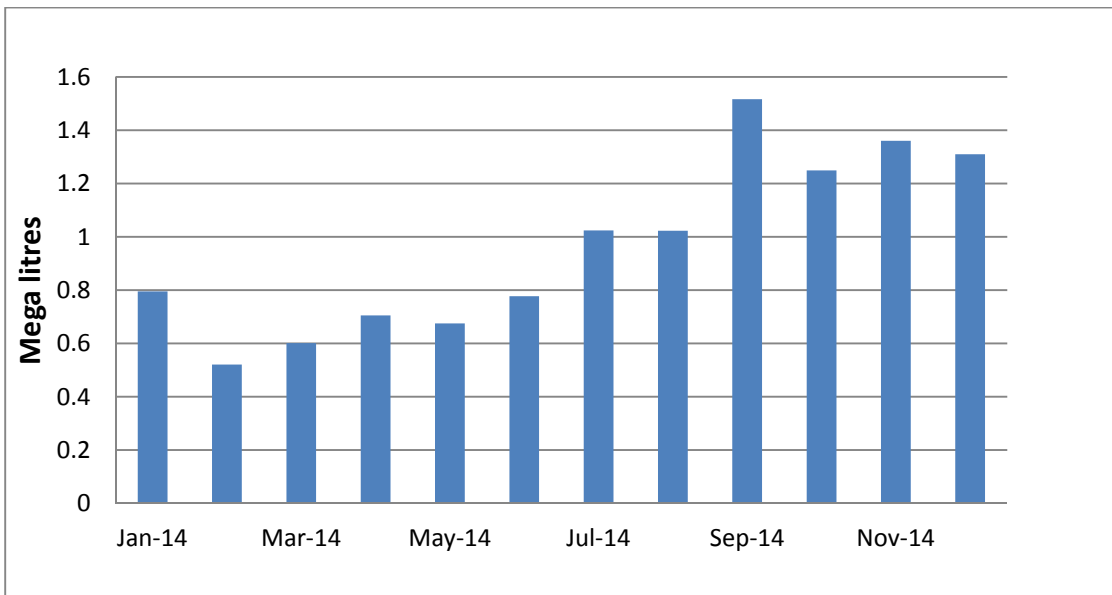
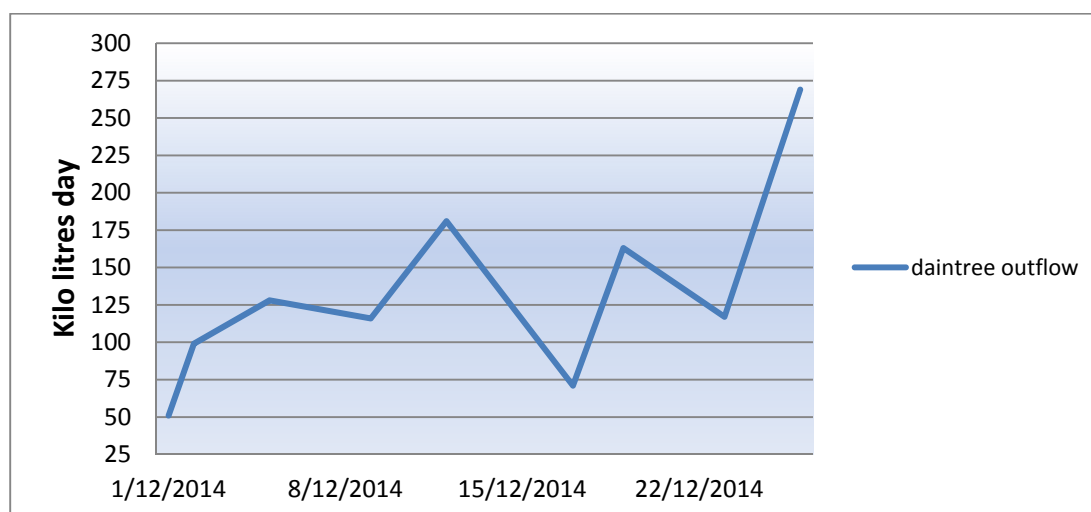


Fig 9. Daintree Daily Consumption during December

3. Water quality monitoring and results

Drinking water is sampled at intakes, reservoirs, treatment plants and in the reticulation network to ensure compliance with the Australian Drinking Water Guideline (ADWG). For the period 1 October to 31 December 2014, a total of 315 water samples were taken in the 4 water supply schemes. A total of 240 samples were tested in the Douglas Water Laboratory and 75 samples were tested by a NATA accredited laboratory for physical, chemical and microbiological parameters. Of these 315 water samples, 182 samples were taken from the public reticulation network, 39 at reservoirs and 91 were samples taken at the treatment process.

All tested parameters in water samples taken during the reporting period were compliant with ADW Guidelines.

Average monthly values for key operational and compliance parameters can be seen in Table 2, 3 and 4 for treated water at the Mossman, Whyanbeel and Daintree treatment plants. The water quality at the treatment plants is indicative of water quality throughout the reticulation system in the Shire. Figures 10, 11 and 12 indicate the daily turbidity trends at the intakes and treated water as recorded at the Mossman, Whyanbeel and Daintree water treatment plants for the period October to December. The raw water turbidity is normally low and very stable during the dry season. During the end of November and early December, Whyanbeel, Mossman and Port Douglas in particular received very welcome and significant rainfalls and consequently led to a small variation in the raw water turbidity.

Table 2. Average monthly values for key operational and compliance parameters in treated water at Mossman treatment plant.

Month	pH	Temp °C	Total Alkalinity mg CaCO ₃ /L	Free chlorine mg/L	Total chlorine mg/L	<i>E.coli</i> CFU/100ml	HPC CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
October 2014	7.10	20.1	5.8	0.85	0.89	<1	<1	<1
November 2014	7.20	21.0	6.0	0.95	1.00	<1	<1	<1
December 2014	7.50	22.0	7.0	0.90	0.95	<1	<1	<1

Fig 10. Turbidity trends at the Rex Creek intake and treated water at the Mossman WTP

