ORDINARY MEETING 4 NOVEMBER 2014	5.7

WATER AND WASTEWATER QUARTERLY REPORT FOR PERIOD JULY-SEPTEMBER 2014

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Paul Hoye, General Manager Operations

RECOMMENDATION:

It is recommended that Council resolve that the Water and Wastewater Quarterly Report for the period July- September 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 July to September 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 relining of sewage pipes to assist in meeting dry and wet weather inflow requirements and the installation of a new race for the Rex Creek intake.

BACKGROUND:

This report is the first 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 the required compliance levels set 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 first 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.

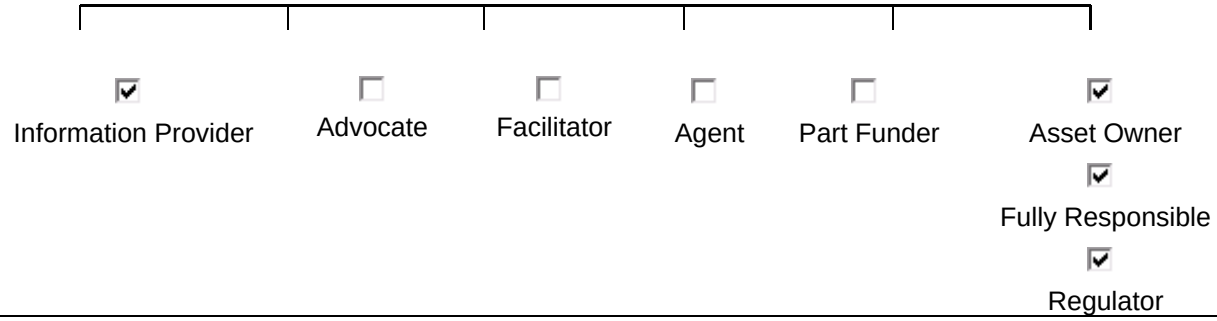
Maintaining Council's Water and Waste assets to ensure maximum lifespan and output capacity in the lifecycle of those assets.

Monitoring of systems, procedures and workplace environment 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 result in 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:

Attachment 1 - Water and Wastewater Quarterly Report for the period ending 30 September 2014

Attachment 1 - Water and Wastewater Quarterly Report
1 July 2014 - 30 September 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)	
New water services connections	19
Settlement meter reads	76
Service repairs	76
Callouts and breaks	28

2. Water schemes and potable water consumption

Mossman/Port Douglas Schemes

The abstraction flow in September from Rex Creek is 235l/s and is still compliant with licenced abstraction flow of 300l/s.

The Mossman water treatment plant is meeting demand capacity, current trends indicate increased water usage due to the prolonged dry period. During September the monthly daily peak consumption for the Mossman and Port Douglas scheme has increased by 2.5 ML. Consumption increased in Port Douglas with approximately 2ML (28% increase) and in Mossman 0.5ML (25% increase).

The total monthly consumption of water in Mossman, Cooya Beach and Newell Beach areas can be seen in Fig 1.

Fig 2 shows the daily water consumption in Mossman, Cooya Beach and Newell Beach areas during September.

Fig 1. Mossman Consumption

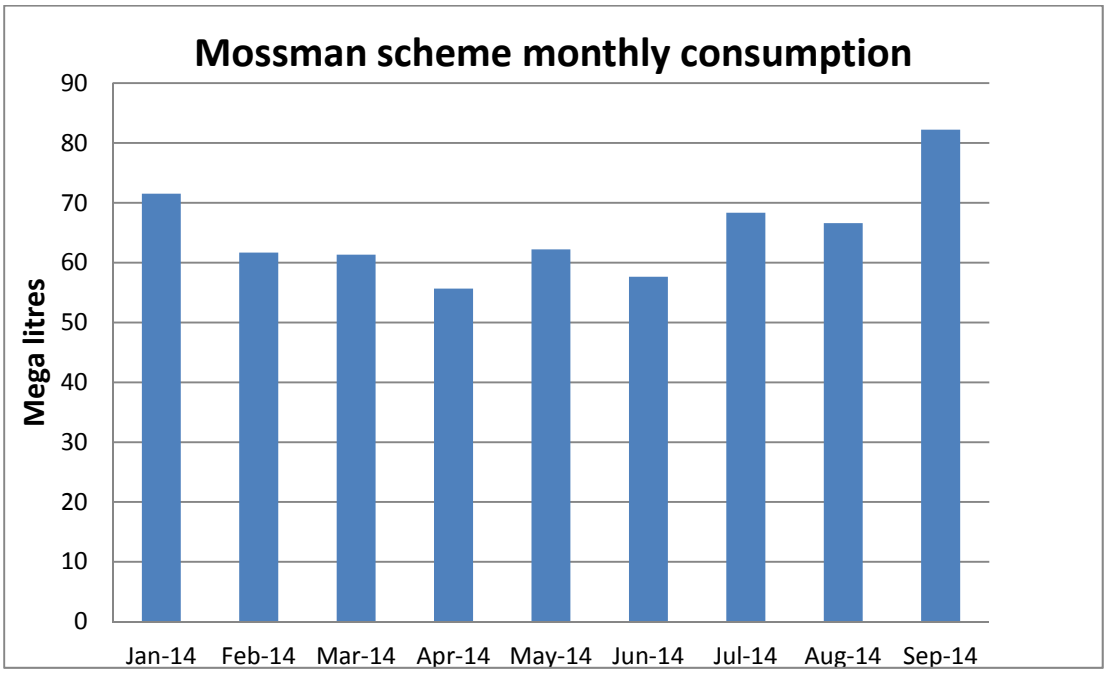
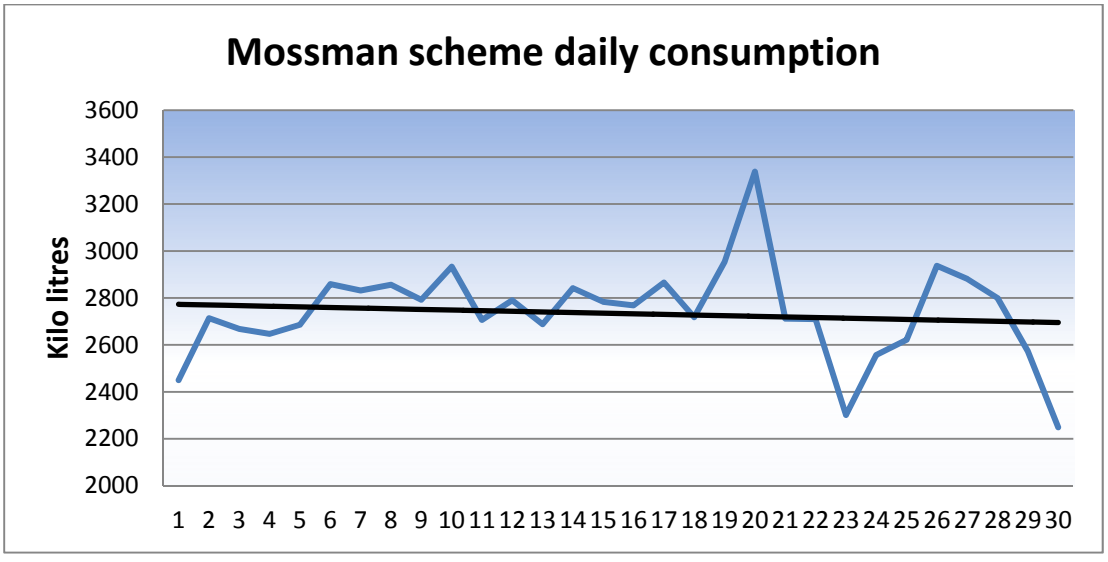


Fig 2. Mossman Daily Consumption during September



Mossman/Port Douglas Schemes

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

Fig 4 shows the daily water consumption in the Port Douglas scheme during September.

