5.14. WATER AND WASTEWATER QUARTERLY REPORT FOR THE PERIOD ENDING 31 DECEMBER 2015

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DEPARTMENT:	Water and Wastewater

RECOMMENDATION

It is recommended that the Quarterly Report of the Water and Wastewater branch for the period ending 31 December 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 1 October to 31 December 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. During this reporting period, significant progress was noted in all of the 36 water and wastewater capital improvements projects. The progress of these projects is reported in a separate Council report.

The Water and Wastewater Branch successfully fulfilled annual regulatory reporting and submitted a Drinking Water Quality Management Plan (DWQMP) Annual Report to the Water Supply Regulator, DEWS (Department of Energy and Water Supply) during December 2015. The amended DWQMP was endorsed by Council on 24 November and submitted for approval to DEWS on 26 November.

Several capital projects were completed ahead of scheduled completion dates; Newell Beach reticulation upgrade (corner Newell Beach Road & Scomazzon Road) has now been completed with 600 meters of 150mm Blue Brute water main laid. This alteration allows interconnection between the Mossman and Whyanbeel schemes and provides for improved water security. The interconnection at the Syndicate Road & Miallo-Bamboo Creek Road intersection has been completed and will secure supply to the Syndicate area. The Daintree intake mains upgrade has also been completed and will assist with maintenance and flushing of the Daintree intake main.

The Programmable Logic Controller (PLC) upgrade commenced early December at Port Douglas WWTP. The upgrade of the PLC was fully completed by 18 December 2015. During the two week installation period, the plant remained operational and compliant with licence conditions.

BACKGROUND

This report is the second Quarterly Report submitted by the Water and Wastewater Branch during the 2015/2016 Financial Year. 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 Quarterly Report documents progress on key operational and service delivery aspects and regulatory compliance levels.

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

FINANCIAL/RESOURCE IMPLICATIONS

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

RISK MANAGEMENT IMPLICATIONS

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

SUSTAINABILITY IMPLICATIONS

Economic:	It is essential to adequately maintain water and wastewater infrastructure in order to provide satisfactory services in support of economic development in the Shire.
Environmental:	Failing to provide adequate and compliant water and wastewater services can lead to environmental harm and breaching of licence conditions.
Social:	The Community expects fully operational and compliant water and wastewater services.

CORPORATE/OPERATIONAL PLAN, POLICY REFERENCE

This report has been prepared in accordance with the following:

Corporate Plan 2014-2019 Initiatives:

Theme 5 - Governance

5.2.1 - Provide Councillors and community with accurate, unbiased and factual reporting to enable accountable and transparent decision-making.

Operational Plan 2015-2016 Actions:

WW1 - Rehabilitation of sewer network in Mossman & Port Douglas.
WW2 - Wastewater and Water Treatment Plants Server SCADA Citect upgrade and Programmable Logic Controller (PLC) SCADA Citect upgrade.
WW3 - Drinking Water Storage: Investigate and repair vermin proofing at water storage/ reservoirs in the Water Supply Schemes.
WW4 - Review and amend Drinking Water Quality Management Plan.

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:

Asset-Owner	Meeting the responsibilities associated with owning or being the custodian of assets such as infrastructure.
Information Provider	Bringing people together to develop solutions to problems.
Regulator	Meeting the responsibilities associated with regulating activities through legislation or local law.

CONSULTATION

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

ATTACHMENTS

Attachment 1	Water and Wastewater Quarterly Report for the period ending 31 December 2015.

Water and Wastewater Quarterly Report
1 October 2015 - 31 December 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	127
New water services connections	22
Service repairs	119
Water mains repairs	2
Water Quality Complaints	2
Flushing Events: Mossman/Port Douglas/ Cooya	2
Flushing Events: Whyanbeel/Wonga	3
Flushing Events: Daintree	2

Table 2. Water Complaints

Address	**CRM Number & Date**	**Nature of water complaint**	**How was it resolved**	**Response Time**
60 Cooya Beach Rd	13936 6/10/15	Metallic taste	Flushed at meter and hydrants in area. Chlorine residual 0.66 mg/l	90mins
73R Cassowary Rd	17605 5/01/15	Strong Chlorine taste	Flushed at meter and hydrant. Chlorine residual 0.05 mg/l	30mins

2. Water schemes and potable water consumption

Raw Water quality is good in all intakes averaging 0.6NTU.

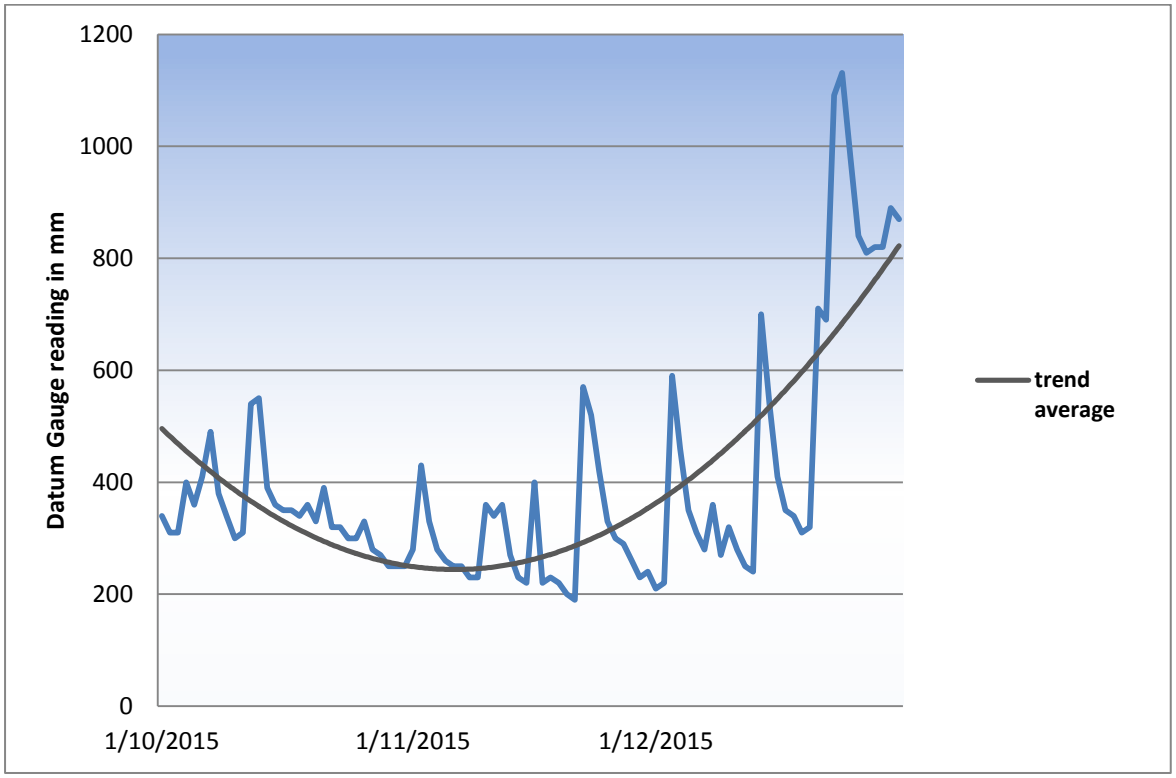
Drier periods developed during the start of the reporting period. This coincided with an increase in consumption which resulted in significant drops in water levels across all the intakes. With the dry conditions expected to continue along with increasing demand during October to December months, Level 2 water restrictions were implemented on 4 November.

With signs of a monsoonal trough forming across the North during December and more frequent storm events occurring, intake water levels and consumption were closely monitored across all schemes with the view to easing water restrictions.

A number of intake blockages occurred as a result of isolated heavy rain events and both Rex Creek and Whyanbeel Little Falls Creek intakes were excavated to remove accumulated sand and debris.

Mossman/Port Douglas Schemes
Rex Creek intake level has adequate capacity to meet maximum extraction flows of >220L/s with no impact on production at this stage.

