ORDINARY MEETING 31 JULY 2015	5.6

QUARTERLY WATER AND WASTEWATER REPORT

Wouter van der Merwe: Manager Water and Wastewater #459948
Paul Hoye General Manager: Operations

RECOMMENDATION:

It is recommended that the Quarterly Report of the Water and Wastewater branch for the period ending 30 June 2015 be received and noted.

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 April to June, 2015.

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 sewer relining and the wastewater treatment process improvement actions to improve compliance with Council's Environmentally Relevant Authority. During this quarter the Mossman Reservoir at the Mossman Water Treatment Plant was re-commissioned. The additional 1.8 mega litres of treated water storage capacity improves assurance in relation to water supply security and will be invaluable at times of plant shutdown due to turbidity events in the Rex Creek intake.

BACKGROUND:

This report is the 4th 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 4th 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.

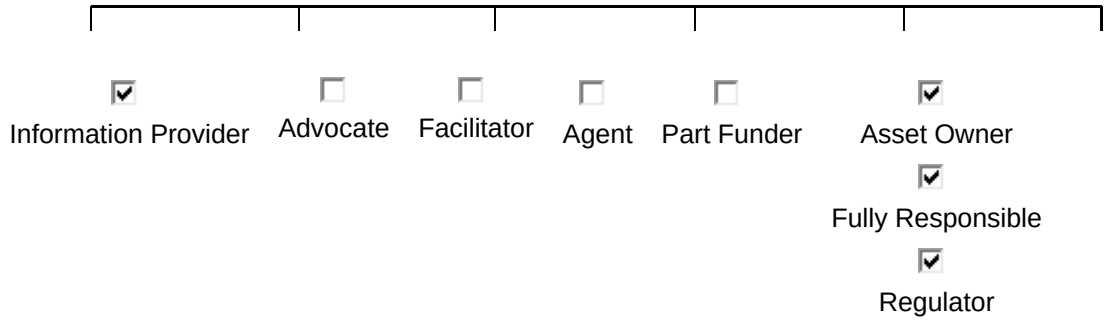
Maintaining Council's Water and Waste assets to ensure maximum lifespan and output capacity in the lifecycle of those assets.

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:



Information Provider:	Providing access to information to assist communities and organisations.
Asset Owner:	Meeting the responsibilities associated with owning or being the custodian of assets such as infrastructure.
Fully Responsible:	Funding the full cost of a program or activity.
Regulator:	Meeting the responsibilities associated with regulating activities through legislation or local law.

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.

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 30 June 2015.

Attachment 1 - Water and Wastewater Quarterly Report
1 April 2015 - 30 June 2015

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	53
New water services connections	9
Service repairs	80
Water mains repairs	4
Callouts and breaks	19
Water Quality Complaints	5
Flushing Events: Mossman/Port Douglas	2
Flushing Events: Whyanbeel/Wonga	2
Flushing Events: Cooya Beach	4
Flushing Events: Daintree	1

Table 2. Water Complaints

Address	CRM Number & Date	Nature of water complaint	How was it resolved	Response Time
5 Middlemiss St, Mossman	29/04/15	High Chlorine	Flushed area and service. Chlorine residual 0.72mg/l	1hr
Lot 91Bonnie Doon Rd, Bonnie Doon	CRM 8600 9/06/15	Smelly water	Flushed main and service. Chlorine residual 0.12mg/l	1hr
10 Cooya Beach Rd, Cooya Beach	CRM 8958 10/06/15	Cloudy water	Flushed area until clear. Chlorine residual 0.17mg/l	15 mins
48 Cooya Beach Rd, Cooya Beach	CRM 8960 11/06/15	Odour and taste	Flushed and took water sample. Chlorine residual 0.12mg/l	10mins
1 Palm St, Cooya Beach	CRM 8886 11/06/15	Cloudy water	Flushed whole area. Chlorine residual 0.16mg/l	15 mins
17 Allamander Cl, Cooya Beach	CRM 9254 18/06/15	Brown water	No problem found. Flushed as a precaution. Chlorine residual 0.18mg/l	25 mins

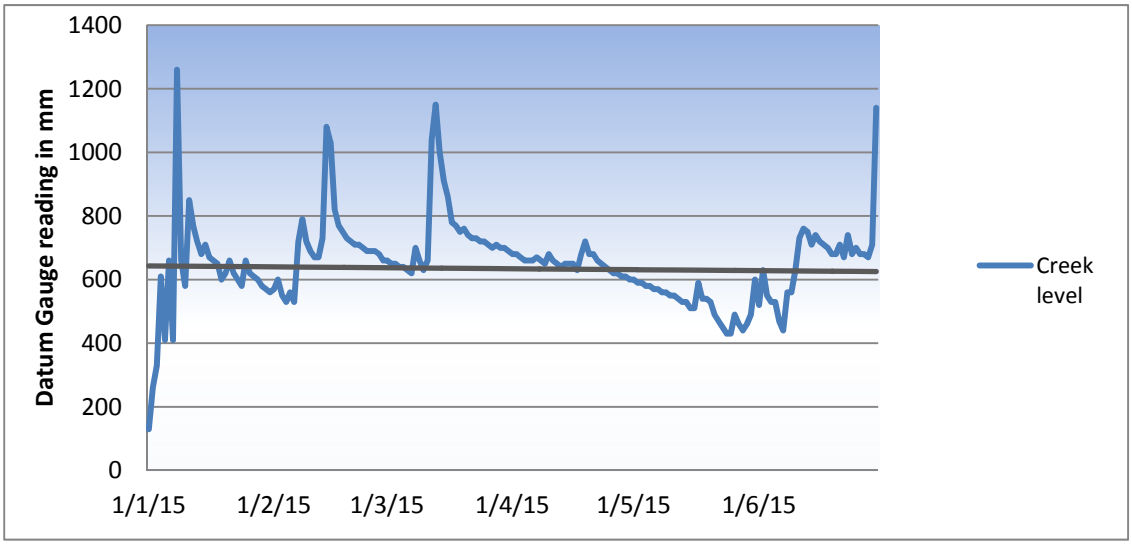
2. Water schemes and potable water consumption

Raw water quality is good in all intakes averaging 0.6NTU. Unseasonal heavy rains have resulted in a number of minor flooding and turbidity events in all intakes. Intake stream water levels were trending downwards, but have increased significantly following good rains in the latter part of the reporting period.

Relatively stable intake levels with average seasonal water consumption from all schemes, has ensured adequate water supplies for the region over the reporting period.

Mossman/Port Douglas Schemes
Rex Creek intake level has adequate capacity to meet maximum extraction flows of >200L/s with no impact on production at this stage.

Fig 1. Rex Creek Intake Level in 2015



During this quarter the Mossman Reservoir at the Mossman Treatment Plant was re-commissioned. The additional 1.8 mega litres of treated water storage capacity improves assurance in relation to water supply security and will be invaluable at times of plant shutdown due to turbidity events in the Rex Creek intake.

Mossman Water Treatment Plant is meeting demand capacity. Current trends indicate average water usage, but a significant increase in consumption was experienced during the brief dry period. From April to June the total consumption for the Mossman and Port Douglas Schemes has steadily increased on average by 15% on the previous quarter, which is in line with seasonal trends.

Mossman Water Supply

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 June 2015.

Fig 2. Mossman Scheme Monthly Consumption Figures

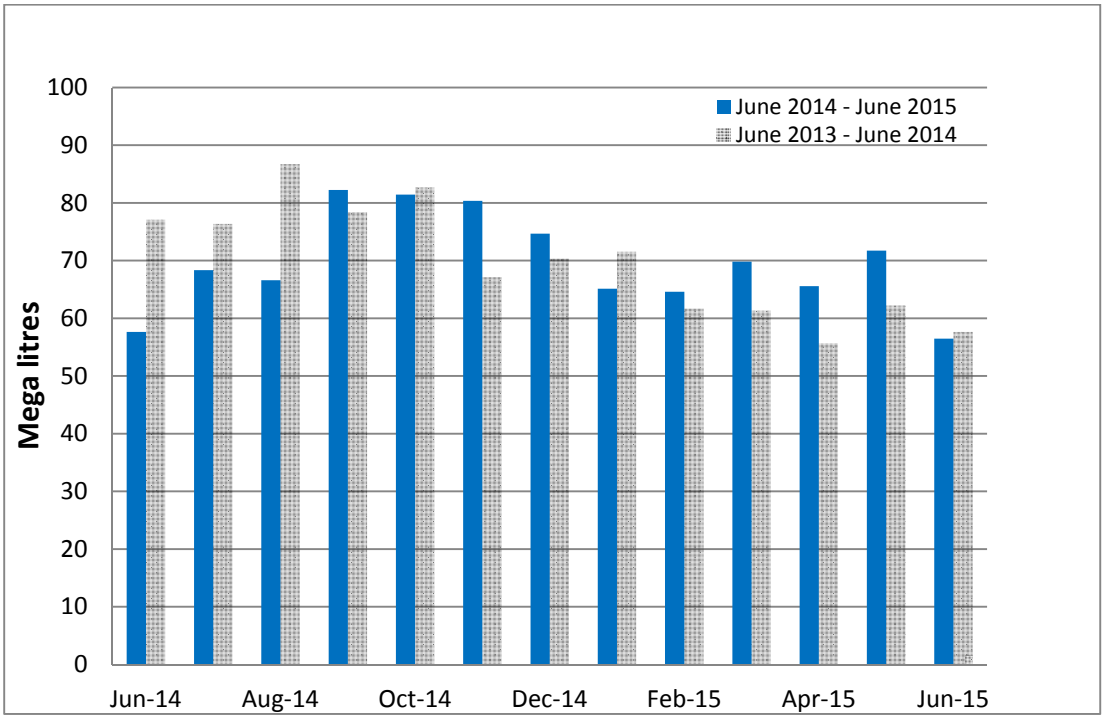
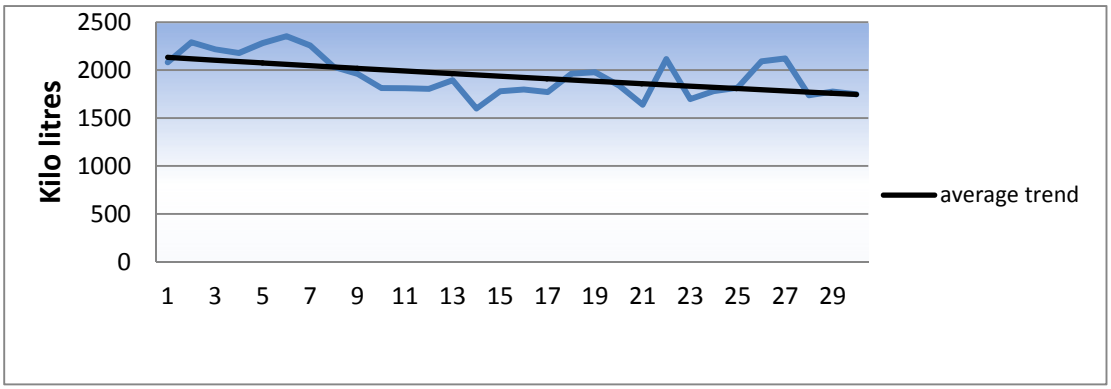


Fig 3. Mossman Scheme Daily Consumption during June 2015



Port Douglas Water Supply
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 June 2015.