Fig 3. Port Douglas Consumption

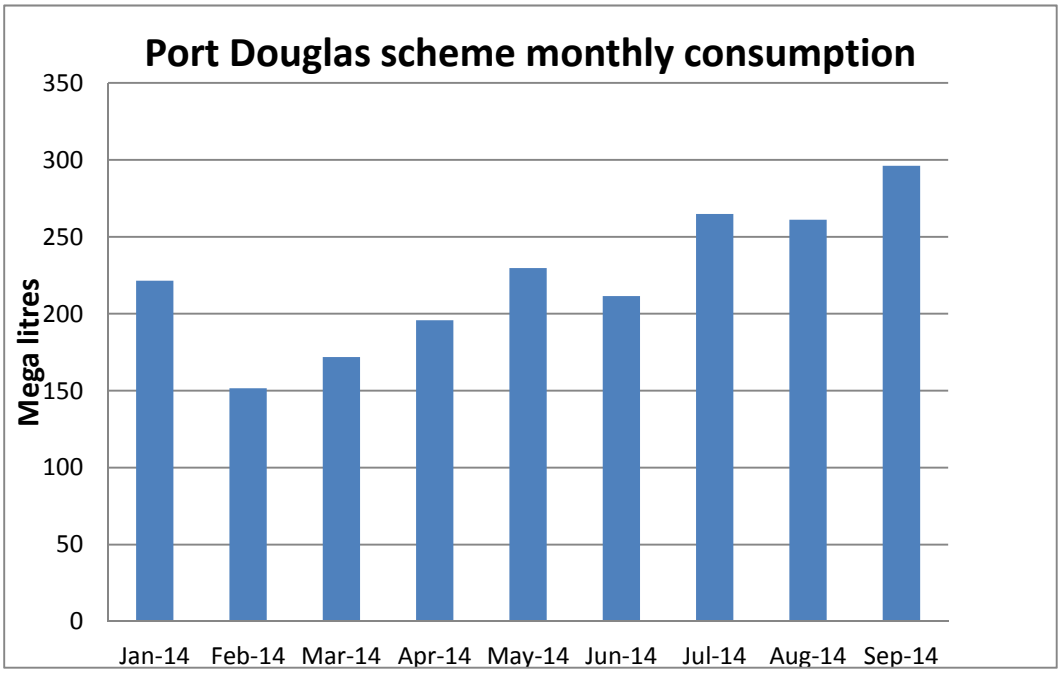
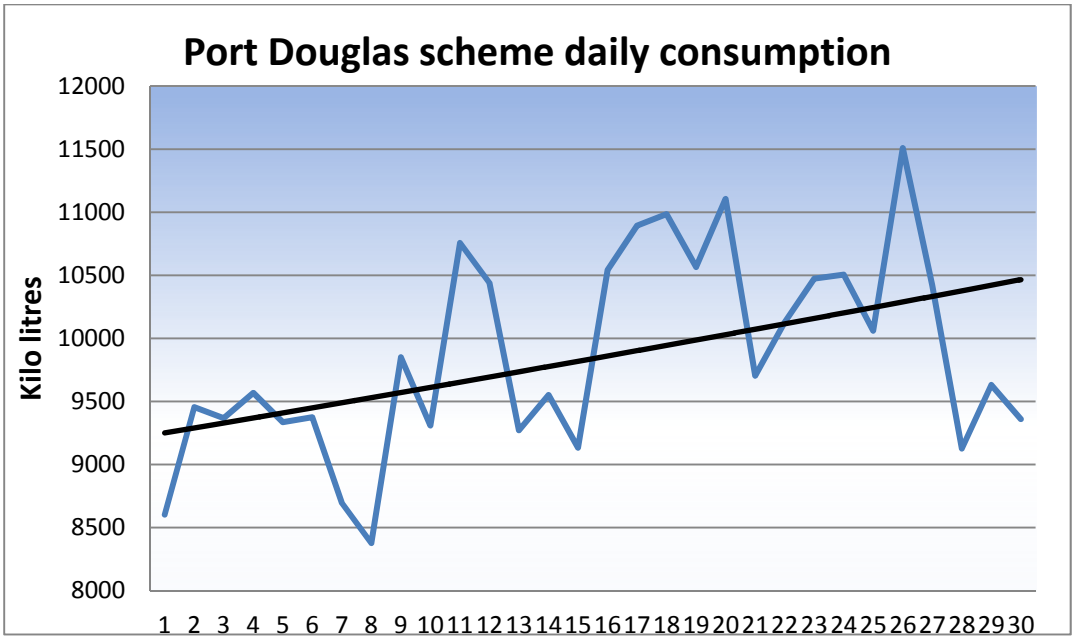


Fig 4. Mossman Daily Consumption during September



Whyanbeel Scheme

Whyanbeel plant is operating and meeting demand. Intake levels at Little Falls Creek are reduced but still adequate for full plant production capacity. The consumption of potable water also increased during the months of July and August but increased significantly during September when the consumption increased to 33.31 Mega litres for the entire Whyanbeel water supply scheme.

The total monthly consumption of water in the Whyanbeel Scheme can be seen in Fig 5 and Fig 6 shows the daily water consumption in the Whyanbeel Scheme during September.

Fig 5. Whyanbeel Scheme Consumption

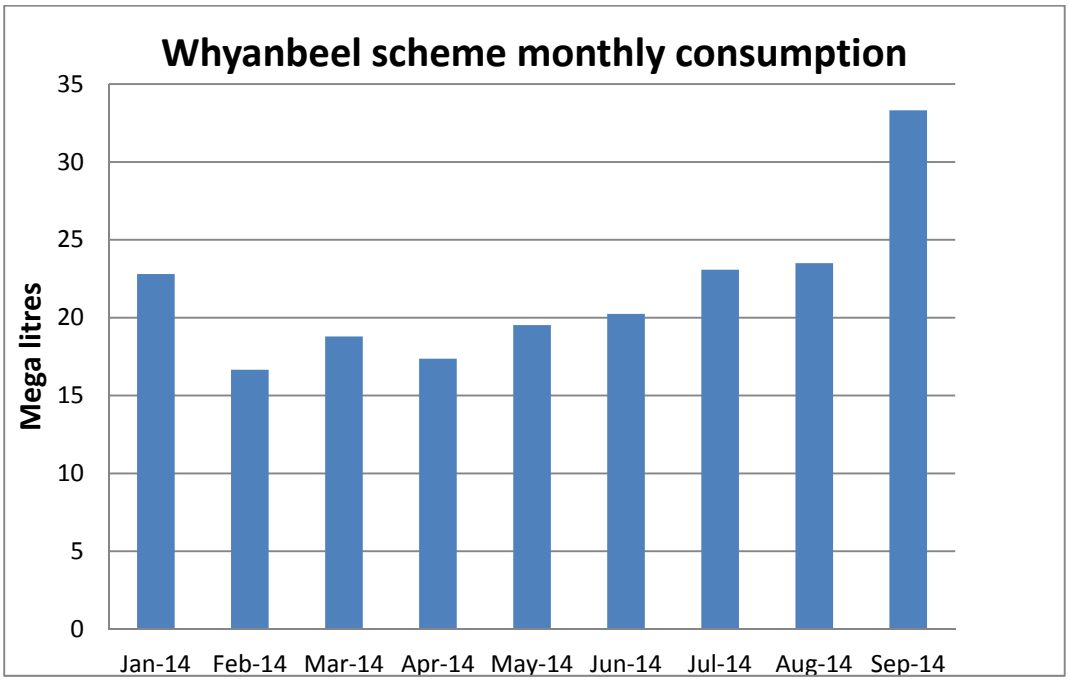
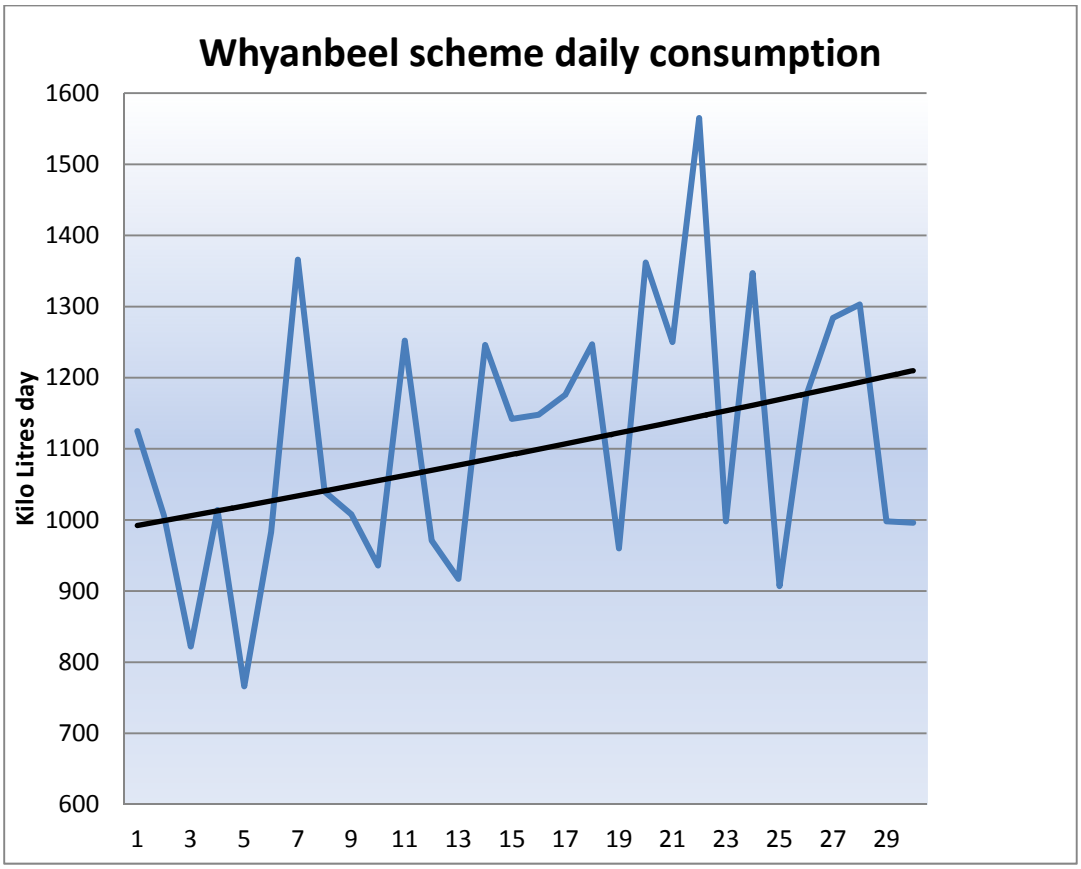


Fig 6. Whyanbeel Daily Consumption during September



Daintree Scheme
Daintree plant is operating and meeting demand. Intake levels at Intake Creek are reduced but still adequate for full plant production capacity. Consumption for this scheme is steadily increasing in line with seasonal trends. During September the water consumption increased to 1.51 Mega litres. Ongoing weekly chemical clean operations are in place to manage rising Trans Membrane Pressures on the Ultra Filtration (UF) rack.