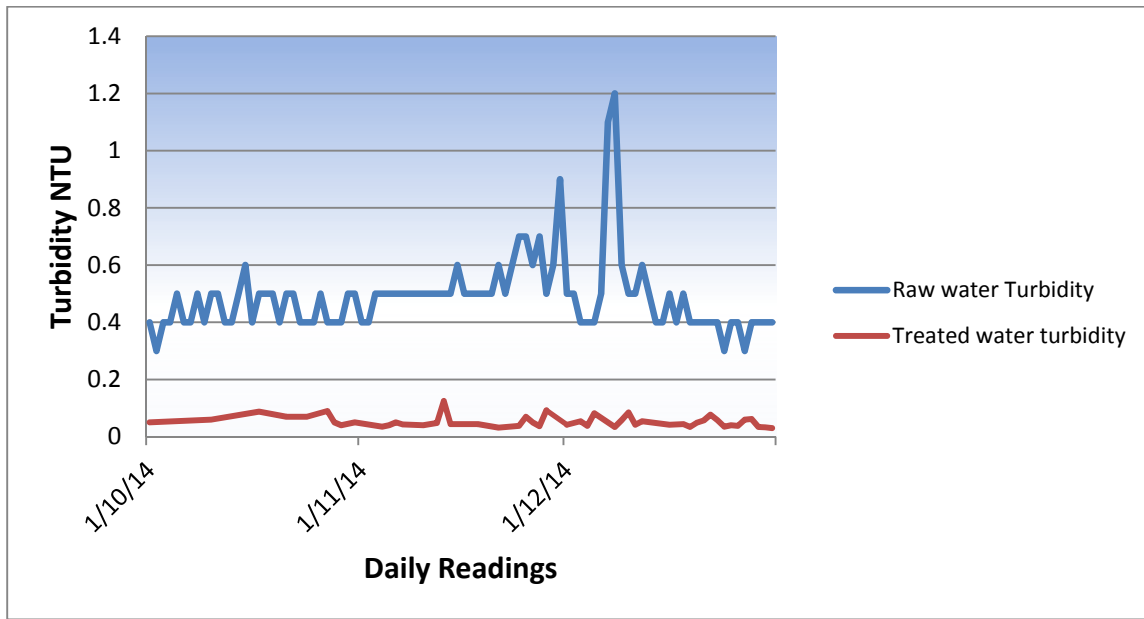


Table 3. Average monthly values for key operational and compliance parameters in treated water at Whyanbeel treatment plant.

Month	pH	Temp °C	Total Alkalinity mg CaCO ₃ /L	Free chlorine mg/L	Total chlorine mg/L	<i>E.coli</i> CFU/100ml	HPC CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
October 2014	6.9	20.0	4.10	0.80	0.90	<1	<1	<1
November 2014	6.9	22.0	5.0	0.97	1.00	<1	<1	<1
December 2014	7.0	24.0	6.0	0.97	1.05	<1	<1	<1

Fig 11. Turbidity trends at the Little Falls Creek intake and treated water at the Whyanbeel WTP

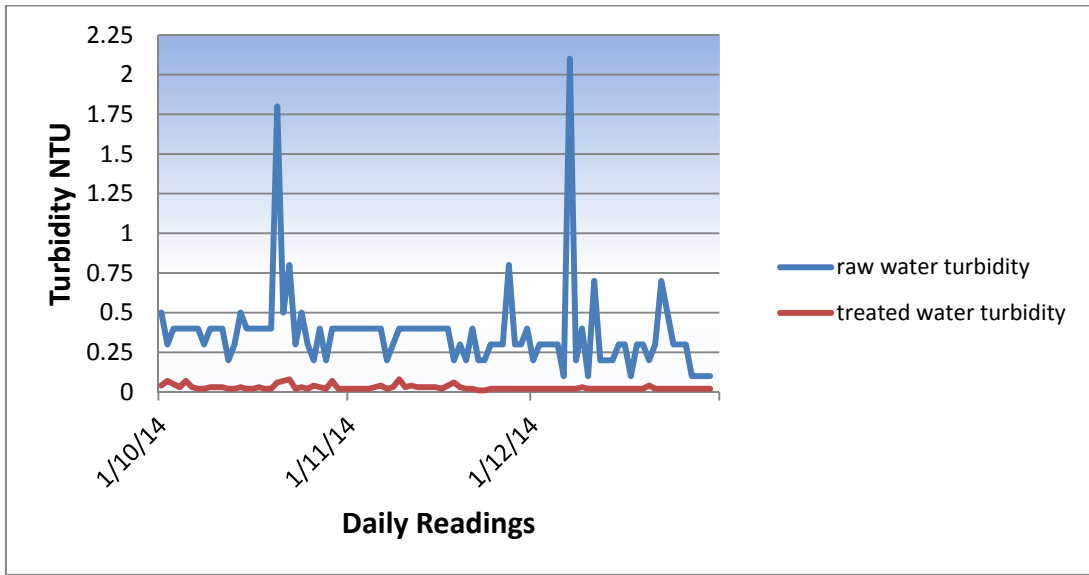
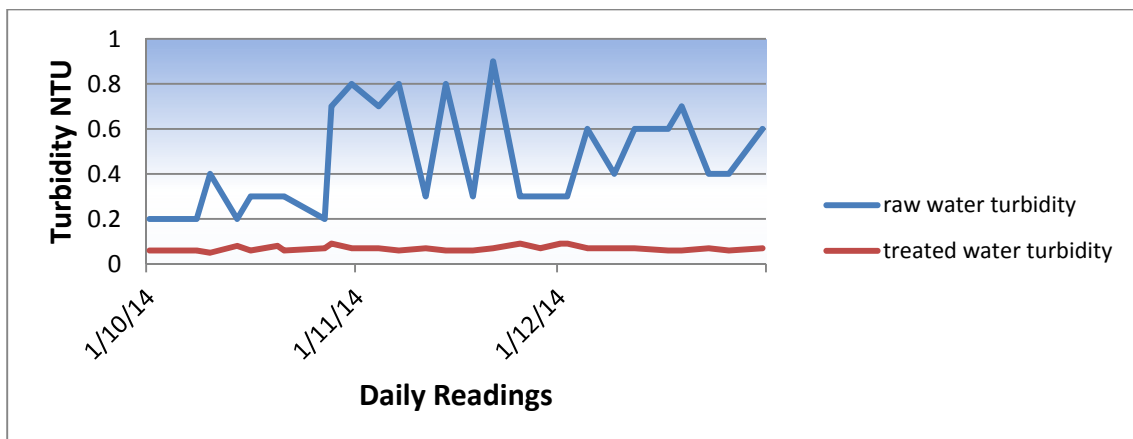


Table 4. Average monthly values for key operational and compliance parameters in treated water at Daintree treatment plant.

Month	pH	Temp °C	Total Alkalinity mg CaCO ₃ /L	Free chlorine mg/L	Total chlorine mg/L	<i>E.coli</i> CFU/100ml	HPC CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
October 2014	7.6	24	17	0.37	0.41	<1	<1	<1
November 2014	7.7	25	20	0.40	0.43	<1	<1	<1
December 2014	7.7	27	20	0.39	0.50	<1	<1	<1

Fig 12. Turbidity trends at the Intake/Martin Creek intake and treated water at the Daintree WTP



Wastewater

4. Wastewater Reticulation Services

General maintenance was carried out at all 31 sewage pump stations and reticulation networks in the Mossman and Port Douglas catchments. The sewer relining and manhole projects have been completed. A total of 1550 meters of 225mm and 150mm sewers were relined in Sorrento Crescent, Seabrook Avenue, Solander Boulevard, Wharf Street (Port Douglas) and in Pringle Street, Alchera Drive, Johnston Road (Mossman). Six sewer pump stations were successfully upgraded.