Fig 4. Port Douglas Scheme Monthly Consumption Figures

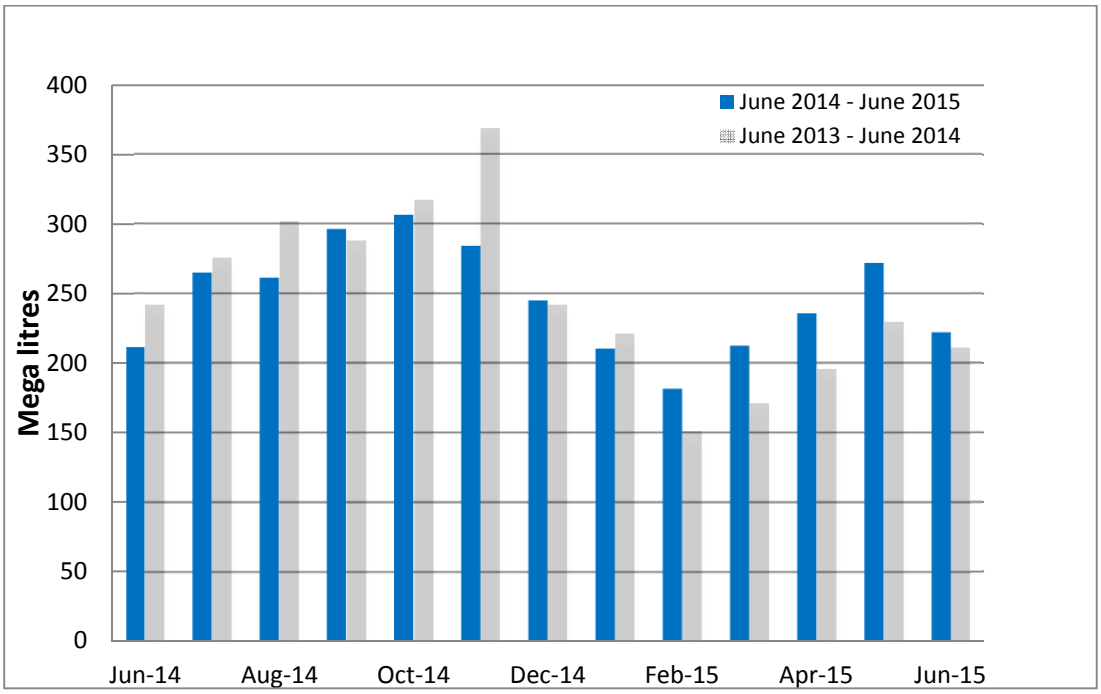
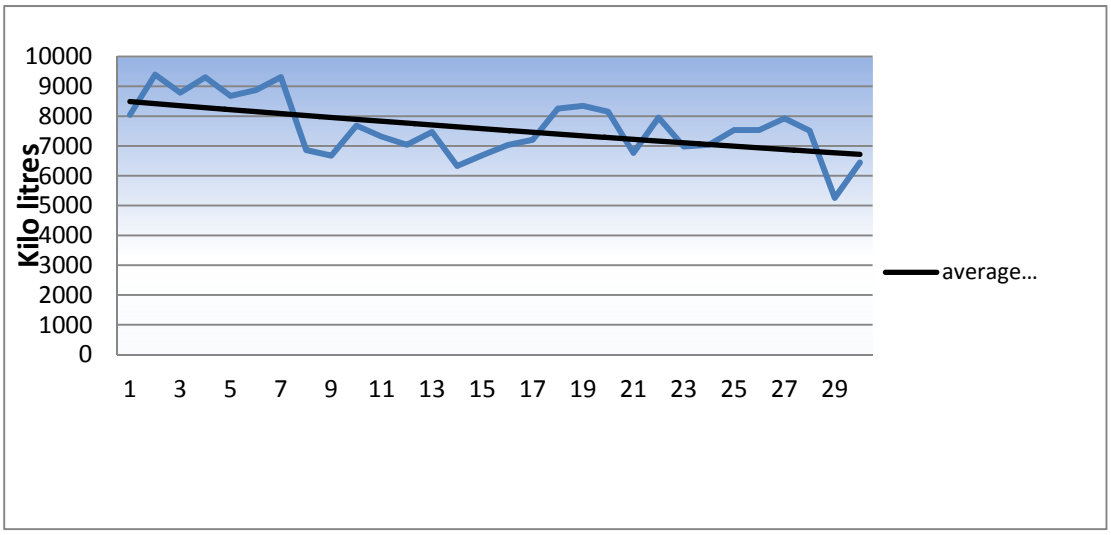


Fig 5. Port Douglas Scheme Daily Consumption during June 2015



Whyanbeel Scheme
Whyanbeel Water Treatment Plant is operating and meeting demand. Intake levels at Little Falls Creek have increased with late rains and are adequate for full plant production capacity. From April to June the total consumption for the Whyanbeel Scheme has decreased on average by 11% on the previous quarter. Consumption for this scheme has decreased in line with seasonal trends.

Whyanbeel Water Supply

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 June 2015.

Fig 6. Whyanbeel Scheme Monthly Consumption Figures

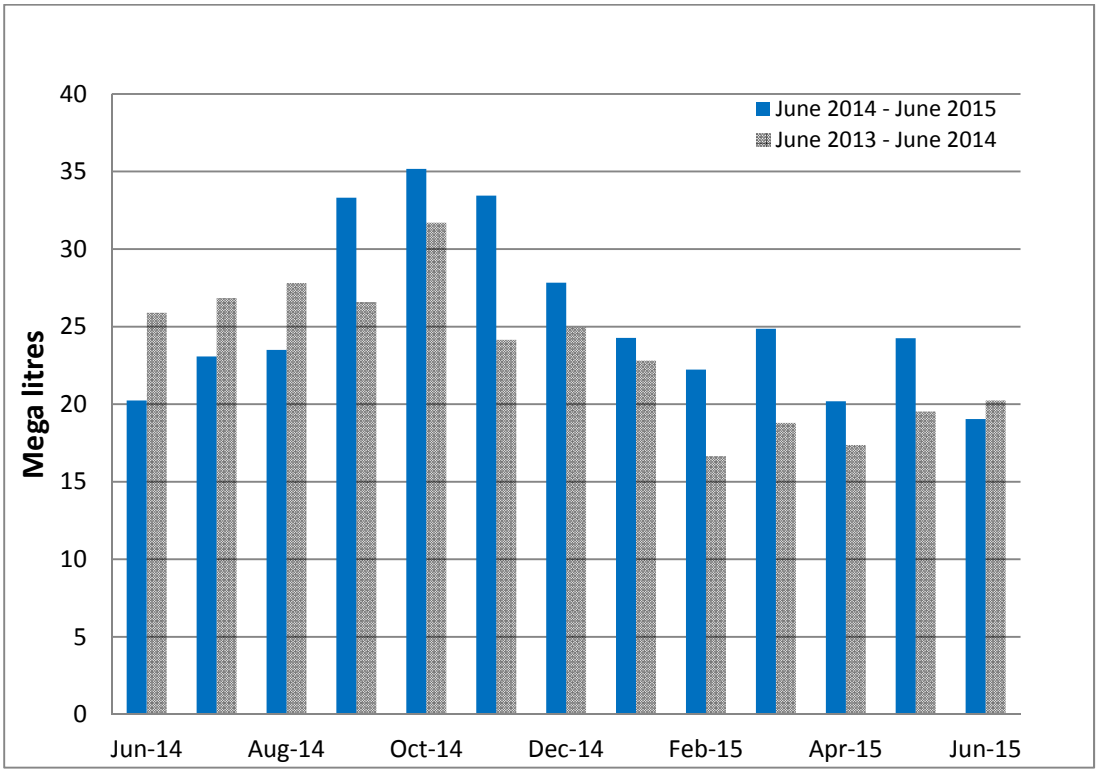
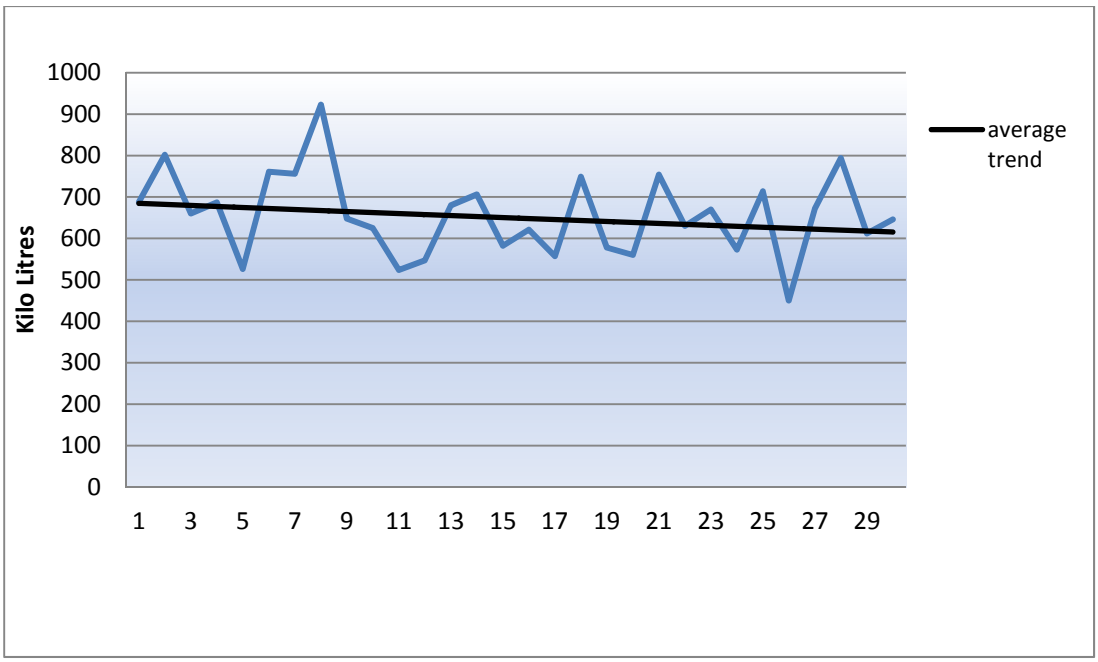