The total monthly consumption of water in the Daintree Scheme can be seen in Fig 7 and Fig 8 shows the daily water consumption in the Daintree Scheme during September.

Fig 7. Daintree Scheme Consumption

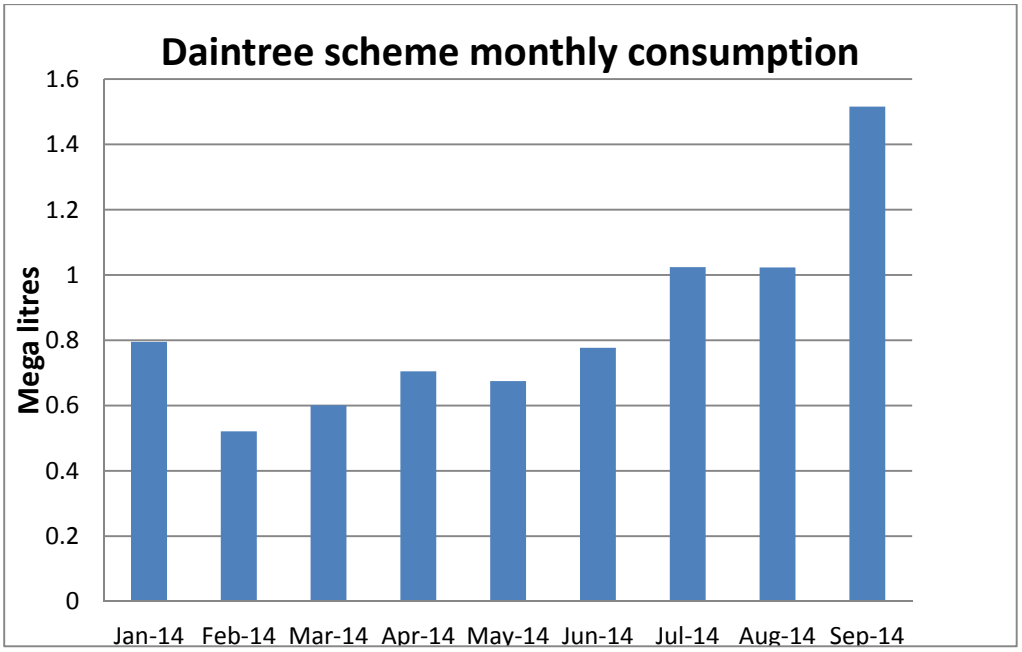
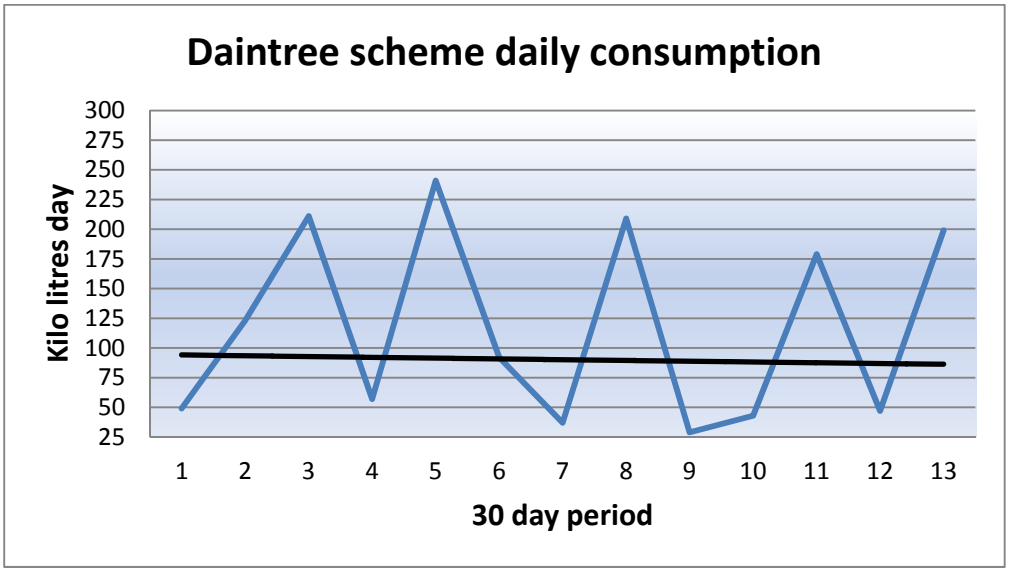


Fig 8. Daintree Daily Consumption during September



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 July to 30 September, a total of 380 water samples were taken in the 4 water supply schemes and tested by a NATA accredited laboratory for physical, chemical and microbiological parameters (See Table 6 for summary of tests). Of these 380 water samples, 205 samples were taken from the reticulation network at public water taps in the Shire (See Table 2 for the sampling points).

Table 2 - Douglas Shire Council Water Sampling Sites

Mossman	***Raw***	***Treatment***	***Reservoir***	***Reticulation***
Mossman Intake	■			
Cooya Beach -Bouganvillea St (cnr Beach Rd)				■
Cooya Beach - Northern End - Boat Ramp				■
Craiglie - Reef Park Reservoir			■	
Craiglie - Teamsters Park				■
Flagstaff - Reservoir No. 2 Pump Station Tap			■	
Four Mile Beach - Barrier Street				■
Four Mile Beach - Esplanade				■
Mossman - Davis Park in front of Church				■
Mossman - Showgrounds near Ticket Box				■
Mossman T/P (Mossman Res) - Post UV		■		
Mossman T/P (Mossman Reservoir) - Pre UV		■		
Mossman T/P (Port Reservoir) - Post UV		■		
Newell Beach - Esplanade - T-Intersection				■
Newell Beach - Jetty - Corner Tap (Croc Sign)				■
Port Douglas - Rex Smeal Park				■
Whyanbeel	***Raw***	***Treatment***	***Res***	***Reticulation***
Whyanbeel Intake	■			
Rocky Point Pump Station				■
Rocky Point Reservoir			■	
Whyanbeel - Post UV		■		
Whyanbeel - Pre UV		■		
Wonga Beach - Bells Park				■
Wonga Beach - Marlin Drive Bus Shelter				■
Wonga Beach Reservoir - North Tap			■	
Daintree	***Raw***	***Treatment***	***Res***	***Reticulation***
Daintree Intake	■			
Daintree - Post UV		■		
Daintree - Pre UV		■		
Daintree - Shire Hall				■
Dagmar Heights	***Raw***	***Treatment***	***Res***	***Reticulation***
Bores	■			
Reservoir			■	
Reservoir supply line to houses -sampling tap				■

The sample sites selected are broken down to reservoir service area and then representative reticulation supply points selected within these reservoir service zones to provide a more detailed view of the water supplied to customers. The sample regime is also in line with ADWG recommendations for frequency and parameters tested.

Process settings, water quality, production levels, intake levels and maintenance aspects are monitored and controlled with SCADA Citect via an extensive telemetry network across the four water supply schemes.

All tested parameters in water samples taken during the reporting period were compliant with ADW Guidelines except one single sample taken on 12 August 2014 at Newell Beach, Jetty - Corner Tap. The pH level was determined to be pH 8.7 at this sample point and exceeded the ADW Guideline value of 8.5. High pH levels are common in long reticulation networks consisting of cement-lined pipework.

Average monthly values for key operational and compliance parameters can be seen In Table 3, 4 and 5 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 9, 10 and 11 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 July to September. The raw water turbidity is normally low and very stable during the dry season. On 6 and 15 September light rain showers occurred and led to a small variation in the raw water turbidity.