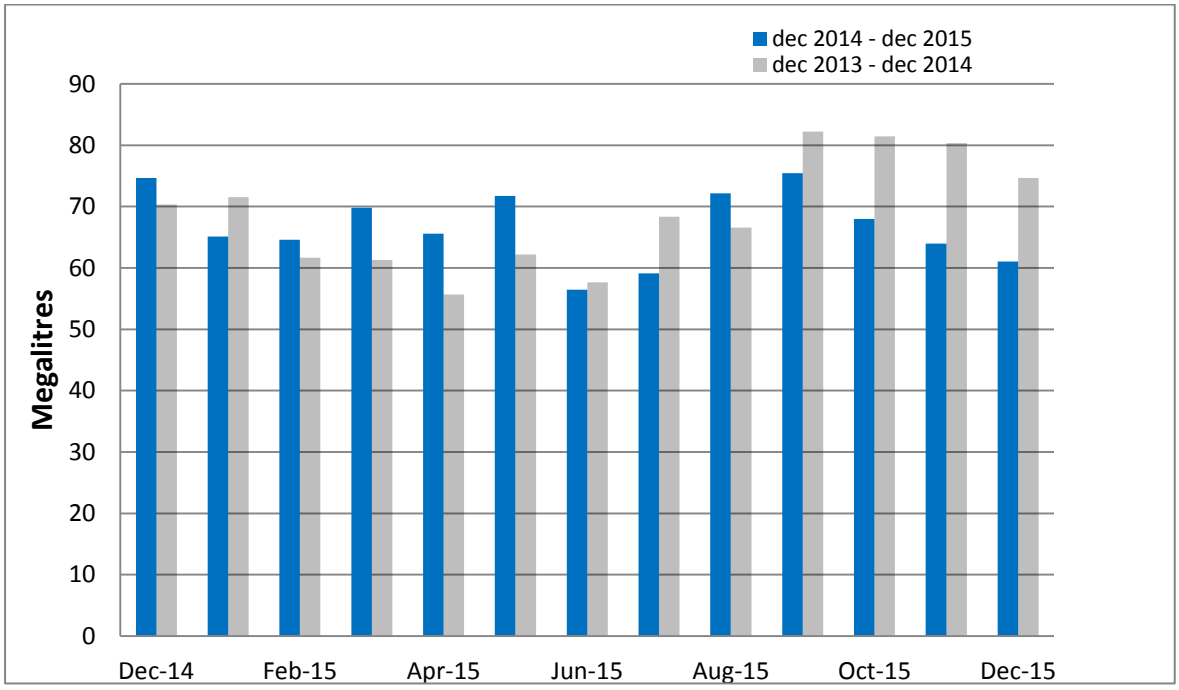
Fig 1. Rex Creek Intake level for the period October to December 2015



Mossman Water Treatment Plant is meeting demand capacity. Net treated water outflow from the Mossman WTP for the reporting period was 923.08 Megalitres. This represents consumption of 192.90 Megalitres for the Mossman scheme and 730.18 Megalitres for the Port Douglas scheme.

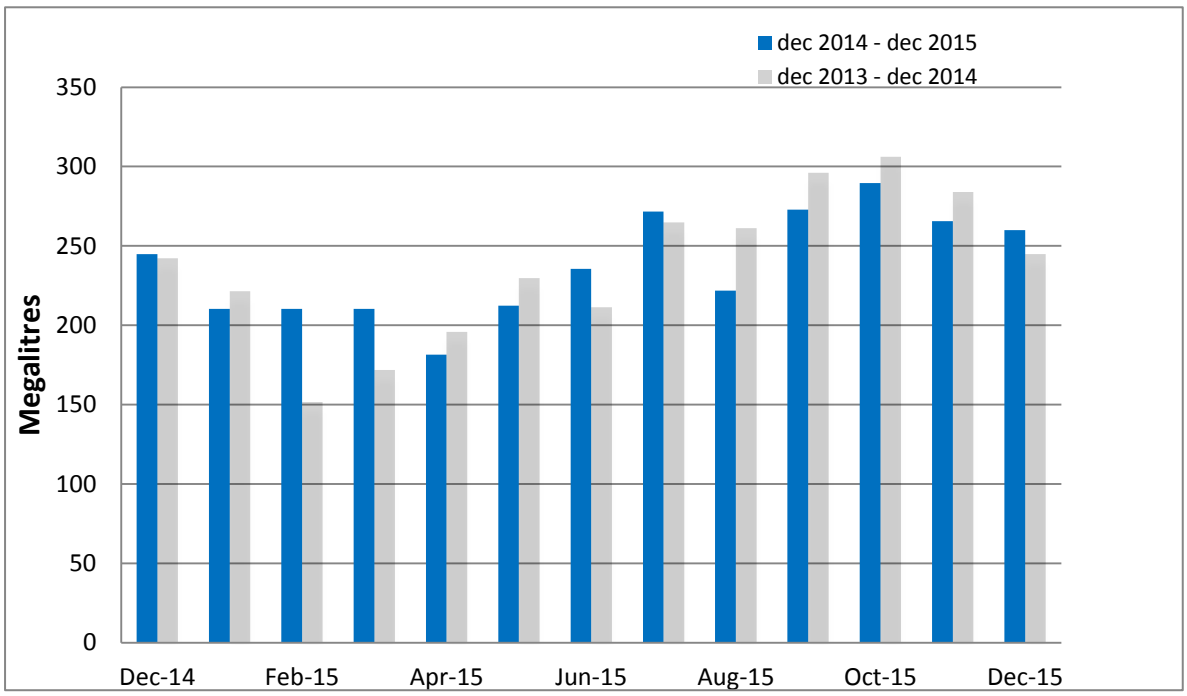
Mossman Water Supply
The total monthly consumption of water in Mossman, Cooya Beach and Newell Beach areas can be seen in Fig 2.

Fig 2. Mossman Scheme Monthly Consumption Figures



Port Douglas Water Supply
The total monthly consumption of water in Port Douglas can be seen in Fig 3.

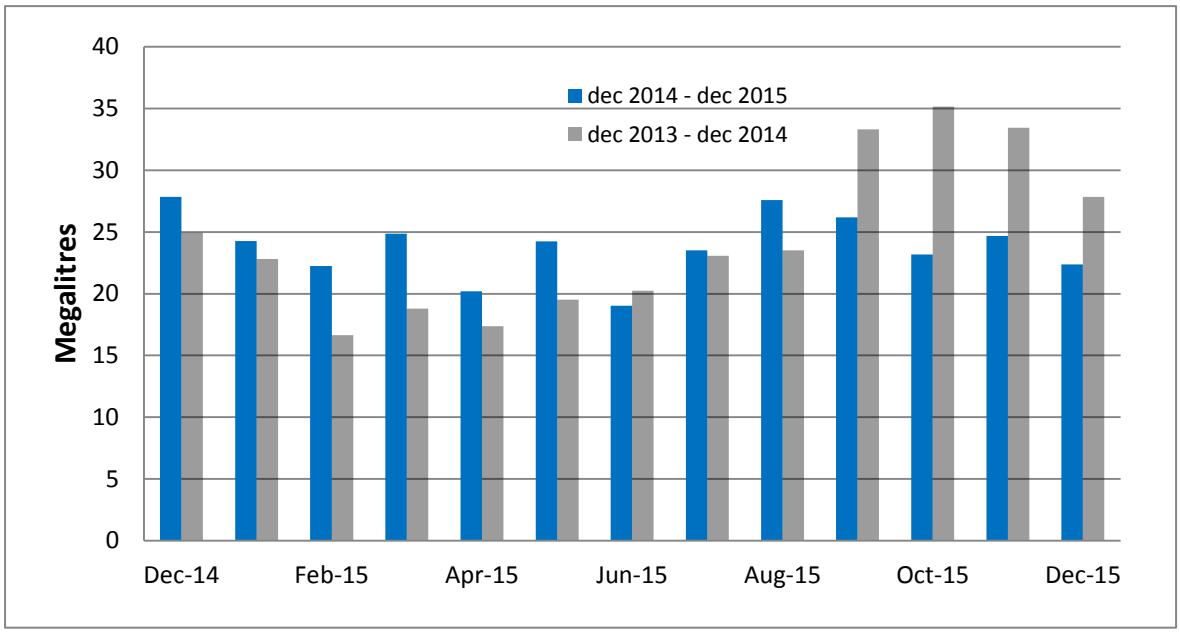
Fig 3. Port Douglas Scheme Monthly Consumption Figures



Whyanbeel Scheme
Whyanbeel Water Treatment Plant is fully operational and meeting demand. Net treated water outflow from the Whyanbeel WTP for the reporting period was 70.46 Megalitres and represents consumption for the entire Whyanbeel and Wonga water supply scheme.

Whyanbeel Water Supply
The total monthly consumption of water in the Whyanbeel Scheme can be seen in Fig 4.