Table 5. Wastewater Reticulation Services

	Port Douglas Catchment	Mossman Catchment
Pump Blockages	4	2
Sewer Chokes	2	0
Sewer Main Breaks	1	0
HCB Repairs (House Connection Branch)	5	2
Odour Complaints	3	2

Odour complaints:

- Odour complaint at Unit 28 Port Haven, Port Douglas; Vent cap installed at Sewer Pump Station 4E.
- Odour complaint at 1 Ti Tree street, Port Douglas; The resident at this property can smell Port Douglas sewer plant on regular occasions, usually night time when the different cycles commence aerating. The Wastewater Team leader is currently investigating the possibility with Odour Technologies for installing (in April) an “odour warrior” on trial basis. This technology is used widely to improve the atmosphere adjoining a number of pump stations and treatment plants.
- Odour complaint 104 St Crispins, Port Douglas; Wastewater staff investigated the sewer on this property, sewer system was all working and functioning as per normal. No other source could be positively identified. The investigation is still ongoing.
- Odour complaint at Demi View Motel, Mossman; Sewer inspected and in order. Smell could be coming from floor drains as they are drying out.
- Odour complaint 2-4 Alchera Drive, Mossman, opposite Sewer Pump Station MB; Lids sealed at pump station and arrangements have been made for contractor to smoke test sewer system early in January 2015.

Environmental incident:

Environmental incident at 8 Macrossan Street, Port Douglas; This incident occurred on 26 November 2014. The cause of this incident was a broken house connection branch (HCB). Tree roots had damaged the sewer HCB, the mass of tree roots had blocked the sewer completely and consequently led to sewage discharged to the environment when the upstream manhole lid was lifted during the initial investigation. The 500 litres sewage spill was reported to EHP and cleaned according to prescribed procedures. The sewer and HCB were repaired.

5. Influent and Irrigation Flows

Port Douglas WWTP

A total of 238,198 kL of influent entered the Port Douglas wastewater plant during the reporting period. The average daily flow was 2,589 kL/d. Tanker truck contractors delivered 500 kL of septage to the plant. Influent is treated in a Sequencing Batch Reactor (SBR) and produced compliant effluent during the reporting period. A total of 75% of the treated effluent was pumped to two resorts and the remaining discharged in the Dickson Inlet. The Sheraton Mirage received 96,903 kL and Reef Links received 82,834 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 146 mm. Daily SBR flows and total monthly flows for 2014 are presented in Fig 13 and 14 respectively.

Fig 13. Port Douglas SBR Daily Flow

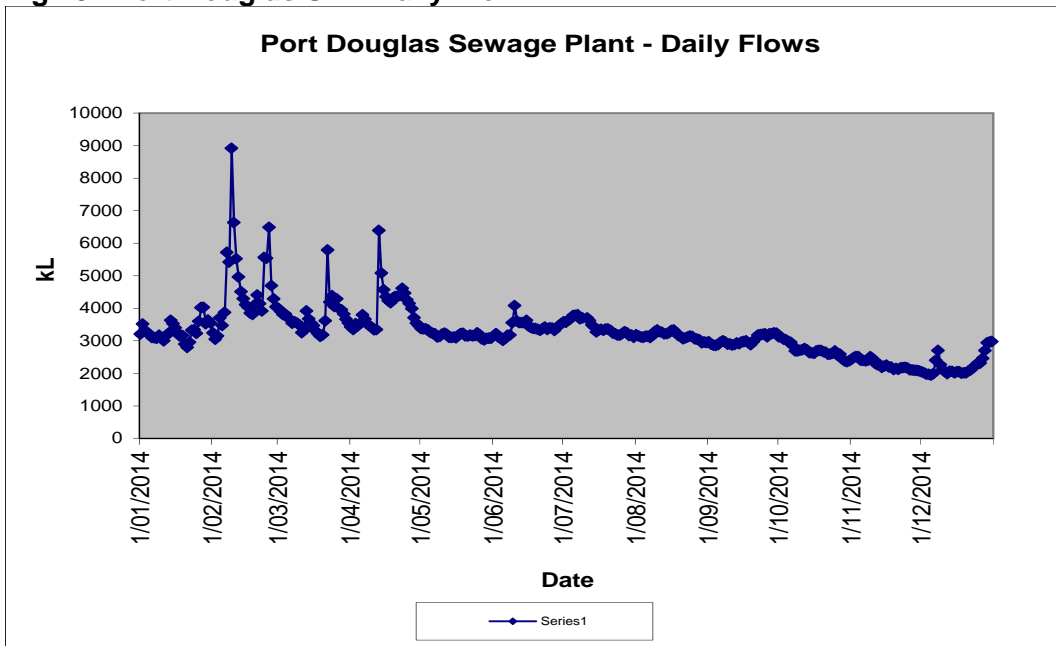
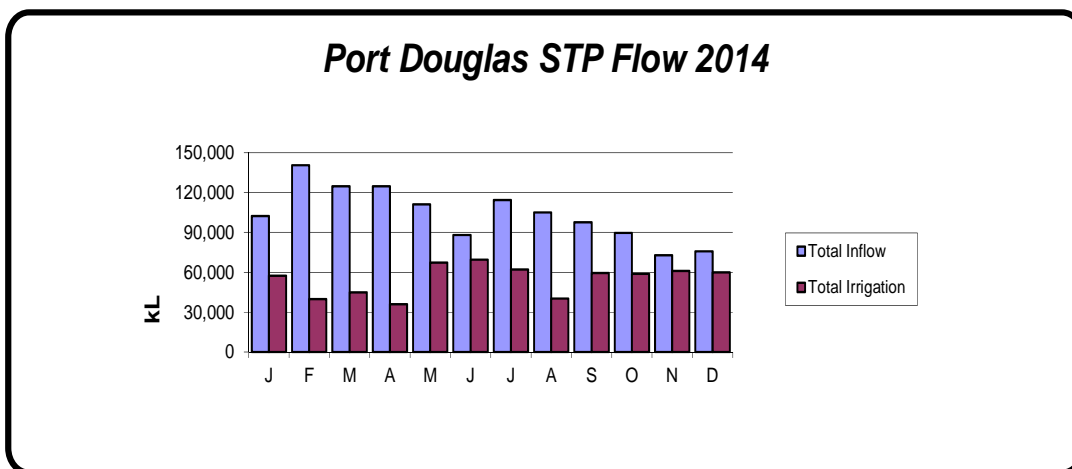


Fig 14. Port Douglas Total Monthly Flow



Mossman WWTP

The Mossman wastewater plant received a total influent flow of 56,315 kL during the reporting period. The average daily flow was 612 kL/d. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged in the Mossman River. Total rainfall on site during the reporting period was measured as 164 mm. Daily flows from the Mossman treatment plant and total monthly flows for 2014 are presented in Fig 15 and 16 respectively.