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/100 ml	HPC CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
July 2014	7.10	17.7	4.94	0.83	0.92	<1	<1	<1
Aug 2014	7.10	18.2	5.2	0.87	0.92	<1	<1	<1
Sept 2014	7.36	19	5.4	0.83	0.87	<1	<1	<1

Fig 9. Turbidity trends at the Rex Creek intake and treated water at the Mossman WTP

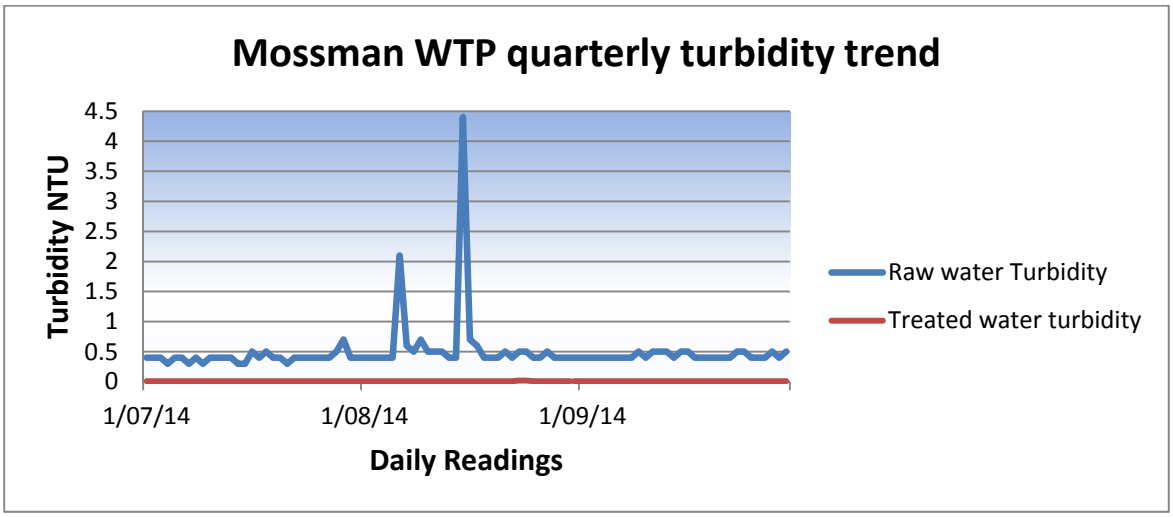


Table 4. Average monthly values for key operational and compliance parameters in treated water at Whyanbeel treatment plant.

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/100 ml	HPC CFU/mL	Total coliforms CFU/100ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
July 2014	6.96	18.9	4.08	0.88	0.98	<1	<1	<1
Aug 2014	7.03	20.2	3.83	0.95	1.04	<1	<1	<1
Sept 2014	6.93	19.06	3.76	0.76	0.85	<1	<1	<1

Fig 10. Turbidity trends at the Little Falls Creek intake and treated water at the Whyanbeel WTP

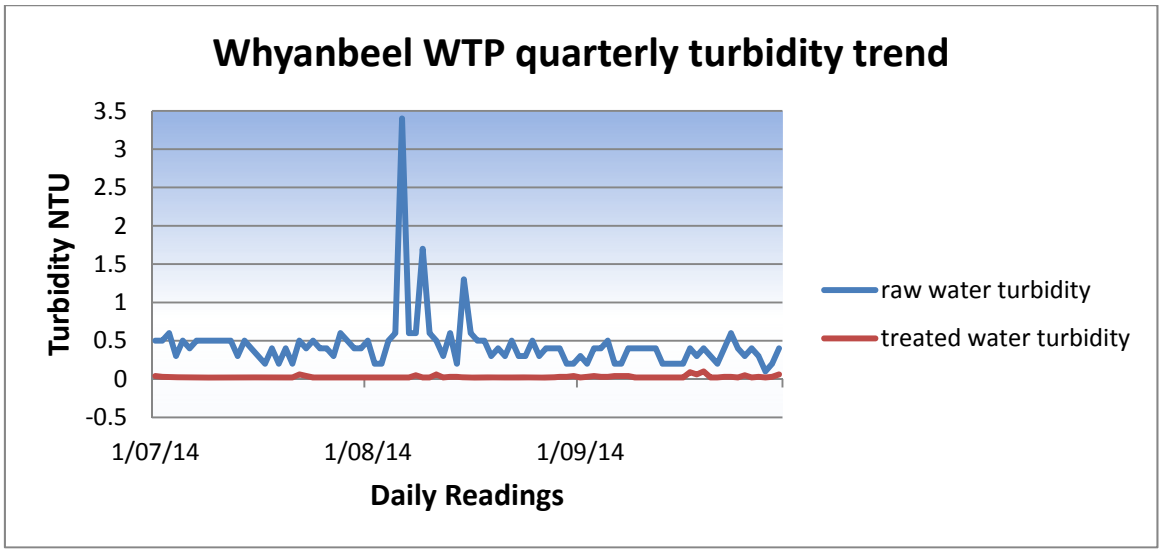
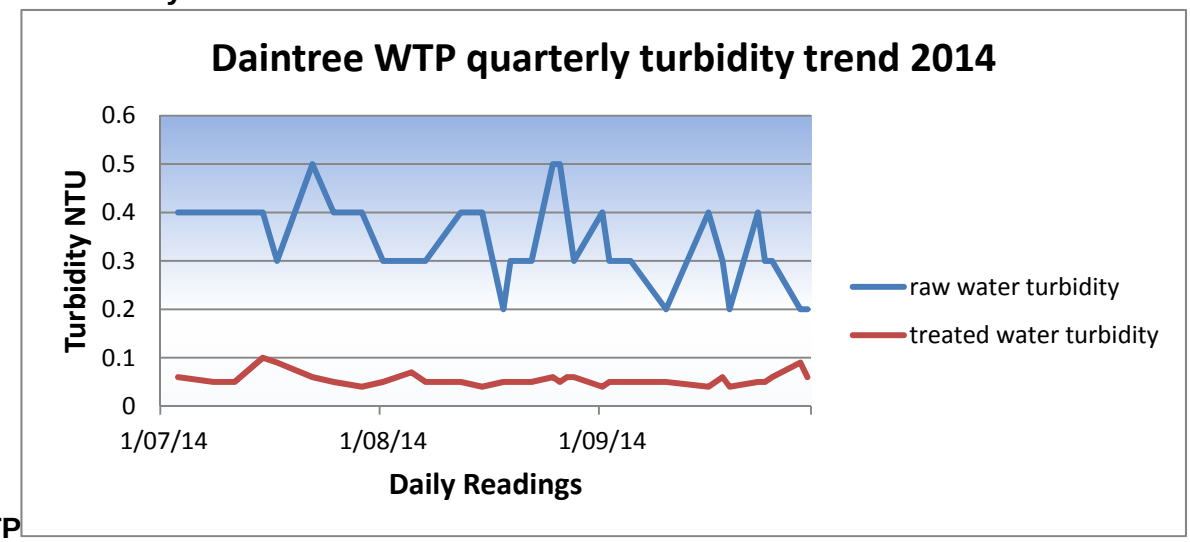


Table 5. Average monthly values for key operational and compliance parameters in treated water at Daintree treatment plant.

Month	pH	Temp °C	Total Alkalinity mg $CaCO_3$/L	Free chlorine mg/L	Total chlorine mg/L	*E.coli* CFU/100 ml	HPC CFU/mL	Total coliforms CFU/100 ml
Standard	6.5-8.5	10-30	0-25	0.1-4.0	-	<1	-	0-10
July 2014	7.56	21.5	16	0.28	0.34	<1	<1	<1
Aug 2014	7.8	21.2	16	0.33	0.35	<1	<1	<1
Sept 2014	7.6	22.7	18.3	0.31	0.35	<1	<1	<1

Fig 11. Turbidity trends at the Intake/Martin Creek intake and treated water at the Daintree WTP



4. Douglas Shire Water Laboratory

Proficiency testing started in August in the Douglas Shire laboratory and 60 samples were analysed and compared with results obtained from the NATA laboratory. Proficiency testing was completed by 30 September. The Douglas Water lab will start with regulatory analyses in October when the schedule in Table 6 will be implemented. Proficiency testing will be monthly and ongoing to ensure a functional and proficient water laboratory.

Microbiological parameters are tested for weekly; 1 week by NATA accredited Laboratory and 3 weeks by Douglas Shire (Colilert-18) Laboratory. Colilert-18 has become the new International Organisation for Standardisation (ISO) standard 9308-2:2012 and detects a single viable coliform and *E.coli* per sample. A summary of the water sampling sites and water quality testing parameters and schedule can be seen in Table 2 and Table 6.