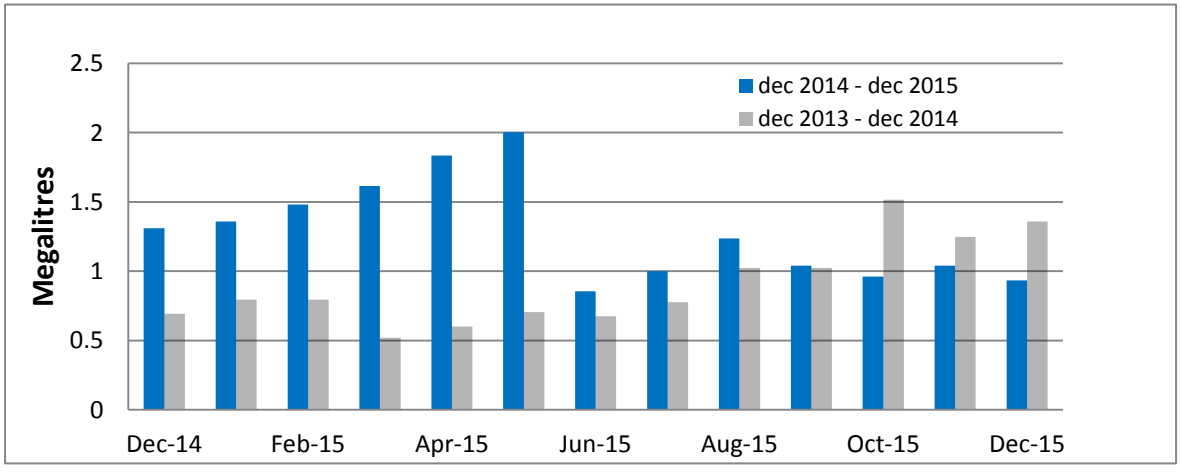
Fig 4. Whyanbeel Scheme Monthly Consumption Figures



Daintree Scheme
Daintree Water Treatment Plant is fully operational and meeting demand. Intake levels at Intake Creek have increased and are adequate for full plant production capacity. Net treated water outflow from the Daintree WTP for the reporting period was 2.73 Megalitres. This represents consumption for the entire Daintree water supply scheme.

Daintree Water Supply
The total monthly consumption of water in the Daintree Scheme can be seen in Fig 5.

Fig 5. Daintree Scheme Monthly Consumption Figures



3. Water quality monitoring and results

The Water and Wastewater Branch successfully fulfilled annual regulatory reporting and submitted a Drinking Water Quality Management Plan (DWQMP) Annual Report to the Water Supply Regulator, DEWS (Department of Energy and Water Supply) during December 2015. The amended DSC Drinking Water Quality Management Plan (DWQMP) was endorsed by Council on 24 November and submitted for approval to DEWS on 26 November.

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 2015, a total of 321 treated water samples and 3 raw water samples were taken in the 4 water supply schemes. A total of 243 samples were tested in the Douglas Water Laboratory and 78 treated water samples and 3 raw water samples were tested by a NATA accredited laboratory for physical, chemical and microbiological parameters. 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.

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 6 indicates the daily turbidity trends at the intake and treated water as recorded at the Mossman Water Treatment Plant for the period October to December 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
Oct-15	7.45	21.0	-	0.94	1.04	<1	-	<1
Nov-15	7.15	22.8	6	0.77	0.92	<1	<2	<1
Dec-15	7.29	23.3	5	0.85	0.93	<1	<1	<1

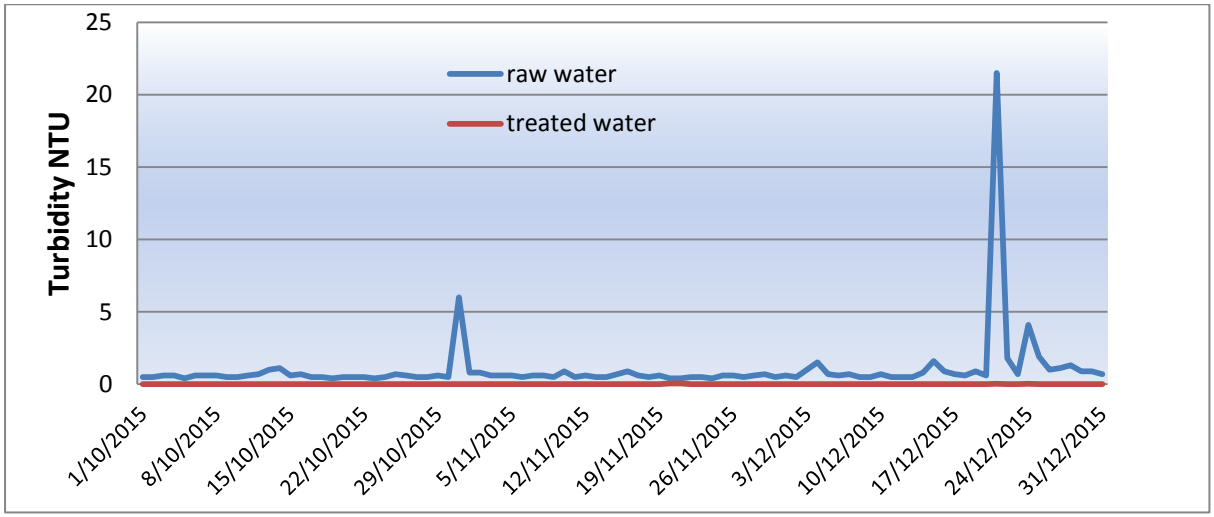
Table 4. Average monthly values for key operational and compliance parameters in the Port Douglas Reservoirs.

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
Oct-15	7.44	22.5	0.80	0.91	<1	<1	-	<1
Nov-15	7.12	24.7	0.61	0.72	<1	<1	<1	<1
Dec-15	7.24	25.5	0.69	0.78	<1	<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
Oct-15	7.69	24.2	0.65	0.73	<1	-	<1
Nov-15	7.45	26.4	0.42	0.51	<1	<10	<1
Dec-15	7.40	27.0	0.56	0.65	<1	<3	<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 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 7. indicates the daily turbidity trends at the intake and treated water as recorded at the Whyanbeel Water Treatment Plant for the period October to December 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
Oct-15	7.05	20.6	-	0.90	1.01	<1	-	<1
Nov-15	6.91	23.4	<5	0.92	1.08	<1	<17	<1
Dec-15	7.05	25.5	<5	0.84	0.89	<1	<1	<1

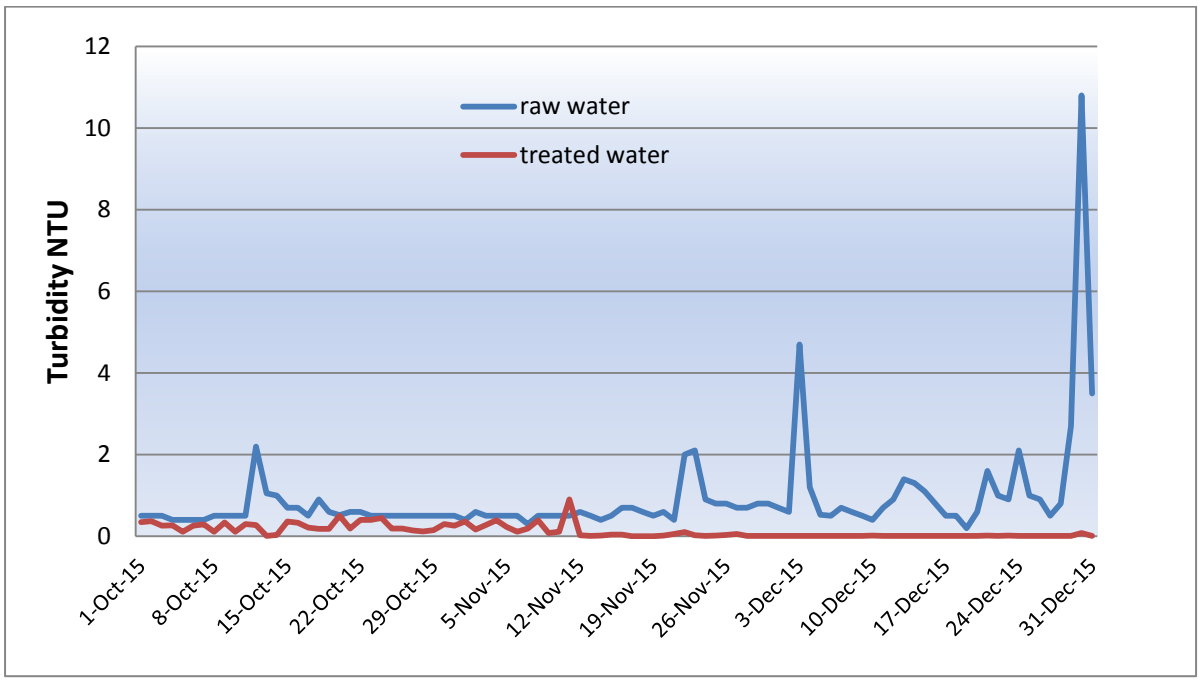
Table 7. Average monthly values for key operational and compliance parameters in the Whyanbeel Reservoir.