Fig 7. Whyanbeel Daily Consumption during June 2015



Daintree Scheme

Daintree Water Treatment Plant is operating and meeting demand. Intake levels at Intake Creek have increased with late rains and are adequate for full plant production capacity. From April to June the total consumption for the Daintree Scheme has increased by 4.0% on the previous quarter. This average is not representative of the overall trend, as in the latter part of the reporting period consumption for this scheme has decreased significantly following the detection, and subsequent repair of a leak within the reticulation system. The leak on a 40mm service line was repaired on 27 May 2015 and consumption from this scheme has returned to average values and should be reflected in the next quarterly report.

Daintree Water Supply

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 June 2015.

Fig 8. Daintree Scheme Monthly Consumption Figures

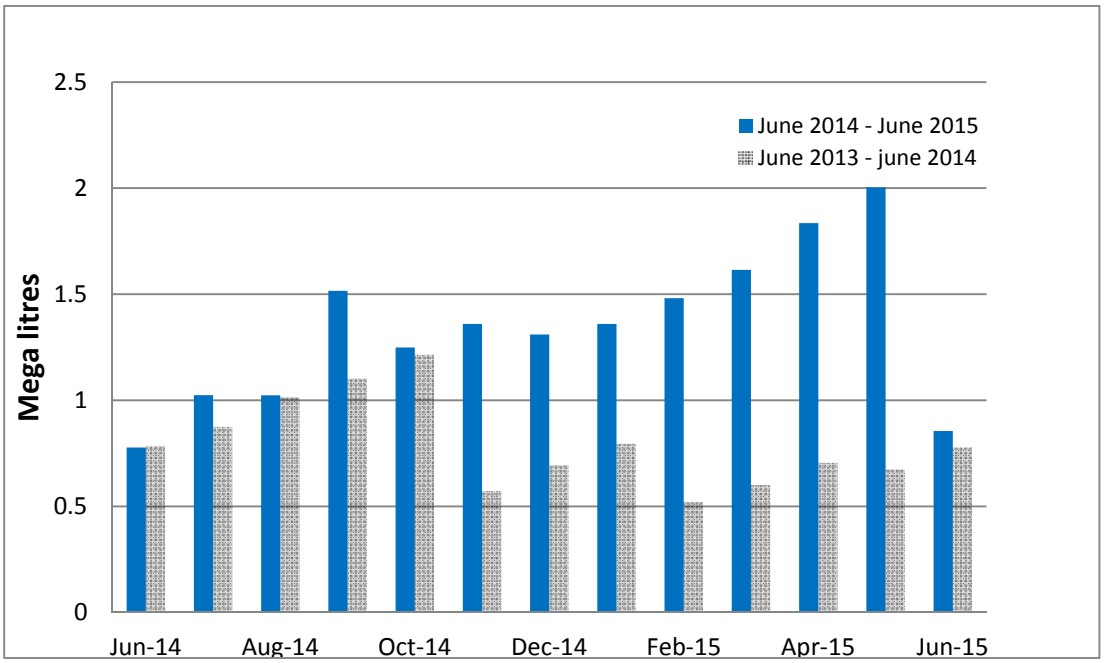
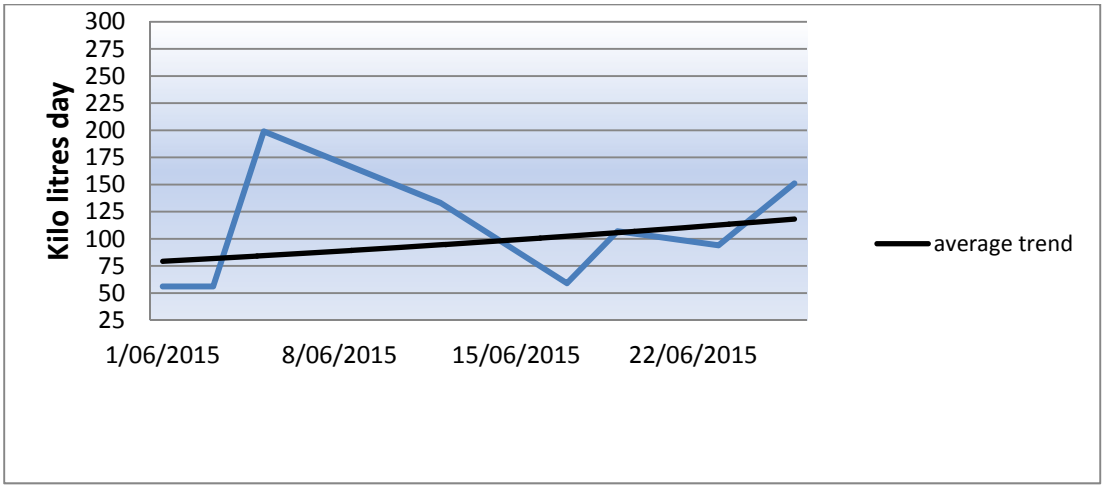


Fig 9. Daintree Daily Consumption during June 2015



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 April to 30 June 2015, a total of 302 water samples were taken in the 4 water supply schemes. A total of 230 samples were tested in the Douglas Water Laboratory and 72 samples were tested by a NATA accredited laboratory for physical, chemical and microbiological parameters. Of these 302 water samples, 175 samples were taken from the public reticulation network, 38 at reservoirs and 89 were samples taken at the treatment process. All tested parameters in water samples taken during the reporting period were compliant with Australian Drinking Water Guidelines (ADWG) and standards required by the Water Supply Regulator and Queensland Health.

The water temperatures especially in the reticulation system decreased with a significant reduction in the Heterotrophic Plate Count (HPC) in water samples if compared to the previous quarter.

The HPC test (or Standard Plate Count), is widely used to measure the heterotrophic microorganism population in drinking-water and other media. Heterotrophs are organisms, including bacteria, yeasts and moulds, which require an external source of organic carbon for growth. Increased bacterial growth and re-growth will occur in warmer reticulated water temperatures. HPC results are not an exclusive indicator of water safety and, as such, should not be used as an indicator of potential adverse human health effects but rather as an indicator of general water quality and a measure of bacterial re-growth potential. The Water Reticulation team uses HPC results to determine where to proactively flush reticulation systems.

Mossman/Port Douglas Supply Scheme

Average monthly values for key operational and compliance parameters can be seen In Table 3, 4 and 5 for treated water at the Mossman Treatment Plant, Port Douglas Reservoirs and Port Douglas/ Mossman Reticulation network, respectively. Fig 10 indicates the daily turbidity trends at the intake and treated water as recorded at the Mossman water treatment plant for the period April to June 2015.

Table 3. 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	*E.coli* CFU/ 100ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
April-15	7.45	22.3	8	0.93	0.98	<1	<1	<1
May-15	7.33	22.3	7.5	0.90	0.95	<1	<1	<1
June-15	7.34	20.6	6	0.87	0.92	<1	<1	<1

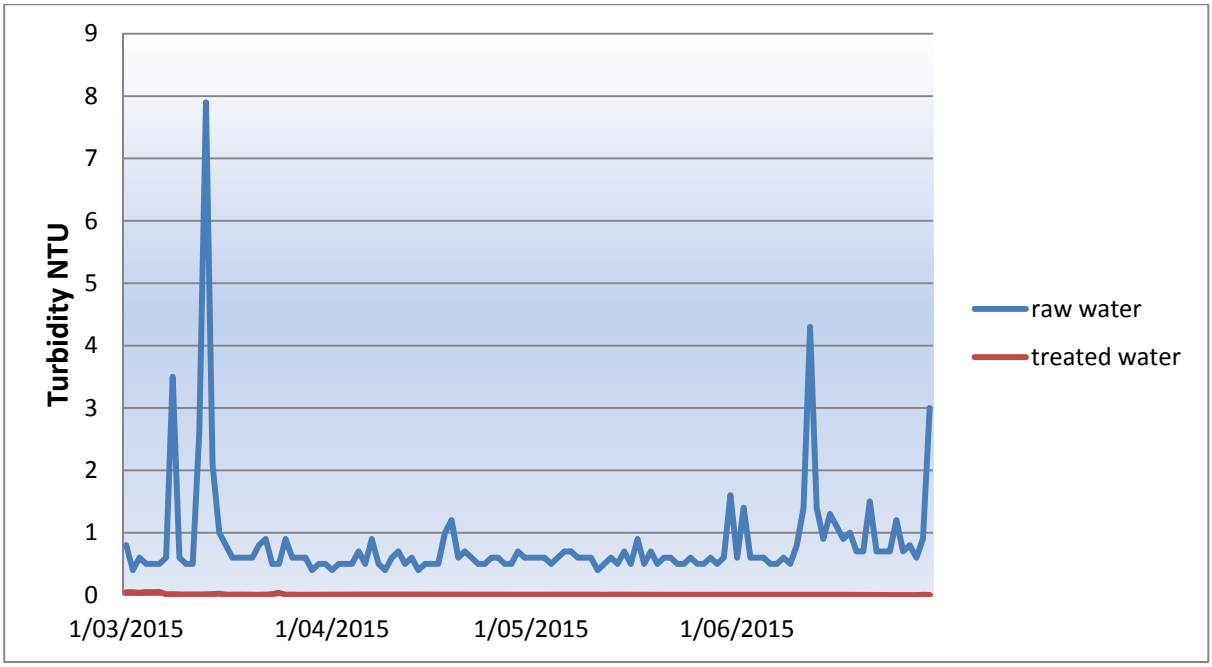
Table 4. Average monthly values for key operational and compliance parameters in the Port Douglas Reservoirs.