Table 6 Douglas Shire Council Water Testing Parameters and Schedule.
*HPC – Heterotrophic Plate Count

	Week 1	Week 2	Week 3	Week 4	Quarterly
Reticulation	Colour, pH, Temp, Chlorine Residual, Turbidity, *E.coli*, Total coliforms, *HPC, All metals (new ADWG)	pH, Temp, Chlorine Residual, *E.coli* & Total coliforms	pH, Temp, Chlorine Residual, *E.coli* & Total coliforms	pH, Temp, Chlorine Residual, *E.coli* & Total coliforms	
Reservoir	Alkalinity, pH, Chlorine Residual, *E.coli*, Total coliforms, *HPC, All metals (new ADWG)	pH, Temp, Chlorine Residual, *E.coli* & Total coliforms	pH, Temp, Chlorine Residual, *E.coli* & Total coliforms	pH, Temp, Chlorine Residual, *E.coli* & Total coliforms	THM's, Chlorite Naegleria
Treatment	Alkalinity, pH, Chlorine Residual, *E.coli*, Total coliforms, *HPC, All metals (new ADWG)	pH, Temp, Chlorine Residual, *E.coli* & Total coliforms	pH, Temp, Chlorine Residual, *E.coli* & Total coliforms	pH, Temp, Chlorine Residual, *E.coli* & Total coliforms	
Raw				pH, Temp, Turbidity, EC	Alkalinity, Ca, Cl, Colour, Salts, EC, F, Hard, Mg, pH, K, Si02, Na, S04, Turbidity, *E.coli*, ICPMS-Fe, Mn, Crypto, Giardia
Analyses by NATA accredited Laboratory					
Analyses by Douglas Shire Lab (Colilert-18)					

Wastewater

5. Wastewater Reticulation Services

General maintenance was carried out at all 31 sewage pump stations and reticulation networks in the Mossman and Port Douglas catchments. It became evident that the Department of Environment and Heritage Protection (EHP) will implement more stringent standards to control the infiltration into the sewer network in Mossman. Proactively the Wastewater team commenced with the sewer lining activities and the refurbishment of manholes in Mossman as part of the 2014/15 capital works program. The sewer relining project has progressed well during the dry season and most camera investigations were completed. Repair works were undertaken in preparation for relining activities at Sorrento Crescent, Seabrook Avenue, Solander Boulevard and Wharf Street (Port Douglas) as well as in Pringle Street, Alchera Drive and Johnston Road (Mossman).

Table 7. Wastewater Reticulation Services

	Port Douglas Catchment	Mossman Catchment
Pump Blockages	8	1
Sewer Chokes/breaks	2	3
Odour Complaints	2	3
HCB Repairs (House Connection Branch)	8	4

6. Influent and Irrigation Flows

Port Douglas WWTP

A total of 316 658kl of influent entered the Port Douglas wastewater plant during the reporting period. The average daily flow was 3196kl/d and the maximum daily flow was 3798kl/d. Tanker truck contractors delivered 646kl 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 51% of the treated effluent was pumped to two resorts and the remaining discharged in the Dickson Inlet. The Sheraton Mirage received 93 770kl and Reef Links received 68 085kl of treated effluent during this period. Daily SBR flows and total monthly flows for 2014 are presented in Fig 12 and 13 respectively.

Fig 12. Port Douglas SBR Daily Flow

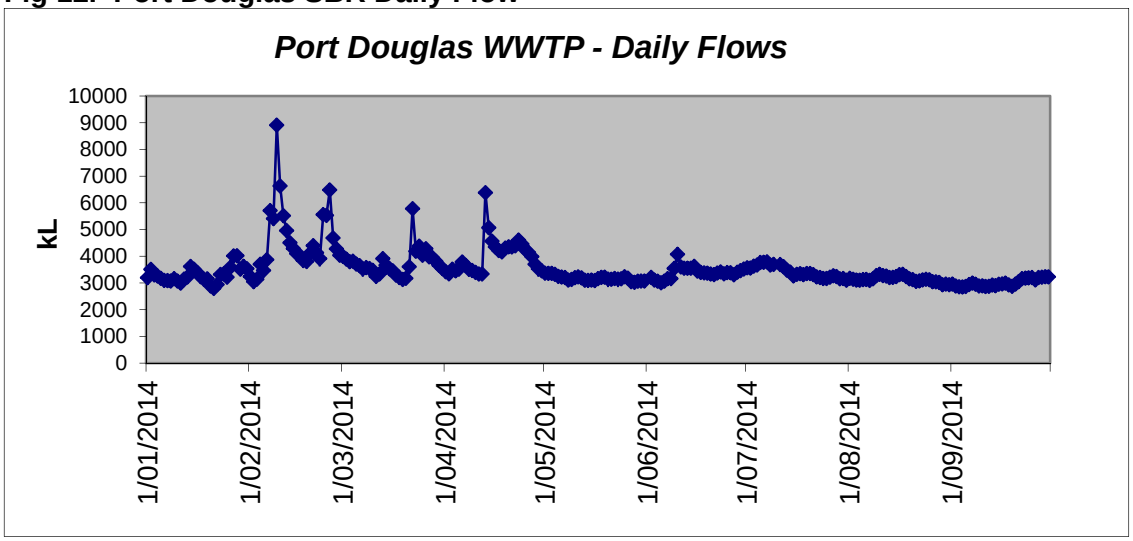
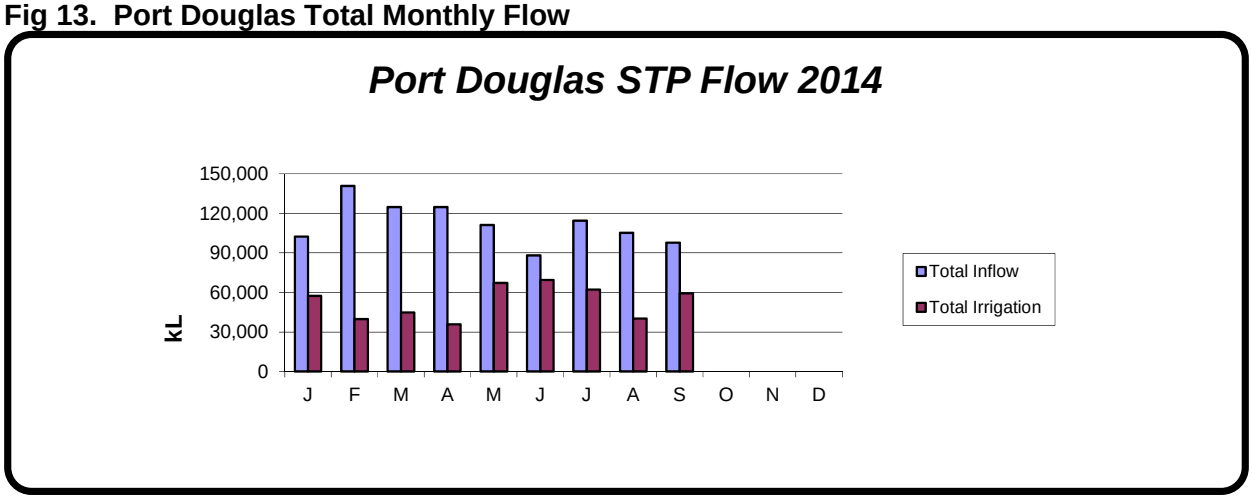


Fig 13. Port Douglas Total Monthly Flow



Mossman WWTP

The Mossman wastewater plant received a total influent flow of 65 114kl during the reporting period. The average daily flow was 707kl/d and maximum flow was 947kl/d. Influent is treated in an Oxidation Ditch system and compliant effluent is discharged in the Mossman River. Daily flows from the Mossman treatment plant and total monthly flows for 2014 are presented in Fig 14 and 15 respectively.