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
Oct-15	7.33	23.1	-	0.87	0.90	<1	-	<1
Nov-15	7.25	25.3	7	0.76	0.82	<1	<17	<1
Dec-15	7.55	26.7	7	0.52	0.62	<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
Oct-15	8.09	24.8	0.43	0.52	<1	-	<1
Nov-15	7.60	27.0	0.38	0.45	<1	<11	<1
Dec-15	7.92	27.7	0.22	0.29	<1	~1	<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 can be seen In Table 9. and 10. for treated water at the Daintree Treatment Plant and Daintree Reticulation network, respectively. Fig 8. indicates the daily turbidity trends at the intake and treated water as recorded at the Daintree water treatment plant for the period October to December.

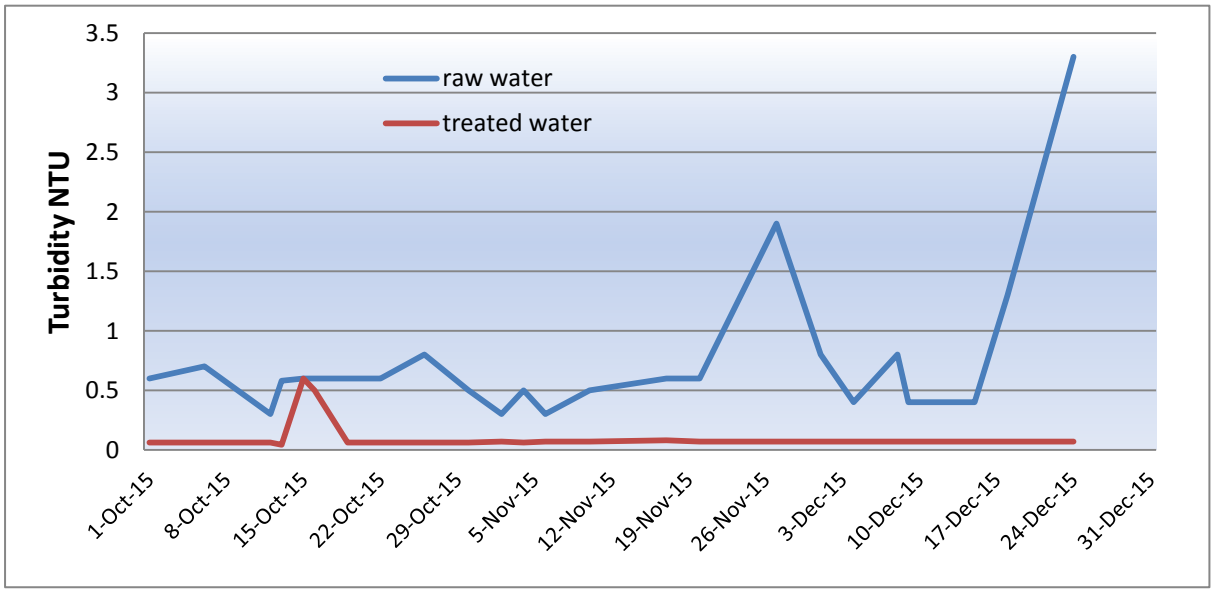
Table 9. Average monthly values for key operational and compliance parameters in treated water at Daintree Treatment Plant.

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
Oct-15	7.43	22.9	-	1.08	1.18	<1	-	<1
Nov-15	7.24	22.2	14.5	0.99	1.05	<1	<1	<1
Dec-15	7.34	25.9	23	0.97	1.02	<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
Oct-15	7.40	23.4	0.68	0.76	<1	-	<1
Nov-15	7.33	25.5	0.59	0.67	<1	~43	<1
Dec-15	7.46	25.8	0.54	0.64	<1	<1	<1

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



Wastewater

4. Wastewater Reticulation Services

General maintenance programs were carried out at the reticulation networks and 31 pump stations in the Mossman and Port Douglas catchments.

Table 11. Wastewater Reticulation Services

	Port Douglas Catchment	Mossman Catchment
Pump Blockages	9	6
Sewer Chokes	2	2
Sewer Main Breaks	0	0
HCB Repairs (House Connection Branch)	4	1
Odour Complaints	0	0

5. Influent and Irrigation Flows

Port Douglas Wastewater Treatment Plant

A total of 250,526 kL of influent entered the Port Douglas Wastewater Treatment Plant during the reporting period. The average daily flow was 2,723 kL/day. Tanker truck contractors delivered 469 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 48% of the treated effluent was pumped to two resorts and the remaining discharged in the Dickson Inlet. The Sheraton Mirage received 68,629 kL and Reef Links received 53,577 kL of treated effluent during this period. Total rainfall on site during the reporting period was measured as 716 mm. On 23 December 2015, the rainfall was recorded as 156.5mm. Daily SBR flows and total monthly flows for 2014/2015 are presented in Fig 9 and 10 respectively.

Fig 9. Port Douglas SBR Daily Flow

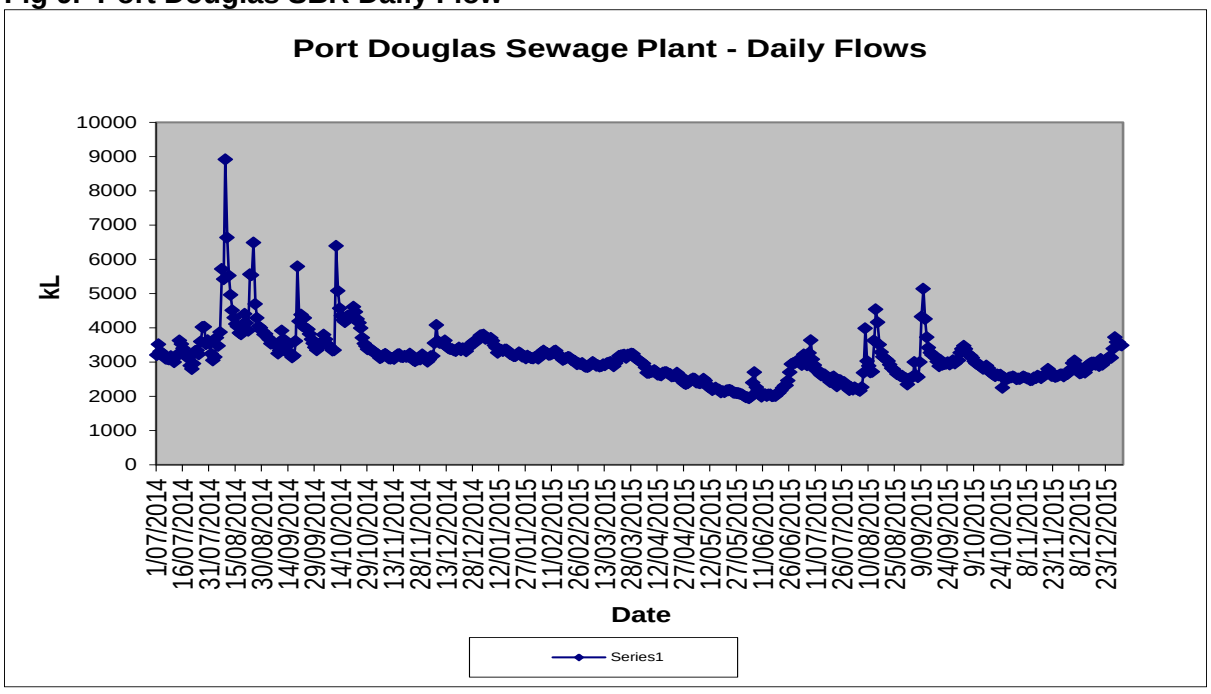
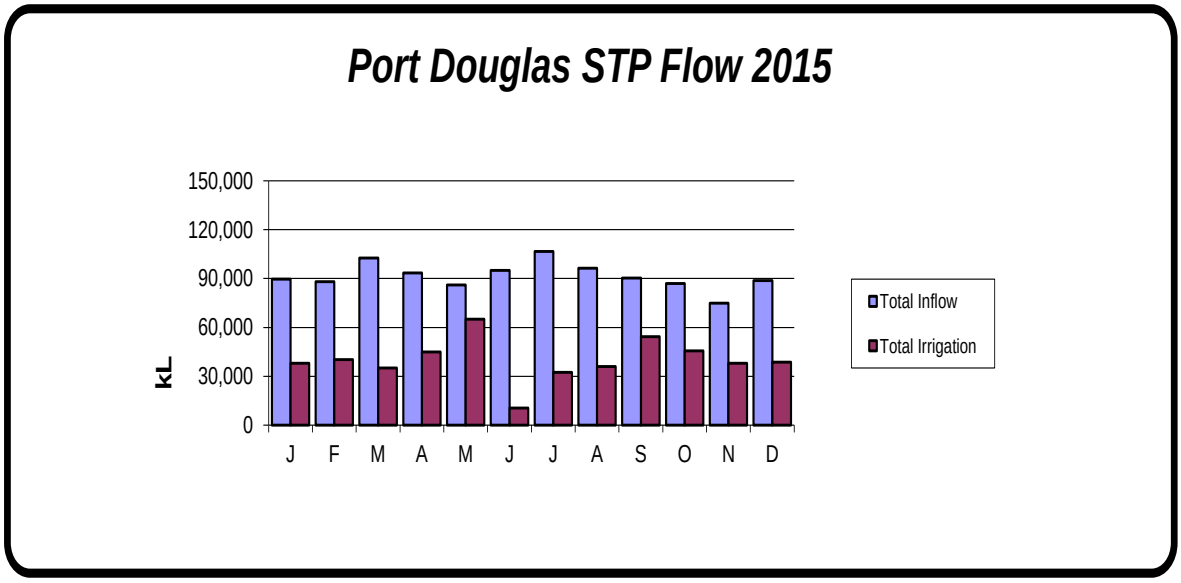