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/ 100ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
April-15	7.78	24.8	8.5	0.78	0.85	<1	<1	<1
May-15	7.60	22.7	8.5	0.91	1.01	<1	<1	<1
June-15	7.49	22.7	7	0.93	1.02	<1	<1	<1

Table 5. Average monthly values for key operational and compliance parameters in the Mossman/Port Douglas Reticulation Network.

Month	pH	Temp °C	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/100 ml	Hetero-trophic Plate Count CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0.1-4.0	-	<1	-	0-10
April-15	7.78	26.7	0.51	0.57	<1	<1	<1
May-15	7.74	25.3	0.55	0.62	<1	<1	<1
June-15	7.89	24.2	0.37	0.44	<1	3	<1

Fig 10. 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 can be seen In Table 6., 7. and 8. for treated water at the Whyanbeel Treatment Plant, Whyanbeel Reservoir and Whyanbeel Reticulation Network, respectively. Fig 11. indicates the daily turbidity trends at the intake and treated water as recorded at the Whyanbeel Water Treatment Plant for the period April to June 2015.

Table 6. 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	*E.coli* CFU/ 100ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
April-15	7.18	23.1	6	0.84	0.90	<1	<1	<1
May-15	6.94	21.2	5	0.87	0.95	<1	<1	<1
June-15	7.10	21.1	5	0.84	0.91	<1	<1	<1

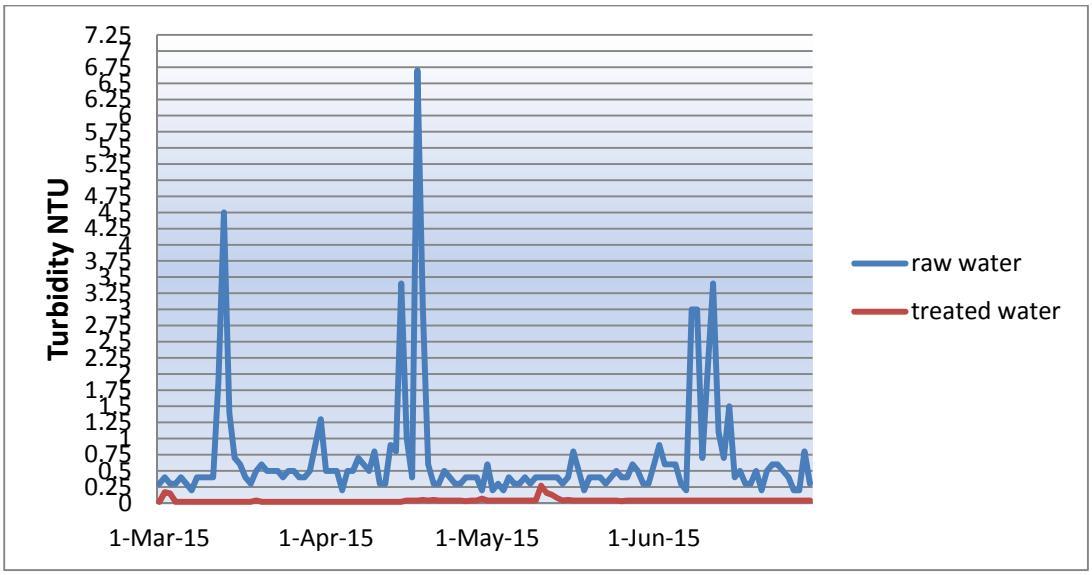
Table 7. Average monthly values for key operational and compliance parameters in the Whyanbeel Reservoir.

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/ 100ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
April-15	7.19	26.1	8	0.82	0.91	<1	<1	<1
May-15	7.10	24.1	8	0.91	1.00	<1	2	<1
June-15	7.18	23.4	7	0.76	0.82	<1	1	<1

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

Month	pH	Temp °C	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/100 ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0.1-4.0	-	<1	-	0-10
April-15	7.95	26.9	0.35	0.41	<1	<1	<1
May-15	7.98	25.6	0.44	0.51	<1	<1	<1
June-15	8.05	24.3	0.24	0.29	<1	<1	<1

Fig 11. 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 can be seen In Table 9. and 10. for treated water at the Daintree Treatment Plant and Daintree Reticulation network, respectively. Fig 12. indicates the daily turbidity trends at the intake and treated water as recorded at the Daintree water treatment plant for the period April to June 2015.

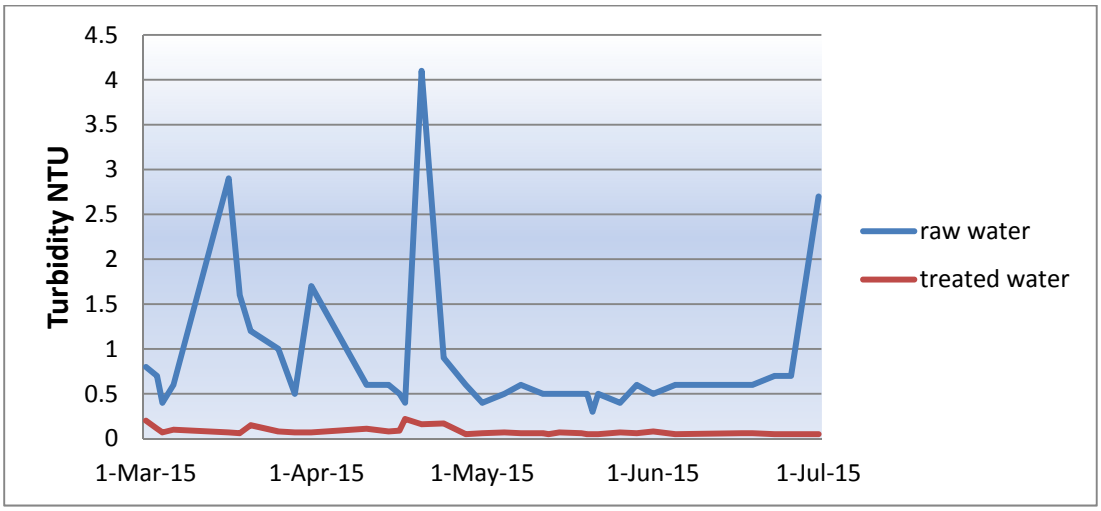
Table 9. Average monthly values for key operational and compliance parameters in treated water at Daintree Treatment Plant.

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/ 100ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
April-15	7.31	25.3	18	0.56	0.63	<1	<1	<1
May-15	7.42	23.4	22	0.77	0.83	<1	<1	<1
June-15	7.38	23.1	20	0.61	0.67	<1	1	<1

Table 10 Average monthly values for key operational and compliance parameters in the Daintree Reticulation Network.

Month	pH	Temp °C	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/100 ml	Hetero-trophic Plate CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0.1-4.0	-	<1	-	0-10
April-15	7.33	25.9	0.07	0.12	<1	4	<1
May-15	7.43	24.5	0.43	0.49	<1	1	<1
June-15	7.60	23.5	0.50	0.55	<1	<1	<1

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



Wastewater

4. Wastewater Reticulation Services

Annual electrical and mechanical preventative maintenance programs were carried out at all 31 sewage pump stations and treatment plants. General maintenance programs were carried out at the reticulation networks in the Mossman and Port Douglas catchments.

All capital projects were completed in the financial year. The sewer relining and process improvement projects ensured better compliance outcomes for flow and effluent quality standards.

Table 11. Wastewater Reticulation Services

	Port Douglas Catchment	Mossman Catchment
Pump Blockages	19	5
Sewer Chokes	5	3
Sewer Main Breaks	0	0
HCB Repairs (House Connection Branch)	6	2
Odour Complaints	2	0

Odour complaint:

- Odour complaints at 1 Ti Tree Street, Port Douglas; The resident at this property can smell the Port Douglas sewer plant on regular occasions. Capital project will commence in next financial year to reduce odour formation at Inlet works.
- Odour complaint at Pandanus Tourist Park, Port Douglas; Campers can smell the treatment plant. The Inlet works is the closest to the caravan park. Capital project will commence in next financial year to reduce odour formation at Inlet works.