Fig 14. Mossman wastewater treatment plant Daily Flow

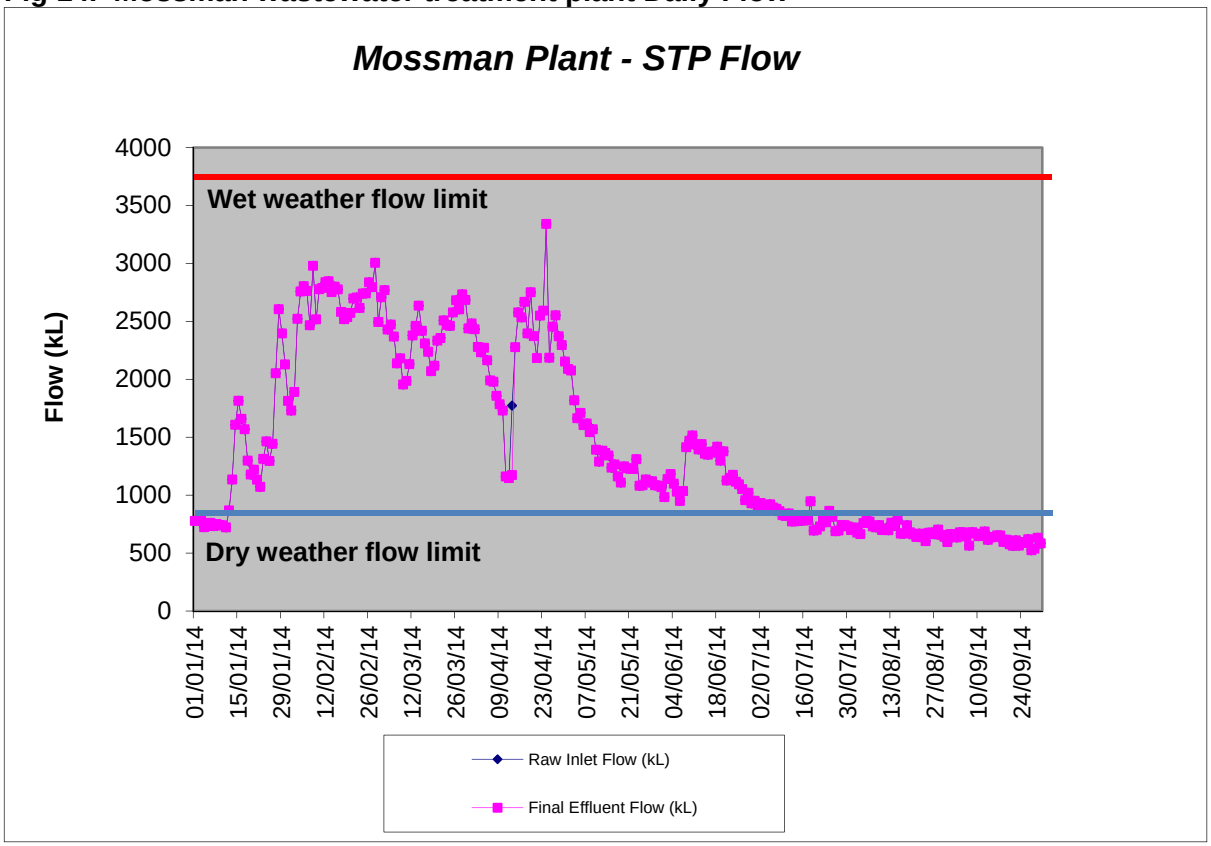
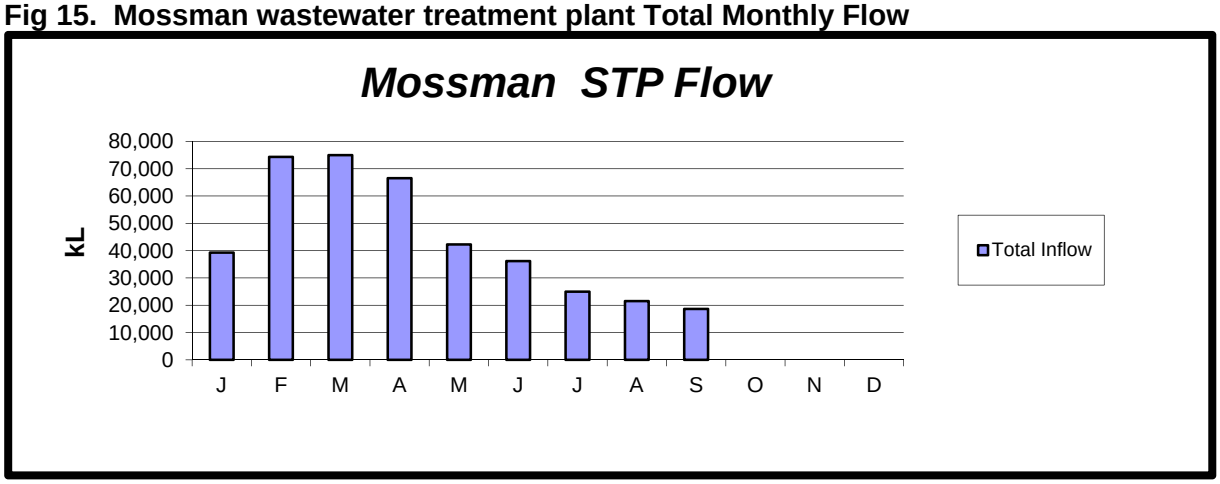


Fig 15. Mossman wastewater treatment plant Total Monthly Flow



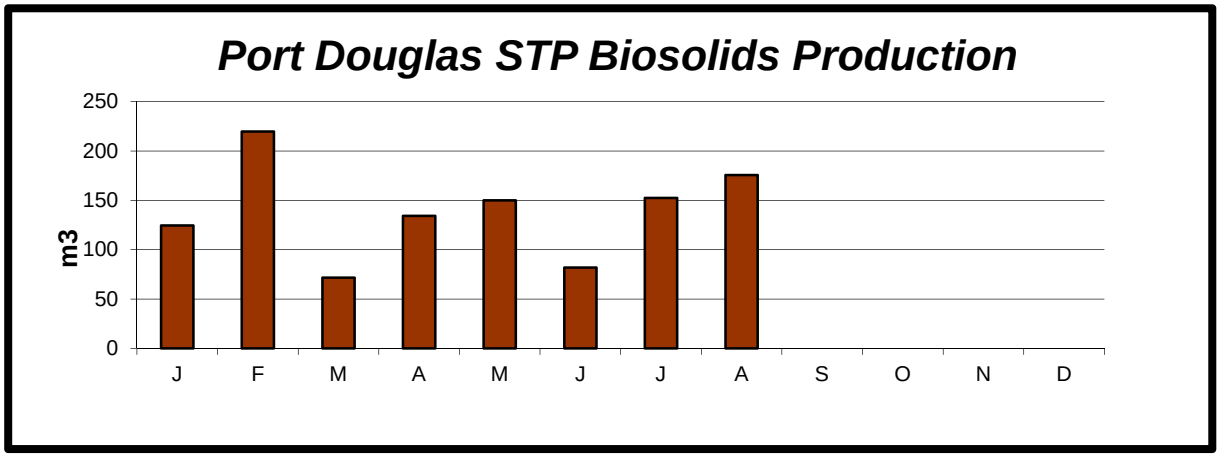
7. Bio-solids Production

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, 74.3 dry tons of bio-solids were produced during the reporting period. The monthly bio-solids production trends can be seen in Fig 16.

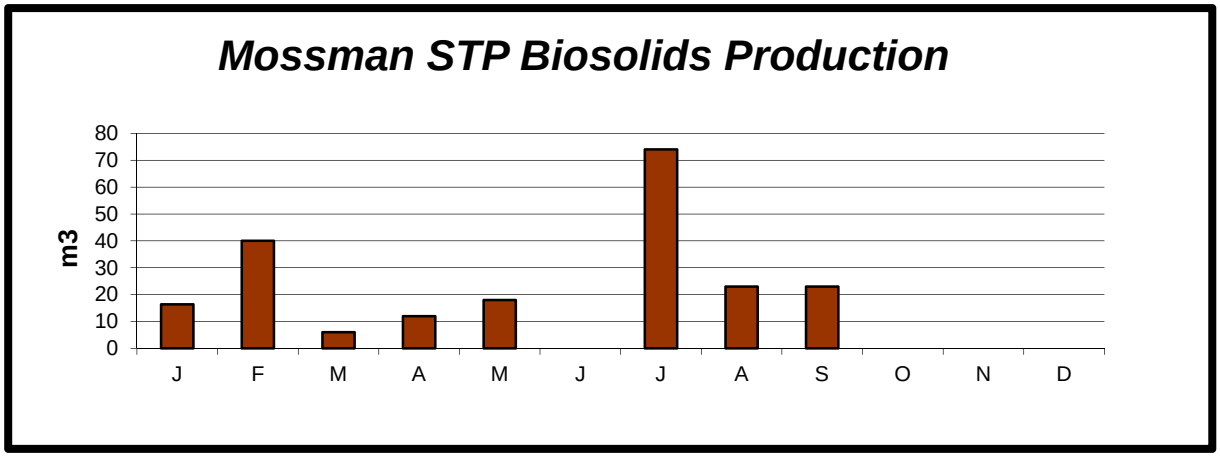
Fig 16. Port Douglas wastewater treatment plant monthly bio-solids production.



Mossman WWTP

At Mossman WWTP, 16.8 dry tons of bio-solids were produced during the reporting period. During June, no bio-solids were produced as a new bio-solid conveyor system was installed at the Mossman wastewater plant. Wastewater operators are no longer required to manually handle bio-solids on site and by employing a semi-truck, the road transport process was streamlined by eliminating another off-loading step. During July significantly more bio-solids were produced as a result of stored sludge during June. The monthly bio-solids production trends can be seen in Fig 17.

Fig 17. Mossman wastewater treatment plant monthly bio-solids production.



8. Effluent Quality and Compliance

During the reporting period a total number of 176 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. One effluent grab sample in a 5 sample time series taken on the 30th of July at the Mossman WWTP exceeded the faecal coliform limit. This result was reported to EHP but did not constitute non-compliance as the monthly 95th percentile remained compliant.

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. As SCADA is an essential component to operate and monitor water and wastewater plants, a quarterly maintenance schedule was developed and implemented to ensure functionality at all times.

Port Douglas WWTP

The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, Total Suspended Solids & BOD) are shown in Fig 18, 19, 20 & 21.