Fig 10. Port Douglas Total Monthly Flow



Mossman Wastewater Treatment Plant

The Mossman Wastewater Treatment Plant received a total influent flow of 82,881 kL during the reporting period. The average daily flow was 900 kL/day. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged in the Mossman River. A total of 971 mm of rain fell on site for the reporting period with the highest daily rainfall measured at 215 mm on 23 December 2015. As a result of the high rainfall during the latter part of December, the plant intermittently didn't comply with the dry weather flow limit due to ingress and infiltration into the sewer network.

Daily flows from the Mossman Wastewater Treatment Plant and total monthly flows for 2014/2015 are presented in Fig 11 and 12 respectively.

Fig 11. Mossman Wastewater Treatment Plant Daily Flow

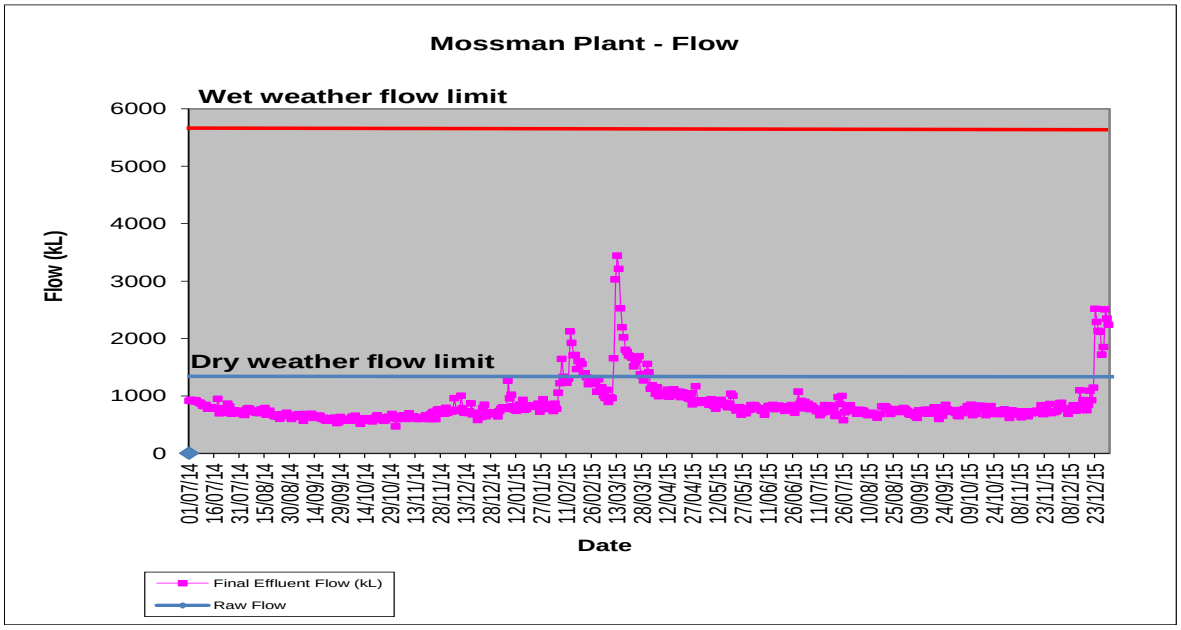
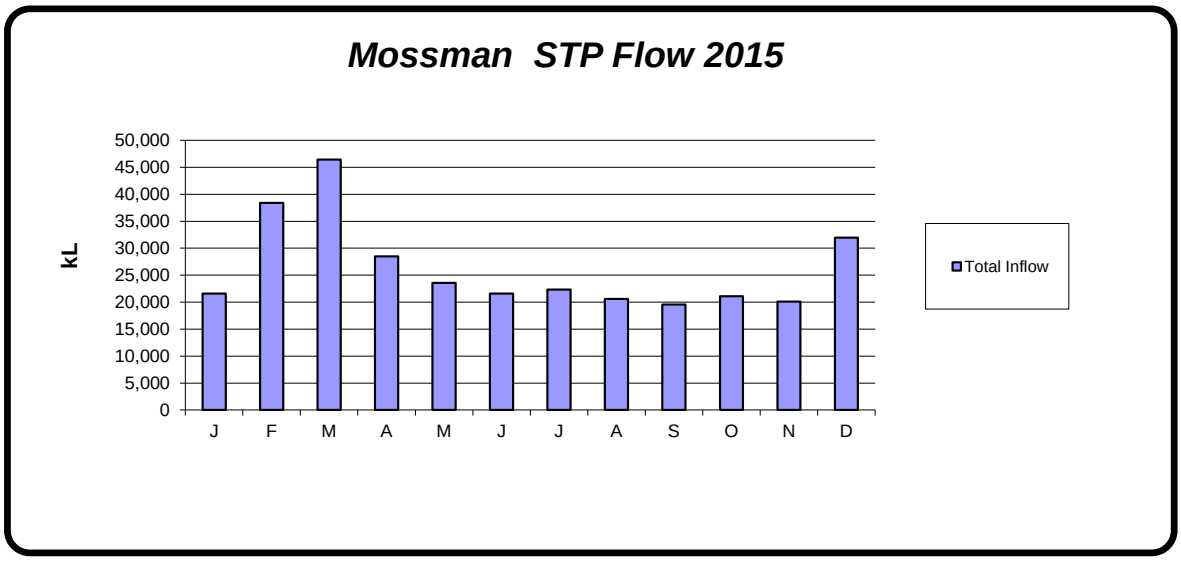


Fig 12. Mossman Wastewater Treatment Plant Total Monthly Flow



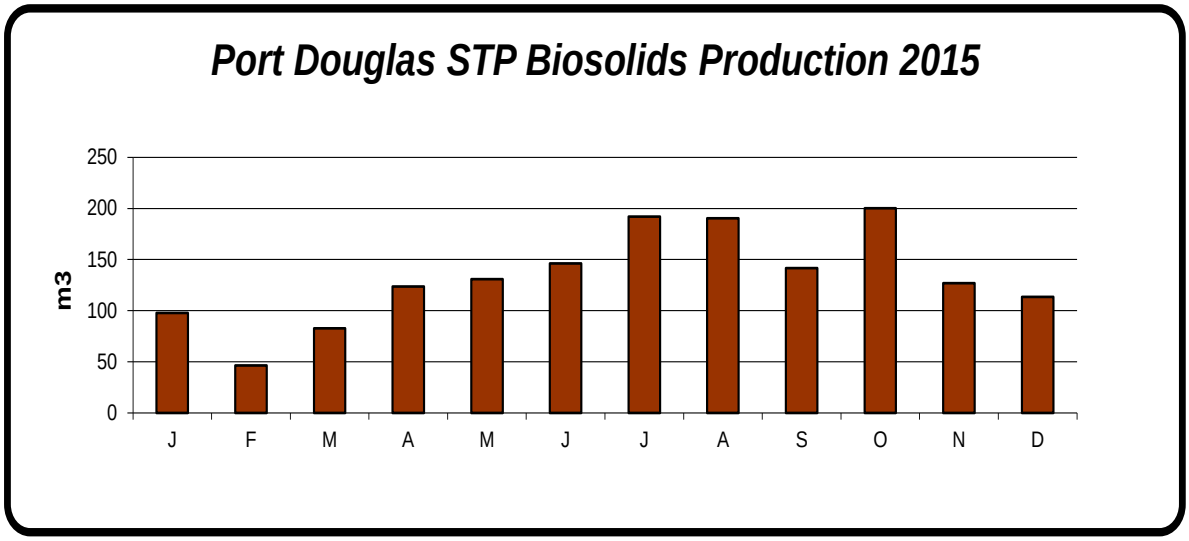
6. Bio-solids Production

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, 440.46m^3 of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet biosolids equates to 61.60 dry tonnes. The monthly bio-solids production trends can be seen in Fig 13.