5. Influent and Irrigation Flows

Port Douglas Wastewater Treatment Plant

A total of 274,671 kL of influent entered the Port Douglas wastewater plant during the reporting period. The average daily flow was 3,090 kL/d. Tanker truck contractors delivered 556 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 44% of the treated effluent was pumped to two resorts and the remaining discharged in the Dickson Inlet. The Sheraton Mirage received 27,334 kL and Reef Links received 93,267 kL of treated effluent during this period. The volume supplied to Sheraton was significantly less due to electrical issues experienced at the Sheraton Pump Station Q4 as the power had been switched off by Sheraton staff which affected the telemetry that controls recycled water pumping. Total rainfall on site during the reporting period was measured as 212 mm. Daily SBR flows and total monthly flows for 2014/2015 are presented in Fig 13 and 14 respectively.

Fig 13. Port Douglas SBR Daily Flow

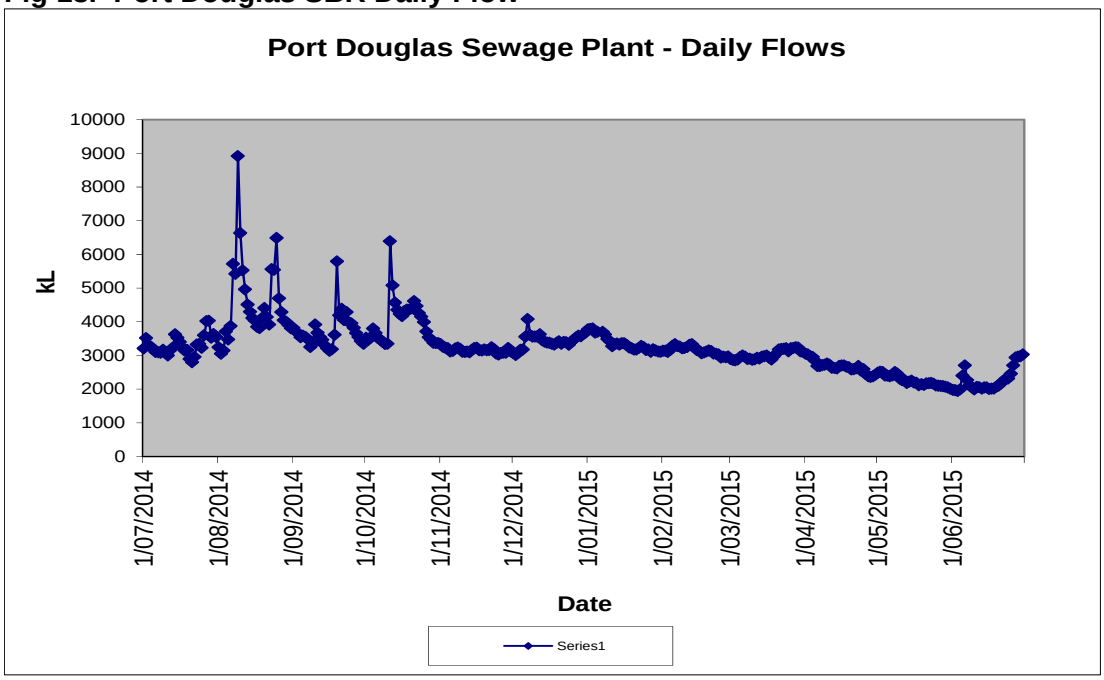
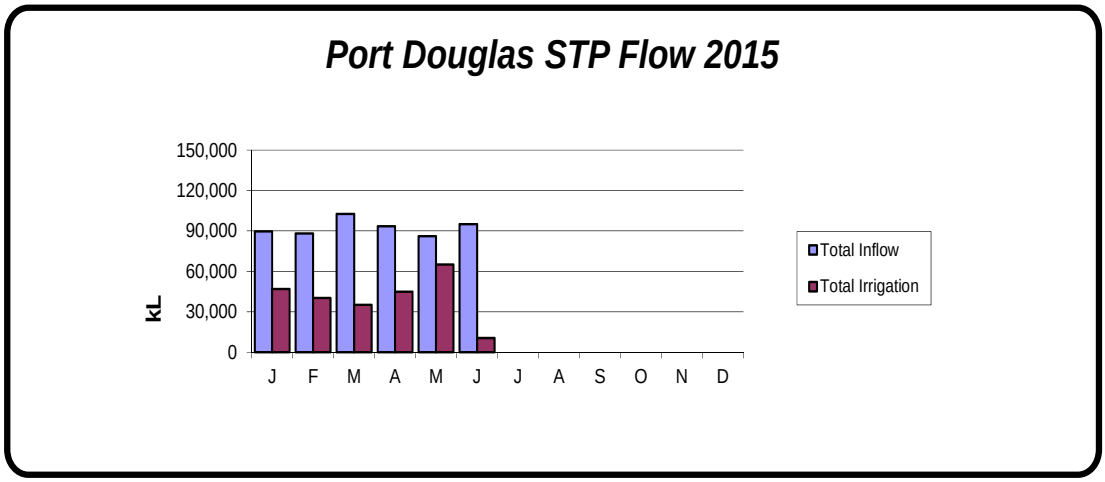


Fig 14. Port Douglas Total Monthly Flow



Mossman Wastewater Treatment Plant

The Mossman Wastewater Treatment Plant received a total influent flow of 81,358 kL during the reporting period. The average daily flow was 810 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 306 mm.

Daily flows from the Mossman Wastewater Treatment Plant and total monthly flows for 2014/2015 are presented in Fig 15 and 16 respectively.

Fig 15. Mossman Wastewater Treatment Plant Daily Flow

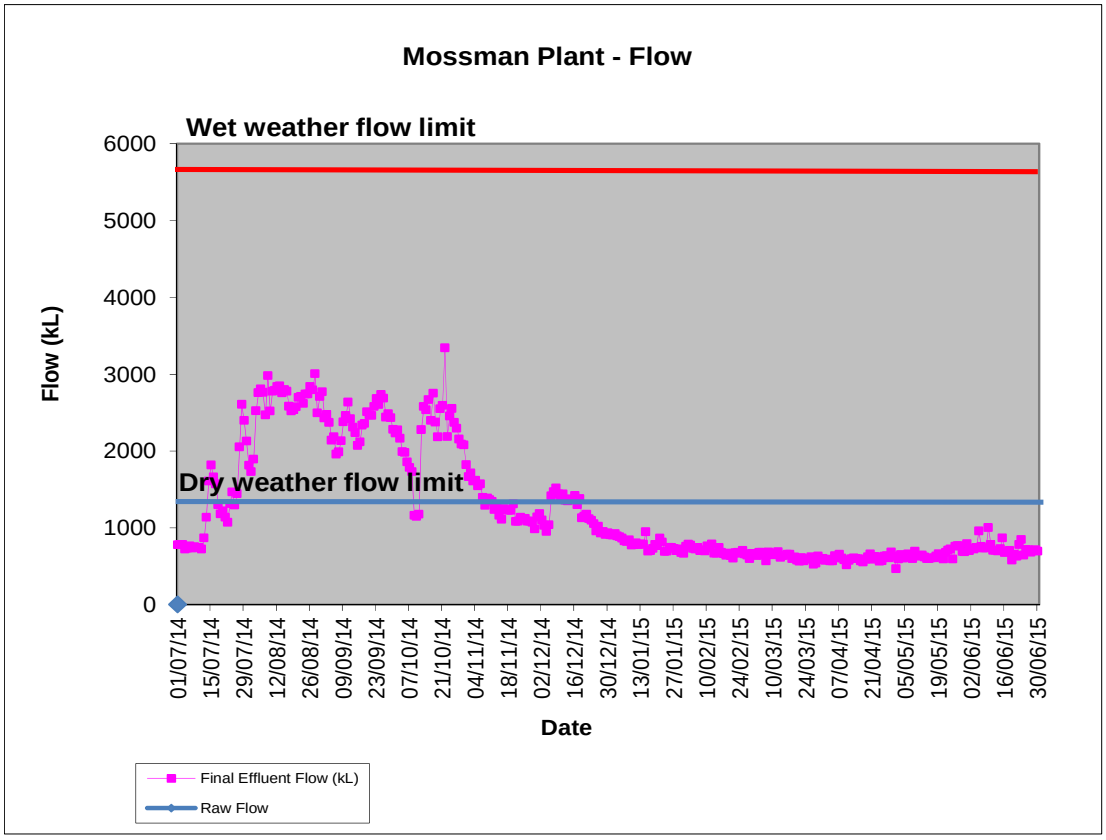
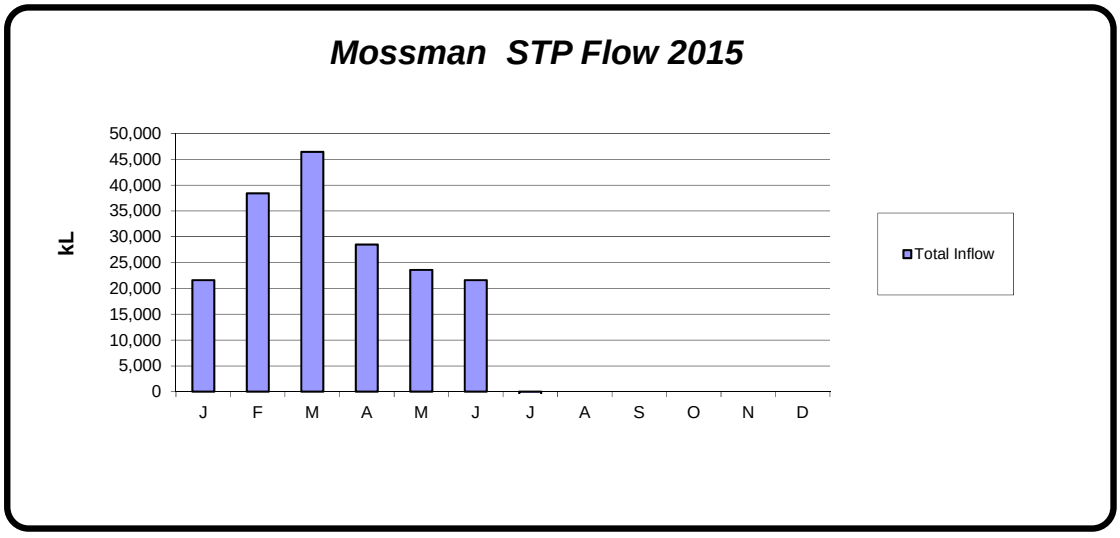