Fig 15. Mossman wastewater treatment plant Daily Flow

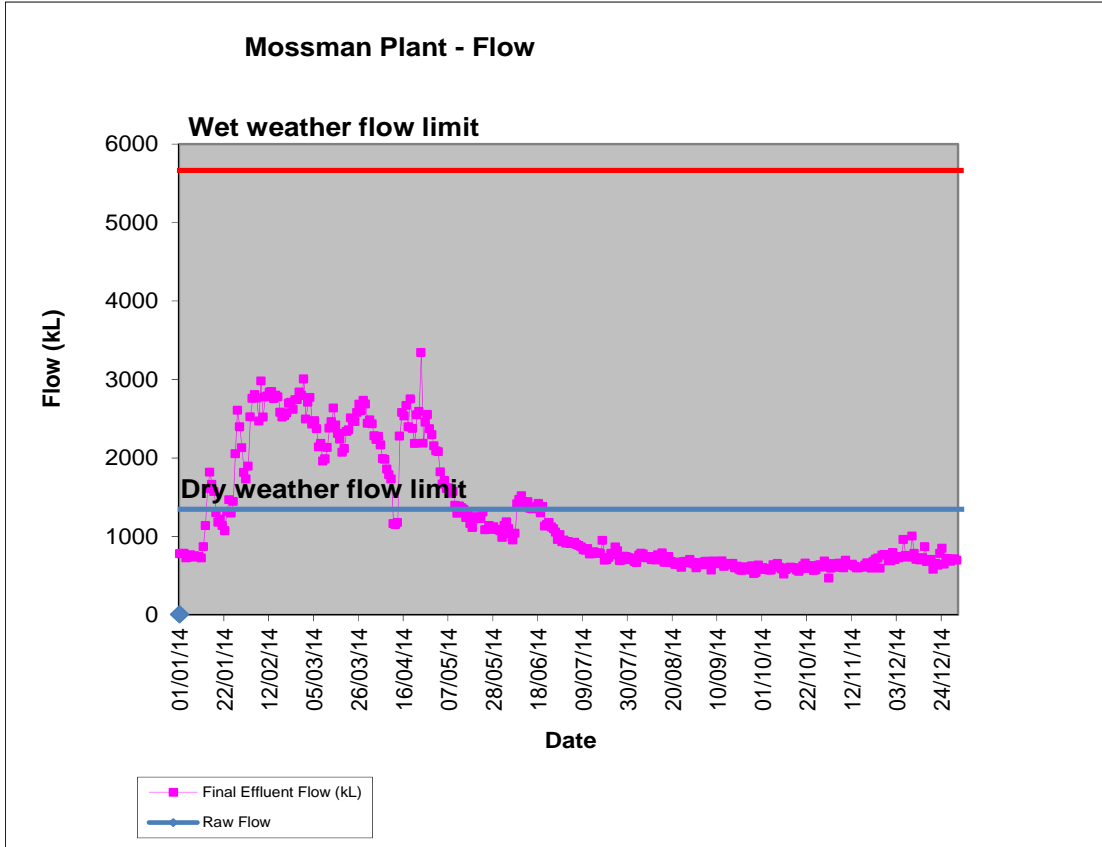
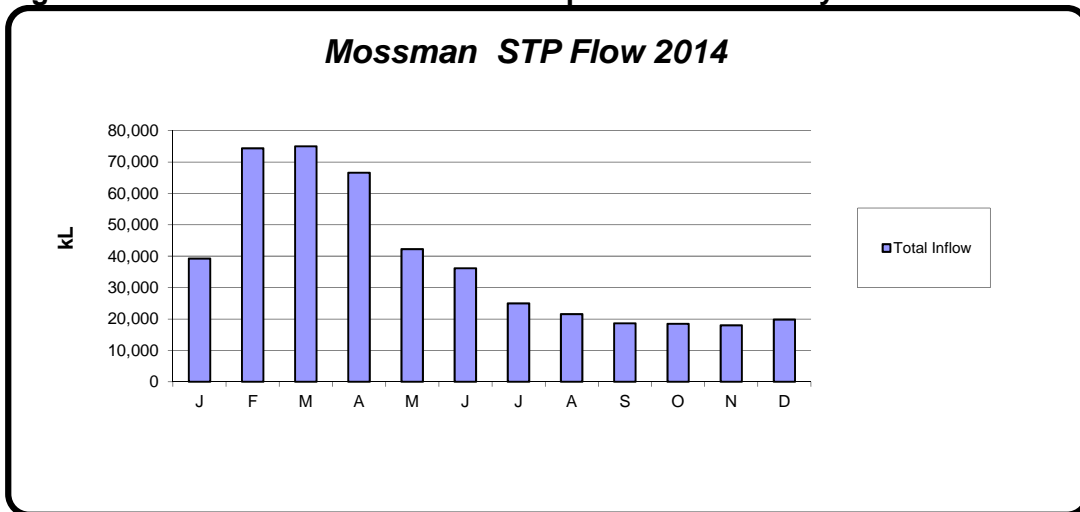


Fig 16. Mossman wastewater treatment plant Total Monthly Flow



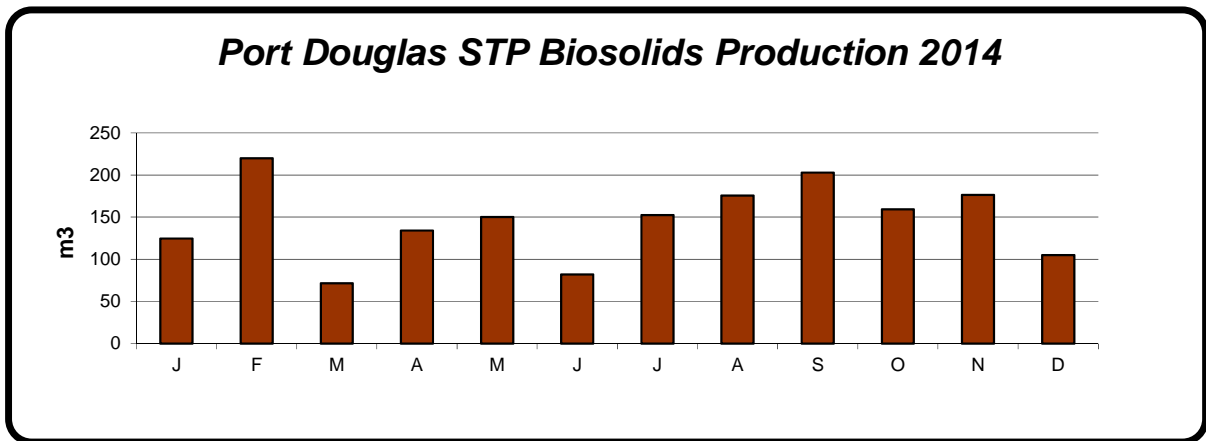
6. Bio-solids Production

Bio-solids were produced at the dewatering plants at Mossman WWTP (18% solids) and Port Douglas WWTP (14% 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 WWTP

At Port Douglas WWTP 61.66 dry tons (440.44m³) of bio-solids were produced during the reporting period. The monthly bio-solids production trends can be seen in Fig 17.