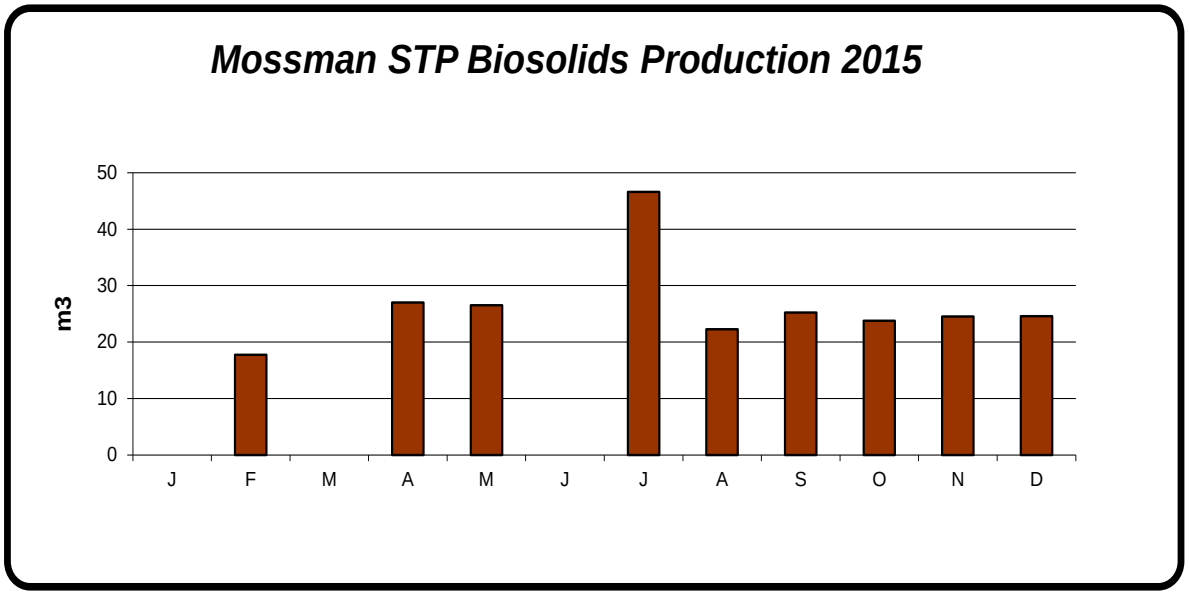
Fig 13. Port Douglas Wastewater Treatment Plant monthly bio-solids production



Mossman Wastewater Treatment Plant

At Mossman Wastewater Treatment Plant, 72.92m^3 of wet biosolids were produced during the reporting period and sent to farms for beneficial reuse. This amount of wet biosolids equates to 10.20 dry tonnes. The monthly bio-solids production trends can be seen in Fig 14.

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



7. Effluent Quality and Compliance

As part of the remedial steps to prevent an environmental incident similar to what occurred on 17 July 2015 (reported previously), the Programmable Logic Controller (PLC) replacement commenced early December at Port Douglas WWTP. The upgrade of the PLC or the Programmable Logic Controller (the “brain” running the wastewater plant and pump systems) was fully completed by 18 December 2015. During the two week installation period, the water operators took some extraordinary measures to ensure that the plant remained operational and monitored daily to ensure compliance with licence conditions. Water operators were trained officially beforehand to empower them to handle any event during the installation period.

During the reporting period a total number of 181 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.

During the reporting period all parameters tested in the Port Douglas and Mossman catchment were compliant with maximum, short and long term 80th percentile concentrations as per licence definitions and conditions. Mossman WWTP intermittently didn’t comply with the dry weather flow limit due to ingress and infiltration into the sewer network.