Fig 16. Mossman Wastewater Treatment Plant Total Monthly Flow



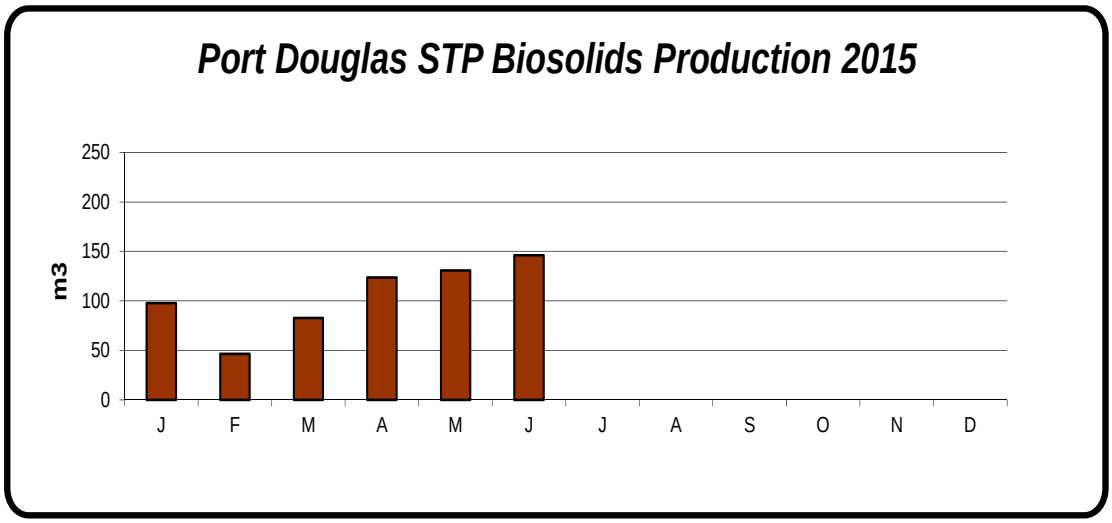
6. Bio-solids Production

Bio-solids were produced at the dewatering plants at Mossman Wastewater Treatment Plant (18% solids) and Port Douglas Wastewater Treatment Plant (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 Wastewater Treatment Plant

At Port Douglas Wastewater Treatment Plant, 56.12 dry tons (400.92m^3) of bio-solids were produced during the reporting period. The monthly bio-solids production trends can be seen in Fig 17.

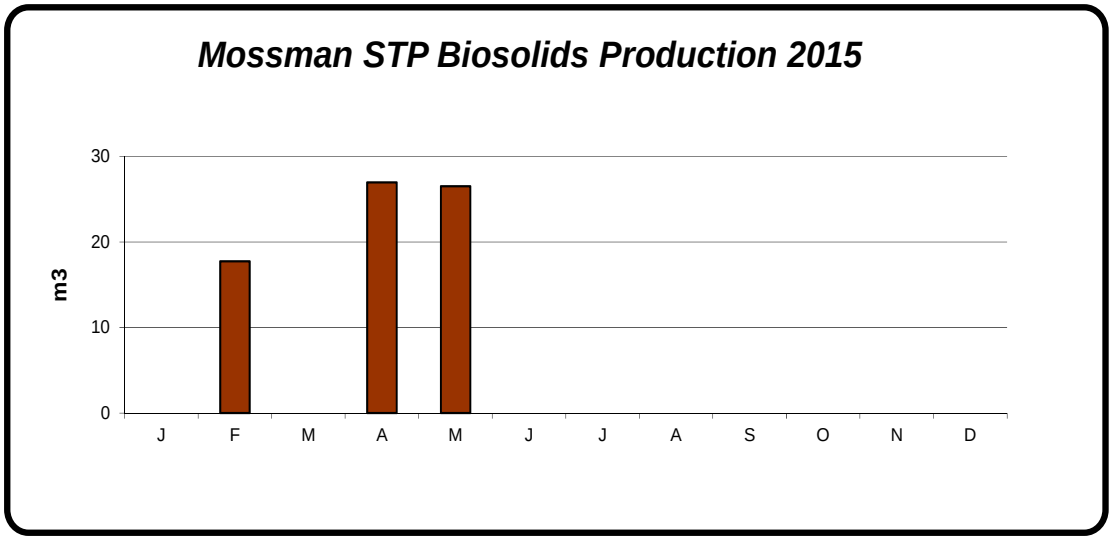
Fig 17. Port Douglas Wastewater Treatment Plant monthly bio-solids production.



Mossman Wastewater Treatment Plant

At Mossman Wastewater Treatment Plant, 7.24 dry tons (53.54m^3) 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 165 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 Wastewater Treatment Plant

The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, and Total Suspended Solids & BOD_5) are shown in Fig 19, 20, 21 & 22