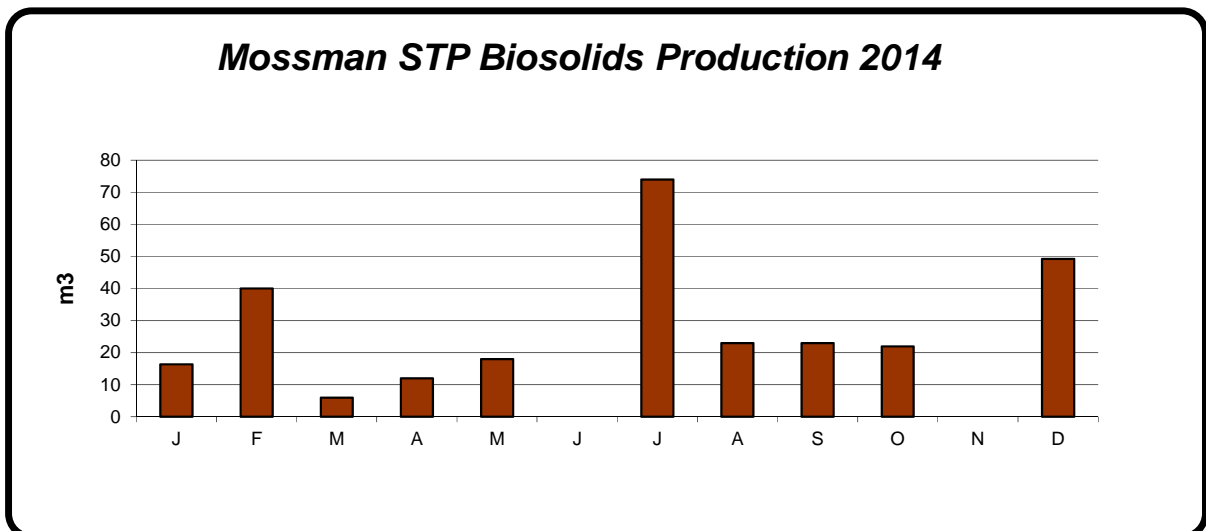
Fig 17. Port Douglas wastewater treatment plant monthly bio-solids production.



Mossman WWTP

At Mossman WWTP 9.9 dry tons (71.2m³) of bio-solids were produced during the reporting period. The monthly bio-solids production trends can be seen in Fig 18.

Fig 18. Mossman wastewater treatment plant monthly bio-solids production.



7. Effluent Quality and Compliance

During the reporting period a total number of 168 wastewater compliance samples were taken from the treatment processes, bio-solids, final effluent, receiving waters and bores in both wastewater catchments. Samples were tested by a NATA accredited laboratory for physical, chemical and microbiological parameters.

All parameters tested in the Port Douglas and Mossman catchment were compliant with licence conditions during the reporting period.

The process and compliance is monitored each day by in-house analyses of samples at the 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 WWTP

The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, Total Suspended Solids & BOD) are shown in Fig 19, 20, 21 & 22.