Fig 18. Port Douglas WWTP Final Effluent Test Results for Ammonia

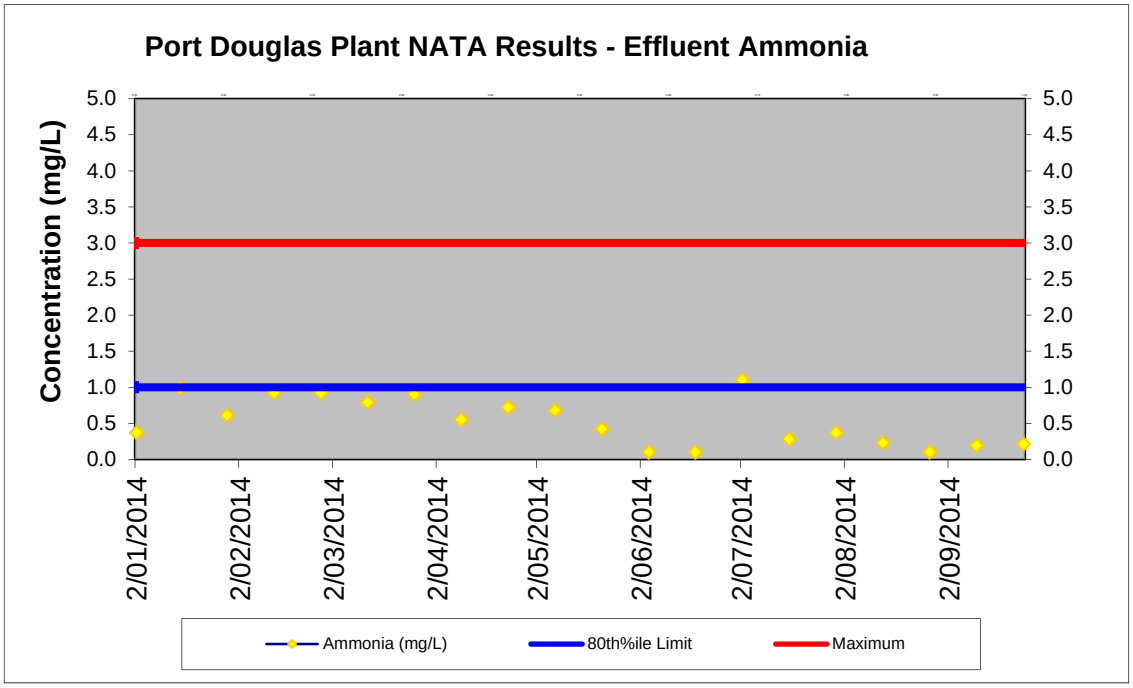


Fig 19. Port Douglas WWTP Final Effluent Test Results for Total Phosphorous

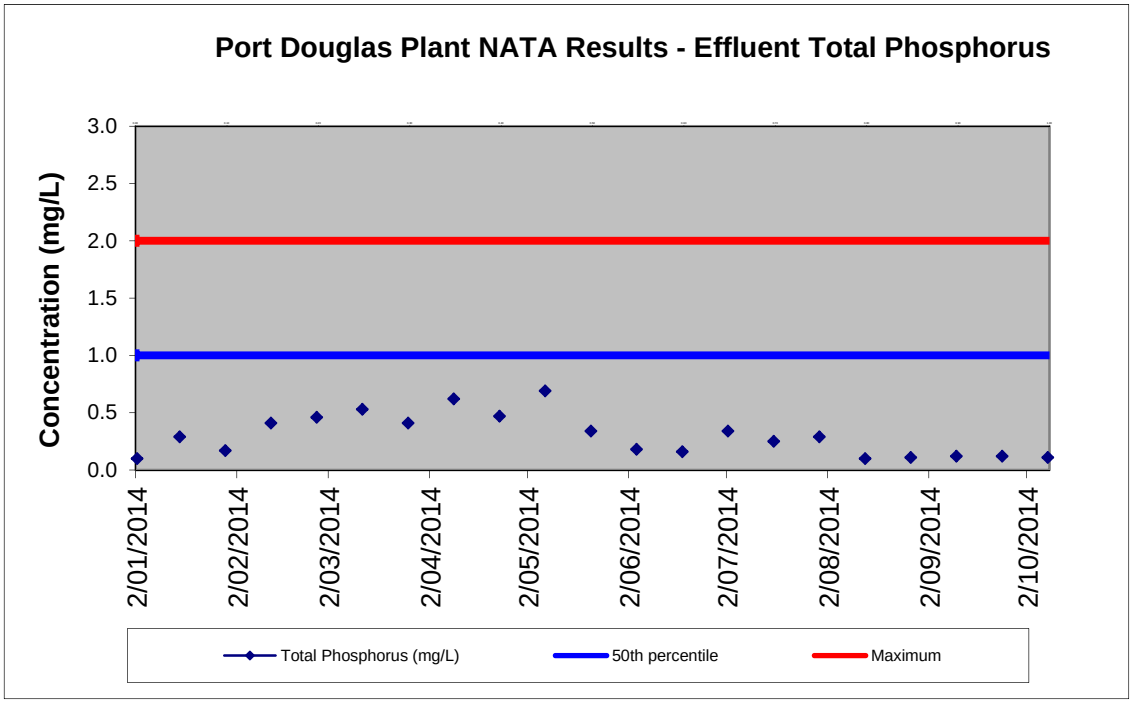


Fig 20. Port Douglas WWTP Final Effluent Test Results for Total Suspended Solids

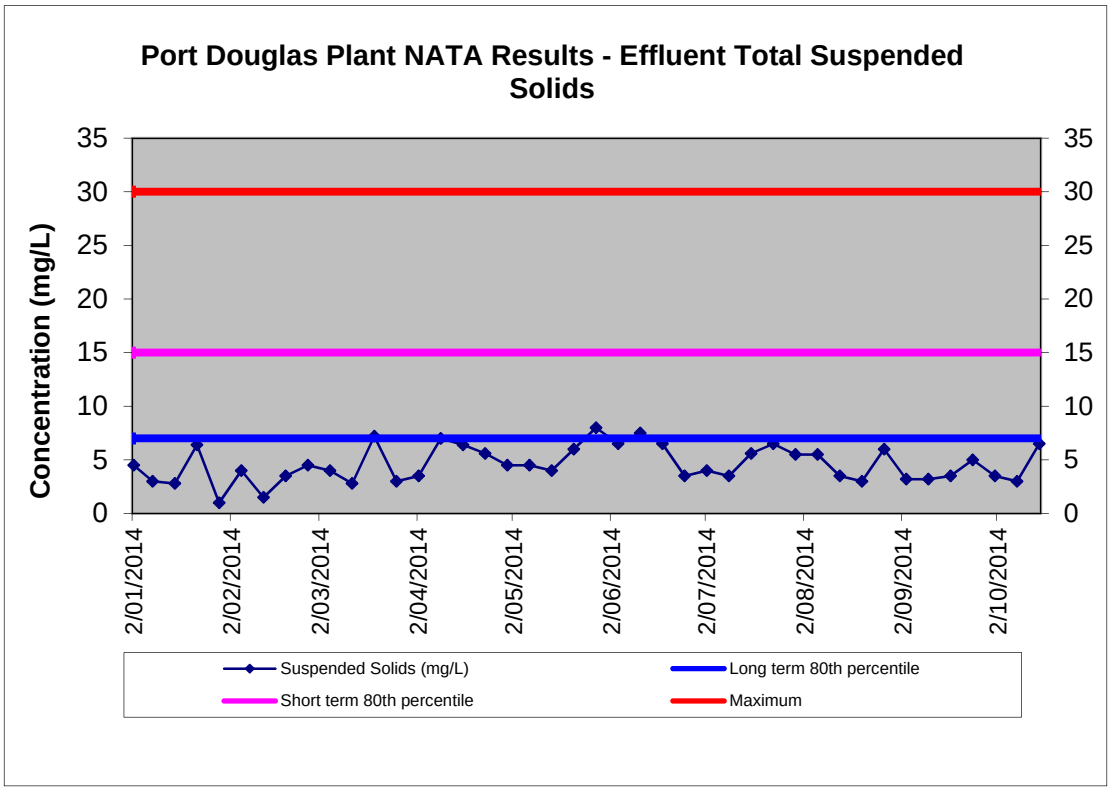
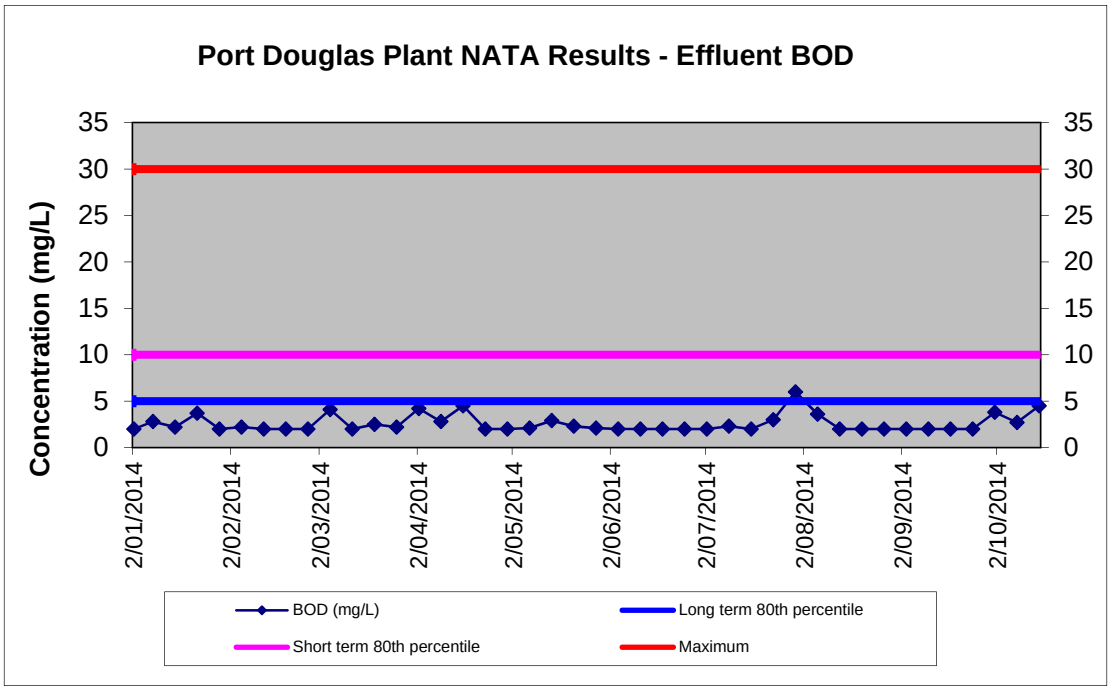


Fig. 21 Port Douglas WWTP Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)



Mossman WWTP

The results for final effluent key licence compliance parameters (Ammonia, Total Phosphorous, Total Suspended Solids & BOD) are shown in Figures 22, 23, 24 & 25.