Fig 19. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Ammonia

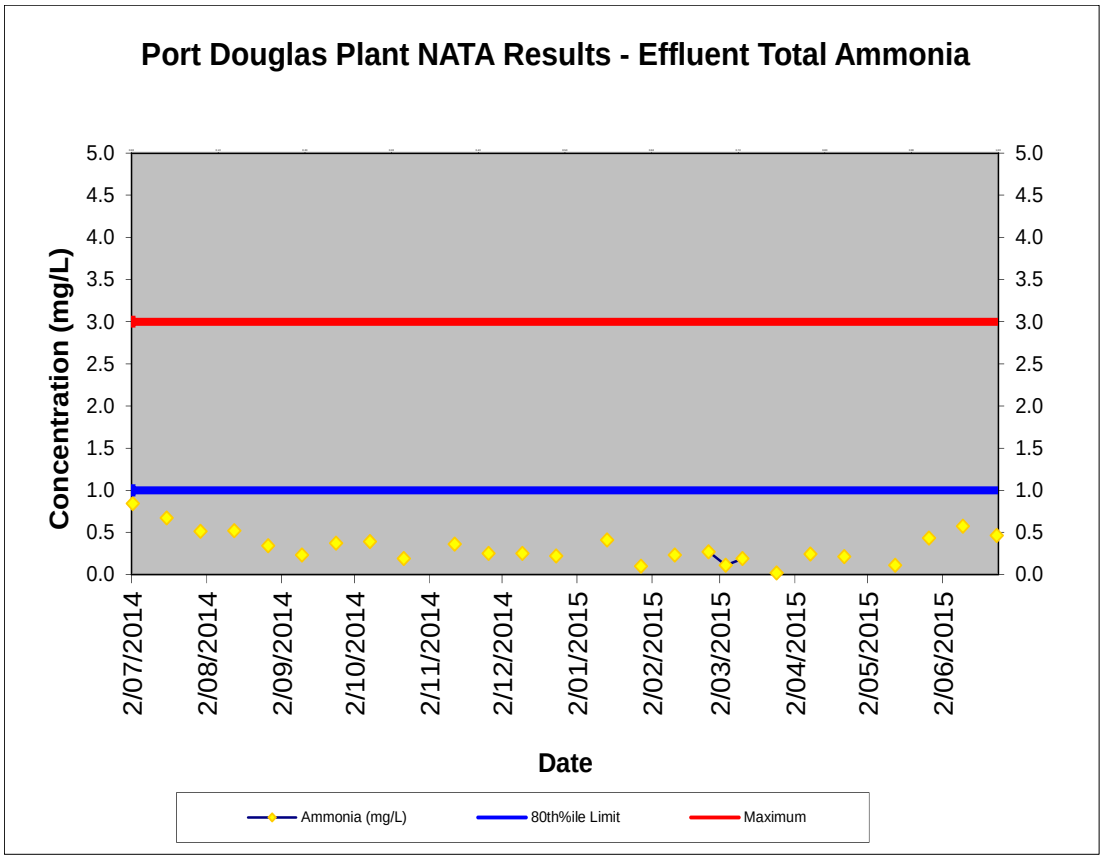


Fig 20. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Phosphorous

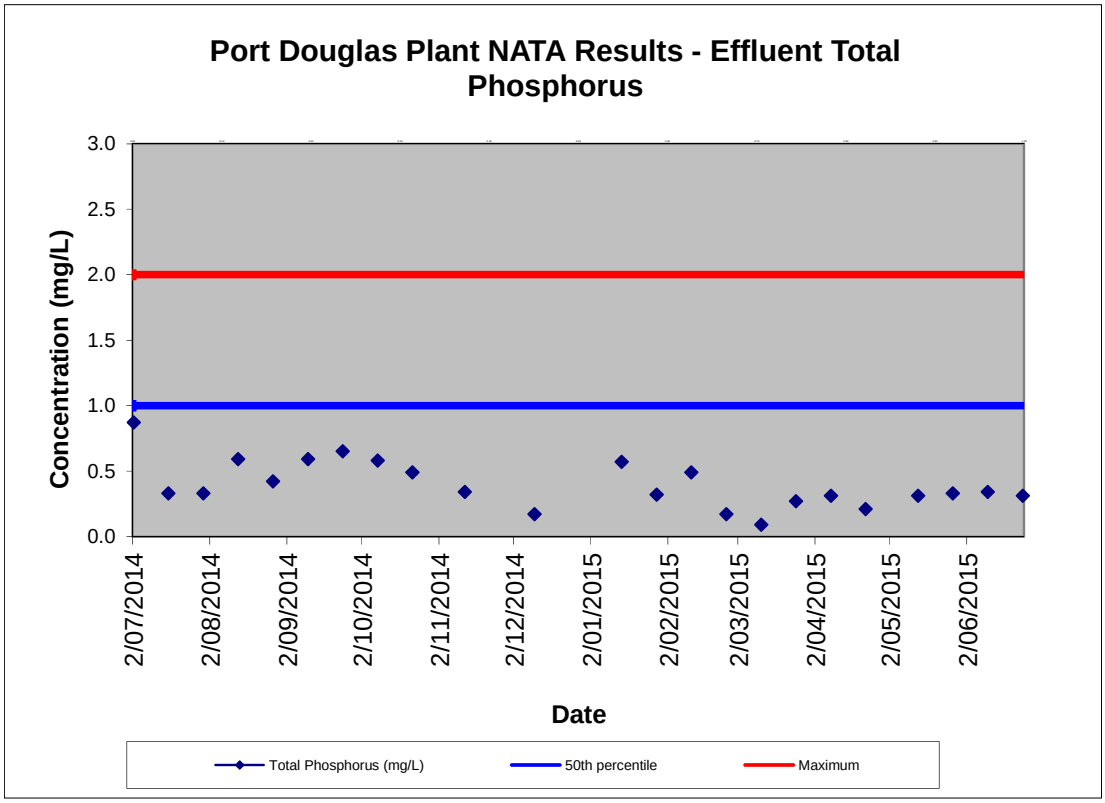


Fig 21. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Suspended Solids

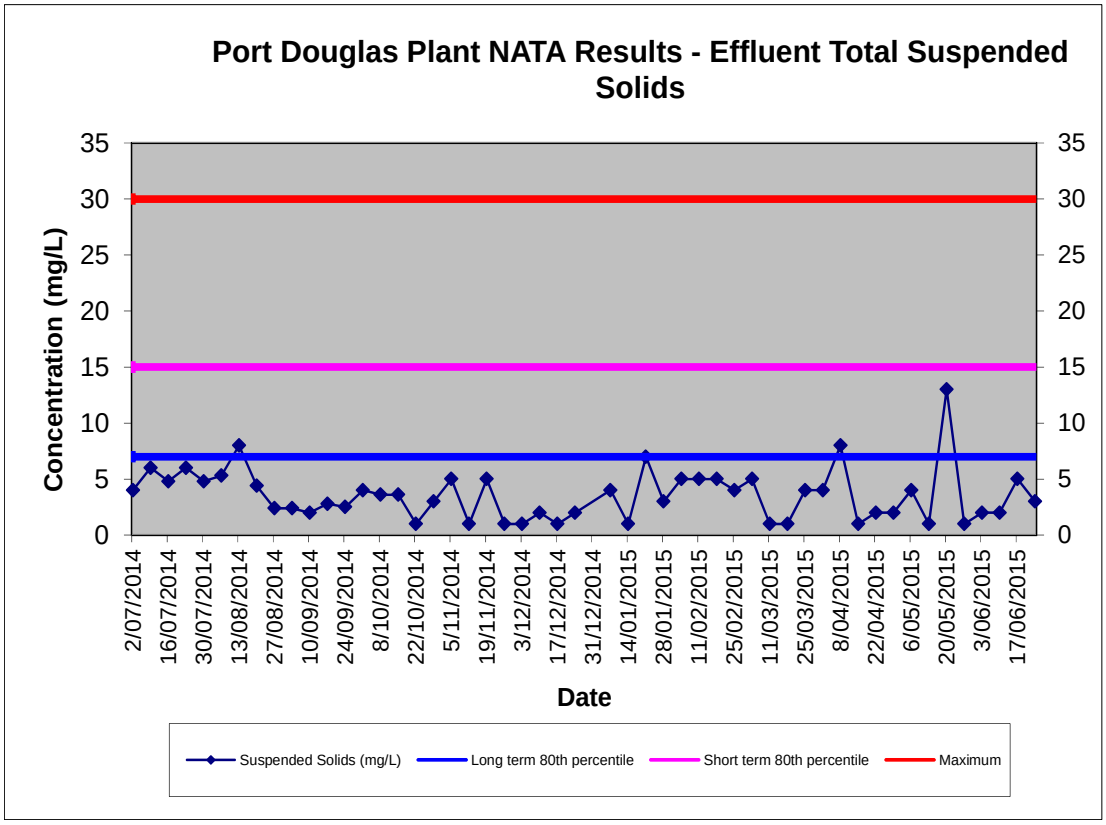
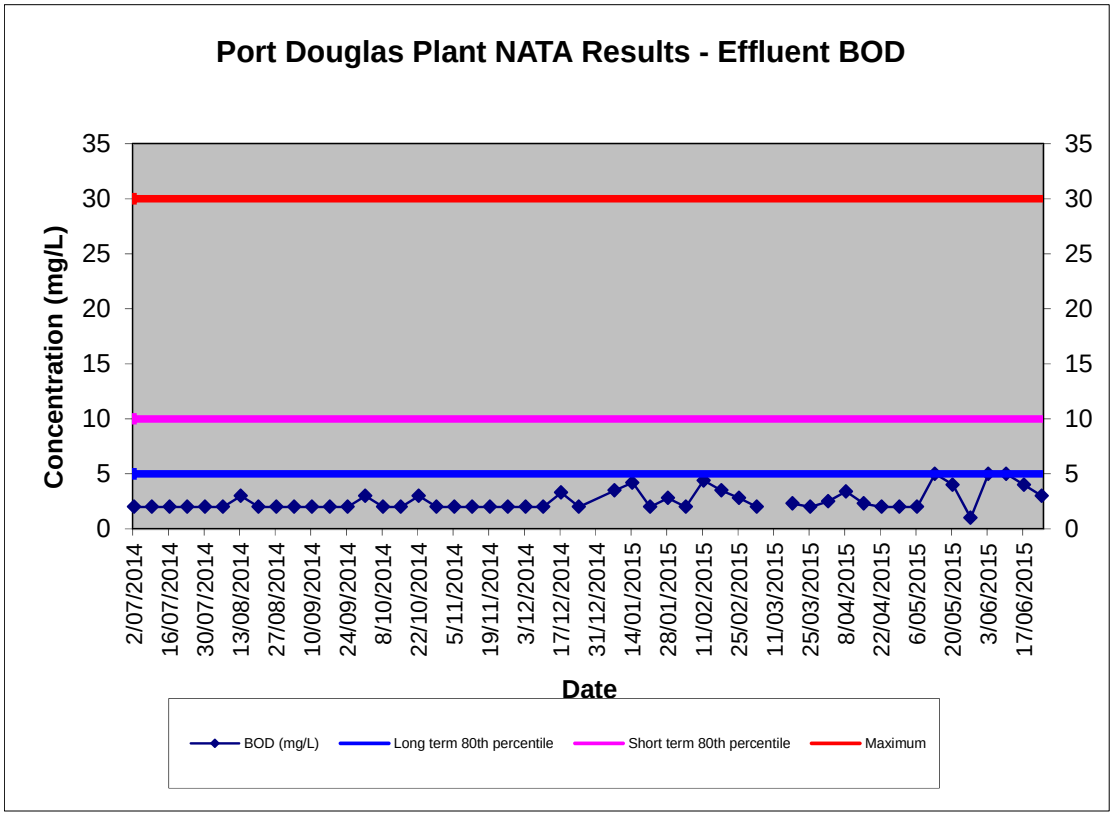


Fig. 22 Port Douglas Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)



Mossman Wastewater Treatment Plant

The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, Total Suspended Solids & BOD_5) are shown in Figures 23, 24, 25 & 26.

Fig. 23 Mossman Wastewater Treatment Plant Final Effluent Test Results for Ammonia