Fig 19. Port Douglas WWTP Final Effluent Test Results for Ammonia

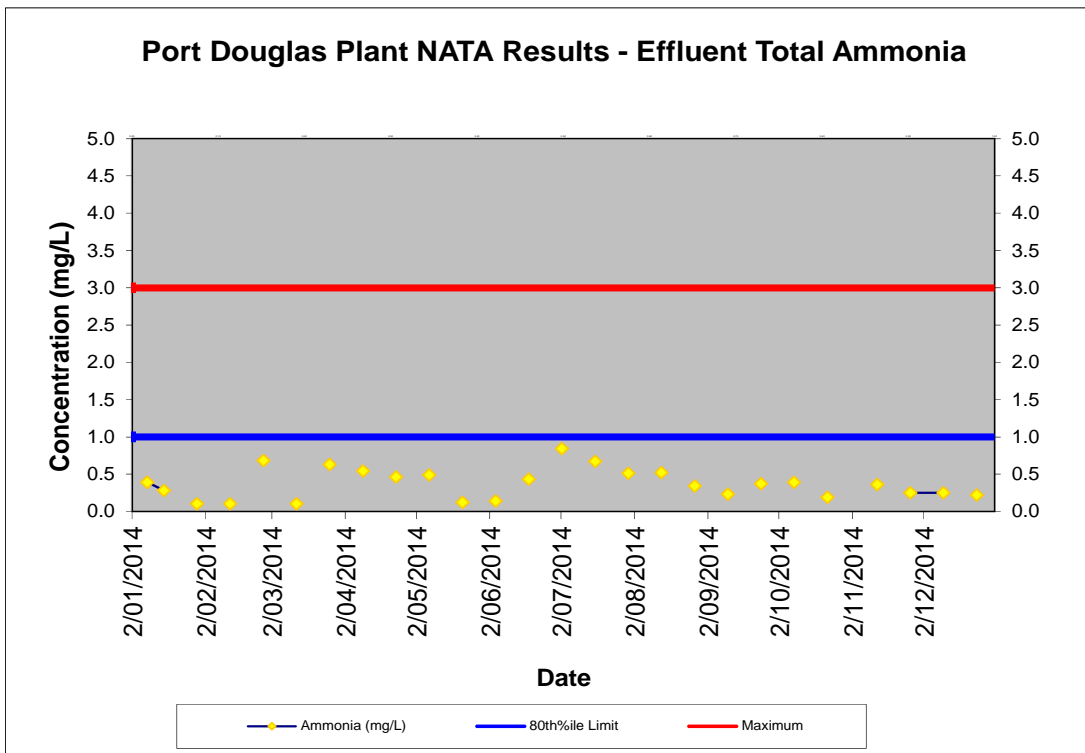


Fig 20. Port Douglas WWTP Final Effluent Test Results for Total Phosphorous

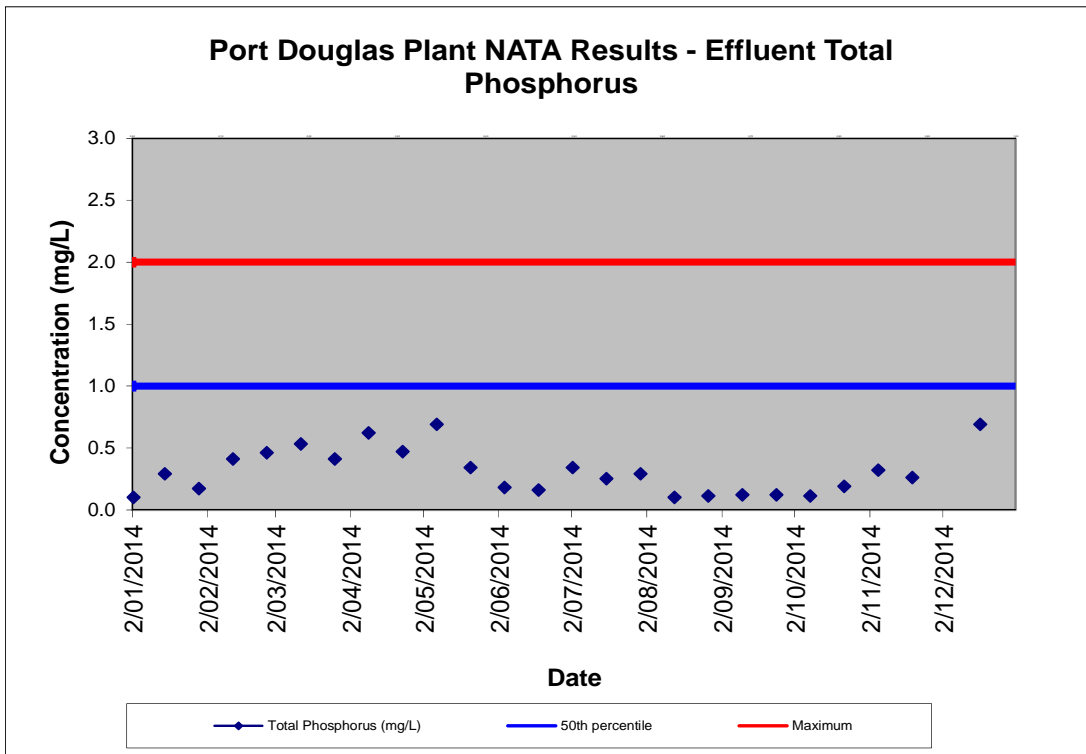


Fig 21. Port Douglas WWTP Final Effluent Test Results for Total Suspended Solids

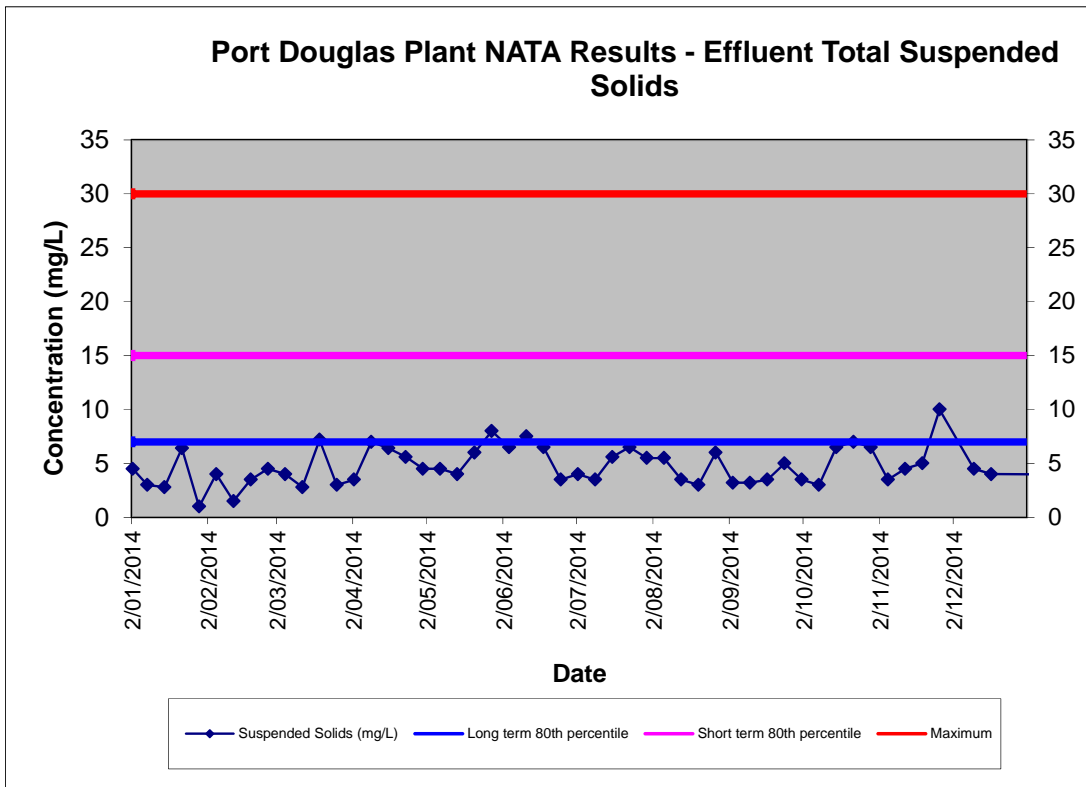
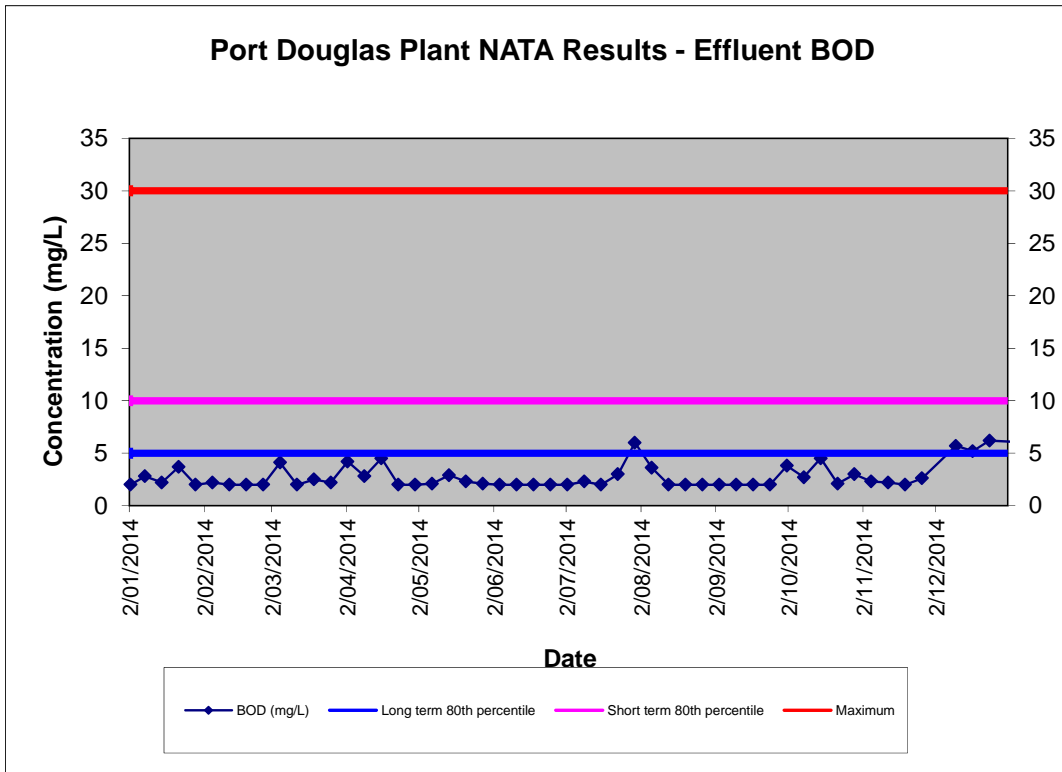


Fig. 22 Port Douglas WWTP Final Effluent Test Results for BOD₅ (Biochemical Oxygen Demand)



Mossman WWTP

The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, Total Suspended Solids & BOD) are shown in Figures 23, 24, 25 & 26.