Fig. 22 Mossman WWTP Final Effluent Test Results for Ammonia

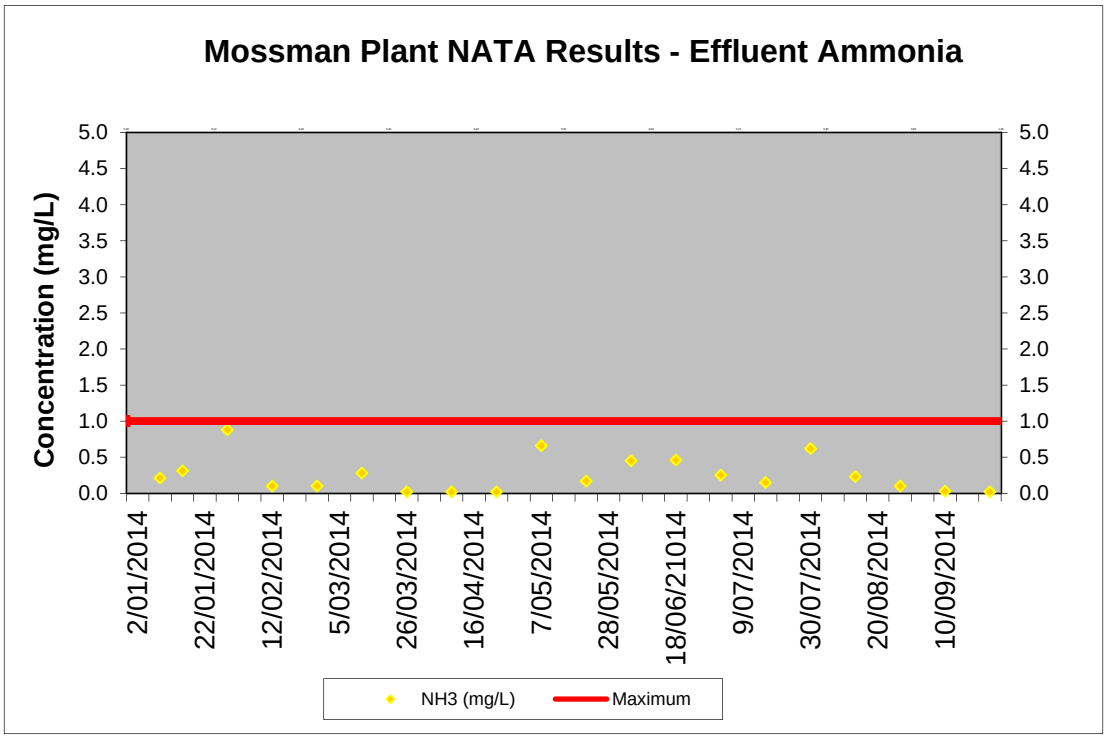


Fig. 23 Mossman Douglas WWTP Final Effluent Test Results for Total Phosphorous

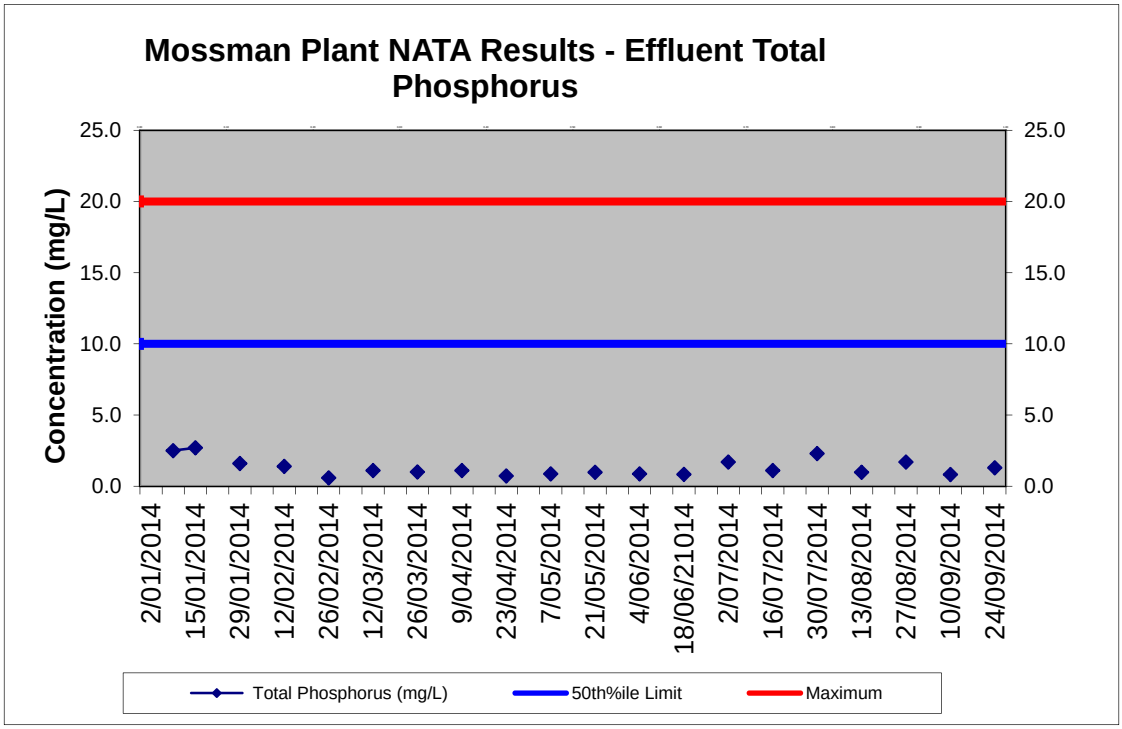


Fig. 24 Mossman WWTP Final Effluent Test Results for Total Suspended Solids

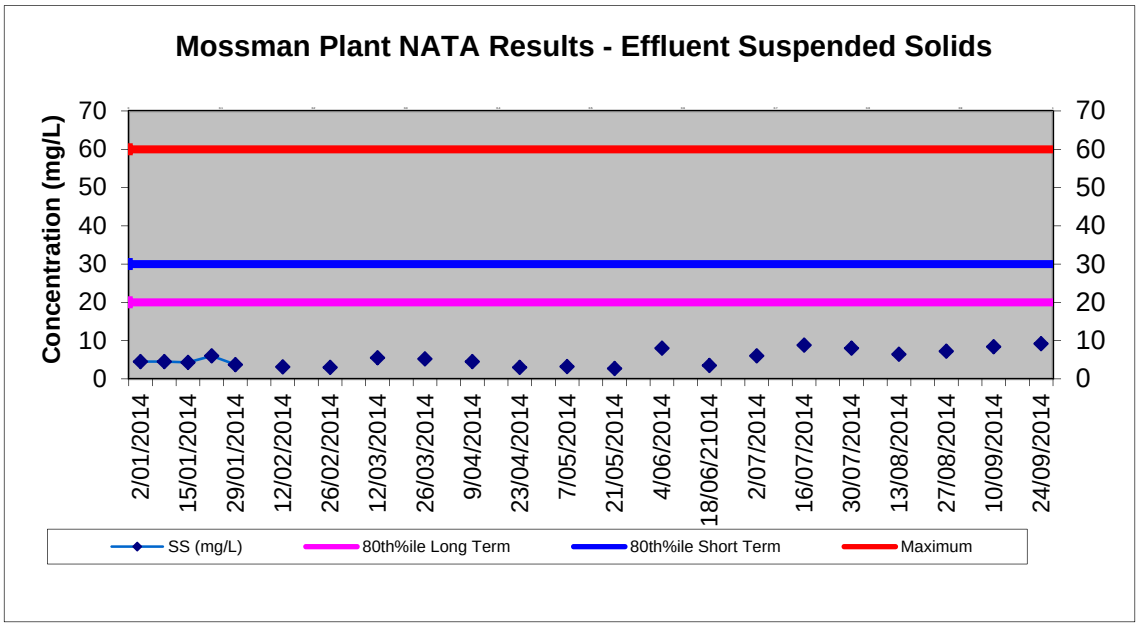


Fig. 25 Mossman WWTP Final Effluent Test Results for BOD_5 (Biochemical Oxygen Demand)