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 15, 16, 17 & 18

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

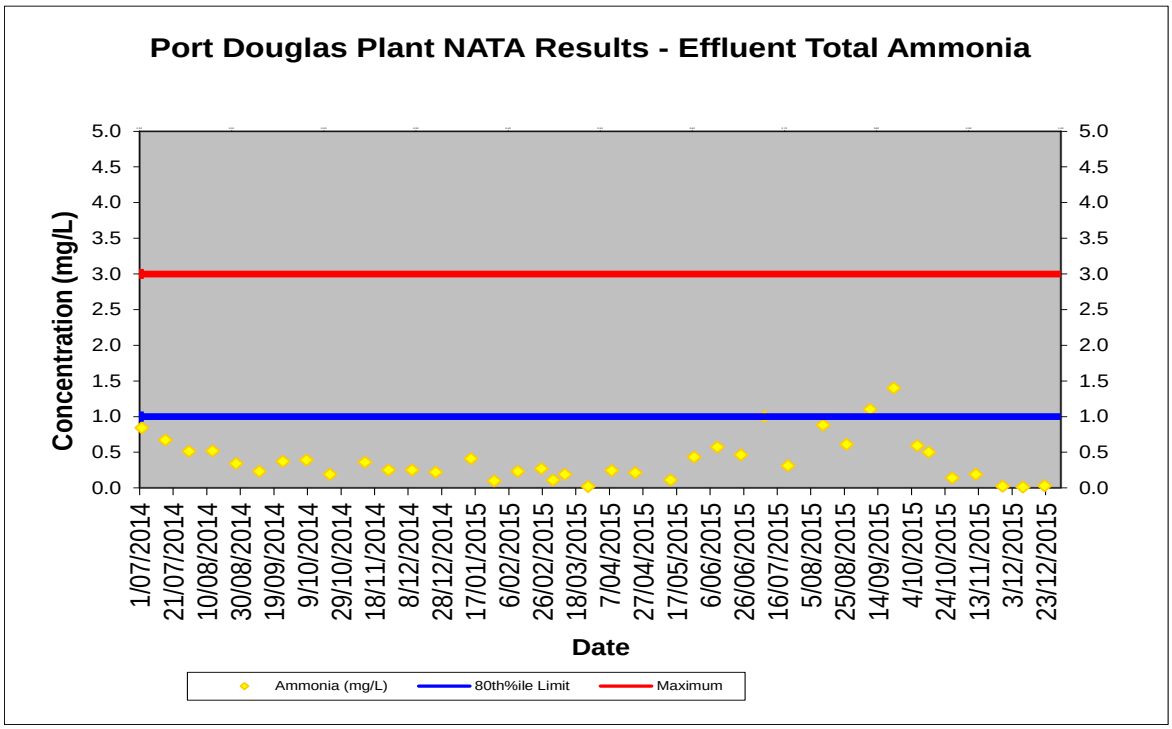


Fig 16. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Phosphorous

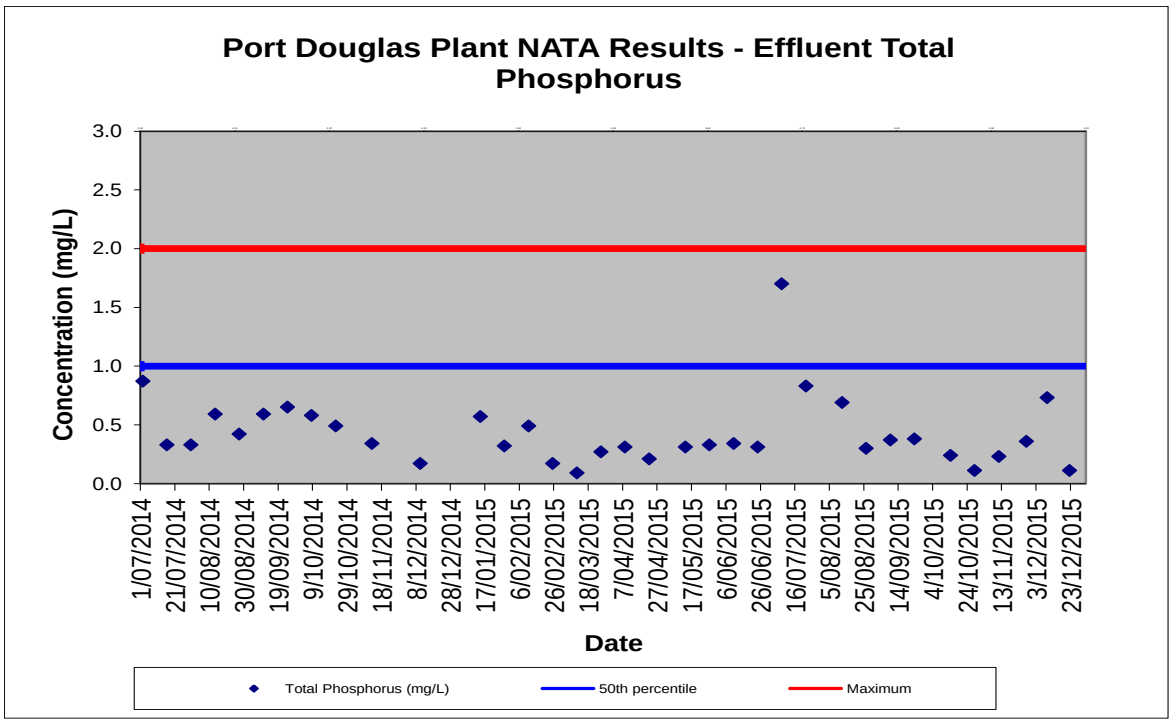


Fig 17. Port Douglas Wastewater Treatment Plant Final Effluent Test Results for Total Suspended Solids

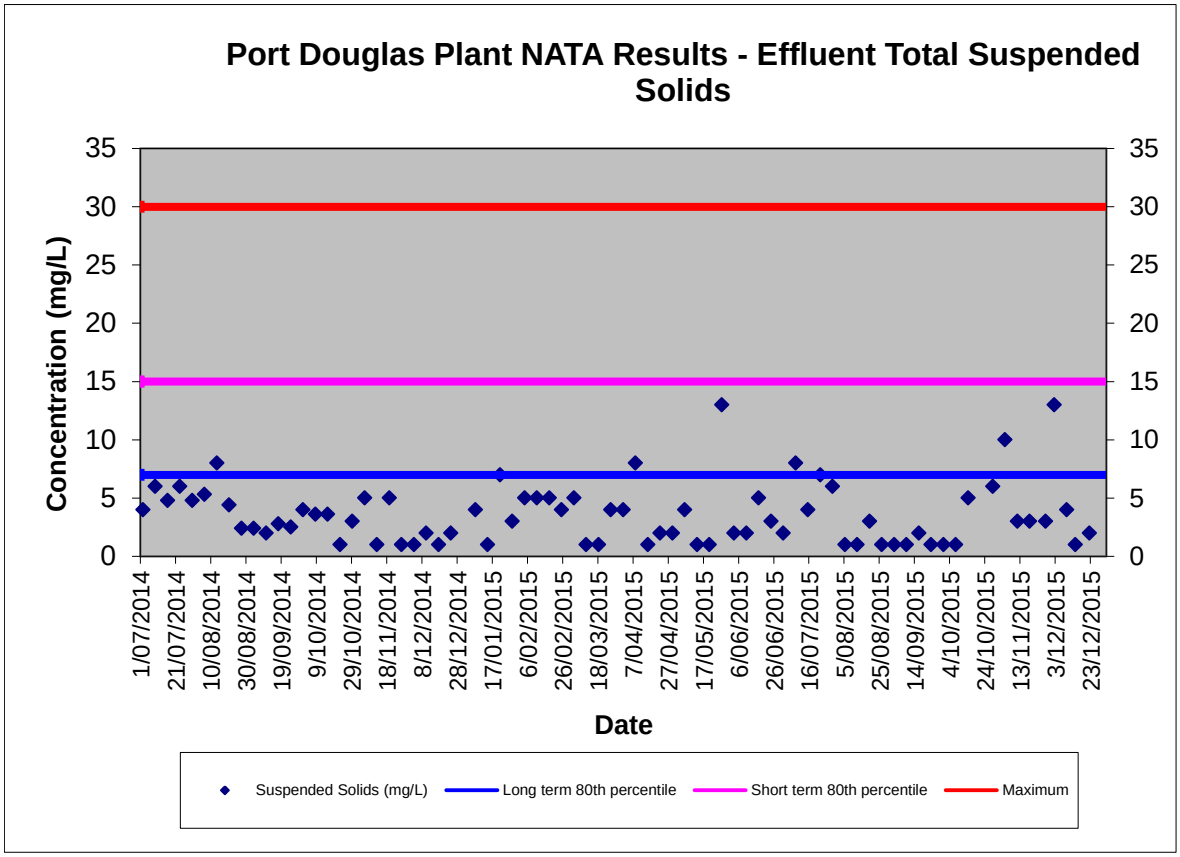
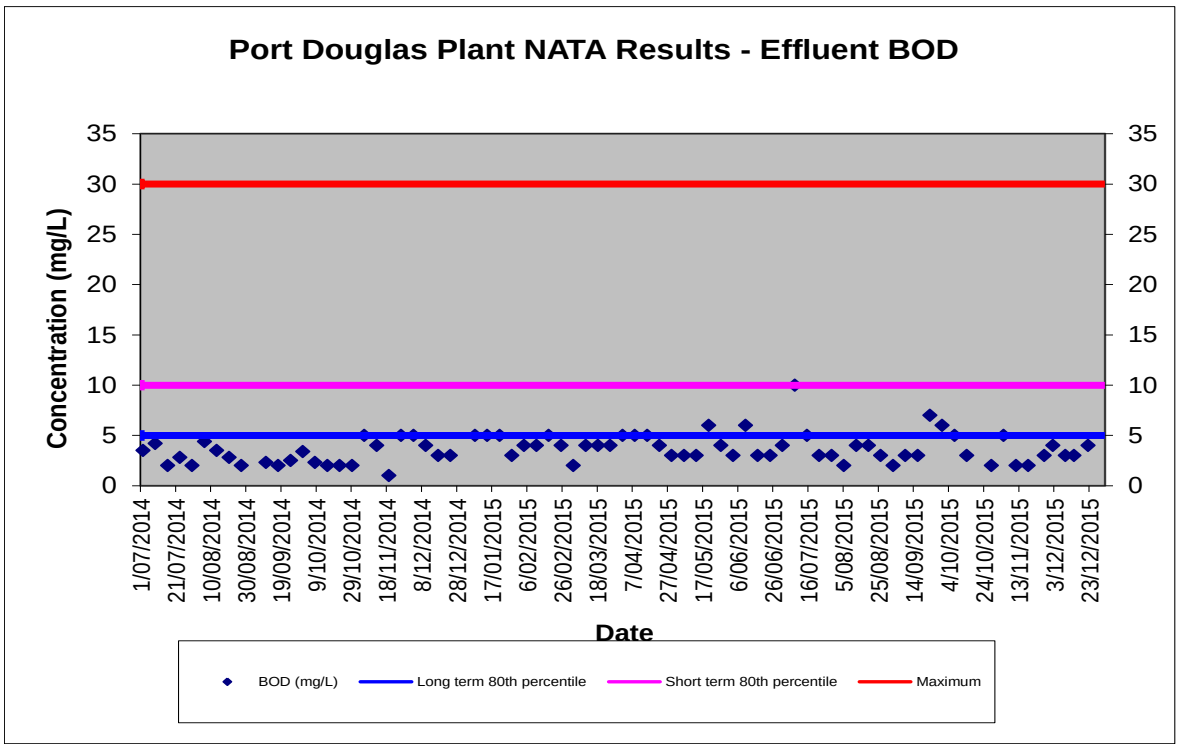


Fig. 18 Port Douglas Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)



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 19, 20, 21 & 22.