Fig. 23 Mossman WWTP Final Effluent Test Results for Ammonia

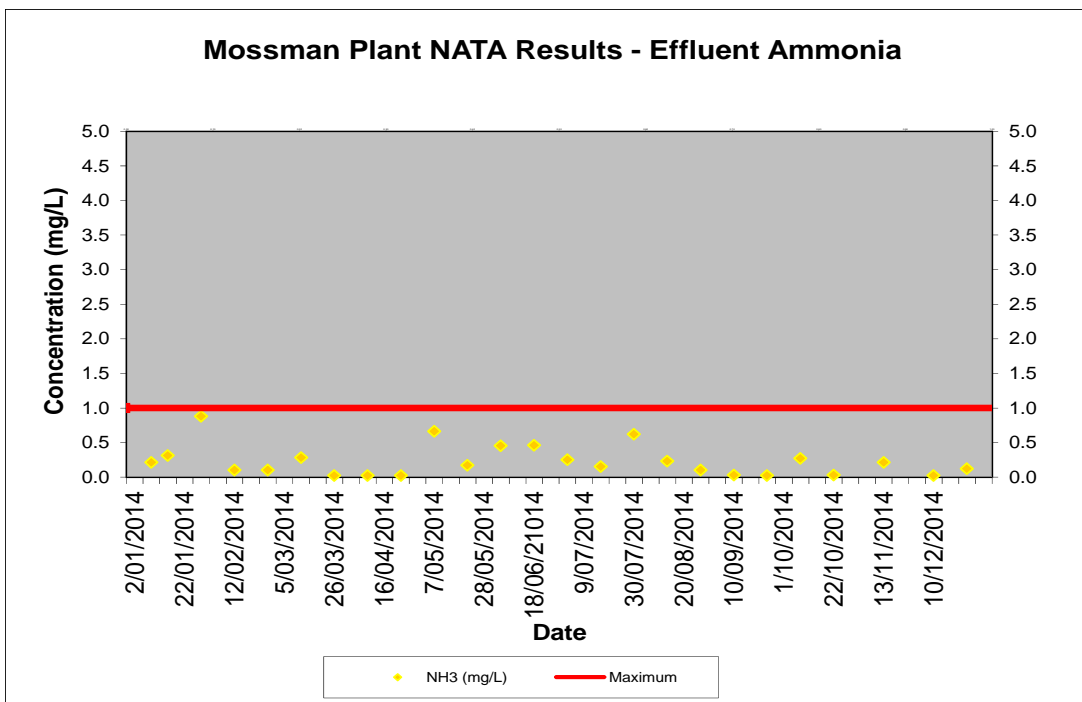


Fig. 24 Mossman WWTP Final Effluent Test Results for Total Phosphorous

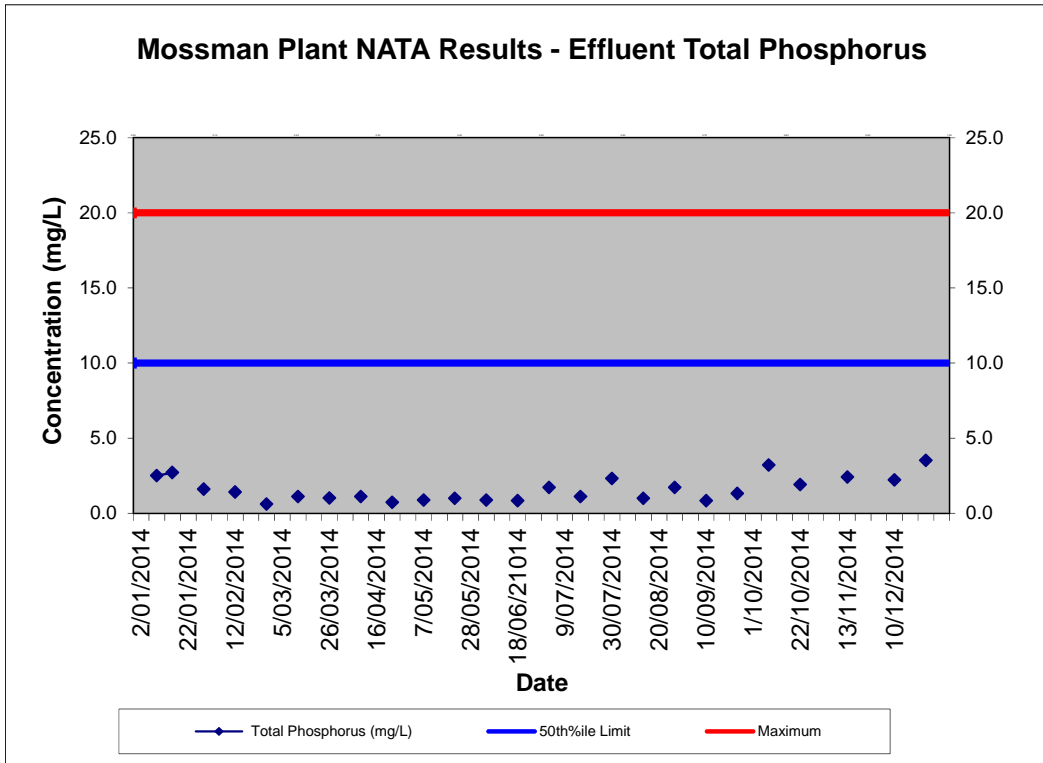


Fig. 25 Mossman WWTP Final Effluent Test Results for Total Suspended Solids

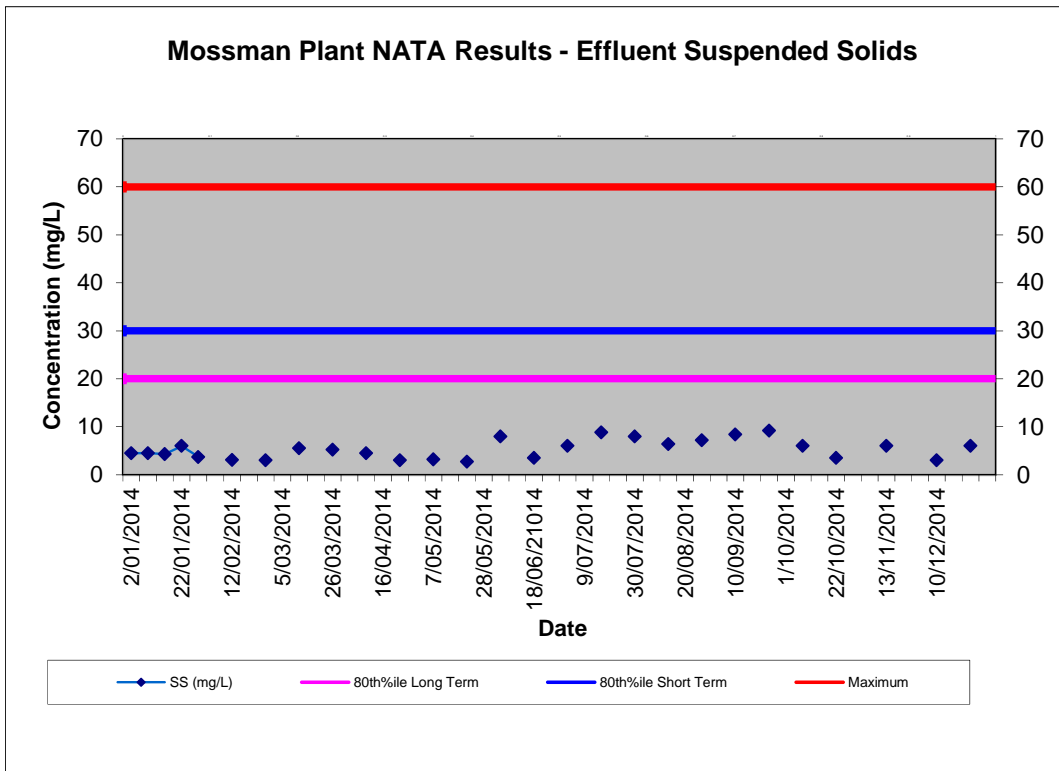
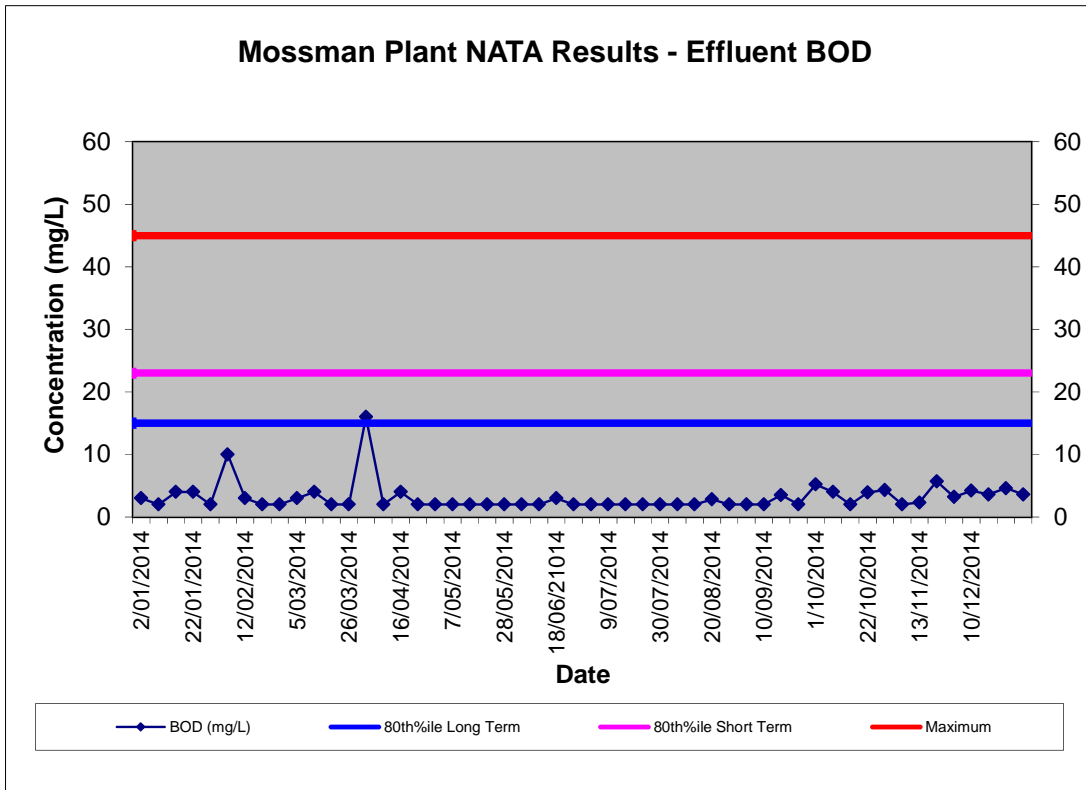


Fig. 26 Mossman WWTP Final Effluent Test Results for BOD₅ (Biochemical Oxygen Demand)



8. Liquid Trade Waste

Liquid waste generated by industry, small business and commercial enterprises is referred to as Trade Waste and this function was transferred to Water and Wastewater in October 2014.

All trade waste discharges to sewer infrastructure are required to meet Council’s sewer admission limits according to the Water Supply (Safety and Reliability) Act. Trade Waste customers are divided in three categories (See Table 6) based on discharge quality and volume for the purposes of a trade waste approval and charging.

Table 6. Douglas Shire Council Trade Waste Categories

Parameter	Category 1 low strength/low volume	Category 2 low strength / high volume	Category 3 high strength/ any volume
Biochemical Oxygen Demand (BOD ₅), mg/L	< 600	< 600	>600
Chemical Oxygen Demand (COD), mg/L	< 1200	< 1200	> 1200
Suspended Solids, mg/L	< 600	< 600	> 600
Total Kjeldahl Nitrogen, mg/L N	< 150	< 150	> 150
Total Phosphorus, mg/L P	< 50	< 50	> 50
Volume, kL/annum	< 500	> 500	Any
Trade waste approval	Permit/Approval	Permit/Approval	Agreement

Douglas Shire Council currently manages 144 Trade Waste customers representing 27 business types. The total volume of trade waste received at DSC WWTP's was estimated as 87 ML/annum. A preliminary analysis of the current available customer data can be seen in Table 7.