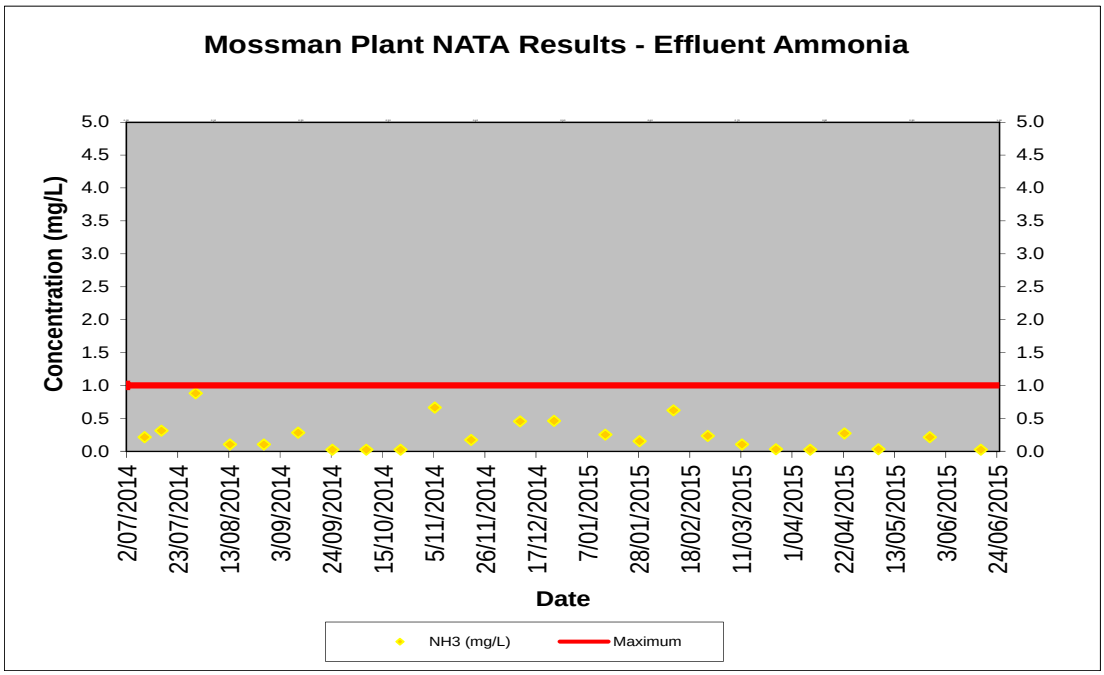


Fig. 24 Mossman WWTP Final Effluent Test Results for Total Phosphorous

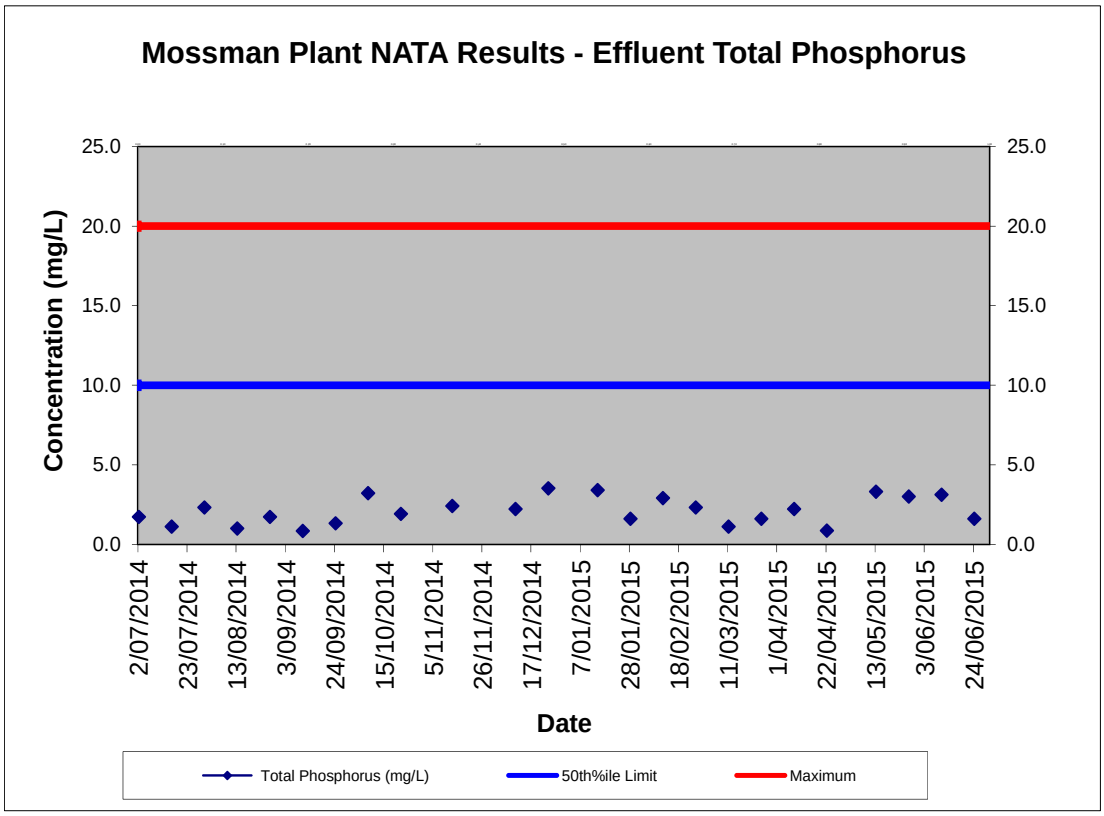


Fig. 25 Mossman WWTP Final Effluent Test Results for Total Suspended Solids

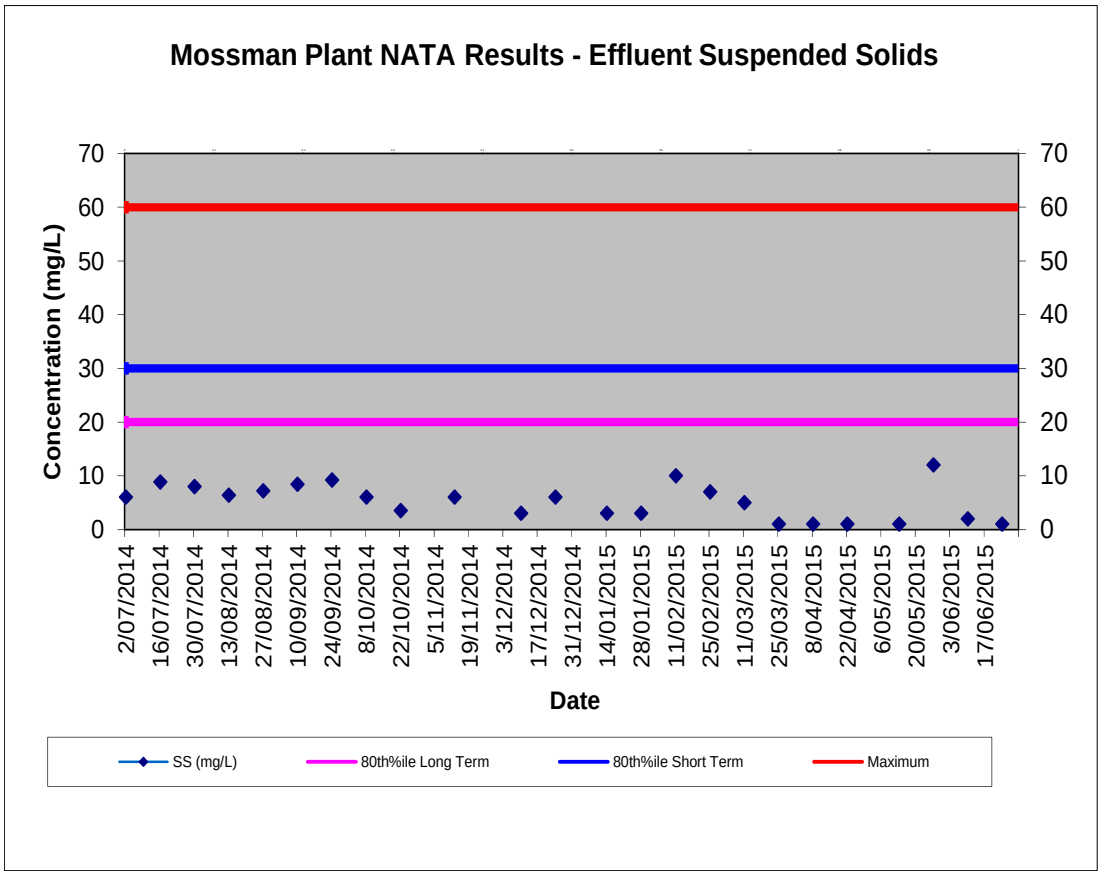
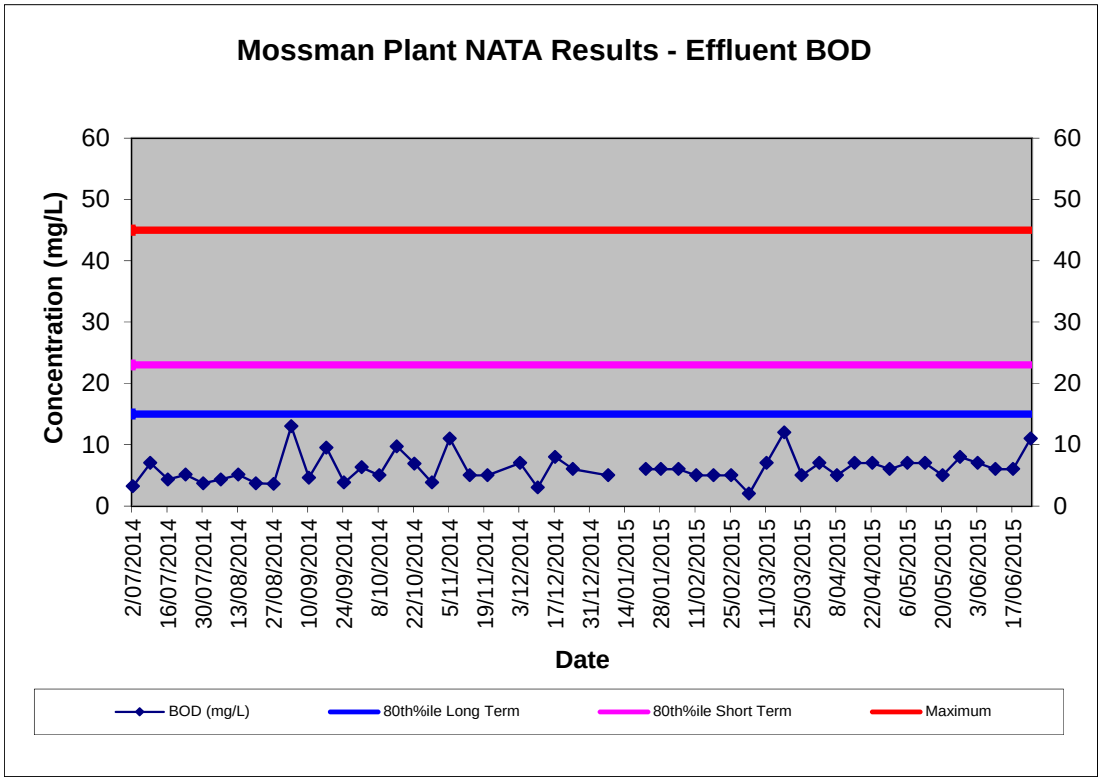


Fig. 26 Mossman Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)



Liquid Trade Waste

Annual inspections have been occurring and most businesses visited are compliant, with only minor aspects to address. Although some business operators have been resistant to change, once the relevance of trade waste is explained, including the adverse impacts their waste can cause on Council's infrastructure, the business operators are cooperating.

Compliant trade waste discharges will greatly improve Council's maintenance of the sewerage system and improve wastewater plant performance.

An automated annual invoicing process is currently being worked on for implementation and, once complete, the monthly raising and issuing of the renewal reminders will be more efficient. Currently the invoices are raised manually.

Table 12. Trade Waste Dischargers - Inspections

Inspections	Total No
New applicants / Change of occupancy	13
Renewal applicants	11
Follow-up inspections	0

Table 13. Trade Waste Dischargers - Approvals

Approvals	Total No
New approvals issued	6
Renewal approvals issued	23
Other businesses identified as requiring approvals	6