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

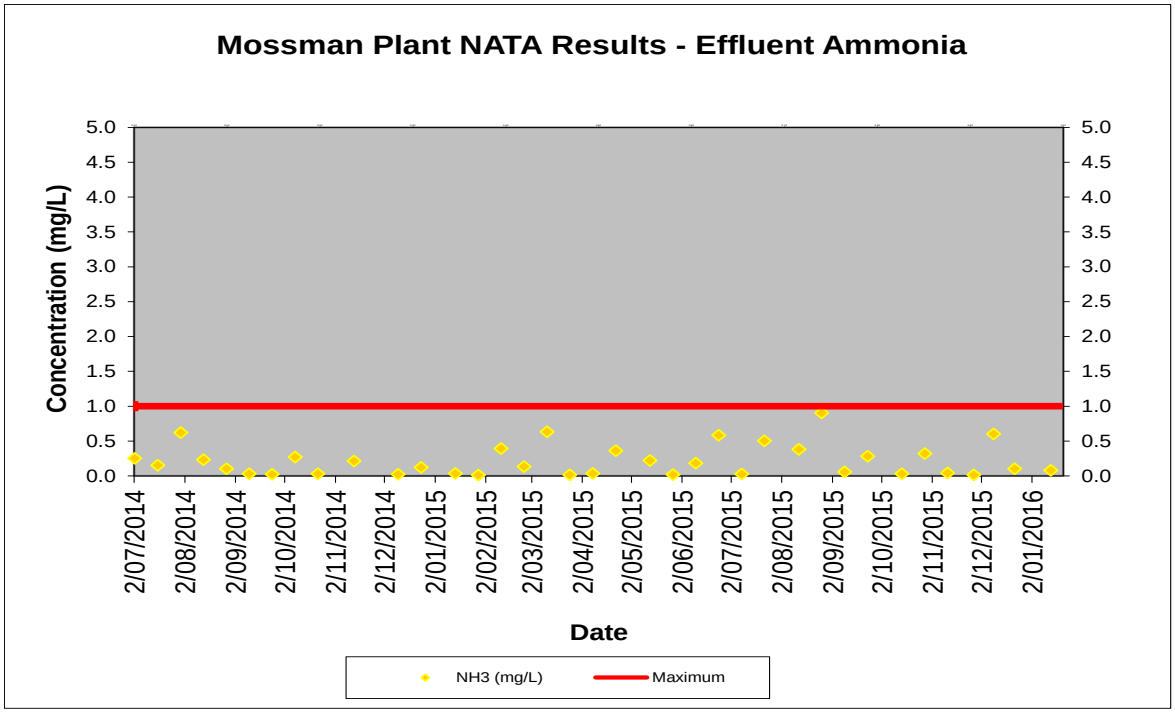


Fig. 20 Mossman WWTP Final Effluent Test Results for Total Phosphorous

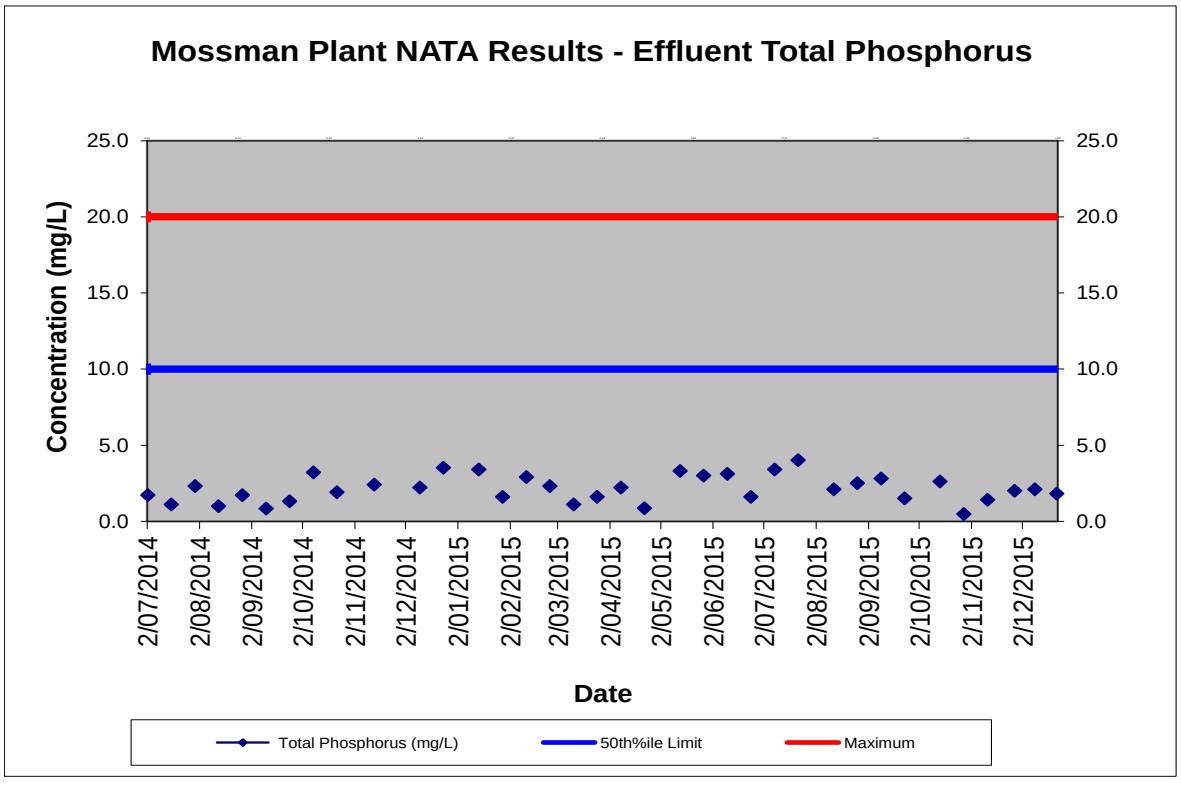


Fig. 21 Mossman WWTP Final Effluent Test Results for Total Suspended Solids

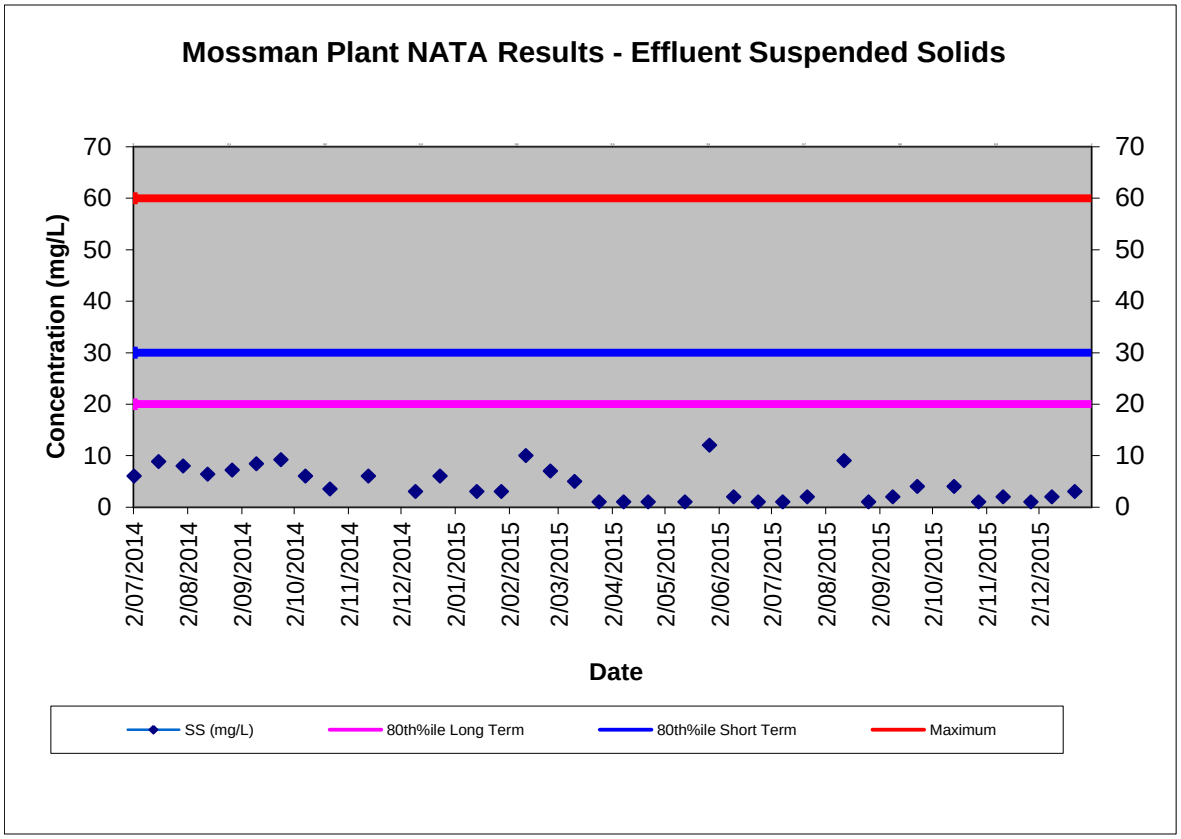


Fig. 22 Mossman Wastewater Treatment Plant Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)