Table 7. Douglas Shire Council Trade Waste Producer numbers according to catchment and Trade Waste Categories in relation to the types of trade waste businesses.

Total Trade Waste Customers in Douglas Shire									
144									
Types of Trade Waste businesses	Port Douglas	Cat 1	Cat 2	Cat 3	Mossman	Cat 1	Cat 2	Cat 3	
Take Aways	11	11			6	6			
Restaurant	37	34	3		4	4			
Food Processing with Grease	1	1							
Cafe	9	9			4	4			
Commercial Laundry	2	2							
Resort	8	7	1						
Hairdresser	4	4			4	4			
Bakery	2	2			1	1			
Dental	1	1			1	1			
Butcher	1	1			2	2			
Caravan Park	2	2			1	1			
Hotel	3	3			1	1			
Mechanical	2	1	1		7	7			
Veterinary					1	1			
Laundry					1	1			
Supermarket	3	3							
Vehicle Washing	5	4	1		3	2	1		
School	1	1			2	2			
Hospital					1		1		
Panel Beaters					1	1			
Hostel	1	1							
Service Station	1	1							
Catering	2	2							
Liquid Waste	1			1	3			3	
Function Centre	1	1			1	1			
Club					1		1		
Nursing Home	1		1						
Totals	99	91	7	1	45	39	3	3	

Water and Wastewater is currently in the process of reviewing permit conditions to ensure trade waste producers are well informed of their obligations when discharging into Council infrastructure. The monitoring of the trade waste producers is also a high priority and a Trade Waste Officer was employed early in 2014 to complement the existing Trade Waste Management system. More staff in Water and Wastewater will be trained in Trade Waste activities in the next quarter to ensure that the impact of trade waste discharges on Council Infrastructure are minimised.